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The Use Of Ict In Learning Of Cell Division As A Concept In Biology In Senior Secondary Schools In Rivers State

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***Abstract*—The focus of this study was to investigate the Use of ICT in Learning of Cell Division as a Concept in Biology in Senior Secondary Schools in Rivers State. Two research questions guided this study. Descriptive method was adopted for the study. The sample of this study was made up of 120 teachersfrom twelve secondary schools that were randomly selected from the secondary schools in the local government area using the random sampling technique. Ten teachers were randomly selected from each of the twelve schools making a total of one hundred and twenty (120) teachers for the study. The instrument used for data collection was the questionnaire. The statistical methods used for the study are descriptive statistics of frequency counts and simple percentage. The results of the analyses revealed that ICT facilities are not readily available in senior secondary schools in Rivers State and majority of the teachers lack the ICT skill required to teach cell division in senior secondary schools. In congruence with the findings, the study recommends that government should ensure adequate provision of ICT resources for effective teaching and learning in our secondary schools. Also, government, through the Ministries of Education, should embark on training and retraining of teachers on the use of ICT to teach students in secondary schools.**

***Keywords*—ICT, Cell Division, Biology, Secondary Schools, Rivers State**

Introduction

The use of ICT in learning creates an environment that produces greater learning and collaboration that can be attained by an individual learner working in competition with others (Adu and Olatundun, 2013). Ajayi (2008) is of the opinion that computer-mediated collaborative learning creates a stimulating environment that encourages student involvement, as well as learning from one another. In agreement, Marshall (2002) remarked that the capability of the computer to personalize learning can lead to new experience that often increases motivation and attention among learners. According to Yusuf (2005), the underlying assumption for the incorporation of ICT in science instruction is that the use of ICT might transform the teaching-learning activity/process. Lewis (2000) submit that the use of ICT could change the usual teacher-dominated activity of presenting factual knowledge into an interactive learner-centered process that nurtures confidence, initiative, and the enhancement of cognitive an affective behavior.

Ndibalema (2014) asserts that ICT which stands for Information and Communication Technology is defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. Ndibalema (2014) remarked that ICT is divided into two main approaches in education such as; ICT for education and ICT in education. Olayiwola (2014) highlighted that ICT for education implies the development of information communication technology for learning and teaching purpose while ICT in education involves the adoption of general components of information communication technology in practical use in teaching and learning process.

Cell division is taught to students in secondary school biology lessons. These lessons aim for students to grasp an understanding of the following: mitosis and meiosis phases, importance of meiosis, importance of crossing-over, DNA replication, homologous chromosomes and separation, relationships within DNA, chromatids (Lewis and Wood-Robinson, 2000). According to Lewis and Wood-Robinson (2000), cell division can be described quite simply, as cell reproductive activities that transfer genetic information from parents to offspring, which can then be expressed in the offspring. Similarly, Atilboz (2004) asserts that cell division is the process by which cells replicate in order to replace cell loss, repair tissue damage and reproduce the organism. Atilboz identified two types of cell division that encountered in the Eukaryotic cell viz. Mitotic and Meiotic divisions.

Atilboz (2004) explained that mitosis and meiosis proceed in two phases viz. nuclear division (Karyokinesis) in which genetic materials are shared and cytoplasmic division (Cytokinesis) in which other organelles of the cell are shared. Smith (1991) remarked that the process of learning cell division is actually very complex. In agreement, Kindfield (1994) noted that biology includes complex relationships of unfamiliar and abstract concepts which is quite difficult to learn and teach. Students often experience difficulty in understanding certain biological concept and try to

learn them via memorization without understanding. Atilboz (2004) believed that the use of ICT can help learners understand difficult concepts in biology education.

Statement of Problem

There are many concepts in biology, including cells, mitosis an meiosis, organs, physiological processes, hormonal regulation, oxygen transport, genetics, genetic engineering, the central nervous system, etc. these concepts can be perceived as difficult to learn by secondary school students. Atilboz (2004) also found that hormones, genes and chromosomes, mitosis, the nervous system, and Mendelian genetics were considered difficult concepts by secondary school students. Experiencing difficulties in so many topics in biology negatively affects students' motivation and achievement (Atilboz, 2004).

Lewis and Wood-Robinson (2000) noted that a considerable number of learners have been found to hold an insufficient understanding of cell theory and related fundamental concepts such as mitosis, meiosis, chromosomes, and chromatids, even after the conclusion of the instructional process. Despite the use of squashed young onion root tips, charts, or electron micrographics, etc in cell theory practicals, Lewis and Wood-Robinson (2000) remarked that these materials do not reflect the dynamic nature of the process because they lack movement and colour.

Consequently, Sorensen, Twidle, Childs& Godwin (2007) agree that presenting lessons through computer-based learning (CBL) is a recent innovation that may be effective in improving the cognitive and affective skill necessary for learning a doing science, Also, researcher like Bransford, Brown and Cocking (2000) in their studies have identified ICTs as tools that encourage and support learning of difficult concepts independently and collaboratively. Similarly, Atilboz (2004) remarked that the capability of the computer to personalize learning can lead to new experiences that often increase motivation and attention among learners. It is against this background that this research was undertaken, aimed at investigating the availability and the extent of use of ICT in teaching cell division in secondary schools in Rivers State.

Objective of the Study

The following specific objectives are set to guide the study

1. To investigate the availability of ICT equipments in Secondary Schools in Rivers State
2. To ascertain the extent of the use of ICT equipments in the teaching of cell division in secondary Schools in Rivers State.

Research Questions

The following Research Questions were formulated to guide the study:

1. What is the level of availability of ICT Resources for teaching of cell division in Senior Secondary in Obio Akpor Local Government Area of Rivers State
2. What is the level of utilization of the ICT Resources available in Senior Secondary Schools in Obio Akpor Local Government Area of Rivers State?

Methodology

Descriptive survey method was considered appropriate for this study. This study covered all the secondary schools in Obio/Akpor Local Government Area of Rivers State. The sample of this study consist of 120 teachers from twelve secondary schools randomly selected from the secondary schools in Obio/Akpor local Government Area using the random sampling technique. Ten teachers were randomly selected from each of the twelve schools making a total of one hundred and twenty (120) teachers for the study. The instrument used for data collection was the questionnaire. The instrument was designed in three sections. Section A for the instrument focused on biographic data of sample teachers. Section B contained information on the availability of ICT resources in the schools while Section C dealt with questions on the utilization of ICT resources by Secondary Schools teachers. The instrument was designed along the modified Likert format of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The responses were scored as follows: SA = 4, A = 3, D = 2 and SD = 1 respectively. Content validity of the instrument was established by pro0fessionals in the Department of Curriculum Studies and educational Technology, Ignatius Ajuru University of Education, Port Harcourt. To establish the consistency of the instrument, test-retest method was used to ascertain the reliability. Consequently, the researcher administered the copies of the questionnaire with the help of a research assistant; and collected same immediately the responses were completed by the respondents. Furthermore, a correlation of 0.84 was achieved which was considered high enough to justify the reliability of the instrument. The statistical methods used for the study are descriptive statistics of frequency counts and simple percentage.

Research Question 1

What is level of availability of ICT Resources for the teaching of cell division in Senior Secondary Schools in Obio/Akpor Local Government Area of Rivers State?

Table 1: Respondents' opinions on availability of ICT resources in teaching cell division in Secondary Schools in Obio/Akpor LGA, Rivers State

S/N	ITEM/VARIABLE	SA	A	D	SD
5.	Mobile phones with internet access	40 (33)	45 (38)	20 (17)	15 (13)
6.	Internet Browsing	20 (17)	10 (8)	60 (50)	30 (25)
7.	Computer laboratories	10 (8)	25 (21)	55 (46)	30 (25)
8.	Social networking	20 (17)	20 (17)	65 (54)	15 (13)
9.	Multimedia facilities	10 (8)	20 (17)	70 (58)	20 (17)
10.	Virtual library	15 (13)	10 (8)	65 (54)	30 (25)
11.	Projection screen	10 (8)	5 (4)	80 (67)	15 (13)

Source: Field Survey, 2021

Table 1 above shows the results of the responses on the availability of ICT resources in teaching cell division in secondary schools in Obio/Akpor LGA of Rivers State. 40 respondents, representing 33% strongly agreed that mobile phones with internet access are available in the schools, 45(38%) agreed meanwhile 20(17%) and 15(13%) disagreed and strongly disagreed respectively. Responses on availability of internet browsing shows that 20 respondents, representing (17%) and 10(8%) strongly agreed and agreed respectively, while 60 respondents, representing 50% of the entire respondents disagreed and 30(25%) strongly disagreed. Result of the table also indicate that 10(8%) of the respondents strongly agreed that computer laboratories are available in the schools, 25(21%) agreed, 55(46%) disagreed while 30(25%) strongly disagreed. On the availability of social networking, 20(17%) and another 20(17%) strongly agreed and agreed respectively to the availability, meanwhile, 65(54%) and 15(13%) disagreed and strongly agreed, respectively. Results of table 1 above further indicate that 10(8%) strongly agreed that multimedia facilities are available for teaching, 20(17%) agree, 70(58%) disagreed while 20(17%) strongly disagreed. In addition, 15(13%) respondents strongly agreed that virtual library is available in the schools 10(8%) agreed, 65(54%) disagreed and 30(25%) strongly disagreed. Lastly, 10 respondents representing 13% strongly agreed that projection screen is available, 5(4%) agreed, 80(67%) disagreed, while 15(13%) strongly disagreed.

Research Question 2

What is the level of Utilization of ICT Resources in Senior Secondary in Obio/Akpor Local Government Area of Rives State?

Table 2: Respondents' opinions on availability of ICT resources in teaching cell division in Secondary Schools in Obio/Akpor LGA, Rivers State

S/N	ITEM/VARIABLE	SA	A	D	SD
12.	I use computer to teach my students	0 (0)	5 (4)	100 (17)	15 (13)
13.	I use PowerPoint in presenting my lesson	0 (0)	0 (0)	80 (67)	40 (33)
14.	I can use scanner to copy images	30 (25)	10 (17)	60 (50)	20 (8)
15.	I can set up a multimedia projector	5 (4)	5 (4)	80 (67)	30 (25)
16.	I browse the internet to get materials for teaching	40 (33)	50 (42)	20 (8)	10 (17)
17.	I use the Microsoft word to set my questions	15 (13)	20 (8)	50 (42)	25 (21)

Source: Field Survey, 2021

Table 2 above depicts the results of the responses on teachers' utilization of ICT resources in teaching cell division in secondary schools in Obio/Akpor LGA of Rives State. Only 5 respondents representing 4%, agreed that they use computer to teach their students, majority of the respondents (83%) disagreed while 15(13%) strongly disagreed. On the use of PowerPoint in presenting lesson, all the respondents were unanimous in their responses as 80(67%) respondents and 40(33%) disagreed and strongly disagree. Also, 30 respondents, representing 25% strongly agreed that they can use scanner to copy images, 10(17%) agreed while 60(50%) and 20(8%) disagreed and strongly disagreed respectively. Furthermore, 5 respondents, representing 4% and 5(4%) respondents strongly agreed and disagreed respectively that they can set up a multimedia projector while 80(67%) respondents and 30(25%) disagreed and strongly disagreed respectively. Majority of the respondents strongly agreed (33%) and agreed (42%) that they browse the internet to get materials for teaching while 20(8%) respondents and 10(17%) disagreed and strongly disagreed respectively. Finally, 15(13%) of the respondents strongly agreed to the use of Microsoft word to set their questions, 20(8%) agreed while 50(42%) respondents and another 25(21%) disagreed and strongly disagreed respectively.

Discussion of Findings

The result of this study shows that ICT facilities are not readily available in the schools sampled by this study. Although mobile phones with internet access are believed to be available since most of the teachers use smart phones, other resources such as internet browsing in the school, computer laboratories, social networking, multimedia facilities, virtual library and projection screen are not available in the sampled schools. The findings of the study corroborate that of

Fakeye (2010) and Oyejola (2007) whose studies revealed that most schools in Nigeria are ill equipped for the application of ICT.

Result of the study also revealed majority of the teacher in secondary schools do not use ICT to teach students. The study also observed that the teachers lack the appropriate skill to use PowerPoint in presenting their lesson. Only a hand full of teachers accept ;that they can use scanner to copy images, meanwhile, most of these teachers lack knowledge, competence to set up a multimedia project and use Microsoft word to set their questions. That notwithstanding, majority of the teachers are believed to get materials for teaching by browsing the internet. This may be as result of the teacher's use of smart phones. In agreement with this study, Fakeye (2010) attributed this scenario to the non-availability of ICT facilities in schools. According to the author, the non-availability of these facilities greatly hinders access and inadequate training of teachers on the use and application of the computer in secondary schools.

Conclusion/Recommendations

This study has revealed that ICT facilities are not readily available in our secondary school, hence, the low level of ICT utilization in our secondary school. They equally revealed that majority of the teachers lack the basic skill to use the computer and ICT equipment. This lack of skill by teachers no doubt is believed to be a result of lack of ICT equipment in our schools.

Based on these findings, the study recommended that:

1.Government should ensure adequate provision of ICT resources for effective teaching and learning in our secondary schools.

2.Government, through the Ministries of Education, should embark on training and retraining of teachers on the use of ICT teaching students in secondary schools.

3.There is need for government through the Ministry of Education to revisit the secondary schools curriculum with a view to incorporating the use of computer and ICT resources in the teaching and learning process.

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