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AVAILABILITY AND ADEQUACY OF INFRASTRUCTURAL FACILITIES AND EQUIPMENT FOR TEACHING OF PHYSICAL EDUCATION COMPONENT OF THE BASIC SCIENCE AND TECHNOLOGY IN JUNIOR SECONDARY SCHOOLS IN EDO STATE, NIGERIA

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Abstract:
This study assessed the extent of availability and adequacy of infrastructural facilities and equipment for the teaching of physical education (PE) component of the Basic Science and Technology in junior secondary schools in Edo State. Two research questions were raised to guide the study. The descriptive survey research design was adopted for the study. The population of the study consists of three hundred and ninety-five teachers (78 PE teachers and all 317 head teachers) of public junior secondary schools in Edo State. The sample size of this study was one hundred and sixty teachers (70 PE teachers and 90 head teachers) in public junior secondary schools in Edo State. A multi-stage sampling procedure was adopted to select the sample for the study. A checklist was employed as a research instrument and validated using Cronbach's Alpha statistics with a coefficient value of 0.72. The data collected were analysed using the descriptive statistics of frequency count, percentage, mean and standard deviation. The findings of the study showed that most infrastructural facilities and equipment for the teaching of physical education component of the Basic Science and Technology are not available, adequate or functional. It was concluded that the implementation of the PE component of the Basic Science and Technology curriculum seems to be facing some problems in the areas of

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having adequate facilities and equipment, professionally qualified teachers, better in-service training for teachers, students' attitudes among others. It was therefore recommended that adequate facilities and equipment used in the physical education component of Basic Science and Technology should be made available and seen to be functional in schools.

Keywords: physical education component, Basic Science and Technology, availability and utilization

1. Introduction

Education stands as the most crucial asset an individual can possess and serves as a vital tool for the economic advancement of any nation. The National Policy on Education (2013) emphasized the practical and functional significance of education, focusing on the acquisition of relevant skills and the cultivation of competence. It plays a pivotal role in helping individuals attain their life aspirations and make meaningful contributions to societal progress. The national educational objective, as highlighted, underscores the importance of acquiring pertinent skills and intellectual growth. Furthermore, education contributes to the enhancement of physical and social capabilities and overall competence, serving as a means for both individual and national development. The growing concern within our education sector revolves around the availability of adequate educational resources for the training of these skill-oriented and proficient individuals. Their level of preparedness is important as future pillars for national development. According to the National Policy on Education (2013), secondary education is the education children receive after primary education before proceeding to the tertiary stage. Secondary education refers to the educational phase that follows primary education and precedes tertiary education. In Nigeria, it constitutes the third level of the educational system and holds a pivotal role within the country's educational framework. It serves as a crucial stage in preparing students for practical integration into society and for pursuing further education at higher levels.

The Junior Secondary School Physical Education Curriculum, according to the Nigerian Educational Research and Development Council (NERDC) (2012), as a component of the Basic Science and Technology curriculum, include Basic Human Movement, Sports and Games, Health Education, Movement of body parts, Athletics, Contact and Non-Contact Games. Here, necessary skills would be acquired and practised by students during the school years as they are the building blocks for more complex movements and combination of movements required for successful and effective participation in physical activities. Moreover, children can participate in games, dance, and swimming, thus resulting in physical, health, socio-emotional, and intellectual benefits (Kahiga, 2014).

In addition, Aluko and Adodo (2011) emphasised that learning activities at primary as well as secondary levels should be adequately diversified to ensure the growth and development of the child. For this to be achieved, the PE curriculum has to be effectively implemented.

The secondary school physical education programme is characterized by individual and lifetime sports as well as team game activities. The physical education programme cuts across recreational and interscholastic sports, which involves facilities, supplies and equipment. The inclusion of physical education in the secondary school curriculum is in accordance with the International Charter of Physical Education. The United Nations Educational, Scientific and Cultural Organization (UNESCO) (1976) recognise "*the practice of physical education and sport as a fundamental right for all*". However, the effective implementation of the PE curriculum implementation has been met with a lot of issues. Lator (2021) emphasised that adequate sports facilities and equipment need to be available to enhance the instructional requirements of the PE curriculum and sports programme.

The availability of facilities and equipment in our secondary schools today can help in facilitating teaching, but unavailability may pose negative feedback (Eimuhi & Eimuhi, 2018). If any system of a school must have a successful outcome, availability of instructional materials like facilities and equipment must be available. Owoeyi (2011) explains that the availability of school facilities is a potent factor in quantitative education. These facilities play an important role in the actualization of the educational goals and objectives by satisfying the physical and emotional components of the staff and students of the school. The provision of facilities, supplies, and equipment holds significant importance in the management of physical education and sports. A well-structured program is the cornerstone of success in physical education and sporting events, and this necessitates access to well-equipped, high-quality training grounds. Having standard facilities and equipment is a fundamental requirement for achieving outstanding and commendable performance. Insufficiency of adequate and standardized facilities and equipment poses obstacles to the effective implementation of physical education and sports programs in various ways. Aibueku (2002) and Aluko (2010) opined that the inadequacy of sports facilities remains a constraint to sports participation in Nigeria's primary and secondary schools.

On the other hand, the utilization of school facilities depends majorly on their availability and the physical education teachers' ability to operate or use the facilities, amongst other factors. Levels of utilization of these facilities may be dependent on capacity usage, rate of usage, and time of usage. Muirillo and Romina (2012) asserted that school facilities in Nigerian schools are inadequate, and few are available, while some are overutilized due to an unprecedented increase in school enrolment. These findings need to be sufficiently backed up with empirical evidence. The significant objectives associated with secondary education underscore the importance of having access to and effectively utilizing the necessary facilities to support this form of education. In light of the above,

this study is instituted to assess the extent of availability and adequacy of infrastructural facilities and equipment for teaching the physical education component of Basic Science and Technology in junior secondary schools in Edo State.

2. Research Questions

To guide this study, the following research questions were raised:

1) What is the extent of availability of infrastructural facilities and equipment for teaching the physical education component of Basic Science and Technology in junior secondary schools in Edo State?
2) What is the extent of adequacy of infrastructural facilities and equipment for teaching the physical education component of the Basic Science and Technology junior secondary schools in Edo State?

3. Methodology

The descriptive survey research design was adopted for this study. This design was adopted because it allows for a systematic gathering of information related to determining the implementation of the physical education component of the Basic Science and Technology curriculum. The Input Process Output (IPO) model was used to assess the implementation of the PE component of the Basic Science and Technology curriculum. The variables in this study include the availability and adequacy of facilities, equipment and infrastructural requirements for teaching.

3.1 Design of the Study

The descriptive survey research design was adopted for this study. This design was adopted because it allows for a systematic gathering of information related to determining the implementation of the physical education component of the Basic Science and Technology curriculum. The Input Process Output (IPO) model was used to assess the implementation of the PE component of the Basic Science and Technology curriculum. The variables in this study include the input variables of policy issues related to the physical education component of Basic Science and Technology; rating of PE objectives; availability and adequacy of facilities, equipment and infrastructural requirements for teaching; and professional qualification of teachers; process variables of availability and use of instructional materials; instructional abilities used by teachers; in-service training received by teachers; and time allocation and general time table information of PE and output variables of students' attitude toward PE.

The input variable represents the independent variables, while the measures and scores derived from the process and output variables constitute the dependent variable.

3.2 Population of the Study

The population of the study consist of 109,778 respondents, made up of 109,383 students and all 78 PE teachers as well as all 317 head teachers of public junior secondary schools, representing the eighteen (18) local government areas in Edo State. Table 1 is a representation of the population of this study as obtained from the Ministry of Education, Benin City, 2021.

Table 1: Distribution of PE teachers, head teachers and students in Edo State, Nigeria

S/N	Local Government Area	No of public junior sec schools	PE teachers	Head teachers	Students
1	Akoko-Edo	29	5	29	6312
2	Egor	13	5	13	9528
3	Esan Central	14	4	14	2782
4	Esan North East	12	0	12	3589
5	Esan South East	17	1	17	2002
6	Esan West	16	5	16	4135
7	Etsako Central	9	0	9	2049
8	Etsako East	16	0	16	4459
9	Etsako West	28	7	28	6888
10	Igueben	10	0	10	1149
11	Ikpoba-Okha	20	17	20	22498
12	Oredo	14	5	14	18157
13	Orhionmwon	28	5	28	3848
14	Ovia North East	29	8	29	6413
15	Ovia South West	15	5	15	2882
16	Owan East	16	4	16	4116
17	Owan West	10	2	10	3210
18	Uhunmwonde	21	5	21	5366
	Total	**317**	**78**	**317**	**109383**

Source: Post Primary Education Board, 2021.

3.3 Sample and Sampling Techniques

The sample size of this study was 1,060 respondents comprising seventy (70) PE teachers, ninety (90) head teachers, and nine hundred (900) students in public Junior secondary schools in Edo State. A multi-stage sampling procedure was adopted to select the sample for the study. In the first stage, the researcher used the existing stratification of Edo State into eighteen (18) local government areas spread across the three senatorial districts, namely: Akoko-Edo, Egor, Esan Central, Esan North East, Esan South East, Esan West, Etsako Central, Etsako East, Etsako West, Igueben, Ikpoba-Okha, Oredo, Orhionmwon, Ovia North East, Ovia South West, Owan East, Owan West, and Uhunmwonde.

In the second stage, the simple random sampling technique of balloting with replacement was used to select ninety (90) public junior secondary schools in Edo state. This involved the use of pieces of paper, which were folded and put in bags. The researcher picked schools based on their local government area, put them back in the bag,

and then picked another. The procedure was used to select five (5) public JSS in each LGA, thus giving a total of ninety (90) out of 317.

In the third stage, the simple random sampling technique was also used to select 70 teachers from the 78 PE teachers from all LGA in the State. The fourth stage involved using a proportionate random sampling technique to select ten (10) students from each of the 90 selected public JSS to give a total of 900 students selected for the study (i.e. 50 students from each LGA). Additionally, the head teachers/principals of each of the sampled schools were used in the study, totalling 90 head teachers/principals.

3.4 Research Instrument

The instrument for this study, titled "Availability and Adequacy of Infrastructural Facilities and Equipment in Teaching of Physical Education", was self-constructed and consists of Sections A and B.

Section A contained items on the socio-demographic profile of head teachers in terms of status, age, name of school, local government area, gender and professional qualifications.

Section B was a checklist on the availability and adequacy of infrastructural facilities and equipment in the teaching of physical education. This was designed to assess the extent of availability and use of infrastructural facilities and equipment for teaching PE at the junior secondary school level. The PE teachers carried out this assessment.

The checklist consisted of 59 PE facilities and equipment, and it was designed to obtain responses based on 'availability', 'non-availability', 'adequacy', 'inadequacy', and 'functionality' of the outlined PE and sports infrastructure in public junior secondary schools. The scale was rated as Strongly Agree (4), Agree (3), Disagree (2), and Strongly disagree (1).

3.5 Validity of the Instrument

The instrument was validated by three experts; two from the Department of Human Kinetics and Sports Science, and one expert from Educational Measurement and Evaluation at the University of Benin. This was carried out to ascertain the face and content validity of the instrument.

3.6 Reliability of the Instrument

To establish the reliability of the instrument, the checklist was not subjected to a reliability test as it was designed by the National Teachers' Institute (2002), showing the minimum number of facilities and equipment for teaching and learning PE in schools and colleges, thus considered a standardized checklist instrument. A reliability coefficient of 0.72 was obtained for the availability and use of course and instructional materials in PE, which was considered a good reliability coefficient for the study.

3.7 Method of Data Collection

The instrument was administered by the researcher, with the assistance of three trained research assistants and the principals or head teachers in each school sampled for the study. The research assistants helped to administer, monitor and retrieve completed instruments, and this lasted four (4) weeks.

4. Method of Data Analysis

The data collected were analysed using the descriptive statistics of frequency count, percentage, mean and standard deviation to answer the research questions. The Statistical Packages for Social Sciences (SPSS) was employed in carrying out the analyses. Benchmarks that aided decision-making are as follows: percentage distribution of responses on the availability, adequacy and functionality of infrastructural facilities and equipment were analysed using frequencies and percentages.

5. Results

5.1 Data Showing the Percentage Distribution of Quantity of Facilities and Equipment for PE Programme in Public JSS

The data reveals the number of PE facilities and equipment in secondary schools. For football field, 53.3% of public JSS have one (1) football field, while 46.7% have two (2) football fields. As regards basketball court, 95.6% of the sample JSS had none, 3.3% had one (1) basketball court, while 1.1% had two (2) basketball courts. For volleyball court, handball court and badminton court, 95.6% had none and 4.4% had one (1) of these courts respectively in their schools. For tennis court, 97.8% of the public JSS had none, while 2.2% had one (1). 96.7% of the public JSS do not have cricket oval, while 3.3% had one (1) each. For hockey field, 96.7% of the public JSS had it non-existent, while 3.3% had one (1) each. With reference to storage room, 44.4% had none in existence, while 55.6% had one (1) each.

Concerning Equipment and Supplies, 93.3% of public JSS had no landing mats, 1.1% had two (2) landing mats each, 2.2% had three (3) and four (4) landing mats each in their schools, respectively, while 1.1% had five (5) landing mats each. In relation to the PE infrastructure under athletics, 2.2% of public JSS had one (1) and two (2) javelin implements each, respectively. 2.2% of the JSS had shot put. As concerns discuss, 1.1% of the schools had one (1), two (2), and three (3) discuss each. For pairs of high stand, 1.1% had one (1) and two (2) each, respectively. 2.2% of the public JSS had aluminium cross bar. In reference to relay batons, 1.1% of the schools had one (1), six (6), and twelve (12) batons each, respectively. 2.2% had four (4) and ten (10) batons each, respectively, while 5.6% of schools had five (5) relay batons each.

For the PE facilities and equipment classified under Ball Games, as they relate to soccer balls, 8.9% of the public JSS had one (1) soccer ball each, 25.6% had two (2) soccer

balls each, 36.7% had three (3) soccer balls, 18.9% of schools had four (4) soccer balls each, 5.6% of the schools had five (5) soccer balls, while 1.1% schools had six (6), seven (7), ten (10) and eleven (11) soccer balls each respectively. As regards inflators, 1.1% of public JSS had one (1) and three (3) inflators each, respectively, while 3.3% had two (2) inflators. For handballs, 1.1% of schools had one (1) and three (3) handballs each, respectively, while 2.2% have two (2) handballs each. For volleyballs, 1.1% of public JSS hand one (1) and five (5) volleyballs each, respectively, while 3.3% schools had four (4) volleyballs each. For basketballs, 3.3% of schools had one (1) basketball each, 2.2% had two (2) basketballs each, and 1.1% of schools had three (3), four (4) and five (5) basketballs each, respectively. For hockey balls, 1.1% of public JSS had two (2) hockey balls each, 2.2% have three (3) hockey balls each. As for table tennis balls, 2.2% public JSS had two (2), three (3) and seven (7) table tennis balls each, respectively, while 3.3% of schools have four (4) table tennis balls each, 1.1% of schools have five (5) table tennis balls, and 6.7% of schools have six (6) table tennis balls each. For cricket balls, 3.3% of public JSS have ten (10) cricket balls each, while 2.2% of schools have twelve (12) cricket balls each.

The PE infrastructure classified under racket games showed that for tennis rackets, only 3.3% of schools have two (2) rackets each. For hockey skills, 1.1% of schools had five (5) hockey sticks, while 2.2% had six (6) hockey sticks each. As regards table tennis bats, 3.3% of schools have two (2) table tennis bats each, 7.8% of schools have four (4) table tennis bats, 1.1% of schools have five (5) table tennis bats each, and 2.2% of schools have six (6) table tennis bats each.

The data as regards general supplies for all sports, 1.1% of public JSS had one (1) stop watch and four (4) stop watches each, respectively, while 3.3% of schools had two (2) stop watches each. For tape measures, 63.3% have one (1) each, while 26.7% had two (2) tape measures each. For weighing scales, 21.1% of schools have one (1) weighing scales each, while 5.6% of schools have two (2) weighing scales each. As relates to whistle (all kinds), 13.3% of the public JSS had one (1) whistle each, 33.3% of schools had two (2) whistles each, 6.7% of schools had three (3) whistles each and 36.7% had four (4) whistles each. As for recording sheets, 15.6% of public JSS had one (1) recording sheet each, 8.9% had two (2) recording sheets each, 26,7% had three (3) recording sheets each, 23.3% of schools had five 95) recording sheets each, 13.3% schools have seven (7) recording sheets each, and 6.7% schools have ten (10) recording sheets each. For sleeping bags, 1.1% of the schools had one (1), five (5) and ten (10) sleeping bags each, respectively. 4.4% of schools have two (2) sleeping bags each, 2.2% of schools have six (6) sleeping bags each, and 3.3% of schools have eight (8) sleeping bags each. 1.1% of schools had one (1) and four (4) camp beds each, respectively, while 2.2% of schools had three (3) camp beds each. For first aid boxes in public JSS, 82.2% had one (1) each, while 11.1% had two (2) first aid boxes each. For anatomy and physiology charts, 12.2% of schools had one (1) such chart, 27.8% had two (2) charts each, while 15.6% of schools had three (3) charts each. Finally, for physiology moulds, 10% of schools had one (1) physiology moulds each, 7.8% of schools

had two (2) physiology moulds each and 5.6% of schools had three (3) physiology moulds each.

Table 2: Percentage Distribution of Responses on Availability, Adequacy and Functionality of PE Facilities and Equipment in Public Secondary Schools

S/N	PE Facilities and Equipment		Availability				Adequacy				Functionality			
		Min. Qty. Req.	Available		Not available		Adequate		Inadequate		Yes		No	
			F	%	F	%	F	%	F	%	F	%	F	%
1.	Football field	1	90	100	0	0	90	100	0	0	90	100	0	0
2.	Basketball court	1	4	4.4	86	95.6	0	0	90	100	4	4.4	86	95.6
3.	Volleyball court	1	4	4.4	86	95.6	4	4.4	86	95.6	4	4.4	86	95.6
4.	Handball court	1	4	4.4	86	95.6	4	4.4	86	95.6	4	4.4	86	95.6
5.	Badminton court	2	4	4.4	86	95.6	1	1.1	89	98.9	4	4.4	86	95.6
6.	Tennis court	2	2	2.2	88	97.8	0	0	90	100	2	2.2	88	97.8
7.	Swimming pool	1	0	0	90	100	0	0	90	100	0	0	90	100
8.	Squash court	1	0	0	90	100	0	0	90	100	0	0	90	100
9.	Hockey field	1	3	3.3	87	96.7	3	3.3	87	96.7	3	3.3	87	96.7
10.	Gymnasium	1	0	0	90	100	0	0	90	100	0	0	90	100
11.	Storage room	1	50	55.6	40	44.4	50	55.6	40	44.4	49	54.4	41	45.6
12.	6-8 lane athletic tracks	1	0	0	90	100	0	0	90	100	0	0	90	100
13.	PHE Resources Centre	1	0	0	90	100	0	0	90	100	0	0	90	100
14.	Gymnastic Tripod (horses)	2	0	0	90	100	0	0	90	100	0	0	90	100
15.	Bucks	3	0	0	90	100	0	0	90	100	0	0	90	100
16	Take-off board	2	0	0	90	100	0	0	90	100	0	0	90	100
17.	Trampolines	2	0	0	90	100	0	0	90	100	0	0	90	100
18.	Long benches	2	0	0	90	100	0	0	90	100	0	0	90	100
19.	Agility mattresses	20	0	0	90	100	0	0	90	100	0	0	90	100
20.	Horizontal bars	2	0	0	90	100	0	0	90	100	0	0	90	100
21.	Agility rings	4	0	0	90	100	0	0	90	100	0	0	90	100
22.	Starting blocks	10	0	0	90	100	0	0	90	100	0	0	90	100
23.	Starting guns	4	0	0	90	100	0	0	90	100	0	0	90	100
24.	Javelin	4	4	4.4	86	95.6	0	0	90	100	4	4.4	86	95.6
25.	Shot put	4	2	2.2	88	96.7	0	0	90	100	2	2.2	87	96.7
26.	Discus	4	3	3.3	87	96.7	0	0	90	100	3	3.3	87	96.7
27.	Pairs of High jump stand	6	2	2.2	88	97.8	0	0	90	100	2	2.2	88	97.8
28.	Aluminium cross bar	4	2	2.2	88	97.8	0	0	90	100	2	2.2	88	97.8
29.	Landing foams for High jump and Pole vault	40	0	0	90	100	0	0	90	100	0	0	90	100
30.	Canvas	20 pairs	0	0	90	100	0	0	90	100	0	0	90	100
31.	Shin guards	20 pairs	0	0	90	100	0	0	90	100	0	0	90	100
32.	Stockings/socks	40 pairs	0	0	90	100	0	0	90	100	0	0	90	100

33.	Relay batons	8 Pairs	12	13.3	78	86.7	8	8.9	82	91.1	12	13.3	78	86.7
34.	Hurdle stands	60 pairs	0	0	90	100	0	0	90	100	0	0	90	100
35.	Soccer balls	10	90	100	0	0	3	3.3	87	96.7	88	97.8	2	2.2
36.	Inflators	2	5	5.6	85	94.4	4	4.4	86	95.6	5	5.6	85	94.4
37.	Hand balls	10	4	4.4	86	95.6	0	0	90	100	4	4.4	86	95.6
38.	Volley balls	10	5	5.6	85	94.4	0	0	90	100	5	5.6	85	94.4
39.	Basket balls	6	8	8.9	82	91.1	0	0	90	100	7	7.8	83	92.2
40.	Hockey balls	10	3	3.3	87	96.7	0	0	90	100	3	3.3	87	96.7
41.	Table tennis balls	12	16	17.8	74	82.2	0	0	90	100	16	17.8	74	82.2
42.	Tennis rackets	12	3	3.3	87	96.7	0	0	90	100	3	3.3	87	96.7
43.	Hockey sticks	30	3	3.3	87	96.7	0	0	90	100	3	3.3	87	96.7
44.	Table tennis bats	20	13	14.4	77	85.6	0	0	90	100	13	14.4	77	85.6
45.	Hockey keeper kits	2 sets	0	0	90	100	0	0	90	100	0	0	90	100
46.	Stop watch(es)	2	5	5.6	85	94.4	4	4.4	86	95.6	4	4.4	86	95.6
47.	Tape measure(s)	5	81	90.0	9	10.0	0	0	90	100	80	88.9	10	11.1
48.	Weighing scales	12	24	26.7	66	73.3	0	0	90	100	22	24.4	68	75.6

5.2 Discussion

Results in the research question show that most infrastructural facilities and equipment for the teaching of the physical education component of the Basic Science and Technology are not available, adequate or functional. This agrees with the findings by Nevenglosky, Cale & Aguilar (2018) that teachers do have the required resources and tools to be successful (Nevenglosky, Cale & Aguilar, 2018). This also agrees with the study by Ayuba and Gatabazi (2010), who found that PE facilities in schools are inadequate.

6. Conclusion

It is concluded that most infrastructural facilities and equipment for the teaching of the physical education component of the Basic Science and Technology are not available, adequate or functional. Therefore, the implementation of the PE component of the Basic Science and Technology curriculum seems to be facing some problems in the areas of having adequate facilities and equipment, professionally qualified teachers, better in-service training for teachers, students' attitudes, among others. These problems have persisted in secondary schools, despite the fact that the National Policy on Education [NPE] (2013), recommended that physical and health education should be emphasized at all levels of the education system.

7. Recommendations

Adequate facilities and equipment used in the physical education component of Basic Science and Technology should be made available and seen to be functional in schools in

order to encourage the PE teachers as well as enhance the attitude, academic experience and achievement of learners.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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