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Assessment of The Use Of Flip Chart Instructional Materials In Educational Process Of Physics In Senior Secondary Schools In Makurdi, Benue State

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Abstract*: The study assessed flip chart instructional materials used in educational process of Physics in senior secondary schools in Makurdi local Government Area of Benue State. A descriptive survey research design was used. The population comprised of four hundred and fifty two (452) Physics teachers drawn from all parts of the LGA. Ten (10) Senior Secondary Schools were selected using Simple random sampling technique in the Area. Eighty (80) senior secondary school Physics teachers were selected as sample through simple random sampling technique. A structured questionnaire was used as instrument for data collection which was found valid by the researcher's supervisor. Three (3) research questions and two null hypotheses were developed for the study. Data collected from the study was subjected to statistical analysis using mean and standard deviation while the null hypotheses were tested with chi-square statistics. Findings showed that flip charts are being used in the teaching of Physics practicals in most senior secondary schools in Makurdi Local Government Area of Benue State. Also flip charts are frequently used by Physics teachers to teach Physics practicals (3.13) and that flip charts are commonly used among Physics teachers in the sampled schools (3.61). Result further showed that there are various factors militating against the use of flip charts in teaching Physics practicals in senior secondary schools in Makurdi Local Government Area of Benue State. It was however recommended that training should be organized to equip teachers with the necessary knowledge of effectively using flip charts in teaching Physics practicals. Teachers should be ready to improvise the needed materials in the teaching of science, particularly Physics and that funds should be provided by the government to secondary schools in Benue State in order to improve the effectiveness of flip charts in Physics practicals class.*

Keywords: Flip Chart, Instructional Material, Learning, Physics, Secondary Schools

INTRODUCTION

Science education is the coaching and gaining knowledge of science to non-scientists, such as school children, college students, or adults within most of the people (Holzner, 2016). Science content, science process (i.e the scientific method), some areas of social science, and some teaching pedagogy characterize the field of science education. Igwe (2013) opined that 'The standards for science education provide expectations for the development of understanding for students through the entire course of their education and beyond'. Therefore Science can be said to be the bedrock on which modern day technological breakthrough is hinged. Different authors according to their own understanding have defined Science. Igwe (2013) described science as a scientific study through the use of observations, experimentations, measurements and recordings to arrive at the nature and behaviour of the materials and physical universe.

Physics is one of the science subjects offered by senior secondary school students at the senior levels as directed by the Ministry of Education (FRN, 2004). In Nigeria, education is however faced with various forms of innovation which has help in transforming the sector in both human and material resources (Okebukola, 2015). This innovation has birthed a variety of approaches of educational process to which flip charting learning belongs, are often embraced by the traditional system of instructions (Oriade, 2018).

Flip chart instructional material is considered an important resource for Physics teaching. That is due to the fact that the ultimate goal of any instructional activity includes pictures/images to facilitate successful instruction and meaningful learning through visual aids. Therefore, flip chart is of paramount importance for translation and enacting of academic laws, curriculum, instructional resources and assessment of school outcomes (Young and Freedman, 2014).

MATERIALS AND METHOD

This study assessed the use of flip chart instructional materials in educational process of physics in senior secondary schools in makurdi, benue state. The study was conducted during the second term of the academic session 2019/2020. Specifically, the following research questions and null hypotheses were formulated and tested at 0.05 level of significance using Chi-Square so as to obtain answers to the research questions:

Research Questions

The following research questions are to guide the study;

I. Is flip chart being used in the teaching of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State?

II. How frequent is flip chart being used in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State?

III. What are the factors that militate against the use of flip charts in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State?

Hypothesis

Two null hypotheses will guide the study;

I. There is no significant use of flip charts in educational process of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State.

II. There are no significant factors militating against the use of flip charts in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State

Research Design

The study adopted the descriptive survey research design, carried out in some selected secondary schools in Makurdi Local Government Area of Benue State, Nigeria.

Population and Sample

The population consists of all Physics teachers in Makurdi Local Government Area of Benue State. Four hundred and fifty two (452) Physics teachers were drawn from all part of the Local Government Area. Eighty (80) Physics teachers which comprised of 54 male Physics teachers and 26 female Physics teachers in 6 selected schools in Makurdi, Benue State as the sample.

Research Instrument

Questionnaire used as instruments for the study. The questionnaire will be sectioned into two (part A, made up of the bio data section and Part B- made up of 3 sections) and will have both closed and open ended items. A Four Point Likert Scale will be rated as rated as strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1 respectively. The instrument will be used to collect data from teachers using the constructed Assessment of the Use of Flip Chart in the Teaching of Physics Practical in Senior Secondary Schools in Makurdi, Benue State Questionnaire (AUFCTPPSSSMBSQ).

Validation of Instrument

The research instrument for this study was validated by experts in the Department of Science Education, Joseph Sarwuan Tarka University, Makurdi, Nigeria to ensure both face and content validity.

Method of Data Analysis

The data collected from this study was analyzed using descriptive statistics. Precisely, the research questions were answered using descriptive statistics namely: the Mean and Standard Deviation. Also, a Mean bench mark of 2.5 will be established using the mean method formula, while chi-square statistics was used to test the null hypotheses at 0.05 level of significance.

RESULT

Research Question 1: Is flip chart being used in the teaching of Physics practicals in senior secondary schools in Makurdi Local Government Area of Benue State?

Table 1: Mean and Standard Deviation of Responses on weather flip chart is being used in the teaching of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State

S/N	Items	SA (4)	A (3)	D (2)	SD (1)	N	$\bar{X}$	STD	REMARK
1	Flip chart is used by Physics teachers during practical class to help attract learner's attention	37	12	17	14	80	2.90	1.18	Agree
2	Teachers are often seen using flip chart to make practical class more interactive and interesting	31	21	14	14	80	2.86	1.12	Agree
3	Flip chart is used to make students remember concept for a longer period of time	31	31	6	12	80	3.01	1.04	Agree
4	Flip chart is used by teachers to teach Physics practicals in senior secondary schools.	38	22	11	9	80	3.11	1.03	Agree
5	Teachers use flip chart to help students understand a practical lesson with ease	30	30	10	10	80	3.00	1.01	Agree

Table 1 above shows that items 1-5 have mean values of 2.90, 2.86, 3.01, 3.11 and 3.00 respectively and are all beyond the benchmark of 2.50. This implies that respondents agreed that flip chart is being used in instructing Physics students during practicals in senior secondary schools in Makurdi Local Government Area of Benue State.

Research Question 2: How frequent is flip chart being used in teaching Physics practicals in senior secondary schools in Makurdi Local Government Area of Benue State?

Table 2: Mean and Standard Deviation of Responses on how frequent flip chart is being used in teaching Physics practicals in senior secondary schools in Makurdi Local Government Area of Benue State

S/N	Items	SA (4)	A (3)	D (2)	SD (1)	N	$\bar{X}$	STD	REMARK
1	Flip charts are frequently used by Physics teachers to teach Physics practical	32	33	8	7	80	3.13	0.92	Agree
2	The use of flip chart is common among Physics teachers	49	31	0	0	80	3.61	0.49	Agree
3	To explain a particular concept during Physics practical, the teachers always make use of flip chart	40	18	11	11	80	3.09	1.09	Agree
4	Flip charts are often used by teachers of Physics to teacher the students during practical class	40	23	17	0	80	3.29	0.80	Agree
5	Teachers are faced with challenges while using flip chart	42	34	6	0	80	3.43	0.63	Agree

Table 2 shows that items 1-5 have mean values of 3.13, 3.61, 3.09, 3.29 and 3.43 respectively and are all over the benchmark of 2.50. This is an indication that in respect to how frequent flip chart is being used in the instruction of Physics students in practical's in schools in the Local Government Area, the following were observed; flip charts are frequently used by Physics teachers to teach Physics practical, the use of flip chart is common among Physics teachers, to explain a particular concept during Physics practical, the teachers always make use of flip chart, flip charts are often used by teachers of Physics to teacher the students during practical class and that teachers are however faced with challenges while using flip chart.

Research Question 3: What are the factors that militate against the use of flip charts in teaching Physics practicals in senior secondary schools in Makurdi Local Government Area of Benue State?

Table 3: Mean and Standard Deviation of Responses on the factors that militate against the use of flip charts in teaching Physics practicals in senior secondary schools in Makurdi Local Government Area of Benue State

S/N	Items	SA (4)	A (3)	D (2)	SD (1)	N	$\bar{X}$	STD	REMARK
1	Flip charts are not effectively used in Physics class because they are too expensive.	50	12	11	7	80	3.31	1.01	Agree
2	Lack of fund reduces the effectiveness of flip charts in Physics practical class.	69	11	-	-	80	3.86	0.35	Agree
3	Flip charts are insufficient and that is why they are not being used.	71	9	-	-	80	3.89	0.32	Agree
4	There are too many students in Physics practical class at a time and this minimizes the effectiveness of the use of flip charts.	74	6	-	-	80	3.93	0.27	Agree

5	Teachers lack of knowledge on the use of flip charts and this mitigates against the proper use of instructional materials	80	-	-	-	80	4.00	0.00	Agree

Table 3 shows that items 1-5 have mean values of 3.31, 3.86, 3.89, 3.93 and 4.00 respectively and are beyond the benchmark of 2.50. This indicates that respondents agreed that there are various factors that militate against the use of flip charts in teaching Physics practicals in senior secondary schools in the Local Government Area.

Hypothesis 1

There is no significant use of flip charts in educational process of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State.

Table 4: Chi-square analysis on use of flip charts in educational process of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State

	N	Mean ($\bar{x}$)	Std	Df	X^2cal	X^2tab	Level of Sig.
Observation	80	3.28	0.60	4	66.40	30.14	0.05

Table 4 shows a chi-square (X^2) value of 66.40, df = 4 obtained at 0.00 level of significance by observation from 100 respondents. Analysis of chi-square indicates that X^2_{cal} value of 66.40 is higher than X^2_{tab} of 30.14 at the 0.05 level of significance. Since X^2_{cal} is higher than X^2_{tab} is higher than X^2_{tab} then the null hypothesis which state that there is no significant use of flip charts in educational process of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State is rejected. Therefore, we can conclude that there is a significant use of flip charts in educational process of Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State.

Hypothesis 2

There are no significant factors militating against the use of flip charts in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State

Table 5: Chi-square analysis on the factors militating against the use of flip charts in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State.

	N	Mean ($\bar{x}$)	Std	Df	X^2cal	X^2tab	Level of Sig.
Observation	80	3.09	0.94	4	34.68	28.87	0.01

Table 5 above shows a chi-square (X^2) value of 34.68, df = 4 obtained at 0.01 level of significance by observation from 80 respondents. Analysis of chi-square indicates that X^2_{cal} value of 34.68 is higher than X^2_{tab} of 28.87 at the 0.05 level of significance. Since X^2_{cal} is higher than X^2_{tab} is higher than X^2_{tab} then the null hypothesis which state that there are no significant factors militating against the use of flip charts in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State is rejected. It is therefore concluded that there are significant factors militating against the use of flip charts in teaching Physics practical in senior secondary schools in Makurdi Local Government Area of Benue State

DISCUSSION

The study shows that flip chart is used by Physics teachers during practical class to help attract learner's attention, teachers are often seen using flip chart to make practical class more interactive and interesting, flip chart is used to make students remember concept for a longer period of time, flip chart is used by teachers to teach Physics practicals in senior secondary schools and that teachers use flip chart to help students understand a practical lesson with ease. This is in agreement with Robinson (2015) who also investigated the influence of the use of visual instructional materials such as flip chart on student academic performance in public secondary schools in Dagotti sub county, Nairobi, Kenya and found that use of visual instructional materials such as models, flip chart and microscope are available for schools in teaching Physics effectively.

RECOMMENDATIONS

1. Training should be organized for the teachers to equip them with necessary knowledge on how to put to effectively use flip charts in teaching Physics practicals.
2. Teachers should be ready to improvise some of the needed materials for the teaching of science, particularly Physics.
3. Funds should be provided by the government to secondary schools in Benue State in order to improve the effectiveness of flip charts in Physics practical class

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