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INFLUENCE OF ICT RESOURCES AND CURRICULUM OF SCIENCE UTILIZATION ON SECONDARY SCHOOLS SCIENCE TEACHING IN IREPODUN LGA, KWARA STATE

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Abstract

This study examined the Influence of ICT Resources and Curriculum of Science Utilization on Secondary Schools Science Teaching in Irepodun LGA, Kwara State. The research type for this study was a descriptive research of the survey type. This study sample included 120 science teachers in twenty-four (24) Secondary Schools selected by random sampling technique. A self designed teachers' questionnaire was administered to one hundred and twenty (120) science teachers. Three research questions and two hypotheses were formulated. Frequency counts and correlation coefficients were used to analysis the data collected. Finding of this study revealed that the influence of ICT on curriculum to science teaching by science teachers was significant. It revealed that there were no significant influence of ICT resource using in science teaching by science teachers towards teaching based on the gender and year of teaching experience. Based on the findings, it was hereby recommended that; ICT Education should be reflected in the curriculum of science and made compulsory in all secondary schools in Irepodun LGA Kwara State in order to improve in science teaching, the Teacher Registration Council of Nigeria should provide ICT tool recourses for both the male and female teachers also there should be opportunity to be ICT literate through in-service education for both the experienced and less experienced science teachers in order to make use of ICT.

Key Word: Information and Communication Technology (ICT), Resources, Curriculum, Science Utilization, Secondary Schools

Introduction

Education is the total process of human learning by which knowledge is impacted, faculties trained and skills developed. Science Education is a field of study concerned with producing a scientifically literate society. It acquaints students with certain basic knowledge, skills and attitudes needed for future work in science and science related fields. There are several issues in science education in Nigeria that needs to be addressing (Omoifo, 2012).

Science is defined as knowledge of the structure and behavior of the natural and physical world which is based on facts that can be proved in the conditions of modern life, a scientifically and technological literate

person is considerably good at playing his full potential in the socioeconomic development of his community (Hornby, 2010). Science is defined as an organized body of knowledge, a method of solving problem and also serves as a search of explanation of natural objects and phenomena (Ayeni, 2002). Ogunleye (2006) observed that science is a dynamic human activity concerned with understanding the working of our world. This understanding helps man to know more about the universe. Science subjects such as Chemistry, Physics and Biology as basis science subjects still suffering set back in the teaching and learning process.

Ige & Arowole (2003) observed that science will continue to play an increasingly important role in every individual's life whether the individual may have chosen science profession or not. Science is concerned with human effort to understand the history of the natural world and how the natural world works, with observed physical evidence as the basis of that understanding. Hence science comprises the basic disciplines such as Biology, Physics, Chemistry Agricultural science (Ahmed, 2010). Cox (2017) stated that the role of teacher in science teaching is to help students apply the concept such as Mathematics, English and science through classroom instruction and presentation.

The rate at which students in our senior secondary schools performance dropped in some of science subjects in favour of other subjects with the type of teachers handling the subjects is a matter that needs urgent attention. When questions are asked from the students on why they did not show interest in offering some science subjects unlike others discipline, the general answer is that the subject is too difficult to comprehend even when some of the students have not attended lesson class once, the wrong notion has been inculcated into them by their seniors they believe without bothering to verify whether it is true or not (Adelokun and Eyengho 2010)

Curriculum is defined as a medium through which educational institution seek to translate the societal values into concrete reality (Alade, 2011). Offorma (2005) viewed curriculum as a vehicle through which education is attained. Adegoke (2005) pointed out that for a curriculum to be effective, it must have a definite and dynamic purpose based on the value of the society and the views of the child as a citizen and a skilled individual. It has provided real opportunities for individualized instruction. Olorundare (2014) describes science as self-criticizing, correcting and improving activities which deal with facts relating to

natural phenomenon and how they are interpreted.

Information communication Technology (ICT) is an indispensable part of the contemporary world. The field of Education has certainly been affected by the penetrating influence of information and communication technology worldwide in particular developed countries. Moreover, ICT has made an impact on the quality and quantity of teaching, learning and the application of ICT in Education has revolutionized teaching and learning in schools. Therefore it is essential to implement ICT in teaching science subjects in secondary schools due to the complex and the abstract nature of some of the subjects (Aina 2013). The place of ICT in teaching science education in schools cannot be over emphasized considering its promises in effective teaching and learning. This project examines the effectiveness of ICT on teaching and learning science subject in secondary schools. ICT as instructional media has improved teaching and learning through its dynamic interactive and engaging content.

The main purpose of ICT in the curriculum is to help in the development of human mental, which allow people to both successfully apply the existing knowledge and produce new knowledge. ICT also plays a major role in human activities in everyday living in order to cope and adapt to the demand of the demand of the environment. If the vision of science education is to bring socio-economic development, the role of ICT in science education cannot be over-emphasized (Hannaatu, 2013).

The use of ICT in Nigeria and African countries generally is increasing and dramatically growing. However, while there is a great deal of knowledge about how ICT are being used in developed countries, there is not much information on how ICT are being introduced into schools in developing countries (Beukes-Amiss & Chiware, 2006).

Kudryashova, Gorbatova, Rybushkina, and Ivanova (2015) observed that teacher are to guide and facilitate learning with a variety of strategies students to share responsibility for their own learning by modeling curiosity, skepticism and the skills of inquiry. Teachers' motivation to use ICT in the classroom is at present adversely influenced by a number of constraints including: lack of time to gain confidence and experience with Technology, limited access to reliable resources, a science curriculum overloaded with content assessment that requires no use of the technology and lack of subject specific guidance for ICT to support learning. This technology can be employed in diverse ways to support different curriculum goals and pedagogy such constraints have often stifled the science teachers the use of ICT in ways which effectively exploit its interactivity. Consequently well integrated and effective classroom use of ICT is currently rare.

The use of ICT in school science laboratory is driven by rather than transformative of the prescribed curriculum and pedagogy. However, the science teachers tend to use ICT largely to support, enhance and complement existing classroom practice rather than reshaping subject contents, goals and pedagogy. Generally, teachers' motivation and commitment are high and practice is gradually changing. Training teachers in the using ICT in the classroom appears to have had more success in science than in other subjects (Osborne and Hennessey 2013).

Shedd (2004) examined the incorporating technology in the classroom and the result suggested that anyone preparing to become teachers must incorporate technology into their class. To become great among the committee of nations, Nigeria must change her method of teaching and learning of science education from traditional way of talk and chalk method and reading by carrying books around. The world is in the era of information and Communication Technology (ICT) where

information is not restricted by time space and channel (Ajayi and Ojo 2010).

Nwalor (2014) assessed the availability and utilization of instructional resources in teaching and learning of Basic Science. The study also revealed that teachers do not improvise instructional materials to facilitate their teaching. Instructional materials have been defined by various authors. For example, Instructional materials are the devices developed or acquired to assist or facilitate teachers in transmitting organized knowledge, skill and attitudes to the learners within an instructional situation Nwachukwu (2006).

Teaching experience is a vital tool in the science teaching and learning situations. Experience can be said to be the attitude or skill acquired by the teacher through his perception and participation in instructional programmes. The experience of the teachers will help him to be able to cope and adapt to change in the educational programmes (Lawal, 2011). The adage which says experience is the best teacher holds water in the sense that the more a professional stays on the job, the more he becomes skilled and perfect in techniques of going about his profession.

Teaching experience is a vital tool in the science teaching and learning situations. Experience can be said to be the attitude or skill acquired by the teacher through his perception and participation in instructional programmes. The experience of the teachers will help him to be able to cope and adapt to change in the educational programmes (Lawal, 2011) Awoyemi (1985) concluded that teachers are generally effective within the first ten years of their teaching experience, while anything outside ten years, there is tendency for a slight decline in productivity. In the study, on whether to accept or reject that the experienced social studies teachers performed better than inexperienced social

studies teachers in the implementation of social studies curriculum in Oke-Ogun Zone.

Okeke (2006) observed that gender refers to the social or culture construct, characteristics, behaviours and role which society ascribes to male and females. Gender is a social or cultural determinant that varies from place to place or culture. It is not universal, unlike sex which is biologically determined and universal too. Colom and Lynn (2004) found out that males have average brain sizes than females and therefore, would be expected to have higher average IQs. Owuamanam and Babatunde (2007) observed that gender stereotyping seems to promote the belief that women should be traditionally feminine and men are to be traditionally masculine. Danmole and Femi-Adeoye (2004) observed the effect of concept mapping technique on senior secondary school students' achievement and retention of ecology concepts and find out that gender is one of the factors interacting with achievement. Afolabi (2007) who examine the influence of the science teachers' attitude and gender factor as determinant of pupils' performance in primary science and found out that the attitude of science teachers have greater effect on the students' academic performance.

Purpose of the study

This study determined the influence of ICT resources in the curriculum of science of science teachers in science teaching to secondary schools in Irepodun Local Government Area, Kwara State. Specifically, this study determined:

1. the extent at which science teachers uses the ICT resources to science teaching.
2. the influence of years of teaching experience of the science teachers towards the use of ICT resources to science teaching.

3. the influence of gender of the science teachers towards the use of ICT resource in science teaching.

Research Questions

1. What is the extent at which science teachers uses the ICT resources in science teaching?
2. Is the year of teaching experience influence science teachers towards the use of ICT resources in science teaching?
3. Does gender of science teachers influence the use of ICT resources in science teaching?

Research Hypotheses

1. There is no significant influence in the years of teaching experience of the science teachers towards the use of ICT resources in science teaching.
2. There is no significant influence in the gender of science teachers towards the use of ICT resources in science teaching.

Scope of the study

This study was carried out in Irepodun Local Government Area, Kwara State, Nigeria which includes science teachers in all Secondary Schools located in Irepodun, Kwara State, Nigeria. The study was carried out among science teachers in Secondary Schools. Teachers of Biology, Chemistry, Physics, Agricultural science and Mathematics were involved in the study. One hundred and twenty science teachers were involved in the study. A researcher-designed teachers' questionnaire was used as the instrument for the collection of data from science teachers in the sampled schools. Variables that were tested in the study were: years of teaching experience, gender and how ICT resources used in the science teaching.

Data Analysis and Results

Research Question One

what is the extent at which science teachers uses the ICT resources in science teaching?

Table 1: Mean Score, and correlation coefficient for testing extent of Science Teachers' using ICT resource in Science Teaching in Irepodun Local Government Area Kwara State, Nigeria

	Number of respondents	Mean Score	Std. Deviation	Test for Correlation coefficient	r (Correlation Coefficient)	Df	p-value
Total	120	71.11	4.50	3.24	0.63	119	0.00

Table 1 shows the numbers of responses of science teachers to the ICT resources using to science teaching in senior secondary schools in Irepodun Local Government, Kwara State, Nigeria. The total number of respondents was 120 science teachers. The mean score was 71.21. The influence of science teachers' using ICT resources to science teaching was significantly positive since $p\text{-value } (0.00) < 0.05$ ($r = 0.63$; df 119 and $p\text{-value } 0.00$). The r also indicated positive influence in the using of ICT

resource in teaching. This shows that science teachers in the Irepodun Local Government, Kwara State, Nigeria, generally had positive influence to the use of ICT resources on science teaching.

Research Question Two:

Is the year of teaching experience influence science teachers towards the use of ICT resources on science teaching?

Table 2: Mean Scores and correlation coefficient for testing influence of Science Teachers' using ICT resource in Science Teaching based on years of teaching experience in Irepodun Local Government Area Kwara State, Nigeria

Experience	No of Respondent	Mean Score	Standard Deviation	Std. Error Mean	Test for Correlation coefficient	r (Correlation Coefficient)	Df	p-value
Less experience (0-5)	36	83.74	5.90	0.20	2.78	0.72	79	0.06
Experience (above 5years)	44	82.94	5.70	0.30				

Table 2 shows that there was no significant influence between the experienced and less experienced science teachers towards the using of ICT resources on science teaching in Irepodun Local Government Area Kwara State, Nigeria since the $p\text{-value } (0.06) > 0.05$. The mean scores range between 82.94 and 83.74 and the r value was 0.72. The null hypothesis 2 (H_{02}), which states that there was no significant influence on the

years of teaching experience of the science teachers towards the use of ICT resources to science teaching based on years of experience, is not rejected.

Research Question 3:

Does the gender of the science teachers have influence towards the use of ICT resources to science teaching?

Table 3: Mean Scores and correlation coefficient for testing influence of Science Teachers' using ICT resource in Science Teaching in Irepodun Local Government Area Kwara State, Nigeria

Gender	No of Respondents	Mean Score	Standard Deviation	Std. Error Mean	Test for r	r (Correlation Coefficient)	df	P Value
Male	72	73.46	5.60	0.30	2.25	0.67	79	0.66
Female	48	72.71	5.8	0.30				

Table 3 shows that the mean scores for male was 73.46 and for female was 72.71 and that no significant influence existed between the score of male and female science teachers using ICT resources on science teaching since the p-value (0.66) > 0.05. The null hypothesis 3 (H_{03}), which states that there is no significant influence in the score of science teachers' towards the using of ICT resources to science teaching based on gender, is not rejected.

Summary and Discussion

The research findings summarized as follows:

Science teachers had positive influence on teaching using ICT as resources to science teaching in the secondary school in Irepodun Local Government Area, Kwara State, Nigeria.

The influence of science teachers towards science teaching using ICT resources to science teaching in the secondary school based on their years of teaching experience and gender was not significant.

Science teachers had positive influence to the using of ICT resource in science teaching. It could be as a result of helpful behaviour, resourcefulness, enthusiasms, good method of presentation and concern for students and teachers knowledge of the subject matter and the acceptance that they are role model. This is in agreement with the findings of Shedd (2004) examined the incorporating technology in the classroom and the result and found out that there is significant in the use of ICT.

It was also revealed in this study that there was no significant influence of science teachers towards science teaching based on their years of teaching experience. It may be due to the fact that, the experienced and less experience science teachers are able to concentrate on the most appropriate way to teach particular topics to students who differ in their abilities, prior knowledge and backgrounds. This finding is in agreement with the finding of Abidoye (2017) observed the influence of gender and experience of senior school Biology Teachers on their Ecology teaching in Kwara State. The findings showed that no significant influence existed in the experience and less experience biology teachers.

It was established in this study that there was no significant influence of science teachers towards science teaching based on their gender. The males and the female had similar mean attitudinal score; the reason that alluded to this finding may be due to the fact that, male and female science teachers have realized more the importance of science teaching for their future. This study was in agreement to the of Abimbola & Abidoye (2013) on the views of Kwara State senior school Biology teachers on the status of ecology teaching in which they reported that there is no significant different between the teaching of male and female science teachers.

Conclusions

Based on the findings of the study, the following conclusions were drawn. Science teachers had positive influence on science teaching using ICT resources in Irepodun Local Government Area, Kwara State.

The influence of science teachers towards the using of ICT resource to science teaching based on their years of teaching experience and gender was not significant in the analysis conducted.

Recommendations

Based on the findings of this study, it is hereby recommended that;

1. ICT Education should be reflected in the curriculum of science and made compulsory in all secondary schools in Irepodun LGA Kwara State in order to improve more in their science teaching
2. There should be opportunity to be ICT literate through in-service education for both the experienced and less experienced science teachers in order to make use of ICT Resources.
3. The Teacher Registration Council of Nigeria should provide ICT recourses for both the male and female teachers.

References

- Abidoye, F. O. (2017). Influence of gender and experience of senior school Biology Teachers on their Ecology teaching in Kwara State. *Journal of Education Curriculum and Instruction* 10 (1): 96-105.
- Abimbola, I. O. & Abidoye, F. O. (2013) Effect of qualification and experience of biology teachers on the status of ecology teaching in Kwara State. *Journal of Education and Practice* 4 (24): 1-8.
- Ahmed, K. (2010). Obstacles to the effective teaching and learning of chemistry at the secondary school level: Curriculum implications for sustainable educational development. 43rd Annual conference of Science Teachers Association of Nigeria (STAN), pp539-542.
- Adegoke, B. A. (2005). Effect of multimedia instruction on senior secondary students' achievement in Physics. *European Journal of Educational Studies*, 3 (3), 537-541
- Adelokun, A. K. & Eyengho, T. T. (2010). The Application of Information and Communication Technology to the Teaching and Learning of Physics in Nigeria Secondary Schools.
- Afolabi, F. (2007). Teachers' attitude and gender factor as determinant of pupils' performance in primary science. *African Journals Online: www.ajol. Info*, 3 (1): 326-332.
- Alade, I. A. (2011). Trends and issues on curriculum review in Nigeria and the need for paradigm shift in educational practice. *Journal of Emerging trends in Educational Research and Policy Studies*. 25 (5), 225-227.
- Ajayi, I. A. & Ojo, F. F. (2010). Information and Communication Technology: a catalyst for democratized system of government. *South-West Journal of Teachers Education* 3(1) 692-708.
- Aina, J. K. (2013). Effective Teaching and Learning in Science Education through Information and Communication Technology (ICT) *American Journal of Education Research* 2 (5) 43-47.
- Awoyemi, M. O. (1985). Measuring the Effectiveness of Teachers. *Journal of Teacher Education*, 2, 10-28.
- Ayeni, B. (2002). A study of students' performance in mathematics. *Lafiagi Journal of Science Education* 1 (1), pp 46-53.
- Beukes-Amiss, C. M. & Chiware, E. R. T. (2006). The impact of diffusion of ICTs into education practices, how good or how bad? A review of the Namibia situation. Retrieved from <http://www.dspace.unam.na:8443/dspace/bitstream/1995/244/im pactiffusonICTedupdf>.
- Colen, R., & Lynn, R. (2004). Testing the developmental theory of sex differences in intelligence in 12-18 years old. *Personality and Individual Differences*, 36 (1), 75-82.
- Cox, J. (2017). What is the role of a teacher? Retrieved from

- <https://www.thoughtco.com/what-is-the-role-of-a-teacher-208151>.
- Danmole, B. T. & Femi-Adeoye, K. O. (2004). Effect of concept mapping technique on senior secondary school students' achievement and retention of ecology concepts. *Journal of Science Teachers Association of Nigeria*, 39 (1&2), 32-38.
- Hannatu, A. (2013). The role of ICT in teaching science education in schools. 19, pp 217-223/ ILSHS, 19, 217 Shehu Shagari College of Education, Sokoto, Nigeria.
- Hornby, A. S. (2010). Oxford advanced learner dictionary (8th Ed.) Oxford: Oxford University press.
- Ige, T. A. & Arowole, A. A. (2003). Effect of computer assisted instruction on senior secondary schools students' academic achievement in chemistry in Osun State. *Nigeria Journal of Computer Literacy (NJCL)* 11 (1).
- Kudryashova, A., Gorbatoval, T. and Rybushkina, S. and Ivanova, E. (2015). Teachers' roles of facilitate active learning. *Mediterranean Journal of Social Sciences*. 7(1), 460-466.
- Lawal, B. (2011). *Characteristics of an outstanding biology teachers as viewed by biology teachers in Kwara State*. Unpublished M.Ed. Project, Department of Science Education, University of Ilorin, Ilorin.
- Offorma, G. C. (2005). Curriculum for wealth creation. Paper presented at the seminar of the World COUNCIL FOR Curriculum and Instruction (WCCI), held at the Federal College of Education, Kano, Nigeria.
- Nwachukwu, C. E. (2006). *Designing appropriate methodology in vocational and technical education in Nigeria*. Nsukka University Trust Publishers.
- Nwafor, C. E. (2014). Availability and utilization of instructional material in teaching and learning of basic science in selected junior secondary school in Abakaliki education zone of Ebonyi State Nigeria. *Global Journal of Bioscience and Biotechnology*, 3 (3), 292-295.
- Ogunleye, A. O. (2006). Towards the Optimal Utilization and Management of Resources for Effective Teaching and Learning of Physics in schools proceeding of the 41st Annual Conference of Science Teachers Association of Nigeria (STAN) University.
- Okeke, S. A. (2006). Effects of prior knowledge of implications of mathematical tasks/concepts to career types and gender on student' achievement, interest and retention. *Journal of Science Teachers Association of Nigeria*, 47, (2), 253-258.
- Olorundare, A. S. (2014). Learning difficulties in science education: An analysis of the current status and trends. *KWASU International Journal of Education*, 1 (1), 1-12.
- Omoifo, C. N. (2012). Dance of the Limits, Reversing the Trends in Science Education in Nigeria, Inaugural Lecture University of Benin, Benin City.
- Osborne, J. F. & Hennessey, S. (2013). Science Education and the role of ICT, Retrived from www.sahennessey.com on science education and the role of ICT.
- Shedd, J. (2004). *Incorporating Technology in the classroom*. A Publication of the School of Examination Syrause University USA: Education Exchange.