The Probabilistic State of Computer in Secondary School Education: A Case Study of Oredo Local Government Area, Edo State

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Authors' contributions

This work was carried out in collaboration among all authors. Author MSUO structured the study, directed the statistical analysis, overhaul the study and wrote the manuscript. Author OS managed the analyses of the study. Wrote the manuscript and managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Computer education around the globe has taken a new dimension and countries that have integrated computer into class room teaching have succeeded in reducing the deficit of traditional classroom education of late 80s and 90s. 21st century children have a different educational mentality to that of 19th century children and the advancement in technology has indeed changed the narrative. However, the 21st century has some setbacks in computer class rooms' integration and this seems to be a similar problem with the developing countries. To a great extent, the quest

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to make the secondary school students use computer in class room has yielded no result in Oredo Local Government Area. This paper examined and conducted a survey on the use of computer in Oredo Local Government Area Secondary School through structured questionnaires. From the survey, it was observed that the Secondary Schools in Oredo Local Government Area of Edo State are yet to comply with the 1987 initiative of the then Federal Government of Nigeria to make computer available in all school which in turn, led to the National Computer Policy of 1988. As at today, the Secondary school students are still being taught computer classes without having computer to demonstrate the nitty-gritty.

1. INTRODUCTION

Computer as a system is a complete chain and if the scheme in Nigeria education is fully realized it will entrench the dichotomy existing between the developed and developing countries education. Information and Communication Technology (ICT) such as the internet has been seen in recent times as a variable tool that can change the scope and size of the developing countries and the opportunities from it access is indeed endless [1,2]. The past four decades saw computer usage relegated to a handful of professionals as many were without computer knowledge, thereby leading to few individual having it. Progressively, the quest to having computer knowledge and training became re-sounding in 21st century and this was because it has witnessed a turnaround in its knowledge, skills and training [3,4]. Other reasons that have changed the narrative of computer usage are

1. Job Creation
2. Speed of doing business
3. Advertisement
4. Technology
5. Research

On job creation, it seems the developing countries have no idea of what computer offers as well as it several developmental advantages to youths and society. Countries that have successfully implemented computer into it economy have witnessed drastic reduction in crime such as banditry, kidnapping, petty crime etc. furthermore, people now owned businesses through the use of computer without necessary looking forward to government. One of the indices that determines country viability is it Gross Domestic Product (GDP) and this is down to the ability to develop product that are consumable internally as well as having enough to export to other countries. As a result, computer has not only helped in this regard but has fostered the tendency for youth to learn new

skills for production. The manufacturing of hardware components of computer is another massive job creation. Companies who are into this have created life lasting income for its citizens. Today, many youth are engaged in the repair of the hardware components which are other areas of job creation. Software development/production is one area that youths of the 21st are gaining employment on daily basis. There are countless aspects of job creation through computer. However, this paper will only concentrate on the few explained above [5,6].

Few decades ago, task use to take several months and time before delivery but the introduction of computer and modern technology into the operation has made relatively task easy and simple. Recall that one of the characteristics of computer is speed and the purpose of it creation is centered on the core characteristics and of which, speed is one of them. Task like result preparation, account processing and engineering drawing have become simple with computer introduction. Before the advent of computer, many businesses lacked the local practice of keeping up with clients or customers and as result, many could not stand the test of time. Businesses are driven by the number of clients or customers reached, so, advertisement is a strong tool in business management and businesses that have succeeded over the years have employed one advertisement technique or the other to keep up with the competitive market. Today, businesses have now adopted the use of computer in reaching out to millions of customers and this is seen as one of the economy advantages of computer in modern society. Several online businesses such as Business to Business (B to B) and Business to Customers (B to C) are striving due to the proliferation of computer around the globe. Computer has changed the shape of business and the results are seen from social media and other computer channels advertisement. Technology is another

area where the use of computer has been felt and knowing that technology is the application of scientific knowledge into the production of tools, machines or in general, goods and services, hence, computer has helped to bridge the gap, thereby leading to rapid design and techniques in technological application. So, computer is important as it has opens up more job opportunities, enhanced professionalism by way of record keeping and the convenient of transactions [6,7].

From research [8], it has been observed that developed countries that have sustained the policy of classroom base computer as well as it introduction to secondary schools curriculum have seen an upward trend in the quality of students studying different courses in higher institution. Computer proficiency can be quite difficult to acquire at adulthood because the basis can be seen as childish in so many ways. Developed countries, knowing fully that computer proficiency is something that must be acquired from foundation class, attentions are given to these low level classes to help instill the right standard and practice and when in adulthood, the nitty-gritty of what computer represents has been fully synergized [9,10]. Computer as a name is one world but the complexity in it details can be discouraging and this is because the language of communication is far from human languages. Though, simplicity had been made (translation) in the course of manufacturing but computer code and syntax are known to be abstract in nature. There are several computer users which are:

(a) Application Oriented Users,
(b) Goal Oriented Users
(c) Computer Oriented Users

Notwithstanding, effort should be geared towards computer oriented which to this paper; it encompasses the two other users. While developing countries concentrate so much time on the gain of the first and second users, developed countries dwell more on the last users which tend to have full understanding of what the computer entails. The design of hardware and coding of software over the years have not been given the needed attention by the developing countries because the basic foundation of computer integrated into secondary school curriculum has not been sustained [11]. Computer proficiency is beyond assembly computer hardware in laboratories. It cut across employing the services of skill personnel/

teachers as well as equipped them with current and active software that the student can learn from [12]. The challenges with the developing countries sustainability of computer based classrooms has been seen to be more of politics than competence. There is virtually no specific plan for improvement in this regards which indeed posed a challenge to the developmental skill or learning of the student who are the first beneficiary [13,14].

This work has been structured as follows: Section 2 covered review of relevant materials to secondary school computer education, section 3 showed conceptual structure of computer integration, Section 4 examined the features of computer, and section 5 discussed the method and the analysis of the work while section 6 showed the concluding part of the work as well as the findings.

2. RELATED WORK

The Federal Government of Nigeria introduced Computer as a subject into secondary school curriculum in 1987 and this was as a result of the meeting held by the National Council on Education in 1987. This decision brought about the Nigeria National Computer Policy (1988) [15]. The policy aimed at making computer hardware, maintenance, funding, teaching personnel and training part of the academic culture and the idea is to make learning/ teaching effective. Part of the questions was that can the policy be achieved? Since the enactment of the policy by the National Council on Education, which is over three decades, the objectives as stated by the policy are still far from reality. The body charged with the responsibility for the policy implementation seems to be far from the understanding of what computer offers. Several outlines as stated in the policy document (computer system, e-learning, internet, software, and other peripherals) are yet to be implemented in Nigeria secondary school, even when the world has gone global through technologies. The policy document (Nigeria National Computer Policy of 1988) which may have been forgotten by government and relevant agencies stated clearly the roadmap of computer proficiency. Today, there are no computer laboratories in secondary schools to cater for the hardware, software as well as the teaching process. Schools that developed interest in having computer laboratory had failed to equipped the laboratory with modern technological facilities [15].

Some schools have over the years have demonstrated wiliness to keeping up with the policy standard of the Nigeria National Computer Policy of 1998 but have no technical ability to regularly carry out maintenance on the computer hardware and software system. The great challenge facing the successful implementation of computer base classroom in Nigeria has been the funding of the National Computer Policy. The Nigeria budget over the years has not given preference to the educational sectors. The budget for 2019 stated that education ministry gets 7.02%, this is 12.98% below the half of the minimum budgetary allocation of 20% recommendation by the United Nations for developing countries. The trained personnel have been completely abandoned. Schools with computer systems do not have qualify teaching personnel to teach students. There is little or no provision for the guidelines on computer base teacher's proficiency. If the teachers that are to be trained are not adequately trained it is expected that the students would not be able to learn the needed skills. What is seen in the study of computer today is simply an act of an isolated teaching by the various secondary schools. Computer system is supposed to be taught holistically so as to bring to the students the needed skill that could further translate to development [16]. The decision by the Nigeria Federal Government to enact the Nigeria National Computer Policy in 1988 was from the idea of the clear advantage of computer literacy to society; the 21st century has seen these clear advantages in different dimension. Few of these advantages as stated above showed clearly the benefits individual and society can gain. The best way to reduce crime is through job creation and computer literacy is one of the ways to reduce crime. As at today, computer cut across all aspect of industrialization as well as the production of goods and services. There are virtually nothing done on earth without the application of computer, outside the sales of the computer hardware and software components which is one aspect of job creation the entertainment industry progressive revolution is owned to the role of computer application. The industry as at today is creating millions of job for Nigeria citizens. Though, in this paper computer is been examined from a direct aspect of job creation but the indirect job creation by computer is more in number than the direct job creation. Modern farming used computer to ensure sustainability. Crops are now scientifically analyzed/modify with the use of computer and these are what computer does in 21st century [17].

The computing industry since it advent has not been static rather; its flexibility has been one of the key interest generated by users. Virtually every day, old technologies and applications fade away while new once emerged. So, coping with this trend has been one of the greatest challenges with end users. However, the basic foundation of computing remains the same. Computer is basically subdivided into three distinct areas of data manipulation and these are input, process and output. The basic foundation of computer as stated above is an edge into knowing how other aspects of computer function and this is one of the reasons why developed countries introduced it early in an elementary curriculum. Developed countries method of funding is one aspect that encourages young students to not only study it but exploit the nitty-gritty of the meaning. Computer is the bridging block of modern society. Company with recruitment advert always requires the service of professionals or employees who are computer literate. Hence, an employment advert made always have computer proficiency as one of the cardinal principle or added advantage for employment. Some establishments in the course of conducting interview provides functional computer with modern software to test the capacity of the applicant and this practice has been because it pays better to have employee with computer skill than those without. The communication industries owned it successes to the introduction of computer. The role it has played over the years is an indication of it role in economy viability among end users, government and the world in general [18,19].

3. CONCEPTUAL FRAMEWORK OF COMPUTER INTEGRATION

There are several aspects of computer that interest end user. The flexibility associated with it usage is one aspect end users cherished and this is down to it definition. Different views have emerged from the definition by scholars but this paper takes a look at the view of few authors [20]. Defines computer as a combination of related devices capable of solving problems by accepting data, performing described operations on the data, and supplying the results of these operations [21]. Defines computer as an electronic device which stores information on

disc or magnetic tape, analyze it and produced information as required. In the remark of [22] computer is a device that accepts data in one form and processes it to produce data in another form. The most profound aspect of all these definitions is on the fact that computer accepts, process and display data which is the structural framework captured in Fig. 1. The computer studies as showed in the second module of Fig. 1 is the systematic application of computer into the learning process of secondary school student while the secondary school is the formal and most second vital stage of human education. The stage serves as a bridging block to lower and higher level education. In a holistic form, the structural framework work as an entity to producing the proficiency needed for economy viability.

According to [15] in the 32nd ministerial council meeting of the National Council on Education in 1987 the federal government of Nigeria initiated computer education into the learning process of secondary school; this led to the constitution of the National Committee on Computer Education to come up with people oriented policy on computer literacy with clear focus on advising government on strategies for implementation. The terms of reference as stated by the federal government are computer literacy among Nigerians by mid-1990s, a platform that encourages student to learn and use computer. As also reported by the Nigeria Tribune in April 11, 1988 the area of the policy indicated that a class should not be more than forty (40) students and eight (8) personal computers (PC) should be allocated to school [23]. Much have been given to other areas of computing but most worrisome is the fact that there are no clear indices that show the growth of classroom computer usage in Nigeria. The body saddle with the responsibility of providing the relevant data has failed in this regards.

Developed countries like the United State (US) had over the years created strategy for monitoring the progress of computer usage in classroom. According to [24], the U.S. National Center for Education Statistics (NCES) revealed that 97% of U.S. classroom teachers used computer. In 2012, the Nigeria Communications Commission's (NCC) in a study also showed the Nigeria's PC ownership penetration [25]. The survey conducted by Nigeria Bureau of Statistics (NBS)'s laid claimed to NCC report showing low penetration of PC usage by Nigerians [26]. Computer is a game changer; it has been seen to have transformed the educational system of the developed countries. Computer did not only facilitate learning it helps in the buildup of educational process. Thousands of information that used to be stored on hard copy, making it cumbersome to convey from one spot to another has become a thing of the past due to the computer availability in housing same materials in software format.
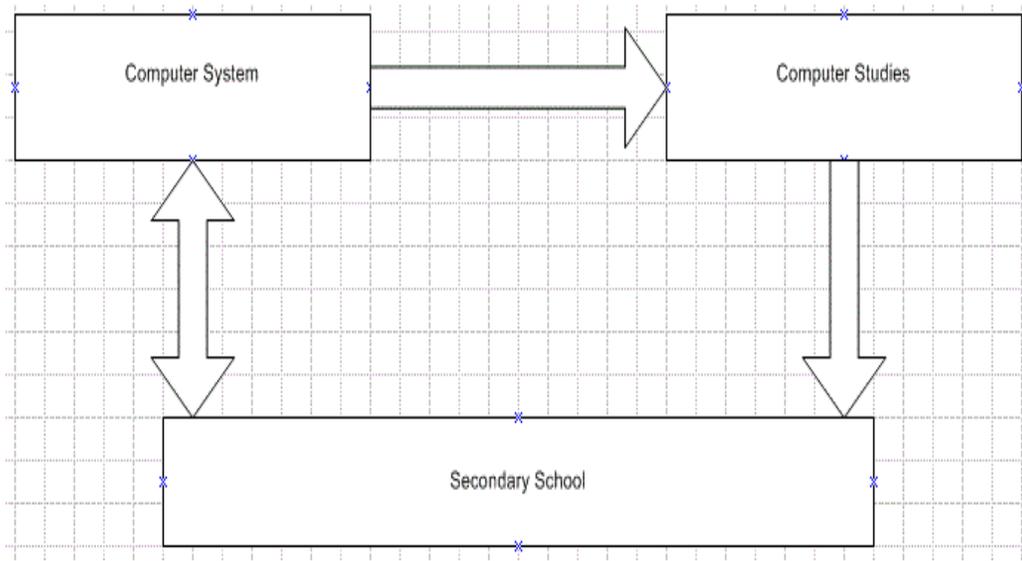

Fig. 1. Class computing integration

4. COMPUTER AND THE NIGERIA CHILDREN EDUCATION

There is no doubt that the use of computer in Nigeria has come to stay, so the necessity of it usage by school children is highly imperative vis-avis the computer policy of 1998. The current state of the nation with so much dependent on oil has not helped so, focus should be shifted to more lucrative and versatile source of revenue. In recent times, there is serious orientation by professional and the developed countries on the need to full implementation of computer in secondary school owning to the benefit associated with it in future. Several opportunities abound with computer. The emergence of digitalized communication means has further demonstrated key areas where opportunities abound with computer literate [18]. The communication industries job chain cannot be under estimated, it emergence has brought to the door step of Nigeria school children life time opportunity that should not be overlook.

The integration of computer into communication industry and other manufacturing industries gained momentum with a shift from analogue to digital computer and since this introduction, computing via computer has not suffer setback rather people have positive experience with it reengineering process. Apple and other communication technological industries like Microsoft, Samsung have over the years reengineered their products and the reason is sequel to how the economy of both developed and developing countries have embraced computer as a positive technological revolution. Notwithstanding, the revolution to computing gadget could be said to be the characteristic associated with computer as an electronic machine [18].

(a) Computer Characteristic

i.   **Fast:** The beauty of computer is the fastness it brings; it can perform multiple tasks in few seconds as compared to human that spend endless time resolving the same issue. It is deigned to process instructions per second no matter the amount.
ii. **Accurate:** It is evident that calculations accuracy is better achieved with the use of computer. It is more accurate than human calculation because it works on the principle of garbage in garbage out. Mistakes do not associate with computer when performing instructions.
iii. **Diligence:** Usually, human get tired when over stressed but computer does not suffer from the human tiredness.
iv. **High Memory:** Though, human memory is infinite, but computer memory has storage capacity of much size one cannot imagine. It has ability to store millions of data and instructions, which can be retrieved and recalled at any given point in time.
v.   **No Intelligence:** Computer though processes data as intelligence being it obviously a machine that work on the command guidelines of it user. It has no ability to decide for itself.

(b) The Need for School Children Computer Education

Many reasons abound for students' quest on computer education. Though, series of drawbacks (insecurity issues) are some of the reasons [27,28] but the demand for computer education in recent times has taken a new dimension and this is as a result of the technological advancement in all spheres of life [29]. Indeed, time has changed and humans have tried to also follow the trend. The advent of modern technologies such as projectors, television, computer, network of various forms, and some other supporting classroom technological devices have made learning an interesting thing around the globe [30]. Nigeria 21st century children are more open to modern technologies and via these technologies they see their peers from developed countries as well as the impact of the devices in their academic. These and more have forms the needed desire to participate fully in the benefit of what the technology offers. Critical areas that have increased the children quest for computer education are:

i.   **Modernizing Education:** There is no comparative disadvantage on the old method of teaching over the modernize approach to teaching in the 21st century; rather, the modernized approach has superior advantage over the ancient method. Prior to the discovering of classroom technologies, many classrooms' teaching in the developing countries where awkward and disgusting and this was because it failed to produced competitive children with the developed countries.
ii. **Improving Student Performance:** The defining state of education is the result

obtained and studies have showed in recent times that the academic performance of students improved exponentially with the use of technology when compare to the traditional method of classroom teaching

iii. **Learning Job Skills:** The main reason for acquiring formal education is to become professional and the use of computer provides these students with the opportunity to learn different skills. Nowadays, people go to YouTube to learn different skills and without the knowledge of computer this might be quite difficult.

iv. **Efficiency:** The characteristic of computer above stated that computer posses some vital features that made it friendly for use and one of them is the accuracy which inline produces efficiency in return.

v. **Research:** The world is shaped by research. The computer revolution and ICT is the brain child of research. No country succeeds without given preference to research. Computer remains a vital organ in this practice. Many resources are gotten by simply using computer to connect the world and source for the relevant material.

5. METHODOLOGY AND RESULT ANALYSIS

The sample selection method was based on the fact that there are 12 wards in Oredo Local Government Area of Edo State namely GRA/Etete; Ibiwe/Iwegie/Ugbague; Ihogbe/ Isekhere/Oreoghene/Ibiwe/Ice Road; Ikpema/ Eguadase; New Benin I; New Benin II; Ogbe; Ogbelaka/Nekpenekpen; Oredo; Unueru/ Ogboka; Urubi/Evbiemwen/Iwehen; and Uzebu ward. A sample size of the study was 100 students and 25 each from two public and two private schools in two wards via simple random sampling. Questionnaires were administered to hundred (100) students to get direct information on the teaching of Computer in secondary school. Fifty (50) respondents were from public and private secondary schools respectively. A total of ninety-seven filled questionnaires were retrieved from respondents.

(a) Description of Respondent's Demographic Data

From the gender perspective as showed in Table 2 the segregation that existed in the 19th century over the none schooling of female student may have tradistically erode from the public domain. This is indeed good indication to making all geneder know the usfulness of computer and it associated facilities. From the standard devition in Table 1 it could be said that no signifivcant differece exist in the number of boys and girls respondent and if further operation was to be conducted it would be that $H0: \delta_1 = \delta_2$ will not be rejected because from all indication, the observed value of t if callulcated, would not be more than the critical value of t with difference of $50 + 47 - 2 = 95$ at .5 level. Table 3 Hence the male and female do not differ significantly in variability.

Table 1. Respondent's statistics

		Gender	Age	Educational level
N	Valid	97	97	97
	Missing	0	0	0
Mean		1.48	1.87	1.96
Median		1.00	2.00	2.00
Mode		1	2	2
Std. Deviation		.502	.342	.200
Variance		.252	.117	.040
Sum		144	181	190
Percentiles	25	1.00	2.00	2.00
	50	1.00	2.00	2.00
	75	2.00	2.00	2.00

Table 2. Respondent's gender

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1 (Male)	50	51.5	51.5	51.5
	2 (Female)	47	48.5	48.5	100.0
	Total	97	100.0	100.0	

Table 3. Overview of the statistical analysis

N	Valid	97	97	97	97	97
	Missing	0	0	0	0	0
Mean		1.48	1.56	3.40	3.70	3.73
Median		1.00	2.00	3.00	4.00	4.00
Mode		1	2	5	5	5
Std. Deviation		.502	.499	1.491	1.459	1.350
Variance		.252	.249	2.222	2.128	1.823
Range		1	1	4	4	4
Sum		144	151	330	359	362
Percentiles	25	1.00	1.00	2.00	3.00	3.00
	50	1.00	2.00	3.00	4.00	4.00
	75	2.00	2.00	5.00	5.00	5.00

Table 4. School with alternative source of energy

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1(Yes)	50	51.5	51.5	51.5
	2(No)	47	48.5	48.5	100.0
	Total	97	100.0	100.0	

Table 5. Number of computers in computer laboratories

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1(Yes)	43	44.3	44.3	44.3
	2(No)	54	55.7	55.7	100.0
	Total	97	100.0	100.0	

Table 6. Number of computer classes in the computer laboratory

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1(Always)	13	13.4	13.4	13.4
	2(Often)	17	17.5	17.5	30.9
	3(Sometimes)	24	24.7	24.7	55.7
	4(Seldom)	4	4.1	4.1	59.8
	5(Never)	39	40.2	40.2	100.0
	Total	97	100.0	100.0	

Table 7. Functionality of the computers

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1(Extremely)	12	12.4	12.4	12.4
	2(Very)	9	9.3	9.3	21.6
	3(Moderately)	22	22.7	22.7	44.3
	4(Slightly)	7	7.2	7.2	51.5
	5(Not at all)	47	48.5	48.5	100.0
	Total	97	100.0	100.0	

Table 8. Teachers teaching computer class with computer

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1(Always)	7	7.2	7.2	7.2
	2(Often)	12	12.4	12.4	19.6
	3(Sometimes)	26	26.8	26.8	46.4
	4(Seldom)	7	7.2	7.2	53.6
	5(Never)	45	46.4	46.4	100.0
	Total	97	100.0	100.0	

Table 4 showed that 52% of the respondents stated that there was an alternative source of energy to power the computer systems. This was indeed positive for a modern education. However, the 48% without alternative source of power is a worrisome proportion because for this to be fully positive for school children 90% of secondary school must have alternate source of energy because the nation power supply is epileptic. 44% as indicated in Table 5 showed that the computer in the computer laboratory were eight and above which corresponded with the best practice as stipulated by the Nation Computer Policy of 1988 but 56% said the policy is still far from reality because the computer are not there. 13% as captured in Table 6 stated that computer studies was taught in the computer laboratory, 18% said they are often taught computer studies in the computer laboratory, 25% stated that they are sometimes taught computer studies in the computer laboratory, while 4% stated that they are seldom, however, 40% said they are never taught computer studies in the computer laboratory. Furthermore, Table 7 showed that 12% stated that the computer systems in the school computer laboratory is functional, 49% stated that the computer systems in their schools' laboratory is not functional and this correspond with 46.4% Table 8, who said they are never taught with computer during computer class.

6. FINDINGS

I. The computer laboratory in the secondary schools in Oredo Local Government do not have eight and above number of computers as prescribed by the National Computer Policy of 1988.
II. The secondary schools in Oredo Local Government do not teach the student's computer studies in the computer laboratory though the laboratory was available in the school.
III. The computer systems in the computer laboratory as captured by the survey are deemed not to be functional.
IV. The teacher(s) do not teach the student with computer when teaching computer subject .

7. CONCLUSION

This research examined the effect of computer system in the teaching of computer studies in secondary schools located in Oredo Local

Government, Edo State. Therefore, on the premise of the inference from the respondents, it could be said that computer system is not used in the teaching of computer studies in the secondary schools. Oredo Local Government is where the State Government house is situated and all the arsenals of government and the wealthy citizen resides in the local government. Now that the schools situated in the area is far from implementing the use of computer in secondary school what more can one expect from other Local Government Areas in the state. From the above analogy, other schools in Edo State are within the same circle of none implementation of computer system in class rooms teaching. This is not a good trend for the 21st century school children who by all standards are the same with other children around the globe. The state Government and stakeholders in the educational sector and should as a matter of urgency of spirit of development implement the National Computer Policy of 1988 setup by the then Federal Government to bridge the gap between developed countries and Nigeria. Until these are done we cannot boldly say that the computer integration into secondary school system is in the right direction.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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