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ASSESSING STUDENTS' PERFORMANCE IN COMPUTER-BASED TESTS AND PAPER-PENCIL TEST EXAMINATIONS

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ABSTRACT
The study examined the performance of students in paper-pencil tests and computer-based tests in Mathematics. The population of the study are SS 3 students in the 2022/2023 academic session in Delta State. A sample of 180 students was selected using a purposive sampling technique. Two sets of equivalent 50 multiple-choice items were used for the study. The validity of the instruments was established using expert judgement while Kuder-Richarson formula 20 was used to establish the reliability coefficient of the instruments. A reliability coefficient of 0.78 and 0.76 was

INTRODUCTION
Testing plays a significant role in the educational system. Testing in Nigeria's Educational system before Western Education was mainly oral and informal. The advent of Western Education in Nigeria brings about formalized model of testing in the educational system in Nigeria. These tests are conducted orally on a paper (paper-pencil test), on a computer (computer-based test) and in a confined area requiring students to physically perform a set of skills. The educational institution has different mediums for conducting these examinations.

The Paper-Pencil test is a traditional student assessment format that requires students to use a pencil/biro to respond to questions in either an objective test or an essay test. Its development requires crucial steps to develop. Paper-Pencil tests can be in the form of multiple choice, matching, true/false, completion, constructed response and essay type.

Over the years most public Examination bodies in Nigeria make use of paper-pencil tests. Public examination bodies in Nigeria such as the West African Examination Council, the National Examination Council of Nigeria, and the State Ministry of Education, make use of Paper-Pencil test examinations. The internal examination conducted in the school system such as the primary, secondary and tertiary institutions makes use of Paper-Pencil test examinations. Imo, Damuut, Bulus, Ogunbiyi & Ozoji, (2022) pointed out that UTME has been a paper-pencil test where the student was required to respond to their question using an Optical Mark Reader (OMR) sheet.

Pomplun & Custer (2005) identified the following advantages of the Paper-Pencil test (PPT) Examination: it creates an avenue for an equal level playing ground for every student. Power failure does not hinder the examination process. It is more efficient when the Paper-Pencil

obtained for the instruments. Correlational survey design was adopted. Data were analysed using mean, standard deviation, frequency counts, percentages, cumulative frequency and Pearson product-moment correlation method statistics at a 0.01 level of significance. It was discovered that there is a relationship between the performance of students in paper-pencil tests and computer-based tests examinations. It equally shows that the performance of male and female students is related. Conclusions were drawn and recommendations were equally made.

KEYWORDS: Assessing, Performance, Computer-based tests and Paper-pencil tests.

test (PPT) is essay-type. It is suitable and more efficient for practical examinations. It is more suitable for assessing oral tests. The paper-pencil test does not require technological know-how before it can be conducted.

On the other hand, the paper-pencil examination is faced with a lot of challenges, these challenges include:

- It is prone to examination malpractice in the process of movement of paper from one location to the other.
- It requires a lot of funds in producing examination papers and transportation costs for moving the paper from one location to the other.

Osuji (2012) pointed out that the Paper-Pencil test (PPT) is associated with the following problems: leakage of examination papers, student conniving with examination officials, impersonation and use of electronic devices. Other negative effects associated with paper-pencils tests include late arrival of material to some centres during an examination, extra cost producing papers in case of cancellation of examinations, late releasing of examination results, removal of questions paper(s) from examination halls to outside, difficulty in carrying of examination materials to some remote and river line areas, attack on supervisors and examination material in the course of writing and returning of examination materials, biases of some examiners in the course of scoring student responses, missing of examination scripts are also associated with Paper-Pencil examination.

The computer-based test is a type of examination where questions are presented to the testee on the computer and also answer the question on the computer. It is an examination conducted using ICT devices to present and respond to the questions. Admiraal, Vermelum & Butterman-Bos (2020) defined a computer-based test (CBT) as a test and assessment of conducting and evaluating students' or candidates' knowledge, skills and characters using computers. Imo, Damuut, Bulus, Ogunbiyi & Ozoji (2022) defined computer-based tests (CBT) as a type of assessment where testees are presented with a set of questions on a computer and answer the questions on the same platform. Various examination bodies and higher institutions of learning in Nigeria have advocated for computer-based test (CBT) examinations for their pupils and students. Some employee of labour has equally advocated for computer-based test (CBT) examination in Nigeria. Primary schools and secondary schools, higher institutions of learning, vocational certification and other

forms of education and training needed the most efficient way of measuring and assessing the outcome of learning that meets the need of 21st-century assessment. Assessment and Evaluation are integral parts of the Educational system. Before the digital era, the assessment of learning outcomes is mostly based on the traditional paper-pencil test (PPT). With the advent of technology and development taking almost all sectors of life, Assessment and Evaluation cannot be left behind in the old traditional paper-pencil test, the need to use ICT as a mode of examination has also increased in the post-pandemic challenges. There need to build a resolute approach to keep the educational system immune to present and future disruptions. A well-organized Computer-based test (CBT) examination will provide a scaffold by minimizing the administrative burden of providing various examination centres, and the cost of printing examination materials and distributing them. It will also help to reduce the time required for such labour in carrying out such tasks.

BENEFITS OF COMPUTER-BASED TEST (CBT)

The computer-based test is more convenient:

- It provides a window of one to three weeks allowing the testee to choose a convenient date and time.
- It saves time and energy in conveying examination materials from one location to the other.
- It is an auto-grade. The Computer-based test does not require a long time before marking and grading. The marking and the grading are automatic as the marking and grading system has been inbuild on the computer.
- Wide range of test takers are assessed at the same time and in different locations.
- It helps to improve test security. The leakage of test questions in the course of conveying questions from one location to another is avoided.
- It brings about improvement in the course of delivery, administration, and scoring of test items during the examination. Sanni & Mohammad (2015) pointed out that computer-based test (CBT) examination helps to avoid missing results and curb examination malpractices. Mubashrah, Tariq & Shami (2012) opined that using computers and other related technologies facilitates broader reports on the cognitive domain.

The computer-based test (CBT) Examination is a new innovation in the educational system in Nigeria and as such is faced with various challenges. These challenges are as follows:

- Basic computers and accessories are not readily available the numbers are grossly inadequate in comprising the increasing numbers of students in Nigeria.
- Olumorin, Fakomogbon, Fasasi, Olawale & Olafare (2013) pointed out problems of possible hacking into the database of the test items, there is also the problem of internet connectivity.
- There is a problem of poor network. Even in a situation where the networks are available, the school lacks the funds to afford the connection fees.
- Unstable electricity in Nigeria has also hindered Computer- Based Test in the country. Aduwa-Ogiegbaen & Iyamu (2005) stated that most schools in rural areas do not have

access to electricity which makes it almost impossible to conduct Computer- Based Test Examinations in rural areas.

- Most of the teachers in the Educational system do not possess the technical abilities to conduct the computer-based test (CBT) examination. The pupils and students are taught in the classroom using chalk and blackboard, they are not exposed to e-learning and therefore find it difficult to write CBT examinations at the end

STATEMENT OF PROBLEM.

The computer-based test makes use of computers and other related technologies in the assessment of the testee. Its introduction in Nigeria is new. Most students do not have the prerequisite knowledge of how to use a computer. Goldberg & Pedulla (2002) pointed out that testees with lower knowledge of computers scored lower on computer-based tests. This scenario implies that the mental trait of the testee about the items is not assessed but rather the computer abilities of the testee. This has violated the unidimensionality assumption of the item response theory that test items are only to be affected by the subject matter without the interference of another subject matter.

The introduction of computer-based tests irrespective of the testee's knowledge and experience with computers and level of its exposure has necessitated this research finding to compare pupil and student performance in computer-based tests (CBT) and the traditional Paper and Pencil Test (PPT).

RESEARCH QUESTIONS

The following research questions guided the study.

1. What is the extent of the relationship between students' performance in computer-based tests (CBT) and Paper and Pencil Test (PPT) examinations?
2. What is the extent of the relationship between male student performance in computer-based tests (CBT) and paper-pencil tests (PPT)?
3. What is the extent of the relationship between female student performance in the computer-based test (CBT) and Paper and Pencil Test (PPT) examination?

HYPOTHESES

The following hypotheses were developed to guide the study.

1. There is no significant relationship between students' performance in the computer-based tests (CBT) and Paper-Pencil Test (PPT) examinations.
2. There is no significant relationship between the performance of male students in computer-based tests (CBT) and Paper and Pencil tests (PPT) examinations.
3. There is no significant relationship between the performance of female students in computer-based tests (CBT) and Paper and Pencil tests (PPT) examinations.

METHODOLOGY

The design for the study is a correlational survey research design. This design was used to determine the extent of the relationship in the performance of students in the Computer-based test (CBT) and Paper-Pencil Test (PPT) examination, the significant relationship between male and

female student performance in Computer-based test (CBT) and Paper-Pencil Test (PPT) examination.

The population of the study is SS 3 students in the 2022/2023 academic session in Delta State. A purposive sampling technique was used in selecting 240 students for the study. 80 students from each of the senatorial districts of Delta State. Two intact classes were used in each of the senatorial districts of the state, one in urban and one in rural areas. Two equivalents set of Mathematics multiple choice test items of 50 items each were used for the study. The two equivalent multiple-choice items were validated using expert judgment for the validity and Kuder Richa-son formula 20 for the reliability of the instruments. A reliability coefficient of 0.78 and 0.76 were obtained for the two instruments respectively. The two instruments were administered to 30 students who are not part of the study. The instruments were administered on the same day. The students were shared into groups A and B, at first group A, sat for CBT while group B was for PPT. Later group B sat for CBT while Group A sat for PPT. At the end of the administration of both tests, the responses of the students were scored. The research questions were answered using mean, standard deviation, frequency count, cumulative frequency count and percentages while the hypotheses were analysed using the Pearson product-moment correlation coefficient to determine the relationship between students' performance in both the Computer-based test (CBT) and the Paper-Pencil Test (PPT) examination.

PRESENTATION OF RESULTS AND DISCUSSIONS.

RESEARCH QUESTION 1: What is the extent of the relationship between students' performance in computer-based tests (CBT) and Paper and Pencil Test (PPT) examinations?

TABLE Ⅰ: Relationship between the performance of the student's computer-based tests and paper-pencil test examinations.

	PPT			CBT		
Scores	Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
0	-	-	-	2	0.8	0.8
14	-	-	-	1	0.4	1.3
15	-	-	-	1	0.4	1.7
17	1	0.4	0.4	-	-	1.7
23	1	0.4	0.8	1	0.4	2.1
24	-	-	0.8	1	0.4	2.5
25	2	0.8	1.7	4	1.7	4.2
28	1	0.4	2.1	1	0.4	4.6
29	5	2.1	4.2	1	0.4	5.0
31	-	-	4.2	1	0.4	5.4
32	1	0.4	4.6	5	2.1	7.5
33	1	0.4	5.0	5	2.1	9.6
34	1	0.4	5.4	4	1.7	11.3
35	1	0.4	5.8	6	2.5	13.8

37	5	2.1	7.9	4	1.7	15.4
38	6	2.5	10.4	3	1.3	16.7
39	4	1.7	12.1	4	1.7	18.3
40	-	-	12.1	2	0.8	19.2
41	2	0.8	12.9	5	2.1	21.3
42	5	2.1	15.0	5	2.1	23.3
43	4	1.7	16.7	8	3.3	26.7
44	8	3.3	20.0	6	2.5	29.2
45	4	1.7	21.7	2	0.8	30.0
46	5	2.1	23.8	6	2.5	32.5
47	12	5.0	28.8	9	3.8	36.3
48	7	2.9	31.7	6	2.5	38.8
49	16	6.7	38.3	10	4.2	42.9
50	10	4.2	42.5	10	4.2	47.1
51	3	1.3	43.8	13	5.4	52.5
52	16	6.7	50.4	12	5.0	57.5
53	5	2.1	52.5	6	2.5	60.0
54	7	2.9	55.4	13	5.4	65.4
55	4	1.7	57.1	2	0.8	66.3
56	2	0.8	57.9	1	0.4	66.7
57	8	3.3	61.3	4	1.7	68.3
58	2	0.8	62.1	2	0.8	69.2
59	5	2.1	64.2	6	2.5	71.7
60	10	4.2	68.3	6	2.5	74.2
61	7	2.9	71.3	6	2.5	76.7
62	12	5.0	76.3	8	3.3	80.0
63	12	5.0	81.3	7	2.9	82.9
64	4	1.7	82.9	7	2.9	85.8
65	2	0.8	83.8	4	1.7	87.5
66	3	1.3	85.0	4	1.7	89.2
67	2	0.8	85.8	7	2.9	92.1
68	-	-	85.8	1	0.4	92.5
69	3	1.3	87.1	2	0.8	93.3
70	2	0.8	87.9	6	2.5	95.8
71	6	2.5	90.4	3	1.3	97.1
72	7	2.9	93.3	1	0.4	97.5
73	6	2.5	95.8	-	-	97.5
74	1	0.4	96.3	2	0.8	98.3
75	2	0.8	97.1	1	0.4	98.8
76	-	-	97.1	1	0.4	99.2
77	2	0.8	97.9	-	-	99.2

79	1	0.4	98.3	-	-	99.2
80	2	0.8	99.2	-	-	99.2
82	1	0.4	99.6	-	-	99.2
83	1	0.4	100.0	1	0.4	99.6
88	-	-	-	1	0.4	100
Total	240	100.0		240	100.0	

		PPT	CBT
N	Valid	240	240
	Missing	0	0
Mean		53.94	50.75
Std. Deviation		12.15	13.23

Analysis of Table Ⅰ revealed that the mean of standard performance in the Paper-Pencil Test is 53.94 and the Computer-based Test 50.75, while the standard deviation for Paper-Pencil Test and Computer-based Test is 12.15 and 13.23 respectively. The table equally revealed that 93 students scored below 50 representing 38.8% and 147(61.2%) scored 50 and above while in the Computer-based test (CBT) 103(42.9%) scored below 50 and 137(57.1%) scored 50 and above.

RESEARCH QUESTION Ⅱ: What is the extent of the relationship between male student performance in computer-based tests (CBT) and paper-pencil tests (PPT)?

Table Ⅱ: Relationship between male student performance in computer-based tests (CBT) and paper-pencil tests (PPT) examinations.

	PPT			CBT		
Scores	Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
0	-	-	-	2	1.7	1.7
14	-	-	-	1	0.8	2.5
23	1	0.8	0.8	1	0.8	3.3
24	-	-	0.8	1	0.8	4.1
25	2	1.7	2.5	2	1.7	5.8
28	1	0.8	3.3	1	0.8	6.6
29	3	2.5	5.8	1	0.8	7.4
31	-	-	5.8	1	0.8	8.3
32	1	0.8	6.6	3	2.5	10.7
33	1	0.8	7.4	1	0.8	11.6
34	1	0.8	8.3	2	1.7	13.2
35	-	-	8.3	2	1.7	14.9
37	5	4.1	12.4	3	2.5	17.4
38	2	1.7	14.0	1	0.8	18.2
39	1	0.8	14.9	1	0.8	19.0

40	-	-	14.9	2	1.7	20.7
41	2	1.7	16.5	4	3.3	24.0
42	1	0.8	17.4	2	1.7	25.6
43	2	1.7	19.0	4	3.3	28.9
44	4	3.3	22.3	3	2.5	31.4
45	2	1.7	24.0	2	1.7	33.1
46	3	2.5	26.4	2	1.7	34.7
47	6	5.0	31.4	5	4.1	38.8
48	5	4.1	35.5	2	1.7	40.5
49	2	1.7	37.2	6	5.0	45.5
50	5	4.1	41.3	3	2.5	47.9
51	1	0.8	42.1	7	5.8	53.7
52	8	6.6	48.8	3	2.5	56.2
53	2	1.7	50.4	1	0.8	57.0
54	5	4.1	54.5	8	6.6	63.6
55	-	-	54.5	2	1.7	65.3
56	-	-	54.5	1	0.8	66.1
57	4	3.3	57.9	2	1.7	67.8
58	1	0.8	58.7	1	0.8	68.6
59	1	0.8	59.5	3	2.5	71.1
60	7	5.8	65.3	2	1.7	72.7
61	5	4.1	69.4	3	2.5	75.2
62	6	5.0	74.4	2	1.7	76.9
63	8	6.6	81.0	4	3.3	80.2
64	1	0.8	81.8	5	4.1	84.3
65	2	1.7	83.5	3	2.5	86.8
66	3	2.5	86.0	3	2.5	89.3
67	1	0.8	86.8	2	1.7	90.9
68	-	-	86.8	1	0.8	91.7
69	-	-	86.8	1	0.8	92.6
70	-	-	86.8	4	3.3	95.9
71	4	3.3	90.1	1	0.8	96.7
72	4	3.3	93.4	1	0.8	97.5
73	3	2.5	95.9	-	-	97.5
74	1	0.8	96.7	-	-	97.5
75	1	0.8	97.5	1	0.8	98.3
76	-	-	97.5	1	0.8	99.2
77	1	0.8	98.3	-	-	99.2
80	1	0.8	99.2	-	-	99.2
82	1	0.8	100.0	-	-	99.2
88	-	-	100.0	1	0.8	100.0

Total	121	100.0		121	100.0	

		PPT	CBT
N	Valid	121	121
	Missing	0	0
Mean		53.70	50.26
Std. Deviation		12.82	14.56

Results of Table Ⅱ indicated that the mean of male students' performance on computer-based tests is 50.26 while that of paper-pencil test is 53.70 while the standard deviation for computer-based test is 14.56 and paper-pencil test is 12.82. 45(37.2%) male students scored below 50 and 76 male students scored 50 and above representing 62.8% while in computer-based 58(47.9%) scored below 50 and 63(52.1%) scored 50 and above.

Research Question Ⅲ: What is the extent of the relationship between female student performance in the computer-based test (CBT) and Paper and Pencil Test (PPT) examination?

Table Ⅲ: Relationship between female student performance in computer-based tests (CBT) and paper-pencil tests (PPT) examinations.

	PPT			CBT		
Scores	Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
15	-	-	-	1	0.8	0.8
17	1	0.8	0.8	-	-	0.8
25	-	-	0.8	2	1.7	2.5
29	2	1.7	2.5	-	-	2.5
32	-	-	2.5	2	1.7	4.2
33	-	-	2.5	4	3.4	7.6
34	-	-	2.5	2	1.7	9.2
35	1	0.8	3.4	4	3.4	12.6
37	-	-	3.4	1	0.8	13.4
38	4	3.4	6.7	2	1.7	15.1
39	3	2.5	9.2	3	2.5	17.6
41	1	0.8	10.1	1	0.8	18.5
42	3	2.5	12.6	3	2.5	21.0
43	2	1.7	14.3	4	3.4	24.4
44	4	3.4	17.6	3	2.5	26.9
45	2	1.7	19.3	-	-	26.9
46	2	1.7	21.0	4	3.4	30.3
47	6	5.0	26.1	4	3.4	33.6
48	2	1.7	27.7	4	3.4	37.0

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49	14	11.8	39.5	4	3.4	40.3
50	5	4.2	43.7	7	5.9	46.2
51	1	0.8	44.5	6	5.0	51.3
52	9	7.6	52.1	9	7.6	58.8
53	3	2.5	54.6	5	4.2	63.0
54	2	1.7	56.3	5	4.2	67.2
55	4	3.4	59.7	-	-	67.2
56	2	1.7	61.3	-	-	67.2
57	4	3.4	64.7	2	1.7	68.9
58	1	0.8	65.5	1	0.8	69.7
59	4	3.4	68.9	3	2.5	72.3
60	2	1.7	70.6	4	3.4	75.6
61	2	1.7	72.3	3	2.5	78.2
62	6	5.0	77.3	6	5.0	83.2
63	4	3.4	80.7	3	2.5	85.7
64	3	2.5	83.2	2	1.7	87.4
65	-	-	83.2	1	0.8	88.2
66	1	0.8	84.0	2	1.7	89.9
67	1	0.8	84.9	5	4.2	94.1
69	3	2.5	87.4	1	0.8	95.0
70	2	1.7	89.1	2	1.7	96.6
71	2	1.7	90.8	2	1.7	98.3
72	3	2.5	93.3	-	-	98.3
73	3	2.5	95.8	-	-	98.3
74	-	-	95.8	1	0.8	99.2
75	1	0.8	96.6	-	-	99.2
77	1	0.8	97.5	-	-	99.2
79	1	0.8	98.3	-	-	99.2
80	1	0.8	99.2	-	-	99.2
83	1	0.8	100.0	1	0.8	100.0
Total	119	100.0		119	100.0	

		PPT	CBT
N	Valid	119	119
	Missing	0	0
Mean		54.23	51.18
Std. Deviation		11.51	11.66

Analysis of Table Ⅲ indicated that the mean of the paper-pencil test is 54.23 and a standard deviation of 11.51 while the computer-based test has a mean of 51.18 and a standard deviation of

11.66. 47 students scored below 50 representing 39.5% in the paper-pencil test and 72(60.5%) students scored 50 and above. In computer-based test 48(40.3%) scored below 50 while 71(59.7%) scored 50 and above.

HYPOTHESIS 1: There is no significant relationship between students' performance in the computer-based tests (CBT) and Paper-Pencil Test (PPT) examinations.

TABLE Ⅳ: Pearson Product-Moment Correlation Summary of Students' Performance in Paper Pencil Test and Computer-Based Test.

Correlations			
		PPT	CBT
PPT	Pearson Correlation	1	0.78
	Sig. (2-tailed)		0.000
	N	240	240
CBT	Pearson Correlation	0.78	1
	Sig. (2-tailed)	0.000	
	N	240	240

Correlation is significant at the 0.01 level (2-tailed).

As shown in Table Ⅳ the r-value of 0.78 was found significant at P=0.000 and also significant at P<0.01. Therefore, the null hypothesis H_0 is rejected. Therefore, there is a significant relationship between the scores of students in the computer-based tests (CBT) and Paper-Pencil Test (PPT) examinations.

HYPOTHESIS 2: There is no significant relationship between the performance of male students in computer-based tests (CBT) and Paper and Pencil tests (PPT) examinations.

TABLE Ⅴ:

HYPOTHESIS 3: There is no significant relationship between the performance of female students in computer-based tests (CBT) and Paper and Pencil tests (PPT) examinations.

Correlations			
		PPT	CBT
PPT	Pearson Correlation	1	0.79
	Sig. (2-tailed)		0.000
	N	121	121
CBT	Pearson Correlation	0.79	1
	Sig. (2-tailed)	0.000	
	N	121	121

Correlation is significant at the 0.01 level (2-tailed).

From Table Ⅴ the r-value of 0.79 is significant at P=0.000 and equally significant at P<0.01. Therefore, we reject Ho, hence there is a significant relationship between the performance of male students in the computer-based tests (CBT) and Paper-Pencil Test (PPT) examinations.

TABLE VI:

Correlations			
		PPT	CBT
PPT	Pearson Correlation	1	0.75
	Sig. (2-tailed)		0.000
	N	119	119
CBT	Pearson Correlation	0.75	1
	Sig. (2-tailed)	0.000	
	N	119	119
Correlation is significant at the 0.01 level (2-tailed).			

Result Table VI shows that the r-value of 0.75 is significant at P=0.000 and also at P<0.01. Therefore, we reject Ho, hence, will conclude that there is a significant relationship between the female students' performance in the computer-based tests (CBT) and Paper-Pencil Test (PPT) examinations.

DISCUSSIONS OF FINDINGS

The result of this study has revealed that the mean performance of students on the paper-pencil test (PPT) is 53.94 with a standard deviation of 13.23, 93(38.8%) students scored below 50 on the paper-pencil test and 147 of the students scored 50 and above representing 61.2%.

Analysis of male students' performance both in the paper-pencil test (PPT) and computer-based test (CBT) shows that the mean and standard deviation of the paper-pencil test (PPT) is 53.70 and 12.82 respectively while in the computer-based test, the mean is 50.26 and standard deviation is 14.56. The performance analysis equally revealed that 45(37.2%) male students scored below 50 while 76 of them scored 50 and above representing 62.8% of the male students. In the computer-based test, 58 students scored below 50 representing 47.9% while 63 students scored 50 and above representing 52.1%

Analysis of female students' performance equally revealed that 47 of them scored below 50 which represented 39.5% of the female students and 72(60.5%) scored 50 and above. For the computer-based test, 48(40.3%) of the students scored below 50 also while 71(59.7%) scored 50 and above.

The mean performance of the students shows a little difference in favour of paper-pencil tests. The analysis of the hypotheses shows that they are a relationship in the performance of the students in general and across gender. The findings are in line with Clariana & Wallace (2002) who opined that the use of computers for examination will impact students' performance positively. However, Imo, Damuut, Bulus, Ogunbiyi & Ozoji (2022) and Oduntan & Ojuawo (2015) stated that there are differences in the performance of students in computer-based tests which they attributed to lack of students' exposure to computers that is computer illiteracy and other problems associated with computer-based tests.

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CONCLUSIONS

Based on the analysis of students' performance, students' performance in both paper-pencil test (PPT) and computer-based test (CBT) examination do not differ significantly. The mean performance of students is almost the same, there is a high degree of relationship between performance in paper-pencil tests (PPT) and computer-based tests (CBT). This is an indication that despite numerous challenges associated with computer-based test examinations Nigeria can still perform better in the examination.

RECOMMENDATIONS

- All stakeholders in the Educational sector should provide the necessary facilities needed; both material and human resources for the effective conduct of computer-based test (CBT) examinations.
- Students should be taught how to write examinations with a computer in the course of their schooling. They should be properly exposed to the use of computers.
- Urgent steps should be taken to provide functional computers to students during examinations.

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