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Impact of Eko Excel Tablet on Mathematics Achievement in Lagos State, Nigeria

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Abstract
The study investigated the effect of using Eko Excel Tablets on primary school pupils' achievement in mathematics in Lagos State, Nigeria. Two research questions and two hypotheses guided the study. The design of the study was quasi-experimental which involved a pre-test and post-test non-equivalent control group. A total of 150 pupils were conveniently sampled in their intact classes for the study. Out of the 90 pupils in the Eko Excel group, there were 44 males and 46 females, while there were equal numbers of males and females out of the 60 pupils in the control group. The Mathematics Achievement Test (MAT) which consists of 50 objective questions was designed by the researchers. The questions were drawn from Lagos State Unified Examination past questions conducted by the Lagos State Examinations Board. The reliability of the instrument was 0.73 with the use of the Spearman rank correlation coefficient. The two research questions were answered using means and bar charts, while hypotheses were tested using analysis of variance (ANCOVA) also known as F-test at a 0.05 level of significance. The findings revealed that the use of Eko Excel Tablets enhanced the achievement of the pupils in mathematics, unlike the conventional method of teaching. It also revealed that there is no significant effect of gender on the achievement scores of pupils taught mathematics using Eko Excel Tablets. It was recommended among others that Lagos State Universal Basic Education Board (LASUBEB) should monitor the effective use of the Eko Excel Tables in all the schools.

Keywords:*Eko excel tablet, Primary school, Mathematics Achievement test, Gender*

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I. Introduction

Primary school is the first level of the education ladder. It is a preparatory ground where the background knowledge is rooted and built up for other academic endeavours (Okeke, 2016). Primary school provides pupils with the basic knowledge and skills needed in various subjects such as mathematics for effective learning of the subject in the future. It also provides pupils with the fundamental skills that will be the foundation for the rest of their academic careers (Nwoye, Okoye, Ugwuanyi, Odo, &Ezieke, 2020). This is why the National Policy on Education states that primary education is the foundation upon which the rest of the educational system is built (FRN, 2013).

The objectives of primary education include the inculcation of permanent literacy and numeracy, laying the foundation for national development, and giving the child opportunities to develop manipulative and scientific skills that will enable him or her to function effectively in society (FRN, 2013). This is a signal that shows a serious need to effectively teach mathematics at the primary school level with the use of technology for a solid foundation and further education. Including primary mathematics in the curriculum greatly exposes the pupils to the basic skills and operations needed for the effective learning of the subject.

Mathematics is a crucial subject needed for skills development and to promote rational thinking in human endeavour. Mathematics is an essential tool for the successful development of any nation (Shu'iabu& Sidi, 2020). Mathematics is a concenter subject which serves as the foundation for pupils' level of thinking, skill development and problem-solving (Malik & Salman, 2018). Mathematics is a subject that prepares an individual for academic excellence and useful living in society, and this useful living must develop a strong mathematics foundation at the basic school level (Malik, Salman, Ameen, & Abdullahi, 2020).

Even though mathematics is taught as a subject every day in primary schools, pupils' interest and achievement in mathematics are not encouraging and it should be a great concern to all mathematicians. Malik and Salman (2016) cited Salman (2009) who asserted that the perennial low performance of Nigerian pupils in mathematics has been attributed to inadequate knowledge of the subject matter content by teachers and poor

instructional techniques. Using technologies in teaching and learning mathematics will go a long way to improve the pupils' interest and understanding of mathematics and the rate of failure will either be reduced or be eradicated (Malik & Salman, 2016).

Technology in teaching mathematics has become increasingly prevalent in recent years. Technology offers various benefits in mathematics education, including providing interactive and engaging learning experiences, facilitating the visualisation of mathematical concepts, and promoting problem-solving skills (Tatar, Akkaya, &Kagizmanli, 2014). Technology will encourage learners to be active by enhancing classroom interactions and providing rapid feedback and monitoring of students' academic work and progress, thereby facilitating quicker correction (Mantoro, Utami, Dewanti, Yudhi, & Ayu, 2017). The use of technology, such as the Eko Excel Tablets in mathematics education can improve the academic achievement of basic school pupils in Lagos State. This prompted the Lagos State Government in December 2019 to create Eko-Excel, an acronym for Excellence in Child Education and Learning, an effort modelled.The goal of this effort is to reposition state public primary schools and improve teaching methods to meet the demands of the twenty-first century.Similarly, it intends to overhaul all government primary schools by connecting all teachers to cutting-edge technology. It seeks to improve instructors' approach by enhancing how they deliver content, regulate behaviour in the classroom, and control classroom disruptions.For its more than 1,017 public primary schools, the Lagos State Universal Basic Education Board (LASUBEB) has trained more than 4000 teachers since 2020 as part of its effort to create a highly skilled and competent workforce. This has been done in partnership with Bridge International and its technical partner.

EKO EXCEL seeks to, among other objectives, increase confidence in the state public education system by developing more skilled teachers through training, supporting, and motivating them to succeed in their classrooms. This is expected to have a positive effect on pupils' performance. In recent times, owing to the declining quality of public education in the country, most parents have resorted to enrolling their children in private schools, even low-cost private schools operating in unconducive environments with poorly qualified teachers. However, governments at all levels have embarked on a series of projects over the years to reverse the trend and attract more children to public schools. The recent programme by the Lagos State Government, Excellence in Child Education and Learning (EKO EXCEL), has been described as a move in the right direction.

Teachers are at the heart of successful learning. Introducing new training models to support and empower them will impact pupils and teachers' success. The EKOEXCEL training is both up-front and on-the-job, throughout the year. A fundamental element is a better methodology for teachers. It also enables the teacher to become more skillful in helping children to learn in a positive environment and increase pupil enrolment across the State. Leveraging technology helps teachers and head teachers to be more effective. They are also being supported through in–person and ongoing coaching. 1017 head teachers receive one-on-one coaching and support.

As Lagos aspires to become a 21st-century economy in Africa, a critical investment in basic education is required to build the quality workforce needed for the future. ''Eko Excel is the injection of modern Edu-Tech into teaching and learning in primary school (Eko Excel). This has made Lagos State's Educational system a leading system where her pupils can compete favourably with their counterparts around the globe without fear. This is a giant stride for Lagos State and Lagos State Universal Basic Education Board (LASUBEB). The Eko Excel are numerous such as teachers being empowered and made able to deliver at the same level as their counterparts around the world, there is on ground strong continuous support that encourages improvement in teachers and pupils to enables to accelerate reading and literacy skills to compete with their peers globally. Besides, the teacher has become more professional and technologically savvy in their work, and more skillful in helping children to learn in a positive environment.

Moreover, LASUBEB and other governing bodies will have adequate data to carry out necessary academic adjustments and infrastructural development across schools and many more. From the information gathered from the state Universal Basic Education Board (SUBEB), over 18,000 head teachers and teachers have been moved from analogue to digital teaching, using tablets and updated curricula. Over 14,000 primary school teachers from 1,017 public primary schools have been captured under the scheme. The intervention has also boosted uniformity and strict adherence to the curriculum. Teachers' tablets are preloaded with Lessons and content for effective monitoring for standardization across all of Lagos public primary schools.

All of these, of course, wouldn't have been possible if Governor Sanwo-Olu wasn't committed to the improvement of education, with a tested Nigerian technical partner providing support. Sanwo–Olu has invested massively in education, dedicating a substantial share of N171.6 billion (or 12.3 per cent) of the total N1.38 trillion 2022 budget to it. It is not a wasted investment as verifiable facts and figures continue to affirm. Even global land national bodies and individuals acknowledge the impressive traits of EKOEXCELL, which was recognized at the global 2021 Education Alliance Symposium in the US.

The Eko Excel initiative of the Lagos State government has checked truancy and improved attendance of the teachers and pupils in public primary schools. Teaching and learning in public primary schools in Lagos State have changed since the launch of the Eko Excel (Excellence in Child Education and Learning (Eko Excel) – the state's technology-driven initiative to improve learning outcomes.

Classroom interaction has also changed. Teachers now sing more songs; there are various chants, call-ups, and responses between teachers and pupils to keep the children's attention; and there is now a character board where pupils' cognitive and affective performances are recorded for all to see. The changes were largely positive for the teacher and their learners. However, they are seeking the review of some aspects of the initiative–like the timing and assessment model fit to deliver on its promise.

EKOEXCEL comes with wonderful experiences in the teaching profession that improve teaching skills. Most of the pupils expressed gratitude to the state government and the LASUBEB for introducing the initiative in the basic education sector which is the foundation of all learning. 'EKO EXCELL IS A PHENOMENON THAT HAS HAPPENED IN THE STATE. It is all about bringing information and communication technology (ICT) into the classroom. It is–encompassing. Eko Excel is meant to open young minds to a learning environment that is 21st-century compliant. It is an initiative geared towards ensuring that no child in Lagos State is left behind in a quest to raise holistic children to provide qualitative education in the contemporary setting. (This Day Newspaper, 2019).

The goal is to enable teachers to use the Eko Excel tablet in their classrooms, allowing the technology to have a significant impact on learning. As a result, the government would accomplish and measure academic improvement in public primary schools.The government hopes that by implementing this strategy, schools will become more appealing to pupils of all backgrounds, allowing them to be appropriately equipped at this cognitive level.Likewise, the State has built teacher training in innovative thinking and research-based teaching methods by effectively integrating technology for curriculum development. This will ensure that no child is left behind in terms of innovative thinking and formidable abilities, ensuring that by the end of their basic classes, they will be digitally literate. With this courageous step, the Lagos State Government is progressively restoring trust in the state's public primary school system. Therefore, this study investigated the impact of Eko Excel tablet on mathematics achievement in Lagos State.

Purpose of the Study

The main purpose of this study was to determine the use of the Eko Excel tablet and its effect on primary school pupils' performance in mathematics. Specifically, the study determined:

1. the effect of Eko Excel tablet on pupils' achievement in mathematics; and
2. the effect of Eko Excel tablet gender.

Research Questions

1. What are the mathematics achievement scores of pupils taught using Eko Excel Tablets?
2. What are the achievements of male and female pupils in mathematics when taught using Eko Excel Tablets?

Research Hypotheses

The following null hypotheses were formulated to guide the study.

$H0_1$: There is no significant effect of Eko Excel tablets on the mean achievement scores of pupils in mathematics.

$H0_2$: There is no significant influence of gender on the mean achievement scores of pupils taught mathematics using Eko Excel Tablets.

II. Materials and Method

The study is a quasi-experimental design type. The experimental group was exposed to Eko Excel Tablets and the control group was taught without being exposed to Eko Excel Tablets. Two primary schools were purposively selected as experimental and control groups respectively in Ojo Local Government of Lagos State. A total of 150 pupils were conveniently sampled in their intact classes for the study. Out of the 90 pupils in the Eko Excel group, there were 44 males and 46 females, while there were equal numbers of males and females out of the 60 pupils in the control group. The Mathematics Achievement Test (MAT) which consists of 50 objective questions was designed by the researchers. The questions were drawn from Lagos State Unified Examination past questions conducted by the Lagos State Examinations Board. Therefore, those questions have already been validated by the Lagos State Examinations Board. Both the experimental and control groups were taught the same topics. The only difference was that the control groups were taught by the teacher using the conventional method. In contrast, the experimental groups were peers in the group using the peer mentoring strategy. The treatment lasted for eight weeks after which the test was given to both groups using MAT and their scores were collated by awarding two marks to any correct answer. The reliability of the instrument was 0.73

with h the use of the Spearman rank correlation coefficient. The two research questions were answered using means and bar charts, while hypotheses were tested using analysis of variance (ANCOVA) also known as F-test at a 0.05 level of significance.

III. Result

Research Question One: What are the mathematics achievement scores of pupils taught using Eko Excel Tablets?

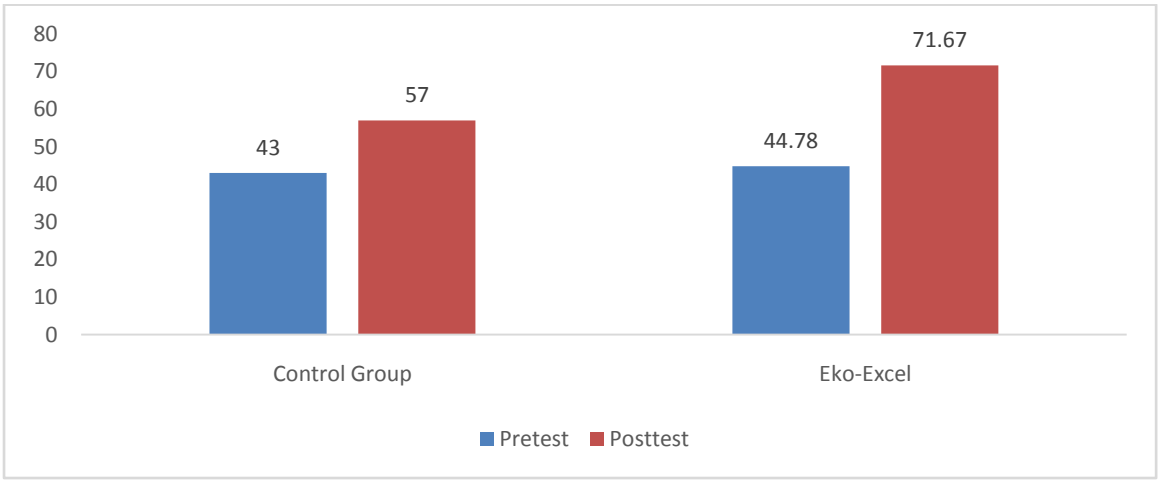

Figure 1. Mathematics achievement scores of pupils taught using Eko Excel Tablets.

The outcome in Figure 1 shows that pupils in the control group scored 43% on the pre-test and 57% on the post-test, while those in the experimental group scored 44.78% before intervention and 71.67% after that. This means that pupils taught with the Eko Excel tablet were better at mathematics achievement.

Research Question Two: What are the achievements of male and female pupils in mathematics when taught using Eko Excel Tablets?

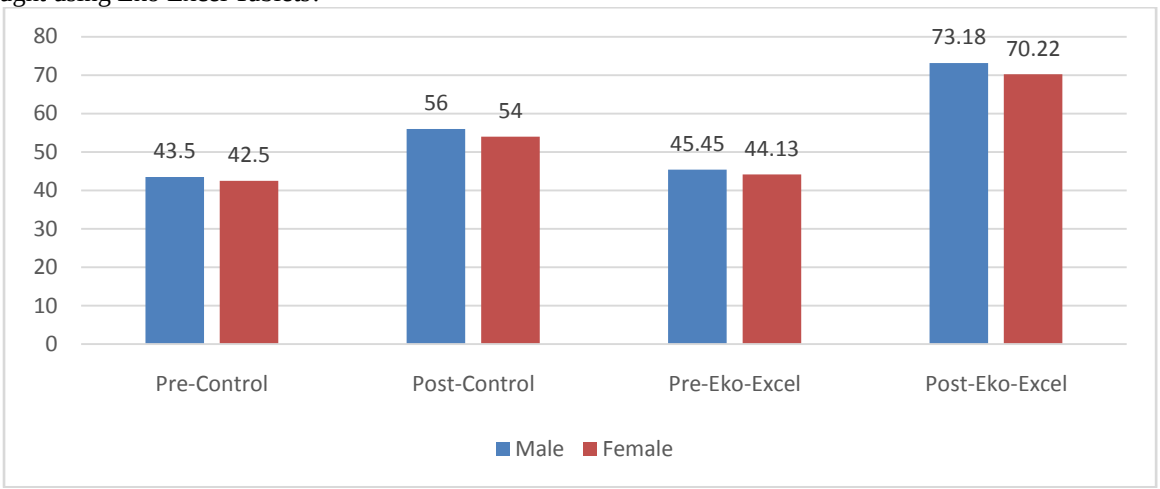

Figure 2. Mathematics achievement of male and female pupils when taught using Eko Excel Tablets.

The result in Figure 2 showed that before the class activities, the male pupils in the control group scored 43.5% and then scored 56% thereafter, while the females scored 42.5% and 54% respectively. On the other hand, the male pupils in the Eko Excel group scored 45.45% and 73.18% before and after the intervention, while the females scored 44.13% and 70.22%. It means that both male and female pupils in the experimental group achieved better than those in the control group after the intervention.

Research Hypotheses

The null hypotheses were tested at a 0.05 level of significance.

HO_1: There is no significant effect of Eko Excel Tablets on the mean achievement scores of pupils in mathematics.

Table 1. Effect of Eko Excel Tablets on achievement of pupils in mathematics.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	304.969[a]	4	76.242	39.715	.000	.523
Intercept	737.255	1	737.255	384.036	.000	.726
Pretest	.550	1	.550	.287	.593	.002
Group	292.742	1	292.742	152.489	.000	.513
Error	278.364	145	1.920			
Total	26456.000	150				
Corrected Total	583.333	149				
a. R Squared = .523 (Adjusted R Squared = .510)						

The ANCOVA result F (1, 145) = 152.49; $p<0.05$ shows a significant effect of the Eko Excel Tablet on pupils' mean achievement in mathematics. Consequently, the first null hypothesis was rejected. This means that the high achievement of pupils in the experimental group was due to the use of the Eko Excel Tablet as supported by the result in Figure 1.

HO_2: There is no significant influence of gender on the mean achievement scores of pupils taught mathematics using Eko Excel Tablets.

Table 2. Influence of gender on the mean achievement scores of pupils in mathematics using Eko Excel Tablets.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	304.969[a]	4	76.242	39.715	.000	.523
Intercept	737.255	1	737.255	384.036	.000	.726
Pretest	.550	1	.550	.287	.593	.002
Gender	3.601	1	3.601	1.876	.173	.013
Error	278.364	145	1.920			
Total	26456.000	150				
Corrected Total	583.333	149				
a. R Squared = .523 (Adjusted R Squared = .510)						

The result F (1, 145) = 1.88; $p>0.05$ shows no significant influence of gender on pupils' mean achievement in mathematics when using Eko Excel Tablets. So, the second null hypothesis was not rejected. This means that the high achievement of pupils in the experimental group was not influenced by gender as supported by the outcome in Figure 2.

IV. Discussions

There was a significant difference between the achievement of pupils exposed to teaching mathematics using Eko Excel Tablets and those taught mathematics using conventional methods. This implies that there was a significant impact of Eko Excel Tablets on the mean achievement scores of pupils taught mathematics. This finding corroborates with the findings of Fabian, Topping, Barron (2018) which stated that students exposed to the use of mobile technology performed better in mathematics. Pakpahan and Rajagukguk (2023) findings also revealed that students taught mathematics with mobile learning media based performed better than students exposed to conventional learning model.Malik and Salman (2016) who concluded that pupils exposed to *BridgeIT* mobile applications performed better than those taught mathematics in a conventional method. It was further corroborated by the findings of Malik, Akudo, Arikewuyo, and Ogunleye (2021) who discovered that students taught numbers and numeration with mathematical laboratory facilities performed better than those taught in a conventional method. The findings of Nasir and Hadijah (2019) which indicated that there was a significant improvement on the mathematics learning achievement of students after being taught mathematics with problem-based learning model and the assistance of animation media on tetragon materials was in line with the findings of this study.

The study further revealed that there was no significant impact of gender on the mean achievement scores of pupils taught mathematics using Eko Excel Tablets. This finding conforms with the study of Rabiu, Muhammed, Umar, Ahmed (2016) that gender was not significant factor in mobile phone usage on academic performance among senior secondary school students. This finding was also supported by the findings of Jackson, Zhao, Kolenic, Fitzgerald, Harold, and Voneye (2008), Salman and Ameen (2014), Malik and Salman

(2016), Saddiq, Salman, and Adeniji (2017), Malik, Agunbiade, and Arikewuyo (2019), and Malik, Akudo, Arikewuyo, and Ogunleye (2021) that there was no significant effect of gender on students' performance in mathematics when exposed to technology.

V. Conclusion

From the findings of this study, it can be concluded that the use of Eko Excel Tablets in teaching and learning mathematics improved the achievement of pupils in mathematics. It implies that mathematics concepts are retained and understood when pupils are being taught using Eko Excel Tablets. It was further revealed that the means of achievement of pupils in the experimental group was not influenced by gender. This implied that Eko Excel Tablets can give equal learning opportunities to male and female pupils when comparing their achievement scores. In conclusion, the use of technology, such as the Eko Excel Tablets, can positively affect the academic achievement of basic school pupils in mathematics.

VI. Recommendations

Based on the findings of the study, the following recommendations were made:

1. Lagos State Universal Basic Education Board (LASUBEB) should monitor the effective use of the Eko Excel Tables in all the schools.
2. The government should engage the pupils, teachers, and school authorities in an annual appraisal of the Eko Excel Tablets through interactions, seminars, and workshops.

References

[1]. Fabian, K., Topping, K., & Barron, I. (2018). Using Mobile Technologies for Mathematics: Effects onStudent Attitudes and Achievement. Educational Technology Research and Development, 66(5),1119-1139.

[2]. Federal Ministry of Nigeria (2013). National Policy on Education: Lagos: Nerdc Press.Jackson, L., Zhao, Y., Kolenic, A., Fitzgerald, H., Harold, R., &Voneye, A. (2008). Race, Gender, AndInformation Technology Use: The New Digital Divide. Journal Of Cyberpsychology & Behaviour, 11(4)

[3]. Malik, N. A., Agunbiade, B. A., &Arikewuyo, D. S. (2019). Effects Of Peer Mentoring Strategy onStudents' Performance in Mathematics at Senior Secondary Schools in Lagos State, Nigeria.Abacus: The Journal of The Mathematical Association of Nigeria, 44(1), 130-135.

[4]. Malik, N. A., Akudo, K. O., Arikewuyo, D. S., & Ogunleye, G. A. (2021). Effect Of Usability ofMathematics Laboratory Facilities on The Achievement of Junior Secondary School Students inNumbers and Numeration. Journal Of Education and Practice, 12(21), 1-7

[5]. Malik, N. A., & Salman, M. F. (2016). Effect Of BridgeitMobile Application on Middle Basic SchoolPupils' Performance in Mathematics in Lagos State. Abacus: The Journal of The MathematicalAssociation of Nigeria, 41(1), 86-92.

[6]. Malik, N. A., & Salman, M. F. (2018). Teachers' Perceptions of The Use ofBridgeit MobileApplication for Teaching Mathematics at Basic Schools in Lagos State, Nigeria. Abacus: TheJournal of The Mathematical Association of Nigeria, 43(1), 25-40.

[7]. Malik, N. A., Salman, M. F., Ameen, K. S., & Abdullahi, K. (2020). Basic Schools Pupils' AttitudeTowards the Use of The Bridgeit Mobile Application for Learning Mathematics. AnatolianJournal of Education, 5(2), 131-142. Https://Doi.Org/10.29333/Aje.2020.5211a

[8]. Mantoro. T., Utami, P., Dewanti, R., Yudhi, W. S. A., & Ayu, M. A. (2017). The Use of LearningManagement Systems (Lms) For College Students to Become Active Learners: Constructivism View: Journal of Computational and Theoretical Nano Science, 23(2), 796-800.

[9]. Nasir, A. M. &Hadijah, H. (2019). The Effectiveness of Problem-Based Learning Model with TheAssistance of Animation Media on Tetragon Material to The Student's Mathematics LearningAchievement of Grade ViiSmp Negeri 5 Mandam. Malikussaleh Journal of MathematicsLearning (Mjml), 2(1), 13-18.

[10]. Nwoye, M. N., Okoye, C. F., Ugwuanyi, V. S., Odo, I. O., &Ezieke, E. N. (2020). Effect Of PartialProduct Method on Pupils' Achievement and Interest in Multiplication of Numbers. Abacus.The Journal of The Mathematical Association of Nigeria, 45(1), 288-297.

[11]. Okeke, N. F. (2016). Investigation Into the Teachers' Level of Use of Skills, In Teaching MathematicsContent in Primary Schools. Abacus. The Journal of The Mathematical Association ofNigeria, 41(1), 58-64.

[12]. Pakpahan, E. S. &Rajagukguk, W. (2023). The Effect of Mobile Learning Media Based onIspring Suiteon Students' Learning Outcomes in Mathematics. Formosa Journal of MultidisciplinaryResearch, 2(1), 85-106.

[13]. Rabiu, H., Muhammed, A. I., Umar, Y., & Ahmed, H. T. (2016). Impact Of Mobile Phone Usage onAcademic Performance Among Secondary School Students in Taraba State, Nigeria. Research OnHumanities and Social Sciences, 6(3), 84-91. Www.Iiste.Org.

[14]. Saddiq, K., Salman, M. F., & Adeniji, S. M. (2017). Effects Of Jigsaw Ii Cooperative LearningStrategy on Senior School Students' Performance in Geometry in Oyo, Nigeria. Abacus: TheJournal of The Mathematical Association of Nigeria, 42(2), 283-291.

[15]. Salman, M. F., & Ameen, S. K. (2014). Comparative Effects of Two Problem-Solving Models on SeniorSecondary School Students' Performance in Mathematics Word Problems. Abacus: TheJournal of The Mathematical Association of Nigeria, 39(1), 1-13.

[16]. Shu'iabu, G., & Sidi, S. B. (2020). Effects Of Problem-Solving Instructional Strategy on StudentsAcademic Achievement in Geometry inGwale Local Government Area Secondary Schools,Kano, Nigeria. Abacus. The Journal of The Mathematical Association of Nigeria, 45(1),31-43.

[17]. Tatar, E., Akkaya, A., &Kağızmanlı, T. (2014). Trends In Dissertations Involving Technology-AssistedMathematics Instruction: The Case of Turkey. Eurasia Journal of Mathematics Science andTechnology Education, 10(6). Https://Doi.Org/10.12973/Eurasia.2014.1216a

[18]. This Day Newspaper (2019) Atiku Decries Diversion of Education Funds by States. Https://Www.Thisdaylive.Com/Index.Php/2019/12/06/Atiku-Decries-Diversion-Of-Education-Funds-By-State