Prospects of Computer Assisted Learning (CAL) Programme in Secondary Schools in Katsina State-Nigeria

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Abstract
This paper highlighted the prospects of mounting Computer Assisted Learning (CAL) in secondary schools in Katsina State. Concept, goals and benefits that could be derived from E-Learning and CAL programme were discussed. Implementation of the CAL programme with JSS and SSS one classes, assistance from Public libraries, Adult education centers and Social welfare centers in providing CAL classes for students consumption during vocation were among some of the strategies outlined for proper implementation of the CAL programme in the state. Benefits that could be derived from the integration and mounting of CAL programme in secondary schools in the state includes syllabus coverage, bridging the gap between higher and lower academic achievers, providing opportunity for a student to learn at his/her own rate and vaccine against examination malpractice. Pilot testing; Precautionary measures such as rules and regulation governing the uses of CAL programme by students; effective supervision by school authority and State zonal education in each local government areas of the state and provision of adequate CD-ROM tutorials in various secondary school subjects were among the recommendations made for the effective implementation and sustainability of the programme.

Keywords: Prospects, E-Learning, Computer Assisted Learning Programme, Secondary Schools.

Introduction
In Nigeria, a great deal of learning in secondary schools takes place through listening and reading (Cognitive aspect), without taking into consideration of the attitude, interest (Affective domain) and skills application (Psychomotor domain) of the learner. A strong belief by educational technologists is that learning is expected to have more important and lasting effect if it is complemented with practical experience (Abdullaki, 2007) that could capture the three cognitive domains of educational objectives. Butcher (as cited in Peters, 2001), observed that computers are capable of providing adaptive teaching programmes that could accommodate all the three domains of Blooms taxonomy of educational objectives. Computers can stimulate a living dialogue between the student and the computer in which the
student’s reactions can determine the sequence of presentation and the amount of explanation, assistance and practice which he or she gets, Butcher (as cited in Peters, 2001). In computer assisted learning for instance, even wrong answers have some explanations provided for them, unlike the traditional teaching method where feedback is not immediate.

Computer Assisted Learning (CAL) is suitable and less expensive when compared with Internet services (Web Assisted Learning). Teaching resources on CAL could be provided on CD-Roms. CD-Roms have the advantage of much faster access speeds than the Web Assisted Learning (WAL) and less risk of temporarily out of service or virus risk. As such reliable and versatile medium for individualizing assisted learning is CAL. Hence the global tidal wave in the world of education industry today is one characterized by its practical objectivity, functionality and efficiency. It is one whose efficiency is capable of producing valid consequences. With advent of the computer in this century, human life activities have been drastically improved. Consequently, education and economy are now technologically based.

Katsina State was fortunate to have the resources like computer laboratories built, well equipped with facilities in all its 34 local Government Areas that could marry the mounting of CAL learning in its secondary schools.

The Concept of Electronic Learning (e-learning)

Electronic learning or e-learning is a term for all types of technology enhancing learning (TEL), where technology is used to support the learning process. Often the medium of instruction is through computer technology particularly involving digital technologies. E-Learning has been defined as “Pedagogy empowered by digital technologies”. (Nicholas, 2008). E-Learning refers to the use of Information Communication Technology (ICT) to enable the access to online learning / teaching (Arkorful & Abaidoo, 2014). E-Learning can also refer to educational websites such as those offering learning scenarios, worksheets and interactive exercises for children. The term is also used extensively in the business sector where it generally refers to the cost-effective online training while in companies; it refers to the strategies that are used by the company network to deliver training courses to employees.

E-Learning is naturally suited to distance-learning and flexible learning, but can also be used in conjunction with face to face teaching, in which case the term Blended learning is commonly used E-Learning pioneer Bernard (as cited in Karrer, 2007) urges that “E” must be understood to have broad meaning if E-Learning is to be effective, the “E” should be interpreted to mean exciting, energetic, enthusiastic, emotional, extended, excellent, and educational in addition to “Electronics” that is traditional notional interpretation.

Goals and benefits of E-learning

- Reducing environmental impact. E-Learning allows people to avoid travel, thus, reducing the overall carbon output and traffic jam. Although this is applicable to developed countries. With the virtual notes instead of paper assessment, E-Learning is more environmentally friendly solution (Nagy, 2005).
- Quality educational made affordable. The fact that instructors of the higher caliber can share their knowledge across borders allows students to attend courses across physical, political, and economics boundaries. Recognized experts have the opportunity of making information available internationally to anyone’s interested at
minimum cost. This could reduce the cost of higher education, making it much more affordable and accessible to the masses (Nagy, 2005).

- Enhancing teaching and learning (Zamimit, 2012).

- Provision of wider availability of best course materials in education which can be shared by means of ICT to foster better teaching (Adu & Olatundun, 2013).

- An internet connection, a computer, and a projector would allow an enter classroom to benefit from the knowledge of experts from abroad.

- Convenience and Flexibility to learners in many contexts. Learning is self-paced and the learning sessions are available twenty four hours per day. Learners are not bound by specific day/time to physically attend classes. They can also pause learning sessions at their convenience.

To achieve these goals and benefits of e-learning, Jethro, Grace and Thomas (2012), observed that provision and availability of hardware (particularly) computers, electricity, appropriate content in appropriate languages will improve e-learning in schools.

**Advantages of e-learning in Schools**
- Students are more independent than the traditional setting (Jethro et al, 2012).

- Attracting students attention, facilitating students learning processes, helping to improve students vocabulary were observed as the most important advantage of using e-learning in schools (Yunus, Nordin, Salehi, Sun, & Embi, 2013).

- By incorporating these technological trends into educational system, a higher quality education can be provided at a cheaper cost and spread over a large segment of the population (Gordon, 2014).

**Disadvantages of e-learning in Schools**

- Over reliance on ICT limits student’s critical thinking and analytical skills (Mikre, 2011).

- Difficulty in classroom control and students distracts as well as their tendency to use short forms in writing tests were among the setbacks identified (Yunus et al, 2013).

Despite these limitations, Mikre, (2011) observed that e-learning is useful in enhancing students engagement in learning and positively impact student performance and achievement.

**An Appraisal of E-learning in Nigeria / Katsina State**

In Nigeria, there was a slow pace of e-learning programme from educational sectors. Despite the fact that Federal and some State governments have provided the facilities in schools conducive for the implementation of e-learning programmes. It could be reflecting that not all subject teachers are using the classroom computers effectively (Peters, 2001). This re-enforce the notion that teachers may be contributing factor in the slow acceptance of e-learning programme and ICT in general within schools because they are either resisting the change, lacking skills and or knowledge of the utilization of e-learning type activities or lacking ICT resources. Within the State (Katsina) only Federal Government Girls College Bakori, is known to have fully embraced the e-learning programmes. Although non-public schools have married e-learning programmes in their curricular but the entire programme is more practice by parents using the home computers to complement school academic activities during school holidays.
Prospect of Mounting/running CAL programmes in Secondary Schools in Katsina State

Algahtani (as cited in Arkorful, et al. 2014) categorized e-learning into two basic types, consisting of Computer based and the Internet based e-learning. The focus of this paper is on the prospects of mounting/running computer assisted learning (CAL) in secondary schools in Katsina State.

Daintith, (2004) defined computer assisted learning as any use of computers to aid or support the education or training of students/people. In computer assisted learning, computers are used instead of traditional methods by providing interactive software as a support tool within the class or as a tool for self-learning outside the class (Arkorful, et al. 2014). From these, it could be deduced that Computer assisted learning can be seen as learning or teaching secondary school subjects through computers with subjects wise learning materials in form of Compact Disk (CD).

A handout on Analysis of Educational Development Index (EDI) in 2009, summarized the advantages that could be derived from computer assisted learning to include:

- The visual animated learning materials not only help to memorize the taught topics at ease but also it will act as a virtual laboratory experiments.
- Subjects like English, Mathematics and Science will be joyful.
- Computer assisted learning packages will serve as a better teaching and learning materials.
- The audiovisual techniques will help and motivate children with special needs to read.

Gregory, Mazzone and Taylo (2005) observed that computer assisted learning was effective as live demonstration and more effective than text book instruction, particularly in facilitating psychomotor skill acquisition and retention. Dewitte, Haelermans, and Roype (2015) observed that schools with lower educational attainments uses more frequently computer assisted learning programme to catch up on learning outcomes. However, Kulik’s (as cited in Mikre, 2011) reports that finding across 75 studies in the United States showed the following; students who used CAL tutorials in mathematics, natural science, and social science score more significantly higher on tests in these subjects. Students who used simulation software in science also scored higher. The findings also indicated that primary school pupils who used tutorial software in reading scored higher in reading score. Very young students who used computers to write their own stories scored significantly higher on measures of reading skills. Moreover, students who used word processors or otherwise used the computer for writing scored higher on measures of writing skill.

Katsina State has embraced computer technology which could afford the opportunity to successfully mount CAL programmes in its post primary schools. Computer studies has been incorporated in all schools in the state. In some cases, it has been made compulsory for civil servants to obtained computer literacy certificates. Modern computer laboratories are built and well equipped with facilities that could enhance effective and smooth e-learning program CAL programmes in most pilot schools within the state. Unfortunately, the utilization of those materials are narrow to secretariat work of typing and printing of official and some extent commercial activities. In some schools, the facilities are seen as mere decoration as they are neither used for secretariat work nor as aid to teaching.

Human resources needed for the successful implementation of CAL programmes in post primary schools in the state are also there, as teachers do not need advanced literacy in
computer to operate them. Contrary to the findings of Mathevule and Uwizeyimana, 2014 and Mathevule, 2015 were scarcity and insufficient use of ICT resources limits the uses of CAL in schools.

There is no cause to worry as regards the attitude of the beneficiaries of the programme. As study carried out (Delhi, 2005), on the attitude of secondary students on the CAL in the United States of America showed that both male and female students generally demonstrate favorable attitudinal tendencies towards e-learning with the mean rating of attitude of questionnaire items of (4.2 and 3.5) and (4.3 and 4.2), for both male and female students respectively. 65% of the students felt that e-learning, activities were better than Paper Assisted Learning Activities (P.A.L.A), 76% of the students believed that e-learning will replaced books in schools in the future and 52% of the students enjoyed the fact that e-learning has animations. The outcome of his study is not different with what was obtainable at Federal Government Girls College Bakori, where the programme was implemented by the author of this article. Although no formal research was carried out similar to that of Delhi (2005).

Running of the programme
The running of the programme would be simple and cost effective. Tutorial subject could be installed on each computer machine and the CD tutorial subjects could be made available to students to obtain their personnel copies at affordable price. The computer laboratory attendant could supervise the programme.

Strategies for implementing CAL in Secondary Schools in Katsina State
It has been observed that teachers and students would work most diligently and most effectively at task in which they are genially interested (Korau, 2001). Kumar (2014) observed that teachers express positive optimism for using CAL. To create and sustain interest in E-learning becomes therefore, one of the most important tasks of school administrators. The process should be gradual. Pilot schools with built computer facilities could start the programme with both J.S.S and S.S.S. one classes as experimental classes. This would enable authority to monitor the outcomes of the program as the pupils progress to the higher classes. Public libraries, Adult education centers and Social welfare centers to assist in CAL programme through providing classes for students especially during vocation. Enlightenment campaign by media on CAL programme, schools should organize quiz competition, inter school competition and designed posters all targetrd at enlightening the general public and students on the need for CAL programme.

How to Integrate CAL in the normal school curriculum
Teachers generally are known to resist any innovation in education especially if they see it as a burden to them or additional workload on their time table. Introduction of CAL programme should not be missing conceived by teachers as additional workload or interference with their schools curricular activities. Rather it should be perceived as a wide range of material providing realistic images for enriching curricular content and as a result enhancing the educational process. How to marry the CAL into the normal school’s curriculum is practically simple. SS 1 classes should each have sixty minutes of their prep period per week in computer laboratory. Depending on the population of student per class and the machine available, the ratio should be at most 1:3 that is one computer machine for three students. Subject teachers are to visit and spent at least 30 minutes in the laboratory per week, reviewing the topics they are to teach before and after each lesson, this would enable them to
update their lesson notes and effectively evaluate and direct their students on what to pay attention to when studying a particular topic. Before any experiment is conducted (emphasis here is on the methodology). Each subject teachers should endeavor to supervise particular class at least once a week. At the end of each topic teachers could carry students to the lab for the general revision using the subject tutorials on the CD and print pages of relevance. Assignment that would itemize students to refer to tutorial subject on the CD should be made available to students at affordable price so that during holidays students could have more drill on the topics of their choice.

Benefits that could be derived from implementation of CAL Programme in secondary schools

CAL is the learning that could:-

- **Ensure syllabus coverage** - School subject operates based on syllabus. The syllabus is issued by Federal ministry of education, State Ministry of education or Examination Bodies aimed at having uniform examination. However, due to interference with the schools calendars, lack of teachers, strike actions by union bodies or teachers attitude toward certain subjects, many topics remain untaught. With subject tutorial on CD students could scroll through the syllabus, find the topic not cover, practical not done due to one reason or the other, study or concentrate on those topics and later evaluate them.

Lack of syllabus coverage has great impact especially on science oriented subjects. The practical aspects may be ignored deliberately due to incompetence of the subject teacher or lack of apparatus to perform practical. Subject like chemistry, physics each has nine (9) major experiments designed in such a way that students could imitate it in the school laboratory.

- **Offers solution to frustration, loss of confidence, and future failure** - Many would agree with the statement that teachers’ attitude towards their work contribute to students truancy especially at the elementary level. Moreover, in mathematics classes the way teachers mark students exercises tend to discourage them. We often hear various remarks from students like I would not do the exercise, even if I do it the teacher would not mark, or I always get it wrong, the teacher always cancels my work for no reason.(As the teacher never bother to give correction), I would rather copy the correction(this is a situation where the teacher used to give correction), Na mad teacher period(instead of mathematics teacher period), e.t.c. the tutorial subjects on electronics learning are designed in such a way that it offers solutions to all these sort of problems. Evaluations sections are designed in such a way that a student can assess himself/herself, corrections are offered for any wrong solution. This would indeed not only motivate students but also enable the students to see reason for getting a particular question wrong. The feedback is designed in such a way that it is learner friendly.

- **Captured student interest and attention** - Interest is the willingness on the part of the learner to give attention to something. “It is a mental attitude resulting from one’s feeling that an object or circumstance counts and therefore should be attended to”(U. P. E Project, 1974). Students in secondary schools think seriously about their careers. This interest soon becomes confused about what he would like to do or what he is capable of doing. The difficulties which often confront the adolescent in selecting a life career make vocational guidance a necessity in our schools. With CAL student interest and future career choice could be captured.

Many psychologists believed that it is difficult to keep students attention on something for long especially during the course of the lesson. The causes are many, for example take a
A case of a geography teacher who tries to demonstrate the rotation of the earth to his students, or how the contours are formed, or moon eclipse. These and similar related examples are beyond student imagination. With CAL, it would accord the student with the opportunity to see how these are taking place. The end result would be a meaningful and permanent learning on the part of the student.

- **Evaluates the students, reminds the teachers of the students’ lapses and alert the school Authority** - Feedback plays an important role in the field of learning. It enables the instructors to evaluate their students, by making judgment regarding their lessons on whether the aims and objectives of the lesson has been achieved or not. In normal classroom situation, questions are often asked before the lesson, at the beginning of the lesson and at the end of the lesson with the soul aim of guiding the classroom teacher on how to go about his lesson. With the present situation of crowded classrooms, having a ratio of 1: above 45 pupils, evaluation not all that easy for a teacher. Even among the profit oriented schools we do find problems of crowded classrooms. With CAL student could evaluates him/her self viz at the beginning, and the end of each topic of his choice, get solution and correction with high proportion of wrong answers indicating something is wrong and this could draw the attention of the teacher or the school authority.

- **Differentiate and bridges the gap between high and lower academic achiever** - Experts in measurement and evaluation concerned themselves with how to set questions that would minimize the gap between higher and lower achievers. In other words questions that would satisfy both students with high and lower Intelligent Quotient (IQ). They also differ in various curricular and extra-curricular activities. In almost any class there would be some pupils with abilities equal to those children below them. While some would compete favorably with children in higher classes. In the past it was the common practice to offer double promotion to very bright children. Coven at the present time, teachers have the habit of retarding less able pupils to repeat a class for another year or two. Both practice has nothing to comment, with present knowledge of the pattern of human development pupils may be mentally advanced but still socially and physically immature and to push them on will mean grouping them with different interest and physical ability.

- **Allows student to learn at his/her own rate** - Conversely, to deny promotion to a child who is perhaps developing more slowly is again making him remain with children who are much younger and whose interests may have outgrown. This makes both practices psychologically unsound. Although one way out is to divide the class in to stream according to ability in various school subjects. The stream will be something like this ‘’A’’ stream, containing the most intelligent children ‘’B’’ stream, containing the children with average intelligence, ‘’C’’ stream, containing the less able children. Work for each group will be the same in type but graded in difficulty levels according to the ability of each group. The question is are these groups going to sit for different external examinations? Would Jamb, and other external examination bodies consider extreme, middle and low grades in admitting students? Is it e-learning that offers clear solution to this, by allowing the individual student to learn at his/her own rate. The intelligent students could learn more topics; evaluate himself/herself within fewer hours than the weaker or average student.

- **Vaccine against examination malpractice** - The best way to succeed in any task is to prepare very well for it ahead of time. Our institutions of learning are suffering from a certain disease known as examination malpractice. Examination malpractice is a serious
concern to the government, schools administrators, parents and examination bodies. Economic development of any nation depends at initial stage on the sound, valid and reliable functional education of that nation. The nation is therefore bound to fail economically due to the impact of examination malpractice. Onyechere(1996) has this to say, “plant the seeds of ethical values in the fertile minds of students as an important ingredient for endorsing political, social, and economic progress” p.8. The causes of examination malpractice in our institutions of learning are well known, for who is to blame remains a rolling ball between parents, examination bodies, and school administrators. However, we should not fold our arms watching domesticating impacts of examination malpractice.

- **Possible alternative**—one of the alternative is to immunize the students against the virus of examination malpractice. The syrup of the vaccine is CAL. This is because a student who prepares himself by ensuring that he/she studies all the topics within the syllabus would enter the examination hall with full courage meant and confidence. As the saying goes, *He who fails to prepares is preparing to fail.* CAL makes it possible for student to study uncovered topics in the syllabus, evaluates him/herself, identify the areas of his/her weaknesses and find possible solutions before the examination period.

- **Individualized learning**—there are various method of impacting knowledge such as classroom method, discovery method, demonstration method, group method, individual method and e.t.c., of all these methods individual method allows the child to learn at his/her own rate. The child under this method is provided with various apparatus for his learning. He decides for himself what to learn, when to learn it, and when to evaluate himself. The CALcaters for this. The slow learners would learn at their own rate too.

**Conclusion**

The paper makes an attempt to enlighten school administrators on the meaning, contents and needs of Electronics learning (E-Learning) at post primary schools in the states. Most of the schools are well equipped with the needed facilities for the programme to take up. Precautionary measures and strategies for proper implementation of the programme have been fully discussed. However, the writer does not claim to have exhausted all the precautionary measures and strategies for its implementation. Further contributions by other individuals may seek to make the proposal more comprehensive.

**Recommendations**

- Based on the highlights of this paper, the following recommendations are made.
- Katsina State Ministry of Education to immediately mount the CAL programmein schools.
- Rulers and Regulations governing the uses of CAL programme by students to be set up.
- Effective supervision of the CAL programme by both school authority, State and zonal education offices.
- Seminars/workshops should be organized for post primary secondary school teachers on the CAL programme.
- CD-ROM Tutorial on secondary school subjects should be made available to all senior students at subsidized price.
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