PERCEPTION AND ATTITUDE OF PUPILS TOWARDS THE USE OF EKO-EXCEL TABLET FOR MATHEMATICS LEARNING

Nasrudeen Ayinde MALIK[1], Kennedy Otuniuya AKUDO[2], Adeneye, A. O. AWOFALA[3], Rianot Temitope YUSSUF[1]
[1] National Open University (Nigeria)
[2] Lagos State University of Education (Nigeria)
[3] University of Lagos (Nigeria)
maliknasrudeen@gmail.com, akudooo@lasued.edu.ng, aawofala@unilag.edu.ng, temiyussuf1610@yahoo.com

Abstract

This descriptive survey examines pupils' perception and attitude towards the use of Eko-Excel Tablet for mathematics learning. With the aid of a self-developed questionnaire, the study sampled 419 randomly selected primary-six pupils (aged 8–10) from four public primary schools in Ikorodu Local government area, Lagos State, Nigeria. Cronbach' Alpha value of 0.81 was obtained for the questionnaire. Data analysis was done using percentages and standard deviation. It finds that pupils perceive Eko (Eko-Excel) tablet easy to use but requires unique classroom arrangements and prevents wandering during lesson; though it helps teachers to save more time and effort but makes them lazy in class. It also reveals that pupils are negative in attitude towards the use of the gadget because it makes the teacher to speak less in class which leads to poor concentration in class. Since pupils do not learn at the same rate, it was recommended that Lagos State Ministry of Education Quality Assurance should give teachers more time and fewer topics to be covered; while pupils should be allowed to access and use the gadget for further practice after the normal school hours.

Keywords: Eko-Excel, Pupils' Attitude, Pupils' Perception, Mathematics Learning

1. Introduction

Mathematics is widely regarded by Nigerian primary school teachers as the king of all subjects because it equips learners with the foundational skills needed for problem-solving, logical reasoning, and effective decision-making (Nneji & Alio, 2017). At the primary level, mathematical competence supports pupils' transition to higher grades and underpins cognitive and creative development. Scholars emphasize that mathematics explains the relationships between numerical attributes and real-life situations, helping learners cultivate critical thinking and practical problem-solving abilities (Malik & Salman, 2018). The rapid advancement of technology in the twenty-first century has expanded the ways people access information, communicate, and learn, creating new opportunities to improve the teaching and learning of mathematics (Imoko & Isa, 2015).

Consequently, Mantoro et al. (2017) recommend integrating information and communication technology (ICT) into primary education which has become a priority for educators and policymakers concerned about the quality of mathematics instruction. ICT is viewed as a tool that enhances cost-effectiveness, improves delivery of mathematics instruction, supports teacher development, and exposes learners to diverse learning opportunities (Malik et al., 2020). Studies have shown that ICT can increase classroom

interaction, provide immediate feedback, and support monitoring of pupils' progress. Although Salehi and Salehi (2012) report that ICT does not replace effective teaching, it serves as an important supplement to classroom instruction and can significantly strengthen teaching and learning outcomes.

In Lagos State, these insights informed the creation of the Eko Excellence in Child Education and Learning (Eko-Excel) initiative, launched in 2019 to modernize public primary school education. Building upon earlier reforms, the program seeks to reposition public schools by equipping teachers with digital tools, improving classroom management, and enhancing instructional practices. Central to the initiative is the Eko-Excel tablet, a digital device used by teachers to deliver structured, grade-appropriate lessons containing graphics and timed instructional activities. The tablet provides daily schedules, attendance systems, lesson guides, assessments, and administrative communication. It is connected to the head teacher's network and synchronized with the Lagos State Universal Basic Education Board (SUBEB) dashboard for real-time monitoring of teacher activity, lesson delivery, and pupils' academic progress.

The primary goals of Eko-Excel are to improve learning outcomes, promote digital literacy, support inventive teaching, and prepare pupils for the demands of the modern knowledge-driven world (Olujuwon *et al.*, 2021). The government has invested significantly in teacher training to ensure that educators are equipped with digital pedagogical skills, and over 4,000 teachers from more than 1,000 public basic schools have been trained since 2020. The initiative of Abubakar and Afebuame (2011) represent one of the most ambitious educational reforms in Nigeria and aims to ensure that no child is left behind in acquiring twenty-first-century skills. Perception plays a major role in learning, as pupils' attitudes toward mathematics affect their engagement, understanding, and willingness to participate. Positive engagement describes the level of students' involvement in teaching and learning activities in terms of devotion and effort (Salhab & Daher, 2023). Positive affective engagement refers to how students positively respond to teachers, learning tasks, schools, classmates, and genuinely treasure acquired knowledge. On the other hand, negative affective engagement denotes students' negative reactions in the classroom (Adegbuyi & Sama, 2024). Positive perceptions of mathematics encourage critical thinking and collaboration, while negative perceptions may arise from teacher-related factors, instructional methods, or the learning environment (Hermawan & Tyas, 2018). Despite the adoption of technologies meant to simplify mathematics, many pupils still perceive the subject as difficult and technical, often requiring significant assistance to comprehend concepts (Fraser, 2012).

The introduction of Eko-Excel was intended to address long standing challenges in mathematics education, yet several practical issues persist. Teachers report limitations such as insufficient instructional time, inadequate classroom interaction, and overreliance on pre-programmed lessons that restrict creativity. The tablets' predominantly textual content, limited use of audio features, and lack of opportunities for students to manipulate or interact with the devices reduce engagement. Network or connectivity issues delay lesson delivery, and inaccurate attendance records weaken monitoring. Additionally, instructional radio broadcasts used in some contexts suffer from low audio quality, electricity constraints, and poor reach within large school environments. These constraints create learning gaps, weaken pupil-teacher relationships, and diminish students' ability to complete classroom tasks satisfactorily.

Another notable challenge is the lack of differentiated instruction. Nigerian public schools typically teach large classes with diverse learning abilities, making it difficult to meet individual learning needs. Research has shown that grouping pupils into smaller, ability-based units can significantly improve learning outcomes, particularly in mathematics. Hermawam and Tyas (2018) believe that smaller groups enable teachers to tailor instruction, sustain

pupils' attention, and refine individual learning deficiencies. Although Eko-Excel attempts to standardize instruction across schools, Adu et al. (2014) submit that its rigid structure leaves limited room for such personalized approaches. Historically, mathematics education in Nigeria has evolved from informal tallying systems rooted in traditional societies to a formal curriculum shaped by missionary and colonial influence. Over time, the development of national education policies and curriculum reforms strengthened the role of mathematics in primary education. The Nigerian primary mathematics curriculum now aims to equip pupils with numeracy skills, problem-solving abilities, data interpretation skills, measurement competencies, and spatial awareness. These objectives align with the broader mission of Eko-Excel, which seeks to digitize teaching methods and improve instructional outcomes.

Lagos State's long-standing commitment to educational reform reflects earlier efforts during the administration of Lateef Jakande, who championed accessible public education. The Eko-Excel initiative echoes this legacy by attempting to make quality education equitable through significant investments in teacher development, digital tools, and modernized pedagogy. Through the provision of tablets, smartphones, and digital learning content, the state aims to empower teachers and enhance classroom delivery, particularly in mathematics and literacy. The program also reduces economic barriers to learning through free instructional materials and digital resources. However, concerns remain regarding the effectiveness of tablet-based instruction. Some teachers argue that the system forces them to deliver lessons too quickly, disadvantaging slower learners. Others note that the method does not promote creativity, deep comprehension, or meaningful interaction. The absence of adequate textbooks, unreliable connectivity, and insufficient time for complex subjects like quantitative reasoning further strain instructional quality. Despite these challenges, many teachers still express positive attitudes toward the tablets and acknowledge their potential to improve teaching efficiency.

Research consistently shows that gender does not significantly influence pupils' attitudes or perceptions toward ICT-based instruction, including the use of Eko-Excel devices Jimoh, et al (2020). Studies have found no meaningful differences between male and female pupils in terms of interest, performance, or engagement with digital learning tools (Badmus, 2013; Lalnunfeli, 2015). This suggests that, when effectively implemented, Eko-Excel can support inclusive learning by providing equitable digital opportunities to all pupils. In summary, the Eko-Excel initiative represents a transformative step toward modernizing mathematics education in Lagos State. While it offers numerous benefits, such as teacher empowerment, improved monitoring, and expanded digital access, its impact is limited by structural, technological, and pedagogical constraints. Addressing these challenges is essential for realizing its goal of raising mathematics achievement and fostering positive perceptions of the subject among primary school pupils.

2. Objectives of the study

The main objective of this study was to examine pupils' perceptions of the use of Eko-Excel tablet for effective mathematics learning. It specifically investigates:

i. Pupils' perceptions of the use of Eko-Excel in learning basic school mathematics.
ii. Pupils' attitude towards the use of Eko-Excel in basic school mathematics.
iii. Significant gender difference in pupils' perception of the use of Eko-Excel in learning basic school mathematics.
iv. Significant gender difference in pupils' attitude towards the use of Eko-Excel in learning basic school mathematics

2.1. Research Questions

The following research questions served as guiding principles for the investigation:

i. How do pupils perceive the use of Eko-Excel in learning basic school mathematics?
ii. What are pupils' attitude towards the use of Eko-Excel in basic school mathematics?
iii. Do pupils differ in perceptions towards the use of Eko-Excel in learning mathematics based on gender?
iv. How do pupils differ in attitude towards the use of Eko-Excel in learning mathematics based on gender?

2.2. Participants and instrument

The study employed a descriptive survey research design. The population included all the primary-six pupils (aged 8–10) from Ikorodu Local Government Area of Lagos State. 419 pupils were selected at random, that is, 190 males and 229 females. The questionnaire consists of Sections A, B and C. Section A captured demographic information which include school name and gender, whereas Section B contains 10 items with options Strongly Agree-SA (5), Agree-A(4), Undecided-U(3), Disagree-D(2) and Strongly-disagree-SD(1) on pupils' perception towards Eko-Excel, while C captured 10 items on their attitude towards the use of Eko-Excel for mathematics learning. Using Cronbach' Alpha, the instrument's reliability was evaluated, and an index of 0.81 was obtained, but was validated by three lecturers in mathematics education at Lagos State University of Education. The data from the investigation were analysed using simple percentage and standard deviation.

3. Results

Four hundred and twenty questionnaires were distributed, and four hundred nineteen (419) were successfully retrieved for analysis.

Research Question 1: How do pupils in primary schools perceive using Eko-Excel for learning mathematics?

As depicted in Table 1, the gadget has 37.83% ability to make mathematics experience pleasant; 38.16% teachers' allowance to use marker board; and 37.11% opportunity for further explanation of mathematics topics which are far below the total mean of 57.03%. It also revealed that the respondents already have 61.45% familiarity with Eko Excel tablet prior to its use by their teacher; 62.04% belief that the gadget is easy is to use; 63.03% ability to determine seating arrangement; and 61.38% capacity to prevent pupils from moving about during mathematics class, 62.17% ability to helps the teacher save time and effort; and 61.25% capability to increases mathematics workload, which are all around the total mean score. It further depicted that the tablet has 85.92% ability to make mathematics teachers lazy which is far above the total mean. This implies that the pupils perceived that the gadget has low ability to make mathematics experience more pleasant; discourages the teacher from frequent use of the marker board; and limited time and opportunity for further explanation of difficult mathematics topics. A good number of the pupils are aware of the gadget before its introduction to the class perhaps through school announcement of through teachers' children. The tablet does not require special training on the part of the teacher before being used. It helps the teacher to make proper siting arrangement; prevent pupils from wandering about; and able to manage the allotted time due to increased workload. However, the pupils believe that it produces lazy teachers, since its contents are read only.

Research Question 2: What are the attitudes of basic school pupils towards the use of Eko Excel for learning mathematics?

As shown in table 2, the pupils perceived that Eko-Excel tablet has 38.32% capacity to make them appreciate learning mathematics with the gadget and 38.87% ability to make them achieve better than they do with textbooks, which are far below the total mean of 62.04%. Those within the total mean score include 62.01% capacity to improve concentration among learners; 62.12% encouragement to learn mathematics; 61.47% ability to make them think about mathematics; 62.74% motivation to problem-solve mathematics on their own; 61.90% ability to make them pay more attention to the learning of mathematics; 86.19% ability to make them fail mathematics; 62.01% perception that Eko-Excel tablet does not diverts their attention from class but has 84.77% capacity to make them afraid of the subject. It was therefore concluded that the use of the gadget makes pupils to have low appreciation for mathematics because it makes the teacher to speak less in class and discourages learners from learning with mathematics textbooks; and produced fear of mathematics in them.

Research Question 3. Do pupils differ in perceptions towards the use of Eko-Excel in learning mathematics based on gender?

As depicted in Table 3, the male and female pupils' respectively perceived 37.63% and 85.26% familiarity with Eko-Excel before being introduced by their class teacher (SD: 0.52 & 0.70); 85.79% and 38.29% belief that it is easy to use for learning Mathematics (SD: 0.70 & 0.51); 87.11% and 38.95% agreement that Eko-Excel mathematics class needs special seating arrangement (SD: 0.66 % 0.52); 85.39% and 37.37% assurance that Eko-Excel makes it difficult for pupils to move around in mathematics classroom (SD: 0.66 & 0.51); 85.39% and 38.95% perception that EkoExcel helps the teacher save time and effort (SD: 0.71 & 0.54); 37.89% and 37.76% awareness that Eko-Excel makes Mathematics experience pleasant (SD: 0.51 & 0.51); 85.13% and 86.71% belief that Eko-Excel makes mathematics teachers lazy. (SD 0.70 & 0.68); 37.63% and 84.87% agreement that the use of Eko-Excel increases mathematics workload (SD: 0.51 & 0.69); 37.89% and 36.32% perception that Eko-Excel allows for further explanation of mathematics topics (SD: 0.66 & 0.65); and 38.82% and 37.5% agreement that Eko-Excel allows the use of marker board for learning of maths (SD: 0.54 & 0.54). Obviously, it was concluded that the male and female pupils equally perceived that the gadget makes mathematics experience more pleasant, while teachers get lazier, mathematics topics receive more explanation and marker board is put into use. However, females are more familiar with the gadget before it was introduced in the class, with higher perception that it increases mathematics workload. Interestingly, the males have stronger belief that it is easy to use for learning of mathematics, calls for special class arrangement, makes it difficult for pupils to leave their seat and helps the teacher to save time.

Research Question 4. How do pupils differ in attitude towards the use of Eko-Excel in learning mathematics based on gender?

The outcome in Table 4 shows that the male and female pupils respectively have 37.66% and 86.35% concentration because the teacher talks less while teaching with Eko-Excel (SD: 0.52 & 0.66); 85.70% and 38.54% disposition towards the use of Eko-Excel tablet to encourage learning of mathematics (SD: 0.67 & 0.53); 84.47% and 38.21% external behavior towards Eko-Excel tablet makes them think about mathematics (SD: 0.70 & 0.53); 86.03%

and 39.41% agreement that they prefer Eko-Excel problems solving approach to others when learning mathematics (SD: 0.70 & 0.52); 85.70% and 38.10% concentration when the teacher uses Eko-Excel to teach mathematics (SD: 0.69 & 0.50); 37.34% and 39.30 preference to learn mathematics using Eko-Excel (SD: 0.53 & 0.53); 86.79% and 85.59% agreement that the use of Eko-Excel for learning makes them fail Mathematics (SD: 0.73 & 0.67); 37.12% and 86.90% belief that the use of Eko-Excel tablet for learning mathematics diverts their attention from class (SD: 0.53 & 0.66); 84.55% and 85.04% fear of learning mathematics with Eko-Excel tablet (SD: 0.74 & 0.72); and 37.99% and 39.74% belief that they learn better when learning with Eko-Excel tablet than they do when using textbooks (SD: 0.51 & 0.51).

It was concluded that the male and female pupils are both negative in attitude toward preference to learn mathematics using Eko-Excel and both negative in attitude toward learning mathematics using the gadget than they do using textbooks, both positive in attitude toward failure in mathematics due to the use of Eko-Excel tablet and both positive toward fear of learning mathematics using Eko-Excel. While the males are negative in attitude towards concentration in class for the fact that they believe the teacher talks less while teaching with Eko-Excel, the females are positive in attitude towards the use of the gadget despite having higher belief that the use of Eko-Excel tablet for learning mathematics diverts attention from class. Moreover, only the males are positive that the tablet encourages them to learn mathematics, makes them think about mathematics, motivate them to prefer its use in problem solving and concentrate better in class.

4. Discussions

The findings revealed that male and female elementary school pupils vary in perceptions of the use of Eko-Excel for mathematics learning. This finding is not consistent with that of Adu, Galloway and Olaoye (2014), who discovered that traits like interest, ability, knowledge, attitude, gender and exposure have the potential to boost pupils' positive achievement in the cognitive, psychomotor, and emotional domains of learning but couldn't change their perception and attitude. Jimoh *et al.* (2020) backed up this finding when they discovered that government strategies targeted at incorporating Eko-Excel into curricular delivery frequently failed to account for the influence of the somewhat similar perceptions of male and female end users. The findings also demonstrated that pupils' perception and attitudes regarding the use of Eko-Excel for mathematics learning differ based on gender. The report of Malik *et al.* (2020); Olujuwon *et al.* (2021) corresponded with the conclusions that gender had some influence on pupils' perception and attitudes towards the use of Eko-Excel application. Although, Badmus (2013) found no significant difference in the attitudes of male and female students exposed to the Web Quest on Educational Technology Concepts.

5. Conclusion

The study concluded that the Eko-Excel tablet is easy to use in a specific classroom environment because teachers do not need special training before use; it prevents pupils from straying during classes. However, most pupils were familiar with tablets before being introduced by the teachers. It was also reported that pupils were not motivated by the gadget to appreciate mathematics because it makes the teacher to communicate less in class through the contents that are read only; makes many pupils to fear the learning of mathematics, and makes them to prefer textbook approach to Eko-Excel. Lastly, there were no gender-based differences in the perceptions and attitudes of basic pupils regarding the Eko-Excel tablet.

6. Recommendations

Based on the findings, it was suggested that:

1. The Lagos State Ministry of Education Quality Assurance should make the use of the Eko-Excel tablet more pupils centered for teaching and learning of mathematics.
2. The Lagos State Ministry of Education should give teachers more time and fewer topics to be covered during teaching period, since pupils do not learn at the same rate.
3. Lagos State Government should make the Eko-Excel tablet available for pupils to use after school hours.

Tables

Table 1. Primary school pupils' perception on the use of Eko-Excel for learning mathematics

Items	Mean	SD
1. I am familiar with Eko Excel before being introduced by my class teacher	61.45	0.52
2. Eko Excel is easy to use for learning Mathematics	62.04	0.68
3. Eko Excel mathematics classroom needs special seating arrangement	63.03	0.68
4. Eko Excel makes it difficult for pupils to move around in mathematics class	61.38	0.68
5. Eko Excel helps the teacher save time and effort	62.17	0.70
6. Eko Excel makes Mathematics experience pleasant	37.83	0.52
7. Eko Excel makes mathematics teachers lazy.	85.92	0.72
8. The use of Eko Excel increases mathematics workload	61.25	0.52
9. Application of Eko Excel allows for further explanation of mathematics topics	37.11	0.71
10. The use Eko Excel allows the use of marker board for the learning of maths	38.16	0.52
Avg	57.03	0.63

(Source: Analysis of data from the survey)

Table 2. Primary school pupils' attitude towards the use of Eko-Excel for learning of maths

Items	Mean	SD
1. I concentrate because the teacher talks less while using Eko-Excel to teach maths	62.01	0.68
2. The use of Eko-Excel tablet encourages me to learn Mathematics	62.12	0.52
3. Eko-Excel tablet makes me think about mathematics	61.47	0.52
4. I prefer Eko-Excel problems solving approach to others when learning maths	62.72	0.52
5. I concentrate when the teacher uses Eko-Excel to teach mathematics	61.90	0.52
6. I prefer to learn mathematics using Eko-Excel	38.32	0.52
7. The use of Eko-Excel for learning makes me fail Mathematics	86.19	0.67
8. The use of Eko-Excel tablet for learning maths improves my attention in class	62.01	0.67
9. I am afraid of learning mathematics with Eko-Excel tablet	84.77	0.69
10. I learn better than I do from textbooks when learning with Eko-Excel tablet	38.87	0.53
Avg	62.04	0.58

(Source: Analysis of data from the survey)

Table 3: Basic school pupils' perception towards the use of Eko-Excel tablet by gender

Items	Male		Female	
	Mean	SD	Mean	SD
1. I am familiar with Eko-Excel before being introduced by my class teacher	37.63	0.52	85.26	0.70
2. Eko-Excel is easy to use for learning Mathematics	85.79	0.70	38.29	0.51
3. Eko-Excel mathematics class needs special seating arrangement	87.11	0.66	38.95	0.52
4. Eko-Excel makes it difficult for pupils to move around in mathematics class	85.39	0.66	37.37	0.51
5. Eko-Excel helps the teacher save time and effort	85.39	0.71	38.95	0.54
6. Eko-Excel makes Mathematics experience pleasant	37.89	0.51	37.76	0.51
7. Eko-Excel makes mathematics teachers lazy.	85.13	0.70	86.71	0.68
8. The use of Eko-Excel increases mathematics workload	37.63	0.51	84.87	0.69
9. Eko-Excel allows for further explanation of mathematics topics	37.89	0.66	36.32	0.65
10. Eko-Excel allows the use of marker board for learning of maths	38.82	0.54	37.50	0.54
Avg	66.87	0.62	57.20	0.59

(Source: Analysis of data from the survey)

Table 4. Primary school pupils' attitude towards the use of Eko-Excel for learning of mathematic

Items	Male		Female	
	Mean	SD	Mean	SD
1. I concentrate because the teacher talks less while teaching with Eko-Excel	37.66	0.52	86.35	0.66
2. The use of Eko-Excel tablet encourages me to learn Mathematics	85.70	0.67	38.54	0.53
3. Eko-Excel tablet makes me think about mathematics	84.72	0.70	38.21	0.53
4. I prefer Eko-Excel problems solving approach to others when learning maths	86.03	0.70	39.41	0.52
5. I concentrate when the teacher uses Eko-Excel to teach mathematics	85.70	0.69	38.10	0.50
6. I prefer to learn mathematics using Eko-Excel	37.34	0.53	39.30	0.53
7. The use of Eko-Excel for learning makes me fail Mathematics	86.79	0.73	85.59	0.67
8.. The use of Eko-Excel tablet for learning maths improves my attention in class	37.12	0.53	86.90	0.66
9. I am afraid of learning mathematics with Eko-Excel tablet	84.50	0.74	85.04	0.72
10. I learn better than I do from textbooks when learning with Eko-Excel tablet	37.99	0.51	39.74	0.51
Avg	66.36	0.63	57.72	0.58

(Source: Analysis of data from the survey)

References

Abubakar, R. B., & Afebuame, A. O. (2011). *The Challenges of Mathematics in Nigeria's Economic Goals of Vision 2010*. Keynote address presented at the Annual National Conference of the Mathematical Association of Nigeria Sept. 1–6.

Adegbuyi, J & Sama, R. (2024). The Predictive Power of a Multidimensional Mathematics Engagement Scale on Students' Mathematics Achievement in Ekiti State, Nigeria. *Elementary Mathematics Education Journal, 6*(1), 6–14.

Adu, E.O., Galloway, G., & Olaoye, O. (2014). Teachers' characteristics and students' attitude Towards Economics in secondary schools: students' perspectives. *Mediterranean Journal of Social Sciences*, *5*(16), 455–462.

Alarcia, Ò. F., & Arco-Bravo, I. (2012). The impact of ICTs on lecturer and student interaction in university education processes. *RUSC. Universities and Knowledge Society Journal*, *9*(2), 31–47.

Badmus, A. M. (2013). *Development and evaluation of a Web-Quest application on educational technology concept for undergraduate students in Nigeria* (Unpublished Doctoral Dissertation). University of Ilorin, Ilorin, Nigeria.

Fraser, M. M. (2012). Once upon a Problem. The Sociological Review, 60(1_suppl), 84–107. https://doi.org/10.1111/j.1467-954X.2012.02118.x

Grabe, M., & Grabe, C. (2007). *Integrating technology for meaningful learning* (5th ed.). Boston, MA: Houghton Mifflin.

Hermawam, S., & Tyas, F. I. W. N. (2018). Pengaruh Nilai Intrinsik, Parental Influence, dan persepsi Mahasiswa Dengan Pendekatan Teori Karier Anne Roe Terhadap Pemilihan karir Sebagai Akuntan Publik Bagi Mahasiswa Akuntansi Universitas Airlangga Surabaya. *JABE (Journal of Applied Business and Economic), 5*(2), 112–129. https://doi.org/10.30998/jabe.v5i2.2111

Imoko, B. I., & Isa, S. A. (2015). *Impact of computer Genus on pupils' achievement in mathematics in primary achievement in mathematics in primary school in Lafia Local Government Area: A tool for technological development*. Proceedings of September 2015 Annual National Conference of the mathematical Association of Nigeria 63–71.

Jimoh, A. S., Bamiro, N. B., Akapo, T. A., Ibrahim, D. A., and Ismail, M.A. (2020). Survey of determinants of the utilization of ICT facilities for instruction in Lagos state secondary schools. *Al-Hikmah Journal of Education*, *7*(2), 42–53.

Lassa, P. N., & Paling, D. (1983). *Teaching mathematics in Nigerian primary schools*. University Press Limited.

Livingstone, S (2012) Critical reflections on the benefits of ICT in education. *Oxford Review of Education*, *38*(1), 9–24. https://doi.org/10.1080/03054985.2011.577938.

Lalnunfeli, D. (2015). *Attitude of students, teachers and community towards sex education at secondary school level in Mizoram*: PhD Thesis, Department of Education, Mizoram University, Aizawl, 31.

Malik, N. A., & Salman, M. F. (2018). Teachers' perceptions of the use of *BridgeIT* mobile application for teaching mathematics at basic schools in Lagos State, Nigeria. Abacus: *The Journal of the Mathematical Association of Nigeria, 43*(1), 25–40.

Malik, N. A., Salman, M. F., Ameen, K. S., & Abdullahi, K. (2020). Basic school pupils' attitude towards the use of *Bridge* mobile application for learning mathematics. *Anatolian Journal of Education, 5*(2), 131–142.

Mantoro. T., Utami, P., Dewanti, R., Yudhi, W.S.A., & Ayu, M.A. (2017). The use of Learning Management Systems (LMS) for college students to become active learner: Constructivism view: *Journal of Computational and Theoretical Nano Science*, *23*(2), 796–800.

Nneji, S. O., & Alio, B. C. (2017). Effect of use of computer animations strategy on secondary school students' achievement and retention in algebra in Enugu State. Abacus: *The Journal of the Mathematical Association of Nigeria, 42*(1), 12–21.

Olujuwon, T., Bamiro, N. B, Akudo, O. K. & Anagun, A. M. (2021). Teachers' Characteristics as Predictor of the Adoption of Eko Excel Pedagogical Innovation in public primary schools in Lagos State, Nigeria: *Journal of educational management and policy analysis 2*(1*),* 14–33.

Salhab, R., & Daher, W. (2023). University students' engagement in mobile learning. *European Journal of Investigation in Health, Psychology and Education, 13*(1), 202–216.

Salau, M. O. (2000). Analysis of student's enrollment and performance in Mathematics at the senior secondary certificate level. *Journal of curriculum studies, 5&6*(12), 1–8.

Salau, M. O. (2007). Implementing computer studies curriculum in the context of culture of reform at the basic education level: Issues, challenges, and panacea for redress. *Nigerian Journal of Curriculum Studies. 14*(3), 35–46.

Salehi, H., & Salehi, Z. (2012). *Integration of ICT in language teaching: Challenges and barriers*. Proceedings of the 3rd International Conference on e-Education, e-Business.