Chapter 53
Subject Specialization and Science Teachers' Perception of Information and Communication Technology for Instruction in Kwara State

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ABSTRACT

This study examined Kwara State secondary school science teachers' perception of ICT for instruction based on their area of specialization. Participants were 630 science teachers of Biology, Chemistry, Physics and Mathematics from both public and private senior secondary schools in 12 Local Government Areas in Kwara State. The data collected through questionnaires tagged Science Teachers Information and Communication Technology Perception Questionnaire (STICOTEPQ) were analysed using frequency count, mean, chi-square and Analysis of Variance (ANOVA) statistics. Findings revealed that (i) the science teachers' perception of ICT was generally positively low and (ii) there was significant difference in the secondary school science teachers' perception of ICT for instruction based on their area of specialization{$F(3,252)$ $= 50.323, p<0.05$}with the Biology teachers having the highest level of perception while the Mathematics teachers had the lowest perception. The implication of this study was that should the secondary school science teachers remain at this level of perception of ICT for instruction, the probability that ICT will be used for classroom instruction in Kwara State is very low. It was therefore recommended that ICT should be fully integrated into science teacher education at the Colleges of Education and the Universities and that Kwara State Government should formulate a programme of ICT training and retraining of teachers currently in service as a way of improving their perception of the use of ICT for instruction.

INTRODUCTION

Science education plays important role in the industrial and technological development of a nation (Ajewole 2003). Realizing the importance of scientific literacy in personal decision making, which eventually will have impact on the society, involvement in civic and cultural affairs and in economic productivity (Dickey & Singer, 2004), the Nigeria National Policy on Education made science a compulsory subject both at the lower and upper basic education (UBE) levels. At the senior secondary level, science is broken down into three components – Physics, Chemistry and Biology out of which each student must choose to offer at least one (Federal Republic of Nigeria-FRN, 2004). Mathematics is not officially classified as a science subject because it is central to all subjects especially science subjects. This is the reason why it is a compulsory subject for all the students at the Junior and Senior Secondary levels of education in Nigeria.

Researchers in Science education have confirmed that this area of study has been faced with many challenges such as student truancy and rote learning which lead to poor performances in the Secondary School Leaving Certificate Examination (SSCE). This has largely been attributed to poor teaching method by science teachers, abstractness of concept and large student population (Bamigbala, 2000, Seymour, 2001, Ajewole, 2003, Oyelekan, 2009). Most of the traditional teaching method employed by the science teachers are rather teacher-centered than learner-centered. This makes the abstractness of the concept stronger and the environment dull and boring since the learners are normally not given room to be involved in the teaching and learning process. In order to realize the vision of science education, emphasis should be placed on inquiry, scientific literacy and focus on understanding rather than surface knowledge (Dickey & Singer, 2004). As a result, there is the need for a teaching method in which the learners will be involved thereby arousing their interest, motivating them to learn and helping them in problem solving. This is the essence of electronic education (e-education). Information and Communication Technology, that is, all range of hardware and software which can be used to collect, store, process, transmit and present the scientific concept to be taught and learned in order improve learning. ICT involves use of computers, internet and electronic mail. ICT in education is referred to as e-learning and it has a great potential to complement and supplement traditional teaching and learning process.

The introduction of the new technology to education with emphasis on ICT makes it possible to review the teaching and learning processes especially in sciences. Several researchers have indicated potentials of ICT in education regarding improvement of learning when ICT is employed (Dawson, Forster & Reid, 2006, Bakar & Mohammed, 2000, Ofsted, 2009 and Yusuf & Balogun, 2011). Science teachers should therefore be encouraged to integrate ICT into classroom activities. For instance, Heinich, Molenda, Russel and Smaldino (2002) reported that ICT acts as an instructor-independent media which acts as a catalyst for change in the whole instructional environment; Ofsted (2009) and Yusuf & Balogun (2011) opined that ICT improves student achievement and removes boredom and superficial questioning; while Arnold, Padilla and Chart (2009) opined that ICT helps the teachers and learners develop Knowledge. Yuen, Lee, Law and Chan (2008) opined that ICT helps to foster the development of students' 21st Century skills in becoming life-long learners and ability to work and learn from experts and peers in a global community. Kwache (2007) opined that the management of education and the traditional process of teaching and learning have been seriously challenged by the new waves of technology.

There are many factors affecting the secondary school science teachers' integration of ICT into teaching and learning. These include their background knowledge of ICT during training.

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