International Journal of Academic Pedagogical Research (IJAPR)
ISSN: 2643-9123
Vol. 8 Issue 1 January - 2024, Pages: 15-23

Teachers' Perception on the Use of Computer-Based Instructional Strategies for Teaching of Physics in Senior Secondary Schools in Makurdilocal Government Area of Benue State.

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Abstract: *The study investigated Teachers' perception on the use of Computer-Based Instructional Strategies for Teaching of Physics in senior secondary schools in Makurdi Local Government Area of Benue State. Four objectives were set for the study which are to determine the number of schools that used Computer Based Instructional Strategies teaching and learning physics in secondary schools, determine the extent teachers adopt the use of Computer Based Instructional Strategies for teaching and learning physics in secondary schools, examine teacher's perception on whether the use of Computer Based Instructional Strategies promotes effective lesson planning and classroom management, examine teachers perception on the use of Computer Based Instructional Strategies promotes effective lesson planning and classroom management. A total number of 128 Physics teachers were used for experimentation (descriptive survey). A convenient sample method was used with sample size of 128. Data was analyze using frequency counts, percentage, and inferential statistics of Chi-square(x2). The result shows that the findings reveals the extent teachers adopt the use of computer based instructional strategies for teaching and learning physics in secondary schools is low. Computer-Based instructional Strategies by teachers on students in Makurdi LGA and the use of Computer-Based Instructional Strategies can be effective when implemented among secondary school Physics teachers in Makurdi LGA and there exist a significant difference between student taught using computer based instructional strategies and those taught using other instructional strategies. The study concluded that; there is no awareness among physics teachers in the use of Computer-Based Instructional Strategies for teaching of physics in Makurdi Local Government Area of Benue State. Computer-Based Instructional Strategies is not in use among physics teachers in Makurdi LGA, the use of Computer-Based instructional Strategies among secondary school teachers can be very effective in Makurdi LGA and there is significant difference between student taught using computer based instructional strategies and those taught using other instructional strategies. The study recommended that awareness should be created in Makurdi Local Government Area of Benue State on the use of significant difference between student taught using computer based instructional strategies and those taught using other instructional strategies in the teaching of physics. Computer-Based Instructional Strategies should be use in the teaching of Physics in senior secondary schools in Makurdi Local Government Area of Benue State. Professionals should be employed in the use of Computer-Based Instructional Strategies to boost students performance Makurdi Local Government Area of Benue State.*

Keywords*: Perception, Computer-Based Instructional Strategies, Teachers, Physics, Senior Secondary Schools.*

1. INTRODUCTION

The growth of science and technology has made it easier for teachers and students to access a wide range of information, such as learning materials. Accessing the internet is easy on laptops, smartphones, and other personal computers, so every teacher has the same chance to develop new ideas and make computer based instructional strategies as needed. Developing computer based instructional strategies is part of the professional duties and skills that every teacher must master. This is because instructional strategies aim to make it easier for educators and students to carry out learning activities. Therefore, many researchers are encouraged to analyze the need for computer based instructional strategies (Reski, Hasanah & Sari, 2023).

Several studies conducted by researchers such as (Mudau, 2016; Netshivhumbe, 2018; Nkanyani & Mudau, 2019; Ntuli, 2019) reveal that Science teachers use outdated teaching approaches such as traditional methods which promote meditation (memorizing) of science concepts instead of understanding. Teachers using this method see themselves as authoritative leaders in the classroom and learners are information recipients.

According to Dupev, (2019), the physics teacher is very important for students' learning of the subject. S/he is the rallying point and her/his mastery of the content and good delivery is very important to how students learn physics. No wonder that the Federal Government of Nigeria (2014) in its National Policy on Education states that "no nation can rise above the quality of its educational system and no educational system can rise above the quality of its teachers". It is logical to assume that the quality of teaching determines the quality of students' learning.

A study by Oktavia et al. (2020), examined the requirements for physics instructional strategies on elasticity among students in Senior Secondary two. The study's findings showed that students require alternative instructional materials, such as interactive learning tools with videos, examples, and practice questions, to help them surmount the difficulty of learning independently at home.

Moreover, the Federal Government of Nigeria has placed significant emphasis on the integration of Information and Communication Technology (ICT) into the realm of education, recognizing its crucial role in advancing knowledge and fostering the acquisition of skills necessary for effective functioning in the modern world (FRN, 2015). Notwithstanding the government's dedicated endeavors, physics students have exhibited subpar performance, as reported by the West African Examinations Council (WAEC, 2016). In order to address this issue, Computer-Based Instructional Strategies have emerged as a promising approach. These strategies involve the utilization of computers to deliver instruction or remediation, offering interactive mode of learning that incorporate captivating animations, sound effects, and demonstrations to elucidate complex concepts. Such an approach empowers students to progress at their own pace and engage in individualized learning, while simultaneously benefiting from immediate feedback regarding the accuracy of their responses. In various academic domains, researchers have employed computer-based instruction to augment the effectiveness of teaching and learning methodologies. For instance, Yusuf and Afolabi (2010) conducted a study investigating the impact of computer-assisted instruction on the academic performance of secondary school students in biology. The findings of their research revealed that students who were exposed to computer-assisted instruction, either individually or through cooperative learning, outperformed their counterparts who received traditional classroom instruction. However, the current study aims to explore the perceptions held by teachers regarding the application of computer-based instructional strategies for teaching of physics in secondary schools specifically within Makurdi Local Government Area of Benue State.

Research Questions

The following were raised to guide the study

1. To what extent do teachers adopt the use of Computer Based Instructional Strategies for teaching and learning of physics in senior secondary schools?
2. Does the use of Computer Based Instructional Strategies promote effective teaching and learning of physics in senior secondary schools?
3. Does the use of Computer Based Instructional Strategies promote effective lesson planning and classroom management?
4. Does the use of Computer Based Instructional Strategies improve students' participation and learning outcomes in Physics?

Research Hypothesis

HO_1: There is no significant difference in the use of computer based instructional strategies for teaching and learning physics in secondary schools

HO_2:There is no significant difference in the use of computer based instructional strategies promote effective teaching and learning of physics in senior secondary schools

HO_3: There is no significant difference in the use of computer based instructional strategies to promote effective lesson planning and classroom management

HO_4: There is no significant difference in the use of computer based instructional strategies to influence teaching and learning of physics in senior secondary schools**.**

2. METHODOLOGY

Research Design

The design of this study was descriptive survey. A descriptive survey is an approach of descriptive research that blends quantitative and qualitative data to provide you with relevant and accurate information. As such design create a means for experiment where teachers use Computer Based Instructional Strategies to teach students and also the traditional teaching method.

Area of Study

Makurdi Local Government Area of Benue State is the study area. The local government was established in 1927. It became headquarter of Benue State province in 1976. It is located at the latitude of 7.73^0 North and longitude of 8.54^0. Makurdi local government area is bounded by Guma local government in the North, south by Gwer-East local Government Area, in the East by Tarkaa local Government area and in the West by Gwer-West local government area. It has eleven council wards which include; Agan, Ankpa/wadata, bar, central/south mission, clerk/market, Fildi, Mbalagh, Morden market, North bank I, North bank II and Wailomayo council wards. The area is predominantly an agricultural catchment area specializing in cash crops, subsistence crops and variety of potentials. The major ethnic groups in Makurdi are the Tiv, Idoma and Igede. Other minor ones are Jukun and Hausa. There are also economically significant numbers of non-indigenous ethnic groups in the state such as Igbo, Yoruba and Igala who are mostly traders. The indigenes are mostly farmers and civil servants. The tertiary institutions in Makurdi include; Joseph Sarwuan

Tarkaa University (Federal University), Benue State University (State University), National Open University of Nigeria, Akawe Torkula Polytechnic, the Schools of Nursing and Midwifery. Makurdi also have many secondary and primary schools including government, private and missionary schools.

Population of the Study

A population study is a study of a group individuals or elements, taken from a general population who share a common characteristic such as sex, specific interest, age or location (Mittal, 2018). In this study, the total population of 763 Physics Teachers in public and private schools in Makurdi Local Government Area of Benue State (Benue State Ministry of Education, 2018), was used. The data analysis depicts the simple frequency and percentage of the respondents as well as interpretation of the information gathered.

Sample and Sampling Technique

A study sample is simply a systematic selected part of a population that infers its result on the population. In this study, the researcher adopted the convenient sampling method to determine the sample size of about one hundred and twenty eight (128) physics teachers from the various schools within Makurdi Local Government Area, Benue state.

Sampling techniques are procedures adopted to systematically select the chosen sample in a specified away under controls, (Nwana, 2005).

In this study, the researcher adopted the convenient sampling method to determine the sample size. Out of the entire physics teachers in public and private secondary schools in Makurdi Local Government Area of Benue State, the researcher conveniently selected one hundred and twenty eight (128) respondents as sample size for this study.

Instrument for data collection

A well-constructed and self developed questionnaire titled "Teacher's Perception on the Use of Computer Based Instructional Strategies (TPUCBI) for teaching physics in secondary schools in Makurdi Local Government was used to get the desired information from the teachers. The questionnaire was divided into two sections (A and B). Section A was for collection of information on personal data of respondents while Section B consisted of questions that elicited responses from the respondents with response options: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD). Then scores of the data was used for aanalysis.

Validity of the Instrument

The questionnaire was validated by two experts, one in Measurement and Evaluation Joseph Sarwuan Tarka University Makurdi, and one from Government Public School. The experts are requested to critically examine questionnaire and advised the researcher on the scope, content, relevance suitability and appropriateness of the instrument in accomplishing the objective of the study.

Reliability of Instrument

A trial-testing of the research questionnaires was conducted using physics teachers from Tilley Gyado College Makurdi, Benue State. Thirty (30) copies of the instruments were distributed to thirty (30) teachers. The reliability coefficient of the instrument (BAT) was found to be 0.86, using Kuder-Richardson method formula ($K\text{-}R_{20}$). A co-efficient value of 0.86 indicated that the research instrument was relatively reliable. The range of a reasonable reliability is between 0.67 and 0.87, (Taber, 2017). The justification for using Kuder-Richardson $K\text{-}R_{20}$ is because the items are scored dichotomous. That is, two points for each correct answer and zero for incorrect answer Emaikwu (2011).

Method of data collection

The researcher collected the needed data through the use of questionnaire and its administration in the selected schools, the administration of the questionnaire was carried out by the researcher and research assistant. A total of 128 copies of the questionnaire was distributed to teachers and retrieved on the spot by the researcher and research assitant.

Method of data analysis

Responses from the questionnaire were analyzed using the descriptive statistics of frequency counts and percentage, and inferential statistics of Chi-square(x2). Descriptive statistics of frequency counts and percentages was used in analyzing demographic variables and research questions while the inferential statistics of Chi-square(x2) was also used to test the stated hypotheses at 0.05 level of significance.

3. RESULT AND DISCUSSION

3.1. Results

The result of the data analyses and interpretations are presented according to the research questions asked.

Research Question 1: To what extent do teachers adopt the use of computer based instructional strategies for teaching and learning physics in secondary schools Benue State?

Table 1 shows the extent teachers adopt the use of computer based instructional strategies for teaching and learning physics in secondary schools in Benue State. The table shows the Teacher's perception mean score of 59.58 with standard deviation of 7.27 for Use of computer based has the performance mean score of 49.89 with standard deviation of 8.10. In addition, the teaching and learning has the performance mean score of 51.33 with standard deviation of 6.94. The standard deviation at each level implies that students' performance varied widely from each other. Hence, the result means that the extent teachers adopt the use of computer based instructional strategies for teaching and learning physics in secondary schools in Benue State is Low.

Table 1: The extent teachers adopt the use of computer based instructional strategies for teaching and learning physics in secondary schools in Benue State

Source	N	Mean	SD
Teacher's perception on instructional strategies	32	59.58	7.27
Use of computer based instructional strategies	41	49.89	8.10
For teaching and learning	55	51.33	6.94

Research Question 2: Does the use of computer based instructional strategies promote effective teaching and learning of physics in secondary schools?

Table 2, shows the use of computer based instructional strategies has effect on teaching and learning of physics in senior secondary schools. The table shows the use of computer based mean score of 32.47 with standard deviation of 9.02, for Promotion of effective teaching the mean score is 34.14 with standard deviation of 10.35, while the Teaching and learning has the performance mean score of 31.48 with standard deviation of 9. The standard deviation at each level implies that students' performance varied widely from each other. Hence, the result means that the use of computer based instructional strategies has effect on teaching and learning of physics in Senior Secondary Schools in Makurdi Local Government Area of Benue State.

Table 2: The use of computer based instructional strategies has effect on teaching and learning of physics in senior secondary schools

Source	N	Mean	SD
Use of computer based instructional strategies	33	32.47	9.00
Promote effective teaching	49	34.14	10.35
Teaching and learning	50	31.48	9.88

Research Question 3: Does the use of computer based instructional strategies promote effective lesson planning and classroom management?

Table 3 shows the use of computer based instructional strategies promote effective lesson planning and classroom management in Makurdi Local Government Area Benue State. The table shows the Use of computer based mean score of 28.12 with standard deviation of 8.32, a mean score of 17.31 with standard deviation of 9.02 is for promotion of lesson planning while the classroom management has the means score of 25.27 with standard deviation of 11.60. The standard deviation at each level implies that students' performance varied widely from each other. Hence, the result means that the use of computer based instructional strategies has effect on promote lesson planning and classroom management in Makurdi Local Government Area Benue State.

Table 3: The use of computer based instructional strategies promote effective lesson planning and classroom management in Makurdi Local Government Area Benue State

Source	N	Mean	SD
Use of computer based instructional strategies	42	28.12	8.32
promotes lesson planning and	34	17.31	9.02
For classroom management	52	25.27	11.60

Table 4 shows the use of computer based instructional strategies affect students participation and learning outcome in physics in Benue State. The table shows the use of computer based mean score of 55.31 with standard deviation of 14.07, mean score of 57.45 and standard deviation of 6.89 is for improvement of student's participation while the student learning outcome mean score of 57.45 with standard deviation of 6.89. In addition, Learning outcome mean score of 52.49 with standard deviation of 17.00. The standard deviation at each level implies that students‟ performance varied widely from each other. Hence, the result means that the use of computer based instructional strategies has effect on teaching and learning of physics in Senior Secondary Schools in Makurdi.

Table 4: The use of computer based instructional strategies affect students participation and learning outcome in physics in Benue State

Source	N	Mean	SD
Use of computer based instructional strategies	36	55.31	14.07
Improves student's participation and	43	57.45	6.89
Learning outcome	49	52.49	17.00

3.2. Test of Hypothesis

Ho: There is no significant difference in the use of computer based instructional strategies for teaching and learning physics in secondary schools in Makurdi Local Government Area of Benue State

Table 5 revealed that the use of computer based instructional strategies for teaching and learning physics in secondary schools in Makurdi Local Government Area of Benue State. The table showed the performance mean score of 53.6 and standard deviation of 7.44. The t-cal is 2.84 and t-critical is 1.96, while the p-value is 0.000 (P<0.005). This means that the use of computer based instructional strategies for teaching and learning physics in secondary schools in Makurdi Local Government Area of Benue State. Subsequently, the null hypothesis which states that use of computer based instructional has no significant effect on teaching and learning physics in secondary schools in Makurdi Local Government Area Benue State is hereby rejected.

Table 5: t-test scores for the use of computer based instructional strategies for teaching and learning physics in secondary schools in Makurdi Local Government Area of Benue State

Variable	N	Mean	SD	t-cal	df	t-critical	value	Decision
The use of computer based for teaching and learning	128	53.6	7.44	2.84	0.05	1.96	0. 000	Rejected

H_1: There is no significant difference in the use of computer based instructional strategies promotes effective teaching and learning physics in secondary schools in Makurdi Local Government of Benue State.

Table 6 revealed that the use of computer based instructional strategies promote effective teaching and learning physics in secondary schools in Makurdi Local Government of Benue State. The table showed the performance mean score of 32.70 and standard deviation of 9.75. The t-cal is 3.72 and t-critical is 1.96, while the p-value is 0.002 (P<0.005). This means that the use of computer based instructional strategies promote effective teaching and learning physics in secondary schools in Makurdi Local Government of Benue State. Subsequently, the null hypothesis which states that the use of computer based instructional strategies promotes effective teaching and learning physics in secondary schools in Makurdi Local Government Area of Benue State, is hereby rejected.

Table 6: t-test scores for the use of computer based instructional strategies promote effective teaching and learning physics in secondary schools in Makurdi Local Government of Benue State

Variable	N	Mean	SD	t-cal	df	t-critica	P value	Decision

Use of computer based promotes effective teaching and learning	128	32.70	9.75	3.72	0.05	1.96	0.002	Rejected

H_2: There is no significant difference in the use of computer based instructional strategies promote effective lesson planning and classroom management in Makurdi Local Government Area of Benue State.

Table 7 revealed that the use of computer based instructional strategies promote effective lesson planning and classroom management in Makurdi Local Government Area of Benue State. The table showed the performance mean score of 23.57 and standard deviation of 9.65 The t-cal is 8.99 and t-critical is 1.96, while the p-value is 0.004 (P<0.005). This means that the use of computer based instructional strategies promote effective lesson planning and classroom management in Makurdi Local Government Area of Benue State. Subsequently, the null hypothesis which states that the use of computer based instructional has no significant effect on the teaching promote effective lesson planning and classroom management in Makurdi Local Government Area of Benue State, is hereby rejected.

Table 7: t-test scores for the use of computer based instructional strategies promote effective lesson planning and classroom management in Makurdi Local Government Area of Benue State

Variable	N	Mean	SD	t-cal	df	t-critical	P-value	Decision
Use of computer based Instructional promote effective lesson planning and classroom management	128	23.57	9.65	8.99	0.05	1.96	0. 004	Rejected

H_3: There is no significant difference in the use of computer based instructional strategies improves student's participation and learning outcome in physics in Makurdi Local Government Area of Benue State, Benue State.

Table 8 revealed that the use of computer based instructional strategies improves student's participation and learning outcome in Makurdi Local Government Area Benue State. The table showed the performance mean score of 55.08 and standard deviation of 12.65. The t-cal is 8.17 and t-critical is 1.96, while the p-value is 0.001 (P<0.005). Consequently, the null hypothesis is rejected. This means that the use of computer based instructional has effect on the students' participation and learning outcome in Makurdi Local Government Area Benue State

Table 8: t-test scores for the use of computer based instructional strategies improves student's participation and learning outcome in Makurdi Local Government Area Benue State

Variable	N	Mean	SD	t-cal	df	t-critical	P-value	Decision
Use of computer based student's participation and learning outcome	128	55.0 8	12.65	8.17	0.05	1.96	0. 001	Rejected

4. Discussion of findings

Finding on research question one revealed that the use of Computer Based Instructional Strategies improves teachers perceptions in teaching and learning of physics in secondary school in Makurdi Local Government Area of Benue State, Benue State In addition, finding on hypothesis one revealed that the p-value of 0.000 was less than 0.05 level of significance. Hence, the null hypothesis which stated that teacher's perception has no significant effect on the use of computer based instructional strategies

for teaching physics in secondary schools in Makurdi Local Government Area of Benue State was rejected. This implied that teacher's perception has effect on the use of computer based instructional strategies for teaching physics in secondary schools in Benue State.

Finding on research question two revealed that the use of computer based instructional strategies has effect on promoting effective teaching and learning Physics in Secondary Schools in Benue State. Additionally, finding on hypothesis two revealed that the p-value of 0.002 was less than 0.05 level of significance. Therefore, the null hypothesis which stated that the use of computer based instructional strategies promote effective teaching and learning physics in secondary schools in Benue State was rejected. This means that the use of Computer Based Instructional Strategies has effect on promoting effective teaching and learning physics in secondary schools in Benue State. This finding is in line with a lot of researchers some of which are Muhammad, Asma, and Munnaza (2015), examined the perception and needs of the teachers of physics for the use of technology for teaching learning process. Sen (2009) also support this result as its finding showed that stimulus variation skill could promote effective teaching strategies among student-teachers.

Finding on research question three showed that the use of Computer Based Instructional Strategies promotes effective lesson planning and classroom management in secondary schools in Benue State. Additionally, finding on hypothesis three revealed that the p-value of 0.004 was less than 0.05 level of significance. Hence, the null hypothesis which stated that questioning skill has no significant effect on the use of Computer Based Instructional Strategies promotes effective lesson planning and classroom management in secondary schools in Benue State was rejected. This means that the use of Computer Based Instructional Strategies has effect on lesson planning and classroom management in Benue State. This finding is in line with the finding of Peker (2009), whose study revealed that there were statistically significant differences regarding lesson planning and classroom management using Computer Based Instructional Strategies.

Finding on research question four revealed that the use of Computer Based Strategies improves students participation and learning outcome in Benue State. Moreover, finding on hypothesis four revealed that the p-value of 0.001 was less than 0.05 level of significance. Therefore, the hypothesis which stated that the use of Computer Based Instructional Strategies in improving students participation and learning outcome in Benue State was rejected. This means that use of Computer Based Instructional Strategies improves students participation and learning outcome in Benue State. Kanno and Francis (2009) supported this by saying that teaching gave teachers the opportunity to plan lessons.

5. Conclusion

Based on the findings gathered from the test of the hypotheses that directed the study, the following conclusion was made;

1. The use of Computer Based Instructional Strategies significantly influences student's academic performance, by participating in the classroom.
2. There exists a significant influence of Computer Based Instructional Strategies on teachers' lesson planning and classroom management.
3. There exists a significant influence of Computer Based Instructional Strategies on teaching and learning of physics in secondary schools
4. There is a significant difference between student taught using computer based instructional strategies and those taught using other instructional strategies

6. Recommendation

1) Workshops and seminars should be organized for teachers by education authorities of the Federal and State Ministries of Education, Institutes and Colleges of Education on the use of Computer Based Instructional Strategies to improve student's performance in Physics
2) Since the use of Computer Based Instructional Strategies has been found to enhance the quality of performance in physics, physics teachers should be encouraged to employ it more in the teaching of the subject. By so doing, the performance of students in the subject could be increased
3) Governments and non-governmental organizations should assist in providing functional computers and ICT infrastructure to secondary schools.

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