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Examination of Ergonomics Appropriateness of Primary Schools in Rivers State

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Abstract. *The study used the descriptive survey design to examine the ergonomic appropriateness primary schools Rivers State. Simple random and stratified sampling techniques were used to choose 498 Basic 4 pupils from 29 classes of 20 schools in 5 local government areas of Rivers state and their teachers. The instrument used for the study examination of available school documents and interview of teachers. The study had 4 research questions. The research questions were answered with tables and charts. The result showed that there was ergonomic appropriateness in Class size of Basic 4 pupils as the class size was well within the recommended 35. The result, however, showed that age of pupils, teacher qualification and curriculum usage were not ergonomically appropriate. Recommendations were made for the study to maintain the small class size observed in schools; provide constant training for teachers without the necessary qualifications and encourage them to upgrade their qualifications, while emphasising the employment of professionally qualified teachers; enrol students who are age appropriate and academically capable in primary education programmes, and ensure curriculum appropriateness.*

Key words: *Ergonomics, Clase-size, Teacher qualification, School age, Curriculum.*

INTRODUCTION

This statement by Dr. Joel Nederhood, a radio minister of the Radio Pulpit in his 'Working and Learning' (1989) reflects the views of millions of people the world over. It states the important place education has by emphasising the effect of not having proper education. The importance of education in any society cannot be over-emphasised. It is recognised all over the world. It is seen as the means to solve the problems that constantly threaten the social fabric and very existence of many countries, especially in Africa, Asia and Latin America, such as poverty, political instability and conflict situations, recurrent drought, food insecurity and the impact of the HIV and AID pandemic (Barrett, 2010). It is seen to play a key role in promoting understanding and helping individuals, societies and governments to make informed choices that help solve problems and make people more governable (Prahalad, 2010). It is seen as an instrument to break the cycle of discrimination of all kind. These could be tribal, ethnic, religious, class, health or gender. It is seen as a tool to help reduce poverty, promote peace and foster development. It is a basic need for human and national development, escape from poverty and build a prosperous society (Global Partnership for Education, 2019).

Education is important only if it is good and geared towards achieving necessary results. A bad education is like having no education at all because it does not add any value to the lives of the individuals who go through it. It is the quality of the education that gives it value and determines if it is good or bad education (Global Partnership for Education, 2019). Quality plays a major role in education. It is the yardstick with which the success of the education of a country is measured. It

influences what students learn, how they learn, how long they stay in school, how regularly they attend school and what benefits they draw from education. The decision whether parents send their children to school and how long they keep them there is to a large extent dependent on the judgement they make about the quality of teaching and learning provided (www.efamonitoringreport, 2005).

Quality education meant different things to different people in the past (Manilla, 2005; Robert-Okah, 2003; Luthan, 2005). In recent times, what constitutes quality education is learner-friendly school environments with learner-friendly instructional delivery systems as seen from available literature (Asiabaka & Mbakwem, 2008). The modern school environment places emphasis on the provision of facilities that are appropriate. Appropriateness, according to Ajayi (2001) means that facilities and personnel such as classrooms, workshops, laboratories, computers, water supply, toilet facilities, teachers, minders, amongst others, are adequate in quantity and quality. This view of quality education is also held by the Learning Plus Initiative (LPI), a body set up by the United Nation's Children Education Fund (UNICEF) in collaboration with 13 southern and eastern African states to look at education in those countries. LPI's quality education is that school systems be adapted to suit the characteristics and needs of the child by providing appropriate curriculum, appropriate infrastructural arrangement, appropriate teaching strategies, appropriate use of resources and appropriate skills needed to fit in and function effectively in the community (Bengtsson, 2009; Batista et al, 2007).

The emphasis of modern education is providing education that takes the characteristics, needs, interest and background of the learner into consideration. This view is related to trends in research in educational technology, which is creating and adjusting the educational process according to the abilities of the students **(**Zunjic et al, 2015, Natividad et al, 2018). Some of the areas of emphasis are Smart Learning Environments, Artificial Intelligence, Augmented/Virtual Reality, Learning Analytics, Adaptive Learning and Immersive Learning (Jarman, 2019; Hitchcock, 2019; Technavio, 2018). Still others are Collaborative learning, Gamification, Seamless Resource Access and Personalized Learning Management System (Hitchcock, 2019; Kinshuk et al, 2013). Irrespective of what the emphasis is, when creating an environment that is comfortable and adjusted to the characteristics of the user is concerned, we are in the field of ergonomics. When we talk about planning the environment to meet the characteristics of the people that make use of it, we are in the field of ergonomics. However, ergonomics is a term that is not frequently related with the educational system. The purpose of this study is to determine if ergonomics is appropriate in the primary schools in Rivers State.

Ergonomics has been defined in various ways by various people. Adams (2019) views ergonomics as the science of work. He says it is the science of fitting the work to the user instead of forcing the user to fit the work. This, he says, is done with the intention of making products and tasks comfortable and efficient for the user. He is of the view that when people carry out work that they are good at, it makes them to be efficient because they are comfortable doing it. Ergonomics has been defined in different ways by various people. To have a proper understanding of the concept, however, it is important to know the origin of the word. Ergonomics is derived from two Greek words. These words are *ergon* and *nomos*. *Ergon* means work, while *Nomos* means natural law. Thus, ergonomics can literarily be defined as doing work according to natural law or what is naturally suitable for an individual (Adams, 2019).

Work, according to Dictionary.com, is the exertion of body and mind in performing or accomplishing something. Middlesworth (2019) said it is an activity that involves mental or physical effort done in order to achieve a purpose or result. Thus, whenever individuals use their mind to think about something, think about solutions to a problem or situation by looking at the causes in order to find solutions, they are doing work. Also, whenever we use our body in various ways to do something in order to achieve a purpose or accomplish something, we are doing work. Work can be hard or easy to do, irrespective of whether it has to do with the mind or body (Dictionary.com). Work is hard when you require a great deal of physical and mental effort or endurance to accomplish it. Work is easy if you do not require a lot of effort or endurance to get results (Connors, 2017). Whether work is easy or hard is determined by the mental and physical characteristics and abilities of the individual or

persons involved in the work. When the work (ergon) people do meet their physical and mental characteristics and abilities, it is work that is naturally suitable for them, so it meets the *nomos* which is the natural law.

Work (*ergon*) according to *nomos* - natural law or what is naturally suitable for the individual - is work that meets the physical and mental characteristics and abilities of the individual concerned. This means that people should be given work that they can carry out comfortably and efficiently. Something is comfortable to do if it is pleasing for the person concerned. It is pleasing if the individual likes doing it (Adams, 2019). In other situations, *nomos* is said to simply mean the law (Middlesworth, 2019). In this light ergonomics can be said to be doing work according to the provisions of the law. It could be said to be carrying out the work or job people do according to what the law says. This could refer to the age to work, number of hours, work environment, educational and professional qualification, tools of the trade, and so on. Ergonomics can thus be defined as the study of the work environment and the work people do in relation to their characteristics and the provisions of the law. It is the study of workers and their environment in relation to their characteristics and the provisions of the law (Goodyear, 1997). Ergonomics is also known as Biotechnology, Human factors and Human Engineering because it seeks to ensure that the characteristics of the human beings is the centre of what they do.

Ergonomics is quite frequently the focus in industry, public health and commercial ventures because it has important functions. To ensure that these functions are effectively performed, ergonomic methods are applied early in the design system. It is so because ignoring ergonomics can lead to designs that are commercial failures or systems and products that do not fit the needs of the user. Some importance of ergonomics in the workplace are the following:

a. It contributes to understanding or work-related stress and solution, anatomy, physiology, anthropometrics, biomechanics, psychology and industrial design and engineering.

b. It makes sure tasks, equipment, information and the environment suit each worker, increases productivity due to less fatigue, less accident due to safer working environment, less absenteeism and improve productivity and performance.

c. It increases safety, comfort and performance of a product or environment

d. It ensures that the needs of the end users are kept in focus at all times.

e. It is used to identify opportunities for innovation.

f. It is used to achieve greater efficiency of both man and his environment.

g. It reduces individual accidents in the workplace.

h. It contributes to the overall health and efficiency of work specialized areas (Duab et al, 2019; Singh et al, 2015; Singh et al, 2011; Anonymous, 2012).

Ergonomics goes beyond just providing good working environment for the user. It has to do with having a working environment that suits the physical, psychological and social characteristics of the user. In doing this, ergonomics helps to provide a safe, easy to use, comfortable environment which results in better productivity/performance in the work environment (Mustafa et al, 2009). It is the assumption of this researcher that if this happens in the work environment, then it certainly will be the case in the learning environment. The learning environment is all the factors that affect teaching and learning. It includes the school location as well as all physical, chemical and biological agents. It also includes the school buildings, the surrounding grounds, all facilities and infrastructure such as classrooms, workshops, laboratories, libraries, fields, playgrounds, offices, furniture, chairs, tables, desks, electricity, instructional materials, noise, lighting, temperature, the learners, the teachers' qualifications, administrative style (Chin, 1997). The quality of teaching and learning is greatly dependent on the availability of an appropriate learning environment. This is an environment in which the various factors meet stipulated requirements.

Thus, the purpose of this study was to determine how ergonomically appropriate the primary schools in Rivers State were. The classroom, which is the core of the learning environment in the formal

educational system, is made up of various variables. They are the learner, teacher, the curriculum and the physical environment. These variables were taken into consideration in looking at the appropriateness of ergonomics in primary schools of Rivers State. In this case the researcher's interest was the age of the learners, the qualification of the teachers, the class size and the curriculum usage.

Statement of the problem

Academic performance is the measure of knowledge gained in formal education which is presented by test scores, grades, points, and so on. Academic performance is a strong indicator of the quality of education of a country. When performance is consistently low it tells that something is wrong. This has been the situation in the Nigerian educational system. In the 16 years going from 2004 to 2020, only 4 years saw a pass rates above 50% of candidates who sat for the West African School Certificate Examination (WASCE) with credits in 5 subjects including English and Mathematics. These years were 2020 (65%), 2019 (64.18%), 2017 (59.22%) and 2016 (52.97%) In some years the percentage of candidates who passed this examination had been as low as 17%.

Table 1: ANALYSIS OF WAEC RESULT FROM 2004-2020

S/N	YEAR	NO. OF CANDIDATES	NO OF STUDENTS WITH 5 CREDITS INCLUDING MATHEMATIC & ENGLISH	PERCENTAGE
1	2020	1,538,445	1,003,668	65%
2	2019	1,590,173	1,020,519	64.18%
3	2018	1,571,531	756,726	49%
4	2017	1,471,151	923,486	59.22%
5	2016	1,544,234	878,040	52.97%
6	2015	1,593,442	616,370	38.68%
7	2014	1,692,435	529,425	31.28%
8	2013	1,543,683	599,103	38.81%
9	2012	1,672,224	649,159	36.57%
9	2011	1,540,250	471,474	30.90%
10	2010	1,351,557	337,071	24.94%
11	2009	1,265,090	356,981	25.99%
12	2008	1,369,142		17%
13	2007	1,249,028	287,276	23%
14	2006	1,149,277		24.95
15	2005	1,054,853		34.41
16	2004	1,019,524		34.47

{Source: WAEC Chief Examiner's Report. https://www.waecdirect; Head of National Office, WAEC, 2020. https://www.waecdirect). (Statistic Office, WAEC, Lagos, 2009)

The results of the national examinations taken show the appalling academic performance in the Nigerian school system because they cut across various states of the country. This is, however, not

the only indicator of poor academic performance in the Nigerian educational system. A World Bank survey of the basic education programme in Nigeria revealed that academic performance of people who have completed the primary school level was very low. The report of a 2018 study carried out on primary school leavers showed that only 20% of them could read a 3-sentence passage fluently or with little help. This is very troubling because the pupils need the reading skills that are taught in English language to study all other subjects. It is important to identify and find solutions to this problem, and there are many ways to do this. In a bid to identify and find solutions to this problem this researcher decided to address it in a way that is trending in educational technology research, through ergonomics. In focusing on ergonomics, the researcher points the searchlight on the learners, the teachers, the class size and the curriculum.

Aim and Objectives

The aim of the study was to investigate the appropriateness of ergonomics in primary schools in Rivers State, especially as it relates to the teaching and learning of English and Mathematics. The objectives of the study were to determine the following:

1. the appropriateness of Age of School Children in Primary schools in Rivers State.

2. the adequacy of the qualification of teachers in primary school teachers in Rivers State.

3. the appropriateness of Class size of primary school teachers in Rivers State.

4. the suitability of the Curriculum used in primary schools in Rivers State.

Research Questions

The study was guided by the following research questions:

1. To what extent is age of school children in primary schools in Rivers State appropriate?

2. What is the qualification of teachers in primary schools in Rivers State?

3. To what extent is the class size of primary schools in Rivers State appropriate?

4. To what extent is the Curriculum used in primary schools in Rivers State suitable?

Operational Definition of Terms

The definitions of the key terms of this research are as follows:

Ergonomics: Ergonomics is the study of workers and their environment in relationship to their characteristics and the provisions of the law. Workers here refers to the pupils and teachers in primary schools in Rivers State, while the environment refers to their classroom, and their content.

Primary School: This is the level of education immediately after Early Childhood Education and before the Secondary level.

Teacher Qualification: Teacher qualification refers to teachers who have NCE, B.ED or PGDE in Primary Education Studies.

Age of School Children: Appropriateness of age of school children refers to children being of the right age in a class. This means that the children should not be younger than the age recommended for primary 4, which is 9years.

Class Size: This refers to the number of pupils that learn together in the same class. To be appropriate, the class size must be 35 and below.

Appropriateness of School Curriculum. This refers to the use and coverage of the Nigerian Primary School Curriculum which is the recommended curriculum for primary schools in Rivers State. The study is particularly interested in finding out the following:

i. The suitability of the curriculum used in the primary schools in Rivers State

ii. Use of the Nigerian Primary School Curriculum which is the recommended curriculum for primary schools in Rivers State.

iii. Use of the topics scheduled in the scheme of work.

iv. Use of recommended textbooks for the class.

Research Methodology

This was a descriptive survey which used the Taro Yamane simplified formula for proportions to get a sample of 498 from a population of 50,000 Basic 4 pupils in primary schools of Rivers State. The study was carried out in week 1-3 of the Third term of 2020 and involved 5 local government areas. Stratified sampling technique was used to choose the two local government areas that make up the state capital - Port Harcourt and Obio/Akpor, Ogu/Bolo, Akuku-toru and Tai. This was done to ensure that the 3 senatorial zones were covered. The random sampling technique was then used to choose the 20 schools and 29 classes used for the total study. The instrument for data collection was analysis of school records to get the age of the children, class size, curriculum usage and teacher qualification. The teachers were also interviewed to verify their qualification, number of pupils and curriculum usage.

Data Presentation

Research Question 1: To what extent is the age of school children in primary schools in Rivers State appropriate?

Table 2: Summary of Percentage distribution of the age of Basic 4 school children in primary schools in Rivers State

Age(years)	Class level (Basic 4)	Total	%
7-9		299	60.04
10-12		199	39.96
Total		**498**	100.00

Average Age= 9.00, SD=1.35

The result from Table 2 shows the summary of the percentage distribution of the age of the school children in primary schools in Rivers State. It shows that the pupils in the age bracket of 7-9 years were 299 representing 60.04% of the pupils whereas those in the age bracket of 10-12 years were 199 representing 39.96% of the pupils. The average age of the pupils was 9.00, SD=1.35.

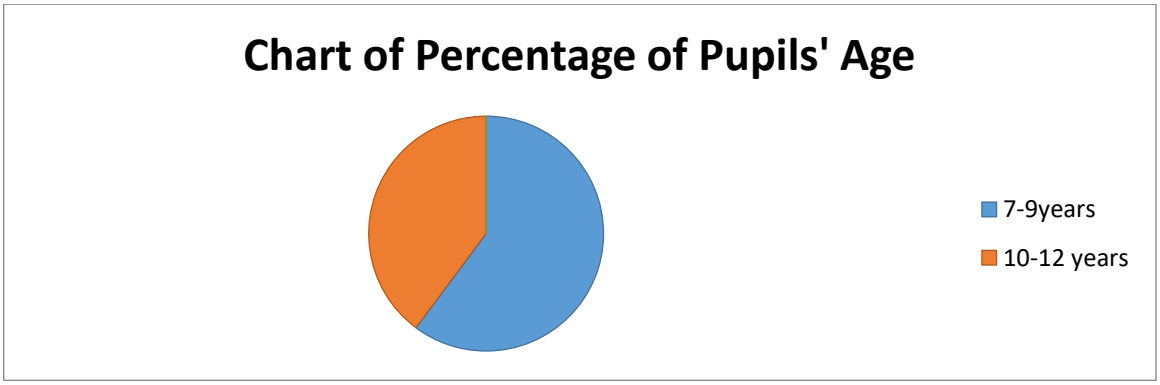

Fig. 1. Chart of Percentage of Pupils' Age

Fig. 1 shows the percentage of the age of the children in the study. It shows that majority of the children fall into the 7-9 age bracket. This made up 60.4% of the sample, whereas the 10-12 age bracket had 39.96%. This is further illustrated in the bar chart in fig.4.1b below.

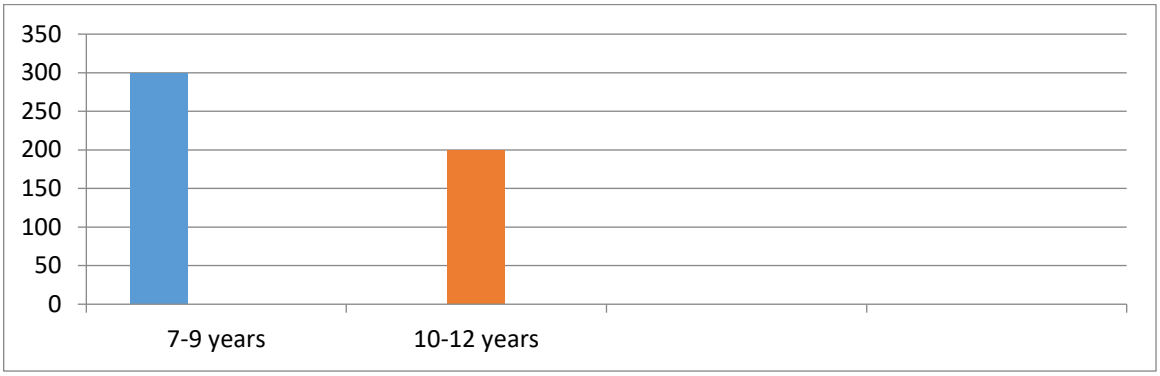

Fig. 2: Distribution of Age of Primary 4 pupils

Table 3: Summary of Number and Percentage the distribution of the age of Basic 4 school children in primary schools in Rivers State

S/N	AGE	NUMBER	PERCENTAGE	Total Number	Total Percentage
1	7 years	101	20.28%	243	48.80%
2	8 years	142	28.51%		
3	9 years	56	11.24%	109	21.88%
4	10 years	53	10.64%		
5	11 years	105	21.08%	146	29.32%
6	12 years	41	8.23%		
	TOTAL	**498**	**100%**	**498**	**100%**

Table 3 shows the breakdown of the analysis of age distribution of Basic 4 pupils according to the various ages found in the schools. This shows that there were 101 pupils representing 20.28% who were 7 years old; 142 pupils representing 28.51% who were 8 years; 56 pupils representing 11.24% who were 9 years old. There were also 53 pupils representing 10.64% who were 10 years old; 105 pupils representing 21.08% who were 11 years, and 41 pupils representing 8.23% who were 12 years old.

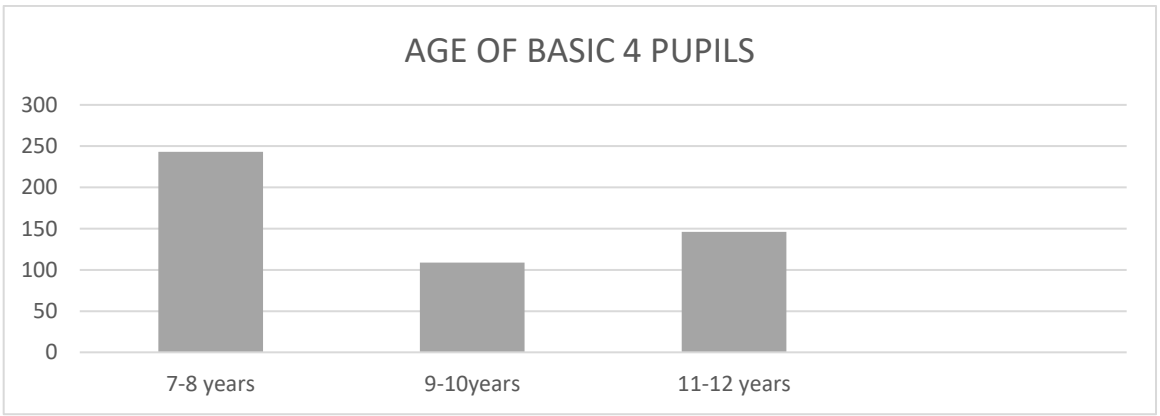

Fig 3: Age distribution of Basic 4 pupils

Figure 3 shows the breakdown of the age distribution of the Basic 4 pupils into clusters. The height of the 7-8 bar shows that there were more children in this class who were in this age bracket than the others. This group has almost 49% of the children. This followed by the 11-12 years bar. This group has 29.32% of the children. The smallest bar, which shows the list number of pupils within that age bracket, is the 9-10 years bar, representing 21.88% of the pupils.

Research Question 2: What is the qualification of teachers in primary schools in Rivers State?

Table 4: Summary of the Percentage distribution of teachers' qualification showing the exact qualification of Basic 4 in primary schools pupils in Rivers State

S/N	Qualifications	Number of Teachers	Percentage
1	PES at NCE/BED	4	14%
2	NCE/BED/PGDE	11	38%
3	HND and above without Teaching Qualification	9	31%
4	OND	2	7%
5	WASC/SSCE/GCSE	3	10%
	TOTAL	**29**	**100%**

Table 4 shows the qualifications of teachers in the classes used for the study. The table shows that more than half of the teachers (15 or 52%) had professional qualifications to be teachers because they had an NCE, BED or PGDE. However, only 4 of this number representing 14% were professionally qualified to teach in primary schools because they had an NCE or BED in Primary Education Studies. The remaining 11 representing 38% had education qualifications that would enable them teach single subjects in of the educational system. 14 teachers representing 48% had no qualifications to function professionally as teachers. Of this number, 9 representing 31% had an HND and other higher degrees, 2 representing 7% had OND whereas 3 representing 10% had WASC/SSCE as their highest academic qualification. This information is further illustrated in fig. 3 below.

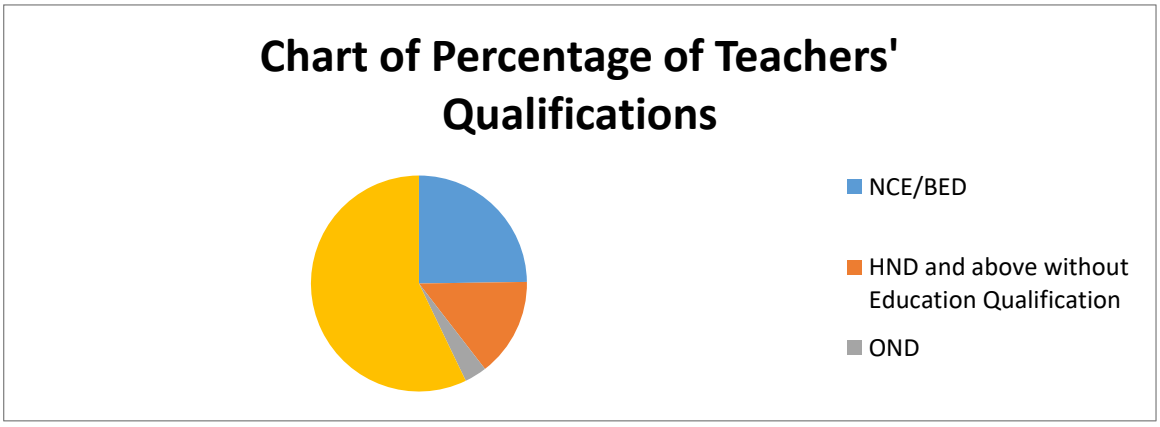

Fig. 4. Chart of the percentage of Teachers' qualifications

Table 5: Summary of the Percentage distribution of the Primary Education Studies teachers' qualification of Basic 4 in primary school pupils in Rivers State

S/N	Primary Education Qualification	Number	Percentage
1.	Pupils With PES Teachers	75	15%
2.	Pupils Without PES Teachers	423	85%

TOTAL	**498**	**100%**

Table 5 is the summary of the descriptive statistics of pupils whose teachers were professionally qualified not just to teach but to teach in the primary level of the educational system. Of the 498 pupils, 75 pupils representing 15% had teachers who had professional training in Primary Education Studies. 423 pupils representing 85% do not have teachers with qualification in Primary Education Studies. This information is illustrated with a bar chart and pie chart in Fig.3 and 4 respectively.

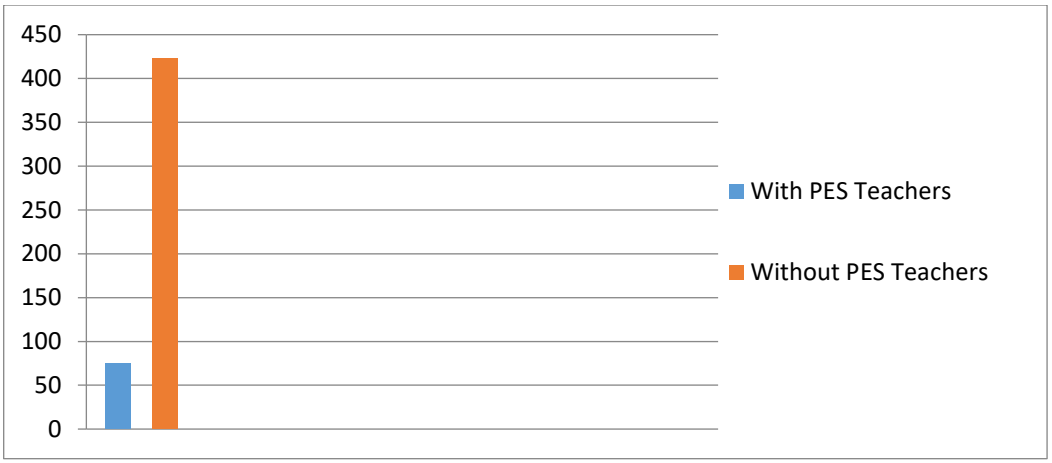

Fig. 5: Bar Chart of PES Teaching Qualification of Basic 4 Teachers in Rivers State

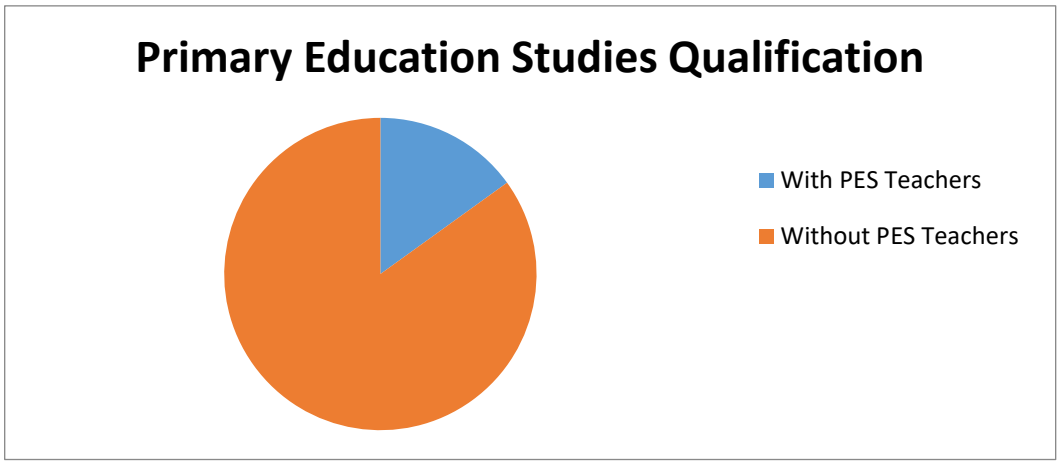

Fig. 6: Pie Chart of Pupils in Basic 4 whose Teachers hold Primary Education Studies Teaching Qualification

Research Question 3: To what extent is the class size of primary schools in Rivers State appropriate?

Table 6: Summary of the Percentage distribution the Class Size of Pupils in Basic 4 classes in primary schools in Rivers State

S/N	Class size	Number	No of Pupils	Percentage of Classes
1	1-10	13	84	45%
2	11-20	5	79	17%
3	21-35	8	217	28%
4	36 and above	3	121	10%
	TOTAL	**29**	**498**	**100%**

Table 6 shows the details of class size and the number of classes of each class size. There were 13 classes that had 1-10 pupils. These 13 classes had a total of 84 children and represented 45% of the classes used for the study. There were 5 classes with 11-20 pupils which had 79 children and represented 17% of the classes. There were 8 classes with 21-35 pupils which had 217 children and

represented 28% of the classes. There were 3 classes that had above 35 pupils with a population of 121 and represented 10% of the classes used for the study.

Table 7: Summary of the Percentage the distribution of the Class Size of Pupils in Basic 4 classes in primary schools in Rivers State

S/N	Class Size	Number of Pupils	Percentage
1	35 and below	377	75.7%
2	36 and above	121	24.3%
	TOTAL	**498**	**100%**

Table 6 also shows the summary of descriptive statistic on the distribution of the Class Size of Basic 4 classes in primary schools in Rivers State. In this table (7), however, the summary is presented showing the class size according to the maximum number of pupils recommended for Nigerian primary schools in the National Policy on Education (FRN, 2013). The table shows that 377 of the 498 pupils used for the study, representing 75.7% fall within the recommended maximum class size of 35, while 121 representing 24.3% is above the recommended maximum class size of 35. This information is shown clearly in the circle chart of fig 7.

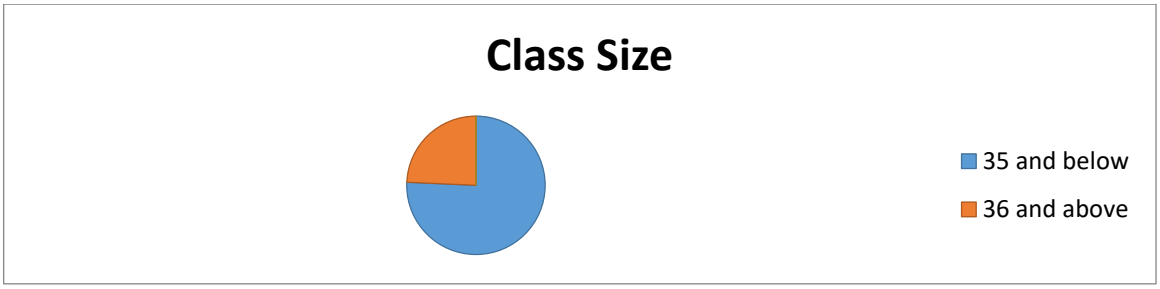

Fig. 7: Pie Chart of Class Size of Basic 4 Classes in Primary Schools in Rivers State

Research Question 4: To what extent is the Curriculum used in primary schools in Rivers State suitable?

Table 8: Curriculum Used in Primary Schools in Rivers State

S/N	Curriculum In Use	No of Classes
1	Nigerian Curriculum	All
2	Nigerian/British Curriculum	9
3	Nigerian/American Curriculum	2
4	Nigerian/British/American Curriculum	1

Table 8 shows the different Curriculum used in primary schools in Rivers State. This table shows that all the primary schools in the study use the Nigerian curriculum which is the required curriculum in school. A few schools, however, combine the Nigerian curriculum with the British and American school curriculum.

Table 9: Topic of Mathematics Taught at the Time of the Study

S/N	TOPIC
1	Addition
2	Addition and Subtraction

3	Addition of Money
4	Addition and Multiplication
5	Division of numbers
6	Fraction
7	Fraction and Division
8	Factors
9	LCM
10	Length
11	Length and Weight
12	Length, Perimeter of regular and irregular numbers
13	Perimeter of regular and irregular shapes, e.g. Length, Square
14	Perimeter of shapes
15	Square Roots
16	Profit and Loss – Simple Interest, Compound Interest
17	Finding Simple and Principle Interest
18	Money: Profit and Loss
19	Area of Borders and Shaded Portions
20	Ratio

Table 9 shows the topics that were taught in Mathematics in the various Basic 4 classes of primary schools in Rivers State at the time of the study. The 29 classes used for the study had 20 different topics in the 2 weeks of the study.

Table 10: Topic of English Language Taught at the Time of the Study

S/N	TOPIC
1	Figures of Speech
2	Parts of Speech
3	Sentences
4	Grammar: The use of ‘as’ and ‘not as’ to compare and contrast
5	Letter Writing
6	Writing a Formal Letter
7	Speech work: Intonation practice
8	Speech work: Intonation practice in connected speech

9	Speech work: Intonation - Command
10	Grammar: Conjunction (So, Therefore, As a result)
11	Reflective Pronoun
12	Aural Discrimination – Consonants /ts/ and /s/
13	Contraction Form
14	Phonetics and Grammar – Index, Pre-fix and Sur-fix
15	Speech work: Intonation practice in connected speech with successive using followed by a falling at the end
16	Question Tag
17	Adjectives
18	Parts of a sentence
19	Nouns and Pronouns

Table 10 shows the various topics in English Language that were taught in Basic 4 classes of primary schools in Rivers State at the time of the study. This table shows that 19 different topics were in use in the study classes in the 2 weeks of the study.

Table 11: English Language Textbook in Use

S/N	Textbook
1	The New Premier English for Primary School 4
2	Evans Modular English Course for Primary School 4
3	Premier English for Nigerian Primary School 4
4	Extension Modern English for Primary School 4 (UBE Edition)
5	Nigerian English for Primary School 5
6	Creative Composition English Book 5
7	The New Premier English for Primary School 5
8	Evans Modular Course for Primary School 5
9	Premier English for Nigerian Primary School 5
10	Understanding English Language 4

Table 11 shows the English Language textbooks used in teaching English Language in the 29 Basic 4 primary school classes used for the study. 10 different textbooks were used in these school.

Table 12: Mathematics Textbook in Use

S/N	Textbook
1	Evans Modular Mathematics for Primary School 4
2	Macmillan Champion Primary Mathematics 4

3	Understanding Mathematics 4
4	Progressive Mathematics for Upper Primary School 4
5	Inside Out Mathematics 5
6	Evans Modular Mathematics for Primary School 5
7	Macmillan Champion Primary Mathematics 5
8	Understanding Mathematics 5
9	Extension Modern Primary Mathematics 5 (Revised Edition)
10	Learn Mathematics Book 5

Table 12 shows the Mathematics textbooks that are used in teaching Basic 4 Mathematics in the classes in primary schools in Rivers State that were used for the study. Like was the situation with English Language, some schools use more than on textbook to learn the subject.

Summary of findings

1. The average age of the pupils was 9 years and most pupils were in the age bracket of 7-9 years. It showed that age was not ergonomically appropriate because 48% of the children were 7- and 8-year-olds who were a year and two years below the required age for primary 4.
2. The result shows that only a tiny majority of teachers had the necessary minimum qualification to be teachers in the Nigerian school system. It, however, shows that a huge majority of pupils in primary schools were taught by teachers who did not have the necessary training as Primary Education teachers, which would enable them teach every subject.
3. The result shows that the dominant class-size where the pupils study had 35 and below pupils. This was so for 75% of the pupils.
4. The primary school curriculum is inappropriate. All the schools made use of the Nigerian primary school curriculum but did not use it in their weekly teaching. Some schools taught primary 5 content to the primary 4 pupils, while others taught second term and third term work in the first term.

Discussion of Findings

The discussion of the findings of the study is done according to the research questions stated for the study. It is as follows:

Appropriateness of the age of the school children in primary schools in Rivers State.

The result from Table 2 shows that there were 299 pupils of the age bracket 7-9 representing 60.04% of the pupils whereas there were 199 pupils in the age bracket 10-12 representing 39.96%. This table shows that the average age of pupils was 9.00 years with a Standard Deviation of 1.35. Table 3 gives a further breakdown of the descriptive statistic on the distribution of the age of Basic 4 pupils into their different ages to give a clearer view of many pupils of each age were in Basic 4 in primary schools in Rivers State. It shows that there were 101 7-year-olds representing 20% of the pupils; 142 8-year-olds representing 29% of the pupils; 56 9-year-olds representing 11% of the pupils; 53 10-year-olds representing 10% of the pupils; 105 11-year-olds representing 21% of the pupils and 36 12-year olds representing 8% of the pupils.

The entry age of pupils into primary school in Nigeria, as stipulated in the National Policy on Education (FRN, 2013) is 6 years. This minimum age requires that the minimum age for children in Basic 4 should be 9 years. This means that there might be a few younger children enrolled because of exceptional intelligence and a few older one because they are lower starters or have repeated a class, but majority of the children should be within the 9-10 years bracket. The statistic shows,

however, that there were on 109 children representing 21.88% who were of the recommended age bracket of 9/10 years. Besides, the study was carried in the Third term, which is towards the end of the school year. This means that a lot of the 9-year-olds that started the school year in Basic 4 should have turned 10. The result of the study shows that there were too many children enrolled in primary schools who were not of the official school age. 243 children representing 48.79% of the study sample were 7- and 8-year-olds, making them one and two years below the official school age. This means that these pupils started primary school at ages 4 and 5 instead of the official age of 6. Thus, age of Basic 4 pupils in primary schools in Rivers State can be said to be inappropriate.

It is not surprising, however, to see that the result of the study shows that there are more children in primary schools in Rivers State below and above the stipulated age for Basic 4 than the stipulated age itself. This, according to Rao (2011), typifies the trend in 28 out of 33 African countries in a study on school entrance age. This assertion agrees with the findings of this study which has more children of 7-8 years and 11-12 years than there are of the official class age.

Adequacy of the qualification of teachers in primary schools in Rivers State.

Table 4 shows the qualification of the teachers in primary schools in Rivers State. It shows that 15 teachers representing 52% had at least a minimum of NCE in education which is stipulated in the national policy on education, whereas 14 representing 48% did not. The breakdown shows that 4 out of the 29 teachers representing 14% had PES teaching qualifications; 11 presenting 38% of the teachers had teaching qualifications in Education such as NCE, B.ED and PGDE; 9 representing 31% had HND or higher degrees but without a qualification in Education; 2 representing 7% had OND while 3 teachers representing 10% has WASC/SSCE as their highest qualification.

The result from Table 3b shows that 423 of the pupils representing 84.90% had teachers who did not have a teaching qualification in Primary Education Studies whereas 75 pupils representing 15.10% had teachers who had teaching qualifications in Primary Education Studies. The result shows that majority of the children in the study group are being taught by teachers who are not professionally qualified to function as primary school teachers.

The result of the study shows that the teachers' qualifications for the teachers of the primary school pupils used for this study was grossly inappropriate because only 15.10% of the children were taught by teachers who were truly qualified to teach them. This was made up of only 14% of the teachers involved in the study. Moreover, the result showed 48% of the teachers had absolutely no qualifications to enable them to teach at any level of the Nigerian educational system as they did not have a minimum teaching qualification of an NCE (FRN, 2013). This result is not far removed from the earlier studies carried out by Kalagbor (2008) which revealed that only 4,000 out of 16,000 primary schools in one of the states of the federation had the minimum of teaching qualification of an NCE; and the National Primary Education Commission (1996) which reported only 128,095 representing 30.5% of the country's 457,114 primary school teachers had a minimum of an NCE to enable them function as teachers. The figure was much lower in Akwa Ibom state where only 5% of the teachers had the minimum of an NCE a few years ago (Akpan, 2002)

Appropriateness of class size of primary schools in Rivers State.

The result from Table 6 shows that 121 of the pupils representing 24.30% were in classes which were over the recommended class size of 35 whereas 377 pupils representing 75.70% were in classes with class size 1-35. The 121 pupils who represented 24.30% of the pupils were found in 3 out of the 29 classes used for the study as shown in Table 4.4. This represented approximately 10% of the classes. The highest number of children seen in any one class was 42 pupils. There were 13 classes of 1-10 pupils representing 45%; 5 classes of 11-20 class size representing 17% and 8 classes of 21-35 class size representing 28% of the classes. These results show that majority (90%) of the classes had class sizes that are appropriate and well within the recommended 35 pupils in a class (FRN, 2013). This finding is in agreement with earlier findings of the UNESCO UIS (2020) and National Bureau of Statistics (2018) which established that the average class size of primary schools in Rivers State was below 20. This is, however, at variance with results of most studies on class size in Nigerian and Rivers schools that put the figure much higher Kalagbor (2008) and Ajibola (2008) put the class

population in Nigerian schools at 70 to 120 while Kalagbor and Owhonda (2014) put the class population at 55.

Suitability of curriculum in primary schools of Rivers State

The result of the study shows the teachers all responding to using the Nigerian curriculum and scheme of work provided by the Universal Basic Education Board. This is applicable to teachers in public as well as private schools. It also shows that the Nigerian primary school curriculum is not the only curriculum used in primary schools in Rivers State. The use of this curriculum is augmented with the British and American school curriculum by some private schools. Most of the private schools also use what is referred to as the 'Montessori curriculum'. Even when the Nigerian primary school curriculum in English and Mathematics are used in teaching the Basic 4 primary school pupils in Rivers State, with the exception of the government primary schools, the schools were teaching topics far advanced that what was specified in the scheme of work. This is the reason the 29 classes used for the study had 20 different topics in Mathematics and 19 different topics in English as seen in Table 9 and 10. Some of the schools went further by teaching Basic 5 content to their Basic 4 pupils.

Table 11 and 12 show the English Language and Mathematics textbooks used in Basic 4 classes in primary schools in Rivers State. As is shown on these tables, there were 10 different textbooks used in each subject in the 29 classes used for the study. Some of these books were textbooks clearly meant for Basic 5 class levels but were being used for Basic 4 classes and with children you were already known to have started school earlier than they were supposed to have started. It also agrees with the findings of Robinson (2012) that complained that there were too many topics to be taught at a specific time that the actual teaching is never equal to the number of topics. The results are also in agreement with the findings of Adebile (2007) which states the curriculum used in Nigerian schools is not appropriate for the children and level it is meant for.

The findings of the study are the following:

1. Age of school age was not ergonomically appropriate in primary schools in Rivers State. This is because too many children (almost 49%) were not enrolled at the age stipulated by the National Policy on Education (FRN, 2014). They started school at 4 and 5 years instead of the recommended 6 years.
2. Teacher qualification is not ergonomically appropriate. 52% of teachers had at least a minimum teaching qualification of NCE. This leaves a large 48% with no professional teaching skills. Only 4 representing 14% of the teachers had qualification in PES, which is supposed to enable them teach all primary school subjects. These teachers teach 75 children representing 15%. The remaining 423 children representing 85% were taught by teachers who did not have the right qualification to teach their level of education.
3. Class size was ergonomically appropriate for 75.7% of the children in primary schools used for this study.
4. The school curriculum is not ergonomically appropriate for several reasons. There was no control as to the curriculum and content used in primary school of Rivers state. Children, who were mostly younger that the recommended age, were being made to study content which was for Basic 4 while they in Basic 4. There was no uniformity in the scheme of work or content studied in school by the children.

RECOMMENDATIONS:

The following recommendations were put forward by the researcher for ergonomic appropriateness of the variables discussed in this study:

1. There is a need to ensure that children are enrolled in primary schools at the official age and taught content that is suitable for their age and class. Although the study showed a mean score of 9, there are still too many children (48%) enrolled at ages one and two years below the appropriate age. The result of this early enrollment, according to Kern and Friedman (2009) is not immediately

apparent but crops up in later years when it results in less educational attainment, worse midlife adjustment and increased mortality risk.

2. There is a need to employ teachers who are professional qualified to teach in primary schools. A professionally trained primary teacher is trained to teach every subject in the primary school curriculum. This is not the case with other teachers who are professionally trained to teach in secondary schools or have a PGDE. There is no significant influence of the qualification of the teachers on the children's academic performance because English Language and Mathematics are compulsory requirements for every academic qualification so every secondary school leaver and graduate has basic knowledge. The situation could be much different if the subjects tested were History, Creative and Cultural Arts of Home Economics which require some expertise.
3. It is important to maintain the small class size that was experienced in most of the Basic 4 classes used for the study. Most of the small classes in the public schools could have been as a result of the regulations connected to the Covid-19 pandemic, which required schools to reduce class size to enable social distancing.
4. There is a need for schools and teachers to implement the Nigerian curriculum in Nigerian schools. Although the teachers indicated its use, it is obvious from the varying topics and textbooks used in the various classes that the curriculum was not followed as it should be.
5. There is a need to make the schools aware of the existence of the new national policy on education (FRN, 2014). A lot of schools still base their school enrollment age at 5 years as was stipulated in the national policy on education (FRN, 2004) instead of 6 years as is stated in the new policy (FRN, 2014).

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