

USE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN TEACHING OF SCIENCE SUBJECTS IN NIGERIAN SECONDARY SCHOOLS

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ABSTRACT

Information and communication technology (ICT) is a "magic bullet" that has changed many aspect of the teaching of science subjects in school. It has become a conveyor belt in fields such as Medicine, Engineering, Chemistry, Agriculture, Biology and others within the past two decades. The use of ICT in teaching of science has significantly changed methods of teaching in Nigerian schools. ICT is used as a catalyst for rethinking, teaching practice as well as developing the quality of teachers. Science is a service-oriented activity. This study looked at the uses of ICTs in the teaching of science in Nigerian schools. Knowing very well, that present-day teaching of science challenges cannot be met with traditional approaches alone. It is high time therefore ICT is considered an important contribution to the solution of the problems in teaching of science subjects in our schools. Teaching approaches using contemporary ICTs facilitates provide great opportunities for constructive teaching through their support for resource-base, student-context and to practice. It is concluded that there is the need for adequate provision and accessibility of ICT facilities such as computers and the internet to all science school to enhance quality teaching of science subject in school as well as ensure that appropriate machinery to ensure that facilities do not leave any negative impact on the students are put in place.

Keywords: *ICT, Teaching, Science, Students*

INTRODUCTION

The acronym ICTs means information and communication technology which include radio and television, as well as newer digital technologies such as computers (desktop & laptop) and the use of internet a potential powerful enabling tool for teaching of science. The ICTs used appropriately expand access to science, strengthen the relevance of science to the increasingly digital workplace and raise science equality by among others in teaching and learning of science in schools into an engaging active process connected to real life. The different ICTs used in the classroom for the teaching of science all over the world, over the past several decades suggests that, the full realization of teaching science benefits is not automatic.

According to Bates (2000), the effective integration of ICTs into the teaching system is a complex, multifaceted process that involves not just technology-indeed, given enough initial capital, getting the technology is the easiest part; but also curriculum and pedagogy, institutional readiness, teacher competencies and long term financing, among others. The effective use of ICTs enhance the quality of teaching of science subject in school system, realizing the need of improving quality

of science subject through the use of Television wherein most competent teacher teaches the topic with the help of most appropriate teaching aids. It also help in improving the quality of teaching science in school where there is no teacher to teach the science subject. According to Sharma (2005), in enhancing reading skills amongst students, the use of ICTs in science have the potential for increasing access to and improving the relevance and quality of teaching of science in our schools. These technologies (ICTs) include computers (laptops and desktop), the internet, broadcasting technologies (Radio and Television) and telephony. This study examines some of these ICTs that are commonly used in the teaching of science in schools. The potential of each technology varies according to how it is used. According to Haddad and Draxler (2002), the use of ICTs in teaching of science subject has five levels. They are as follows: (i) Presentation, (ii) Demonstration, (iii) Drill and practice; (iv) Interaction and (v) Collaboration.

Each of the different ICTs print, audio/video cassettes, radio and television broadcasts, computers or the internet are used for presentation and demonstration. On the other hand, networked computer and the internet are the ICTs that enable interactive and collaborative teaching of science best in the schools. The ICTs brings more rich materials in the classroom. It also provides opportunity for the student to use maximum senses to get the information. ICTs has broken the monotony and variety in the teaching of science. The ICTs being latest, is used in the teaching of science subjects in secondary schools in the following areas: diagnostic texting evaluation, development of virtual laboratory, developing instructional materials and psychological testing. The use of ICT in teaching of science in schools, mostly concentrates on giving information which is not the sole objective of teaching. Along with giving information, it developed understanding and application of the concepts, reasoning and thinking power, and the development of judgment and decision making ability of the student. Also, develop proper study habits, self-concept and value clarification, tolerance and ambiguity, risk taking capacity, scientific temper and improving comprehension, spread and vocabulary of student in classroom teaching. It is a well known fact that not a single teacher is capable of giving up to date and complete information in his subject.

The ICT fills that gap because it provides access to different sources of information as comprehensive as possible in different formats with different examples. ICTs provide variety in the presentation of content which help students in concentration, better understanding, and long retention of information which is not possible otherwise. According to Perraton and Creed (2002), using new technologies (ICTs), the learners (students) can get opportunity to work on any live project with students and experts from other schools outside his/her own countries. ICT provides flexibility to student which is denied by the traditional process and method. Flexibility is a must for quality learning.

Diagnostic Testing: The common observation is that the quality of teaching science subjects in the classroom is on the decline. More and more students are depending

on the private tutorial classes. There are students who fail to understand certain concepts or retain certain information on science subject. This can be assessed by introducing the diagnosis in the process of teaching - learning of science. According to Samsanwal (2005) and Lylla (2007), diagnostic testing in the science subjects helped the teacher as well as students in identifying the gray area of each and every student in the school. The student can take the test to find exactly what he/she has not understood, student progress can be monitored and his/her performance can be improved. This will develop confidence in students and may change their attitude towards the science subject. It may also help in reducing the suicidal tendency among students. Students will start enjoying teaching.

Evaluation: At present the paper pencil tests are conducted for evaluating the academic performance of the science students. These tests are evaluated by the science teacher but feedbacks are not given immediately to each student as a result students are unable to know their weaknesses. With the use of ICT, students can evaluate their learning. According to Sansanwal and Dahiya (2006) on Test your understanding, ICTs in science school help the student to get the feedback about the study of his/her understating instantaneously. It goes a long way in improving the learning in student by assessing their own understanding of the science subject.

Thus, the use of ICTs evaluating improve the quality of learning in student.

Virtual Laboratory: The virtual laboratory was developed by the Information and Communication Technologists to give free access of information to science student in the school. As matter of fact, students understand better, if they do some practical work related to the concepts. It makes learning easy and interesting. Laboratory helps in developing scientific temper. In short, there are many restrictions under which the students have to work in the laboratory. With the use of ICT, virtual laboratory is possible in science school for teaching. It provides lots of freedom to students. The students can manipulate any attribute or variable to the experiment and can see how it affects the outcome (Engaugu, 2002).

The virtual laboratory using ICTs in the teaching of sciences go a long way in helping students at all levels of learning. For example, suppose a student wants to study the factors that can affect the focal length of a mirror. At present in the real laboratory, the student cannot manipulate many variables that he/she thinks might be related. But virtual laboratory can provide lots of freedom to the student. That is, student can take different types and shapes of objects, change the distance between mirror and object to any extent, change the thickness of the mirror and also see how such attributes affect the focal length of the mirror.

Instructional Material: At present there is a shortage of qualified and competent teachers in all most all science subject at all levels in the school. Not only this, even the instructional material available in the print form is not of quality. The use of ICTs in teaching will enhance the quality of instruction in the classroom. The teacher uses them in the classrooms and also organizes discussion after it wherein the new points will be added both by the teacher as well as students. According to Sansanwal

and Dahiya (2006), it will make the teaching of science effective, participatory and enjoyable. The ICTs has lots of potentiality to bring quality in the teaching of science in our schools.

Psychological Testing: There are individual differences, the use of ICT in psychological teaching of science in the classroom, assess the students on some of the correlates of science subject achievement. This is the age of digital technology. It is used to digitalize all the psychological tests including the scoring and evaluation. Even student can use it individually and can share the result with the teacher who can help the student to improve his/her academic performance in the school. Suthar (1981) said that the ICT in psychological testing will be very easy to use in teaching of science and economical also:

CONCLUSION

One of the most common reasons for using ICTs in teaching of science in the classroom has been to better prepare the current generation of science students for a workplace. The ability to use ICTs effectively and efficiently is thus seen as representing a competitive edge in an increasingly globalizing job market. The use of ICTs enhances the quality of teaching in several ways; by increasing student motivation and engagement, by facilitating the acquisition of basic skills. ICTs are also transformation tools which, when used in the classroom appropriately, will promote the shift to a student-centered environment. Also, promote the acquisition of the knowledge and skills that will empower students for lifelong learning. ICT enhanced learning mobilizes tools for examination and analysis of information, thus providing a platform for science student inquiry, analysis and construction of new information.

ICTs help in integrating theory and practice, relations between science subjects. With the use of ICTs in teaching science, allow the science students to explore and discover rather than merely listen and remember. The above taken into consideration, it is concluded that there is the need for adequate provision and accessibility of ICT facilities such as computers and the internet to all science school to enhance quality teaching of science subject in school. Nevertheless, there should be appropriate machinery to ensure that they do not leave any negative impact on the students.

REFERENCES

- Bates, A. W.** (2000). Managing Technological change: Strategies for university and college leaders.
- Engauge, S.** (2002). North Central Regional Educational Laboratory
- Haddad, W. and Draxler, A.** (2002). The Dynamics of Technologies for Education
- Perraton, H. and Creed, C.** (2002). Applying New Technologies and cost-effective Delivery systems in Basic Education.
- Sansamwal, D. N.** (2005, 2006) Institute of Education
- Sansanwal, D. N. and Dahiya, S.** (2006). C.R. College of Education, Rohtak.
- Sharma, D.** (2005). Developing Instructional materials for facilitating creativity among elementary school children.
- Suthar, K. S.** (1981). A study of performance on programmed learning material in relation to some psychological characteristics.