INFLUENCE OF TEACHERS' QUALIFICATION ON THE USE OF *OPON-IMO* (TABLET OF KNOWLEDGE) FOR TEACHING CHEMISTRY IN SENIOR SECONDARY SCHOOL IN OSUN STATE, NIGERIA

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Abstract

The usage of Opon-Imo to teach chemistry in senior secondary schools in Osun State, Nigeria, was examined in relation to the qualifications of the teachers. The study used a survey-style descriptive research design. All of the teachers at Osun State's public senior secondary schools made up the study's population. A total 120 teachers from 32 public senior high schools made up the sample, which were chosen at random. In this investigation, data was collected using a single research instrument. This tool; the Teachers' Questionnaires on the Use of Opon-Imo for Teaching, was used to gather information regarding the qualifications of the teachers. T-test analysis and simple linear regression were used to examine the gathered data. According to the study's findings, secondary school chemistry instruction in Osun State, Nigeria, was significantly impacted by the teaching credentials of instructors who utilized Opon-Imo. Therefore, the study recommended that before Opon-Imo is used to teach chemistry in secondary schools, the qualifications of the teachers should be taken into account. Teachers with education degrees should also be hired by the government to ensure that Opon-Imo is used effectively for secondary chemistry instruction.

Keywords: *Opon-Imo,* Qualification, Teachers, Teaching, School.

Introduction

Computers have a revolutionary and essential function in education. It improves the educational process, gives pupils necessary skills, and gets them ready for challenges in the future. Additionally, it gives instructors and students immediate access to resources like scholarly journals, e-books, online courses, and instructional videos, among others. Information technologies (IT) and communication technologies (CT) are combined to form information and communication technology (ICT), which includes computer and internet-related software and applications (Tezci in Gokhan, 2017). "The use of computer-based communication that incorporates daily classroom instructional process" is the definition of information and communication technology (ICT) integration in education. ICT is widely employed in teaching and learning processes in schools throughout many nations, and it plays a significant role in the educational systems of modern societies. Technology integration, according to Gilakjani in Yusuf & Josta (2019), is the art and craft of utilizing technology in the classroom to successfully complete teaching and learning activities. The need

for information and communications technology (ICT) literacy is rising in Nigeria in line with the globalization trend. This might be as a result of workers realizing how these facilities can improve productivity. The influence of computers on all facets of human endeavors keeps growing. Education is one such endeavor.

In addition to helping students learn, computers have improved their capacity for independent study, information analysis, critical thinking, and problem-solving. Technology and computers are viewed as supplementary resources that are necessary for improved teaching and learning, not as a replacement for effective teaching methods. Computer education, according to Salako (2016), is the knowledge and capacity to effectively use computers and related technology, encompassing a variety of abilities ranging from basic to advanced use. ICT integration is a continuous learning process that offers a proactive teaching-learning process rather than a one-step learning method. ICT can be applied in a variety of ways to support students' and instructors' learning in their various subject areas. The then Governor Aregbesola may have done this in order to determine "where the bread of Osun State education system left unbuttered" before to Opon-Imo's arrival.

Making students ICT literate and providing them with the required technology resources—such as computers, tablets, interactive whiteboards, televisions, radios, and mobile phones—are only two of the ways that students need to be supported. Students' academic performance will probably increase as a result of doing this. This is one of the reasons Opo-Imo was included to Osun State's educational system. Other benefits of the Opon-Imo (Tablet of Knowledge) include its solar-powered capability. It can record audio courses, relieve students of the burden of duplicating notes, free up more time for learning, and help kids become familiar with ICT at a young age. Its touch screen makes it easy to use, and its battery lasts up to six hours. Finally, by saving the state a significant amount of money that would have been required to purchase textbooks annually, this small gadget would significantly support Osun State's free education policy. The saving is enormous, in fact. Opon-Imo (Tablet of Knowledge) integration will assist students by allowing them to engage in hands-on activities in a technology-based course that is intended to promote their understanding of the subject matter, rather than being restricted by a limited curriculum and resources. Additionally, it assists educators in creating engaging, innovative, and successful lesson plans that encourage students to actively learn (Aregbesola, 2019).

Utilizing information and communications technology (ICT) seems to be one of these creative and promising ways to raise the standard of education. Through the Opon-Imo (Tablet of Knowledge) program, the State Government of Osun, led by Governor Rauf Aregbesola, has taken a revolutionary step in its commitment to promoting innovative ideas for Africa by leveraging ICTs to effectively address the learning problem. The State created a learning tool that has the potential to completely transform education in underdeveloped nations worldwide through its Opon-Imo (Tablet of Knowledge) Technology Enhanced Learning System (OTELS). Opon-Imo, sometimes referred to as the "Tablet of Knowledge," is a digital textbook used by Osun State senior secondary school pupils. Like other computers, this e-learning gadget has both software and hardware components. The Android operating system is incorporated into the Opon-Imo. The e-Library, the Test Zone, and the Virtual Learning Environment are its three (3) main sub-environments. The entire lesson notes for seventeen (17) subjects created by Osun Master Instructors—Osun state instructors

chosen from various schools on all subjects—are stored in the Virtual Learning Environment.

For the last ten (10) years, the Test Center has 40,000 previous questions and answers for the seventeen (17) subjects of the WAEC and JAMB exams. 56 textbooks covering the seventeen (17) subjects offered in the state are available in the e-Library. Additionally, this Android 4.0 PC tablet includes a dictionary, the Bible, the Quran, an Ifa book, and a health book. Additionally, it features development games like Tetris, Sudoku, and Chess. According to Hyperlink (2017), it has 32 GB of internal storage and 512 MB of RAM. The first of its kind in the world, Opon-Imo featured five additional curriculum subjects for Senior Secondary One, Two, and Three levels in addition to the 17 core subjects. Class by class, this device is set up. It can function without the internet, in contrast to other PCs. As a result, all pupils can use it, regardless of where they attend school or their socio-economic background.

The quality of instruction that students get in the classroom has a direct impact on the quality of education. Teachers and their training determine the quality of education in any nation. Therefore, without the right training, a teacher cannot perform any role. Every school curriculum's implementation and success are decided by the teachers. According to Ikwuka, Onyali, Olugbemi, Etodike, Igbokwe, and Adigwe (2020), educators are crucial to the development of a nation, and their credentials are essential in fostering the moral character of the next generation of citizens so that they can live productive lives. Additionally, a student's performance on any test correlates with the caliber of their teachers. According to Ogundola and Oso (2018), the National Education Policy asserts that the teaching-learning process is significantly influenced by the teacher's devotion, subject-matter expertise, and academic credentials. Teaching, according to Ogundola and Oso (2018), is an act that may be improved with practice and instruction. They claimed that a key component of rebuilding the educational system is the availability of qualified teachers. As a result, this effort must analyze teacher qualifications. Teachers should also possess the pedagogical abilities necessary to properly support learners. Given the need for holistic professional development and to align teaching methods with the changing use of information and communication technology (ICT), Ikwuka et al. (2020) explained that teacher professional development not only encourages but also helps teachers stay current with new and effective practices in teaching and learning.

The abilities a teacher needs to teach well can be referred to as their qualifications. These skills may include formal education, subject-matter expertise, pedagogical skills, and the length of training, certificate, and professional development (Otoide, 2018). Therefore, in order to be eligible to teach, a teacher needs to have a significant quantity of the previously described talents. According to Malik (2016), the foundation of the educational system is a core of committed, knowledgeable, and skilled educators.

In addition to academic achievement, individual differences among instructors may be linked to their motivation, learning styles, cognitive abilities, and anxiety levels. Amie-Ogan and Omunakwe (2020) investigated how students' academic performance in public senior secondary schools in the Port Harcourt Metropolis was believed to be impacted by the quality of their teachers. Using three research questions and three hypotheses, the study examined how students' academic performance in public senior secondary schools in the Port Harcourt Metropolis was thought to be impacted by the quality of their teachers.

Descriptive survey design was used in the study. There were thirty-five (35) public Senior Secondary Schools in Port Harcourt and Obio/Akpor Local Government Areas of Rivers State, and eleven thousand three hundred and sixty-four (11,364) SS2 pupils made up the study's population.

Using stratified and purposive selecting approaches, a sample of 1,137 students—506 male and 631 female—was selected for the study. A self-designed questionnaire called the "Perceived Influence of Teacher Quality on Students‟ Academic Performance Questionnaire (PITQSAPQ)" served as the study's instrument. It was validated by experts, and reliability indexes of 0.87, 0.93, and 0.87 were obtained using Cronbach Alpha. The study issues were addressed using the mean and standard deviation, and the hypotheses were tested at the 0.05 level of significance using the z-test. Results showed that students' academic performance in public senior secondary schools in Rivers State's Port Harcourt Metropolis is positively impacted by instructors' years of experience, pedagogical expertise, and communication abilities. In order to improve pupils' academic performance, the administration of Rivers State was advised, among other things, to hire only certified and trained teachers for the state's public secondary schools.

One of the most crucial science courses in the senior secondary school curriculum is chemistry, and its importance cannot be overstated. This is due to the fact that it is essential to many other professions, like medical, pharmaceutical sciences, and agriculture, without which people cannot live peacefully in this world. It has been demonstrated by studies that chemistry improves life quality. Nonetheless, chemistry is crucial to agriculture in the creation of insecticides, fertilizers, herbicides, facilities for processing and storage, corrosion-prevention chemicals, machinery maintenance, and many other things. Additionally, the study of medicine, pharmacy, agriculture, textiles and apparel, and all engineering specialties require a solid understanding of chemistry. As stated by Akinnodi (2019), chemistry is the study of the physical properties of distinct atoms, how they combine to form molecules, how different types of molecules interact with one another, and the energy changes that result from these interactions.

Despite the significance of chemistry in the nation's advancements, the invention of the Opon-Imo (Tablet of Knowledge), and government initiatives to create a supportive learning environment, Osun State senior secondary school pupils are struggling in chemistry. According to chief examiner reports from the West African Senior Secondary School Examination (WASSSE), the pupils' poor performance in Chemistry serves as proof of this. It's possible that Osun State secondary school teachers and their pupils haven't made full utilization of Opon-Imo, or the Tablet of Knowledge. Thus, it is necessary to look at how teachers' qualifications affect the usage of Opon-Imo (a knowledge tablet) in senior secondary schools in Osun State, Nigeria, to teach chemistry. Additionally, as of the time of this inquiry, Opon-Imo is not in use, despite its benefits.

Purpose of the Study

The purpose of the study was to examine the:

i. Influence of teachers' qualification on the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State.
ii. Difference between the use of *Opon-Imo* in teaching Chemistry between teachers with education and non-education qualifications.

Research Hypotheses

1. Teachers' qualification does not significantly influence the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State.
2. There is no significant difference in the use *Opon-Imo* in teaching Chemistry in secondary schools between teachers with education and non-education qualifications.

Materials and Methods

The multistage sampling procedure was used. At the first stage, four (4) Local Government Areas (LGAs) were selected from each of the three Education Senatorial Districts through simple random sampling technique. At the second stage, thirty-two (32) public Senior Secondary Schools were selected from all of the Local Government Areas (LGAs) earlier selected using purposive sampling technique. At the third stage, all the Chemistry teachers in the selected Senior Secondary Schools were used as sample. Purposive sampling technique was used because the population of the students determined the number of Chemistry teachers that were posted to the schools, therefore, researcher had to consider the population of Chemistry teachers before choosing a particular school. Also, not all the available Senior Secondary Schools were using *Opon-Imo* during that period. One instrument was used to obtain data for this study. This is Teachers' Questionnaires on the use of *Opon-Imo* for teaching Chemistry (TQOC). Teachers' Questionnaires on the use of *Opon-Imo* for teaching Chemistry (TQOC) was used to obtain information on the influence of teachers' qualification and attitude of teachers who used the device. This instrument consisted of four Section A and B. Section 'A' deals with personal information of the respondents, such as year of teaching, gender, and teachers' academic qualification. Section B elicits information on attitudes of teachers towards the use of *Opon-Imo*. This consisted four responses having a 4-point Likert-type scale ranging from Strongly Agree (SA) (4), Agree (A) (3), Disagree (D) (2), and Strongly Disagree (SD) (1).

Results

Hypothesis 1: Teachers' qualification does not significantly influence the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State.

Table 1: Simple Linear Regression of Influence of Teachers' Qualifications on the Use of *Opon-Imo* in teaching Chemistry

Model	Unstandardized Coefficient		Standardized coefficient		
	B	**Std. Error**	**Beta(β)**	**t**	**Sig. t**
(Constant)	38.221	2.422		21.223	0.000
Teachers' Qualification	0.073	0.024	0.086	2.032	0.000

$R = 0.087$, $R^2 = 0.79$, Adjusted R2=0.502, Standard Error=7.445, Fcal. = 5.056, Ftab. = 3.315
$P < 0.05$

The following regression model could be derived from Table 1:

$Y = a+b_1X_1$

Where

X_1 = Teachers' Qualification

bi = (i = 1) Regression weight Coefficient

a = Constant

The simple linear regression shows the influence of teachers' qualification on the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State, Nigeria.

$Y = 38.221+0.073$

The results further show that F_{cal} (5.0567) is greater than F_{tab} (3.315) at 0.05 level of significance. The result is significant ($p<0.05$). Thus, the null hypothesis was rejected. This implies that teachers' qualification had significant influence on the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State, Nigeria.

Equally, the results revealed that there was a significant positive correlation between the predictor variables (teachers' qualification) and the outcome variable (the use of *Opon-Imo* in teaching Chemistry) ($R = 0.087$, $p<0.05$). This indicates that teachers' qualification had significant influence on the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State, Nigeria. The coefficient of determination ($R^2 = 0.89$) implies that teachers' qualification accounted for 89% (R^2 x 100) of the total variance in in teaching Chemistry using *Opon-Imo*. This indicates that the predictor (teachers' qualification) had 89% influence on the use of *Opon-Imo* in teaching Chemistry in secondary schools. The remaining 11% unexplained variation is due largely to other variables that can account for the use of *Opon-Imo* in teaching Chemistry in secondary schools in Osun State, Nigeria.

Hypothesis 2: There is no significant difference in the use *Opon-Imo* in teaching Chemistry in secondary schools between teachers with education and non-education qualifications.

Table 2: t-test analysis of the difference between the use *Opon-Imo* in teaching Chemistry in secondary schools between teachers with education and those with non-education qualifications

Source of Variation	N	Mean	SD	df	t_{cal}	P
Teachers with Education Qualification	107	43.116	5.675	118	0.345	0.000
Teachers without Education Qualification	13	2.077	1.454			

Table 2 indicates that the t-cal value of 0.345 for the difference in the use of Opo-imo between teachers with education background and those without education background is significant. Therefore, the null hypothesis—that teachers with and without education credentials do not significantly differ in their usage of Opon-Imo when teaching chemistry in secondary schools—was rejected. According to the mean difference, secondary school chemistry teachers with education degrees use Opon-Imo than those without.

Discussion

The findings of this study showed that the employment of Opon-Imo in secondary school chemistry instruction was significantly influenced by the qualifications of the teachers. The findings supports the submission of Ikwuka et al. (2020), that teachers' professional development not only encourages but also helps teachers stay current with new and effective teaching and learning practices.

The results are consistent with those of Ikwuka et al., (2020), who found that teachers are crucial to the development of a nation and that their training is essential to fostering the growth of young people's character for long-term, holistic development that allows them to live productive lives. The findings of this study is also in line with those of Ogundola and Oso (2018), who found that a teacher's commitment, subject-matter expertise, and academic credentials all had a significant influence on instruction.

Conclusion

Based on the findings of this study, it can be concluded that instructors with education degrees used Opon-Imo differently than teachers without education

degrees when teaching chemistry in secondary schools. Given the need for holistic professional development and to align teaching methods with the changing use of information and communication technology (ICT),

Recommendations

Based on the findings of this study, the following recommendations were made.

1. Teacher's qualifications should be considered before the introduction of ICT gadgets such as *Opon-Imo* for teaching of Chemistry in secondary schools.
2. Teachers with education qualifications should be employed by government for effective use of ICT such as *Opon-Imo* for teaching of Chemistry in secondary

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