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Teachers Perception of the Utilization of Instructional Graphics Organizers Based on Gender

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Abstract. *This study investigates Teachers Perception of the Utilization of Instructional Graphics Based on Gender in public primary Schools in Obio/Akpor Local Government Area of Rivers State, Nigeria. Two research questions and two null hypotheses were used to guide the study. The study was a descriptive survey research. The population of the study was 676 teachers and the random sampling technique was used to get a sample size of 50 respondents. The instrument that was used for data collection was the Graphic Organizers Teachers' Questionnaire (GOTQ). With a Reliability coefficient of 0.05. Mean and Standard Deviation were used to answer the research questions, while Independent Sample Test Statistics was used to test the hypotheses using Statistical Package for Social Science (SPSS, version 15.0). Findings from the study revealed that: There is a significant difference in the mean scores of teachers who uses graphic organizers in teaching basic science. There is no significant difference in the utilization of graphic organizers between male and female teachers when teaching basic science concepts. The study recommended among others, that graphic organizers should be used for teaching both concrete and abstract concepts to pupils at lower primary school level. Also, that, Professional and research organizations such as the Science Teachers' Association of Nigeria (STAN), National Teachers" Institute (NTI) and The Nigerian Educational and Research Development Council (NERDC) that carryout seminars, workshops and conferences should incorporate themes / topics on graphics in their basic science education re-training programs for teachers at the Public Primary School level.*

Key words: *Teachers Perception, Utilization, Instructional Graphics, Gender.*

Introduction

Education is the process by which an individual is encouraged and enabled to develop fully his or her potentialities. It also serves the purpose of equipping individuals, with what is necessary to be productive members of the society. An individual acquires and develops knowledge and skills through teaching and learning experiences that is why effective teaching is crucial to learning because the products of teaching such as knowledge, skills and attitude acquisition are much dependent on the teacher's effective teaching. Effectiveness of a teacher and students' learning can be enhanced

through the appropriate strategy adopted in a learning situation., hence, the use of graphics in instruction.

Graphics denotes something more than mere art or science of mechanical drawing. Dexter & Hughes (2011) described graphics as adjectives depicting visual symbols that causes one to have clear pictures in mind. Graphics is a term derived from two Greek words "graphikos" meaning "painting", drawing and "graphein" meaning to "write" and "to represent by means of lines". As an adjective, graphics means? Vivid, clear description, effectively presented message, it is "arts by which we express ideas in lines, pictures, sketches, diagrams". It includes materials which communicate facts and ideas clearly and succinctly through a combination of drawing, words and pictures.

A graphic is also an image or visual representation of an object. Graphics are often contrasted with text, which is comprised of characters, such as numbers and letters, rather than images. Graphic materials have two - dimensional representation (except the globe), they are non-projected materials, flexible and varies in size ratio to the object or event being represented. A good graphic material attracts the learners because its Legible, Brevity and Simple for easy comprehension making highly pertinent for the use of graphic organizers in instruction.

Graphic organizers are visual and graphic displays which shows the relationship between facts, terms, and/or ideas within a learning task and are also sometimes referred to as knowledge maps, concept maps, story maps, cognitive organizers and are also a teaching and learning tool that is used to organize information and ideas in a way that is easy to comprehend and internalize. By integrating text and visuals, graphic organizers show relationships and connections between concepts, terms and facts. They are visual and kinetic display of information designed for the benefit of all classes of learners involving drawings that use geometric shapes or tables to show the relationship between various pieces of information (Zwiers 2014). There are several types of graphic organizers explained by many scholars, some of which are;

- Attribute chart,
- Story map,
- Main idea and detailed chart,
- Cause and effect diagram,
- Venn diagram,
- Flow diagrams,
- Sequence chart,
- Concept map,
- Big question map,
- Circle organizer,
- Discussion map. (Uba, et al., 2016).

Graphic organizers are conspicuously seen everywhere because it facilitates learning through the sense of sight (Miller, 2011). They are seen to be valuable tools that are used in producing pedagogical structures and understanding the connection between concepts in education. Graphic organizers as defined by Bishop (2013) are visual display of key content information designed to guide learners and to enhance their comprehension ability. Millers (2011), stated that graphic organizers serve as visual representation of ideals that help learners organize their thought and apply their thinking skills to the lesson content in a more orderly manner. Furthermore, Miller added that graphic organizers often occur in the form of complete sentence structure and they are gaining popularity in modern schools as a favorite teaching approach in the classroom due to its effective application in teaching across all levels and subjects (Lilian 2012). Graphic organizers are instructional tools which helps pupils to understand and simplify complex information, they can be useful in all the stages of learning, ranging from brainstorming and to presentation of findings in the classroom individually or in groups (Zaini, Mokhtar & Nawawi, 2010).

Challenges that Teachers Face in Accessing Graphic Materials

Teachers in community primary schools most especially in rural community schools face some challenges in accessing graphic materials. One of the big challenges that teachers in community primary schools face in accessing instructional materials is meagre funds provided by the government to community primary schools for purchasing instructional materials and most times the absence of funds for the purchase of these materials. Community primary schools depend on a large extent on the government for funding. Very little support is received from local government and communities around the schools most especially in rural areas due to poverty. The funds are provided in form of capitation grants. The capitation grant is aimed at improving the quality of education by making sure that sufficient learning materials are supplied to schools at all levels. In particular, the capitation grant is meant to finance the purchase of textbooks and other teaching and learning materials as well as to fund repairs, administration materials, and examination expenses (Ugwu 200)7. This amount of money is grossly insufficient to purchase a minimum set of textbooks apart from other instructional materials which are highly needed by the teachers. Another challenge that teachers face is the lack of exposure and limited accessibility to modern instructional facilities. Most community primary schools especially in rural areas do not have access to information communication technology (ICT) which could alleviate shortage of graphics materials. As we are in a new millennium, there is an increased awareness of the need to use modern scientific approach in teaching and learning processes in our schools even the use of arts and designers. (Torres, Espana, & Orlean 2014). (Tanglog, & Bucayong 2019).

Poor salary is also another challenge that teachers face. Teachers like most civil servants in Rivers State are poorly paid. This becomes a hindrance for them to purchase their own teaching materials or acquisition of new ideas, skills and knowledge by failure in enrolling for further educational programs and updating themselves in instructional innovations. Gullavan, 2010 agrees that with this, the academic and intellectual capabilities of teachers and learners are bound to be affected substantially during classroom interaction. Lack of sufficient skills and creativity may hinder teachers to improvise their own instructional materials. Local governments and communities around community primary schools are supposed to provide resources most especially funds to these schools so that teachers can use them to access graphics materials. But very often this is not the case due to number of reasons. Some local communities have very narrow tax base.

Also, the performance of local councils in the collection of their own revenue have been recorded very poor. Many local authorities however are unable to deal with such a rapid increase in expenditure and their budget deficit increase. Education is one of the sectors, which are mostly affected by this situation. Poverty is another reason, which may hinder members of the community in supporting teachers and schools financially so that they can access instructional materials. Hanley (2018), stipulated that, parents and community participation differ from rural to urban communities and from one mode of economy to another. Parents who are involved in cash crops economy have economic ability to finance education compared to parents who are not involved in cash crop economy. For example, pastoral communities with low income have poor financing strand for their children, teachers who work in such areas have more challenges in accessing instructional materials.

Another challenge that teachers face in accessing instructional materials is lack of clear policy and monitoring mechanisms to ensure that enough funds are provided to community primary schools for purchasing graphic materials and that these funds are used for the intended purpose. As Gallavan, (2014) comments that, government policy towards efficient provision of these aspects of educational resources has not been encouraging and has always not been well planned, monitored, supervised and evaluated with rural schools as the back bench of implication of these policies.

Strategies to Minimize the Challenges of Attaining and Using Quality Graphics Organizers

There are a number of strategies, which can be used in order to minimize the challenges of attaining and using quality Graphics materials. According to studies done in different parts of the world including Africa, one of the strategies is improvisation of instructional materials. Eshiet (2016) states that improvisation involves sourcing, selection and deployment of relevant instructional materials

into the teaching-learning focus in the absence or shortage of standard materials for a meaningful realization of specified educational goals and objectives.

Graphic organizers could be both beneficial for both pupils and teachers. They could make teaching and learning process enjoyable and interactive for everyone. Some specific benefits of integrating graphic organizers to teachers and pupils are as follows:

Table 1: Benefits of Graphic Organizers to teachers and pupils

Benefits to pupils	Benefits to teachers
✓ Makes content easier to understand/ comprehend text ✓ Organize information ✓ Identify key points of the text ✓ Improve memory/remember/recall ✓ Recognize and assimilate different points of view ✓ Develop creative and critical thinking ✓ Helps to summarize the text	✓ Illustrate and explains relationships between and among contents ✓ Makes lessons interactive ✓ Helps learners to acquire information more easily ✓ Motivate pupils ✓ Assist pupils in reading comprehension and writing skills ✓ Assess what pupils know

Source: Adapted from Curriculum Development Institute, 2001

Methodology

Aim and Objectives

(1) Verify the extent at which teacher's utilization graphic organizers in teaching UBE 3 pupils Basic science in public primary schools in Obio/Akpor Local Government Area.

(2) Verify the level of use of graphic organizer among female and male teachers when teaching basic science in Obio/Akpor Local Government Area.

Research Questions

(1) To what extent do teachers in public primary schools utilize graphic organizers in teaching Basic science in Obio/Akpor Local Government Area?

(2) What is the level of use of graphic organizer among female and male teachers when teaching basic science in Obio/Akpor Local Government Area?

Hypotheses

H01) There is no significant difference between teachers who utilize graphic organizers in teaching Basic Science and those who teach using Montessori teaching method in public schools in Obio/Akpor Local Government Area.

H02) There is no significant difference in the level of the utilization of graphic organizer among female and male teachers when teaching basic science in Obio/Akpor Local Government Area.

Data Presentation and Analysis

Research Question One: To what extent do teachers in public primary schools utilize graphic organizers in teaching Basic science in Obio/Akpor Local Government Area?

Table 2: T-test analysis of mean scores of teachers using graphic organizers

S/N				Remarks
		$\bar{X}$	STD	
1	Teacher generated graphic organizers are an effective tool in instruction.	2.15	0.66	LE
2	Pupils generated graphic organizers are an effective tool in instruction.	2.08	0.91	LE
3	A mixture of teacher and pupils generated graphic organizers are effective tools in the classroom.	2.05	0.64	LE
4	The graphic organizers included in the text for my courses are effective tools in the classroom.	2.10	0.57	LE
	Grand Mean	2.09	0.70	LE

From the result shown in Table 2 on the extent at which teachers in public primary schools uses graphic organizers in teaching Basic science in Obio/Akpor Local Government Area, it was shown that item 1 (teacher's generated graphic organizers are an effective tool in instruction) had a mean rating of 2.15 (SD = 0.66), item 2 (student's generated graphic organizers are an effective tool in instruction) had a mean rating of 2.08 (SD = 0.91), item 3 (the mixture of teacher and Student generated graphic organizers are effective tools in the classroom) had a mean rating of 2.05 (SD = 0.64), while item 4 (graphic organizers included in the text for my courses are effective tools in the classroom) had a mean rating of 2.10 (SD = 0.57). Generally, the items yielded mean values of 2.09 (SD = 0.70) which suggests that there is a low extent to which teachers in public primary schools use graphic organizers in teaching Basic science in Obio/Akpor Local Government Area.

Research Question Two: What is the extent of the utilization of graphic organizer among female and male teachers when teaching basic science in Obio/Akpor Local Government Area?

Table 3: Mean, Standard Deviation and Mean difference for Male and Female Teachers use of graphic organizer when teaching basic science.

Variable	Gender	N	Mean	Std. Deviation	Mean Difference
Experimental	Male	66	16.79	4.89	3.39
	Female	87	13.40	4.95	

The results shown in table 3 indicates the mean performance scores of male and female teachers who taught basic science concepts using Graphic Organizers. The mean difference in the mean performance scores for male is 16.79 and female is 13.40 with a mean difference of 3.39 in favour of the male teachers. Therefore, the male teachers have high usage scores than their female counterpart**.**

Hypotheses Testing

Hypothesis One: There is no significant difference between teachers who utilize graphic organizers instructional strategies in teaching Basic science in UBE 3 pupils and those who utilize Montessori method in Obio/Akpor Local Government Area.

Table 4: Independent Sample t-test on the difference between teachers who utilize graphic organizers instructional strategies in teaching Basic science in UBE 3 pupils and those who use Montessori method

Usage	N	Mean	SD	Mean Gain	df	T	p	A	Decision
Use	14	20.95	3.66	5.28	48	12.23	0.0005	0.05	Reject
Non-Usage	36	11.23	3.12						HO_4
									$p<0.05$

From the result displayed in Table 4, it can be observed that when the mean score of 20.95 (SD 3.66) of teachers who use graphic and the mean score of 17.23 (SD = 3.39) of those who use montessori method was subjected to independent samples t-test, a calculated t-calculated value of 12.23 at 58 degrees of freedom with a corresponding p-value of 0.0005. Since the p-value of 0.0005 was lesser than the chosen alpha of 0.05 guiding the study, it therefore implies that there is a significant difference between teachers who utilize graphic organizers instructional strategies in teaching Basic science in UBE 3 pupils and those who use montessori teaching method Obio/Akpor Local Government Area.

Hypothesis Two: There is no significant difference in the extent of the utilization of graphic organizers among female and male teachers when teaching basic science in Obio/Akpor Local Government Area.

Table 5: Analysis of Covariance (ANCOVA) for Male and Female teachers using graphic organizers in teaching basic science

Experimental Group	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	863.925[a]	2	431.962	20.071	.015	S
Intercept	1571.099	1	1571.099	73.002	.011	S
Covariates	433.757	1	433.757	20.155	.012	S
Gender	272.731	1	272.731	12.673	.323	NS
Error	3228.193	150	21.521			
Total	37890.000	153				
Corrected Total	4092.118	152				

From Table 5, the result demonstrated no significant difference in the mean scores of male and female teachers who use graphic in teaching basic science. The results of P =0.323, which showed no significant difference in the scores among the male and female teachers that uses with Graphic Organizers. That is, P=0.323 is greater than 0.05, therefore the null hypothesis which states that there is no significant difference in the level of use of graphic organizers between male and female teachers when teaching basic science concepts was retained, meaning that Graphic Organizers is gender friendly.

The Summary of Findings

The following findings were obtained in the course of this study.

1. The result in Table 4 revealed a significant difference on teachers that are exposed to graphic materials. The result indicates that the teachers who uses graphic organizers in teaching are more organized, efficient and effective. They demonstrated greater intellectual capacity in recognizing of both concrete and abstract concepts in graphics. The greater academic performances of the pupils might be attributed to the advantages derived from the application of their prior knowledge to graphics sources presented to them.

Frank (2017) reported that graphics facilitates the recall of visual materials because an image evoke an associated word. This finding is in agreement with the report by Thomas, (2001) that presenting concepts in both verbal and visual forms enhances retention, retrieval, and transfer of concepts. However, Manoli and Papdopoulou's (2010) submission comes in handy here. They advocate that teachers should make use of GOs in the classroom and also train learners to use them to become independent and self-regulated learners. Therefore, the better academic performance by the pupils in Basic Science could be due to the educational benefits the subjects derived from the use of graphics, via - the activation of visual memory codes in the learners, the increased interest in the lesson content and the development of harmonious relationship between the teacher and the pupils.

2. This result in Table 5 investigated teachers' perceptions and use of graphic organizers among female teachers and male teachers in lower basic school classrooms. The results suggest that teachers do use and are familiar with graphic organizers in high school academic classroom, at least under the conditions of the present study.

The findings of this study established that the use of graphics in teaching Basic science boost pupils' academic performance in the subject. Consequently, the strategy holds a viable prospect for improving teaching and learning of other subjects at primary School level as well.

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