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Disposition Of Stme Teachers To ICT Usage For Promotion Of Science Education In Colleges Of Education

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Abstract: ***In this study, Disposition of STME Teachers to ICT usage for promotion of Science Education in Colleges of Education, a descriptive survey design was adopted. A well- structured questionnaire composing of two sections A and B was used as the instrument for the study. The population target was the entire seventy five (75) teaching staff of the School of Science, FCE (Special), Oyo. A total of forty (40) science lecturers/teachers participated in the study. This comprised of both the males and female lectures ranging from Assistant Lecturer (AL) to Chief Lecturer (CL). Descriptive and Inferential statistical methods were used in the analysis of data collected and results presented in tables. From the findings, it was concluded that ICT usage in Nigerian schools today comes with many challenges. Yet for effective STME teaching and learning in this Information age, the deployment and utilization of the opportunities of ICT in the Science classroom and environment is non- negotiable. ICT facilities must be available, accessible and utilized. Science educators must accept the phenomenon, possess the capacity to use ICT, must be ready to learn and change the mode of teaching to incorporate ICT in their day to day teaching activities. Recommendations include that science teachers and students should endeavor to continually improve on their knowledge of computers and other ICT learning resources for better productivity; the government should be more involved in the funding of science- based education and various opportunities for scholarship and other motivation should be made available to attract students and teachers toward science education especially STME.***

Keywords: STME, Information and Communication Technology (ICT), ICT Device, ICT Advancement and Science Education.

I. BACKGROUND OF THE STUDY

Science, Technology and Mathematics Education (STME) is a major key to the technological and economic transformation of the underdeveloped nations of the world including Nigeria. Education is the systematic process of giving and gaining knowledge with implication for the transformation and advancement of both the learners and the society at large. There is a global change in education round the world providing access and progress. Effective education allows for continuous learning, embracing new insights and innovations.

Qualitative education has the power to change lives. Change here means positive transformation and making a positive difference. Science education, according to Nnamdi, (2014) cited by Hamaad, Abubakar and Yau (2018), is that field concerned with sharing scientific knowledge and methods with people not considered part of scientific community. Science education has been identified as one of the bedrock for sustainable development of our country. Biology as a branch of science and prerequisite subject of many fields contributes immensely to technological growth of the nation; equipping the learners with useful concepts, principles and theories that will enable them cope with challenges before and after graduation. The aim of Science education is to develop critical thinking and conflict resolution skills along with mathematical and scientific literacy. A sustainable society requires scientifically, technologically and environmentally literate citizens (Tan, 2012).

The relevance of Information and Communication Technology (ICT) in the field of Science and STME in this 21st century cannot be overemphasized. According to Gerai (2005) in Ayoade (2019), Information and Communication Technologies (ICTs) are modern techniques that facilitate information gathering, processing, transmission and storage and comprise hardware and software components that can be put to heterogeneous use through digitalization connecting individuals and institutions over wide swathe of geopolitical areas. ICTs cover internet services provision, Telecommunication equipment and services, media and broadcasting, libraries and documentation centers, commercial information providers, network based information services and other related information and communication activities.

Scientific and technological advancement and ICT usage are interwoven and is an essential tool for advancement of STM education. For an enhanced teacher quality (and quality education), the teacher must be empowered in Information and Communication Technology and be able to use and apply ICT tools and materials. This should be an essential part of pedagogical courses (Paul, 2010 in Musbau and Abdulgaffar, 2011). ICT has long been observed to have become a key tool in acquiring processing and disseminating knowledge. It has become an imperative tool for measuring development of as nation in the 21st century. The revolutionary impact of ICT in all spheres of the society has not spared the educational sector (Adedoyin, Akinumesi and Adegoke, 2008). According to Ogwuegbu and Araoye (2015), Information and Communication Technology have been embraced in various fields in human endeavor due to its obvious advantages. Consequently, advancement in the ICT industry had impacted on other areas of human enterprise, education inclusive. In tertiary education, ICT adoption becomes imperative in teaching-learning, research and community development. In the classroom, an ICT device becomes instructional material. It complements the effort of the teachers, thereby facilitating learning and generally creating a paradigm shift in the approach to educational delivery.

Tertiary education institutions have always been at the forefront of new scientific discoveries and innovations, brought about by the activities of teaching, learning and research (Adedoyin, Akinumesi and Adegoke, 2008). Interestingly, ICT is highly STME based originally. However, as stated by Abolade and Durosinmi (2019), research on ICT in Nigeria has shown appalling report on ICT advancement nationwide. Nigeria like the rest of the world must embrace the rapid changes in Information and Communication Technology so as not to disengage from globalization and economic development trend as well as not to be left behind in the sphere of industrialization. ICTs are potentially powerful tools for extending educational opportunities.

ICT has a lot of benefits in the advancement of tertiary education particularly STM education. As stated by Ayoade (2019), ICT increased the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and the way they learn, (student centered) which in turn would better prepare the learners for lifelong learning as well as to contribute to the industry. As observed by Anowor, (2010) cited in Ebhomien, Oriahi, Okogwa and Ebhomien (2014), not only can the teachers easily source the content of lessons from the computer via the internet, but preparation and delivery of lesson can be made easier and more efficient through the use of a combination of computer, telecom facility and multimedia projector. Teaching skills can be more readily acquired and improved through the e-learning and e-teaching, virtual library, virtual laboratory and video conferencing.

The adoption of ICT in education (STME) however, has some challenges. As highlighted by Ebhomien, Oriahi, Okogwa and Ebhomien, (2014), effective use of Information System in educational sector in Nigeria is challenged by erratic power supply, poor funding of education, high cost of information system equipment, teacher's resistance to change and innovation, poor value orientation of teachers and students and lack of political patronage. Others may include insufficient qualified ICT personnel in our institutions, poor implementation of ICT policies, security problem, poor funding, high cost of ICTs equipment, resistance to change and poverty, etc.

Even in the face of these challenges, ICT is an all-important vehicle for any educational advancement. Teachers and students must endeavour to embrace this innovation and explore its benefit for better productivity. Ebhomien, Oriahi, Okogwa and Ebhomien, (2014) emphasized that, no professional require the services of Information System more than the teacher because he is constantly engaged in research and publication. The teacher equally serves as a moral agent whose primary duty is to transmit worthwhile values, knowledge and skills from generation to generations.

STME teachers cannot ignore the importance of ICT in this present age of global scientific and technological advancement and curricular restructuring. There is this popular saying that we are in the jet and computer age. Students therefore must be engaged in the new drive through qualitative adoption of ICT in the teaching and learning processes.

II. STATEMENT OF THE PROBLEM

Traditionally, most of the instructional practice generally employed by STME teachers is organized around the hard copies paper based and mainly textbooks. In Nigeria, so many policies in the educational sector have been put in place to advance the teaching and learning of Science and Technology Education. Yet not much has been achieved. STME teachers are considered significant in the pursuit of realizing the policy directions and vision of Science and Technology – driven economy. However, there can be no effective STME teaching and learning without acquisition, deployment and the utilization of the opportunities of ICT in the classroom environment. The extent to which the ICT facilities are available, accessible and utilized become important. Also, the acceptability by the teachers of this phenomenon, the capacity to use ICT, the readiness to learn and change the mode of teaching to incorporate ICT is also of concern. This is against the background of incessant failure and low performance of science students in the Colleges over the years.

It is on the premise above that this study investigated the disposition of STME Teachers to ICT Usage for promotion of

Science Education in the Colleges, F.C.E. (Sp), Oyo as a case study.

III. OBJECTIVE

The main objective of this study was to found out the extent to which STME teachers have embraced ICT and its deployment in the classroom, irrespective of the challenge(s).

IV. RESEARCH QUESTION

To achieve the stated objective, the following questions were raised:

- ✓ To what extent has the STME Teachers irrespective of their ranks adopted the use of ICT in the education of science students?
- ✓ What is the attitude of STME teachers regardless of rank in the adoption of ICT as means for personal development towards promoting science education?
- ✓ Irrespective of rank, what is the perception of STME teachers of ICT as a tool to enhancing students' academic performance?

V. HYPOTHESES

$H0_1$: Teachers adoption of ICT is independent of teachers rank

$H0_2$: Teachers attitude to ICT usage is independent of teachers rank

$H0_3$: Teachers perception of ICT is independent of teachers rank

VI. METHODOLOGY

For the quantitative study, a descriptive survey design was adopted. A well-structured questionnaire which composed of two sections A and B was used as the instrument for the study. Section A covered personal data of the respondents while section B (of 20 research items) solicited the teacher's views on the topic. The section B part of the questionnaire employed a 4- point Likert scale response format. The population target was the entire seventy five (75) teaching staff of the School of Science, FCE (Special), Oyo. However for this study, a total of forty (40) Science lecturers/teachers whose questionnaires were effectively completed were engaged to participate in the study. This comprised of both the males and female lectures ranging from Assistant Lecturer (AL), Lecturer III (LIII), Lecturer II (LII), Lecturer I (LI), Senior Lecturer (SL), Principal Lecturer (PL) to Chief Lecturer (CL). The questionnaire were administered and collected personally by the researcher. Descriptive and inferential statistical methods were used in the analysis of data collected and results presented in tables.

VII. RESULTS AND DISCUSSION

$H0_1$: Teachers adoption of ICT is independent of teachers rank

H_1: Teachers adoption of ICT is dependent of teachers rank

Count

		Adopt ICT			Total
		Strongly Agree	Agree	Disagree	
Rank	A.L	2	6	3	11
	L111	0	6	3	9
	L11	2	5	0	7
	L1	0	1	1	2
	SL	0	3	1	4
	PL	0	2	1	3
	CL	1	2	1	4
Total		5	25	10	40

Table 1(a): Crosstab

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.571[a]	12	.818
Likelihood Ratio	10.891	12	.538
Linear-by-Linear Association	.004	1	.948
N of Valid Cases	40		

a. 19 cells (90.5%) have expected count less than 5. The minimum expected count is .25.

Table 1 (b): Chi-Square Tests

Table 1: Hypothesis 1

Decision

Since the asymptotic significant (2-sided) value of 0.818 is greater than the p-value (0.05) and the chi-square value of 7.571 is less than the chi square tabulated value at 6 degree of freedom, the null hypothesis is therefore not rejected and it is concluded that Teachers adoption of ICT is independent of teachers rank. This implies that STME Teachers irrespective of their ranks have embraced the use of ICT in the education of science students. This is being achieved in the face of certain challenges such as insufficient technical resources, failure in power supply, lack of ICT facilities in students learning environment, and high cost of maintenance of ICT usage as observed in this study.

$H0_2$: Teachers attitude to ICT usage is independent of teachers Rank

H_1: Teachers attitude to ICT usage is dependent of teachers Rank

Count

		Attitude to ICT			Total
		Strongly Agree	Agree	Disagree	
Rank	AL	4	6	1	11
	L111	4	5	0	9
	L11	2	5	0	7
	L1	0	2	0	2

	SL	0	4	0	4
	PL	2	0	1	3
	CL	1	3	0	4
Total		13	25	2	40

Table 2 (a):Crosstab

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.656[a]	12	.323
Likelihood Ratio	15.484	12	.216
Linear-by-Linear Association	.339	1	.561
N of Valid Cases	40		

a. 19 cells (90.5%) have expected count less than 5. The minimum expected count is .10.

Table 2 (b): Chi-Square Tests

Table 2: Hypothesis 2

DECISION

Since the asymptotic significant (2-sided) value of 0.323 is greater than the p-value (0.05) and the chi-square value of 13.656 is less than the chi square tabulated value at 6 degree of freedom, the null hypothesis is therefore not rejected and it is concluded that teachers attitude to ICT is independent of teachers rank. The teachers' disposition to ICT usage for personal development was positive. Out of the 40, 38 agreed that, their use of ICT facilities, grant them access to current information on temporary issues related to their field of study. They employ ICT for a variety of academic and research activities to enhance their teaching proficiency. By reason of their right attitude to ICT usage, it facilitates their keeping track of all student academic progress and feedback; improves collaboration with colleagues and sharing of ideas related to the curriculum and also allows for improvement in their academic progress.

$H0_3$: Teachers perception of ICT is independent of teachers rank

H_1: Teachers perception of ICT is dependent of teachers rank

Count

		Perception of ICT			Total
		Strongly Agree	Agree	Disagree	
Rank	A.L	4	7	0	11
	L111	7	2	0	9
	L11	4	3	0	7
	L1	1	1	0	2
	SL	1	3	0	4
	PL	0	2	1	3
	CL	2	2	0	4
Total		19	20	1	40

Table 3(a): Crosstab

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.890[a]	12	.091
Likelihood Ratio	13.241	12	.352
Linear-by-Linear Association	1.571	1	.210
N of Valid Cases	40		

a. 19 cells (90.5%) have expected count less than 5. The minimum expected count is .05.

Table 3 (b):Chi-Square Tests

Table 3: Hypothesis 3

DECISION

Since the asymptotic significant (2-sided) value of 0.091 is greater than the p-value (0.05) and the chi-square value of 18.890 is less than the chi square tabulated value at 6 degree of freedom, the null hypothesis was therefore accepted. It is concluded that teachers' perception of ICT is independent of teachers rank. From table 3 findings, it showed that, STME teachers have a good perception of ICT as a tool for enhancing students' academic performance. Majority perceived that ICT usage in science education would enable self-paced learning , encourage students' motivation, self-confidence, active learning, improves speaking skills and grammar as well as foster a live contact between the teacher and the students through e-mails, e- learning , web- based utility and thus better productivity.

VIII. CONCLUSION

Teaching and learning in the 21st century has greatly been motivated through the adoption of ICT globally. In Nigeria, so many policies in the educational sector have been put in place to advance the teaching and learning of Science and Technology Education. STME teachers are considered significant in the pursuit of realizing the policy directions and vision of Science and Technology – driven economy. However, ICT usage in Nigerian schools today comes with many challenges. Yet for effective STME teaching and learning in this Information age, the deployment and utilization of the opportunities of ICT in the Science classroom and environment is non- negotiable. ICT facilities must be available, accessible and utilized. Science educators must accept the phenomenon, possess the capacity to use ICT, must be ready to learn and change the mode of teaching to incorporate ICT in their day to day teaching activities.

IX. RECOMMENDATIONS

This study recommends as follows:

- ✓ Science teachers and students should endeavor to continually improve on their knowledge of computers and other ICT learning resources for better productivity.
- ✓ The government should be more involved in the funding of science- based education.
- ✓ Various opportunities for scholarship and other motivation should be made available to attract student and teachers toward science education especially STME.

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- ✓ ICT usage generally has some demerits. Science teachers and students should therefore exercise some level of self-discipline in order not to breed laziness and concomitant negative effect on their academic performance.
- ✓ There is need for effective monitoring of the Science and Technology policy of government to ensure its implementation and expected impact.

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