

**DEVELOPMENT OF INSTRUCTIONAL MATERIALS
FOR ENHANCING OBJECT RECOGNITION AMONG NURSERY
AND PRIMARY SCHOOL PUPILS OF KOGI STATE POLYTECHNIC
STAFF SCHOOL, LOKOJA, KOGI STATE.**

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ABSTRACT:

Instructional materials are essential requirement for successful teaching, in schools, student teachers are required to learn how to make and use simple and cheap instructional materials. This is an account of the Design and development of instructional graphic materials for teaching alphabets and recognition of shape/objects. The materials developed were tested at Kogi State Polytechnic Staff School, Lokoja, Kogi State. The population of the study was Nursery two (2) and primary one (1) pupils of the aforementioned school. The class has 45 pupils out of which 18 pupils were selected using random sampling technique. A questionnaire was prepared for the class master and mistress who duly responded. It follows therefore, that the research instrument used are, questionnaire, interview and observation, while interviews and observation, were adopted for the pupils, simple percentage was the statistical tool used for the analysis. Results revealed that: the instructional materials designed met principles of design and elements.

INTRODUCTION

Instructional graphics can be defined as the pictorial expression of content designed to promote learning and improve performance in work setting (Association for programmed learning and education technology, 1972) it is a means by which clear description or highlight of an instructional content/item is presented to the target audience or learners. This has to do with posters, photography, motion pictures, paintings, artwork, road signs and so on are very important in teaching and learning situation because they facilitate the direct association between words and the object they represent (Jacob, 2010). They help to vividly illustrate meanings of things because they are associated with the materials used by the teacher to improve the quality of his teaching. One of the specific ways educational institutions can contribute to societal evolution and development is to indigenise human and material resources for educational institutions” (Gbodi, 2006).

The process of creating instructional graphics consist of determining the content and goals of lesson, features of the visual and characteristics of learners. The steps taken in production of the graphic materials for this study entails; acquiring the drawing materials, sketching the drawings, layout of the drawing, developing and labelling. The university of Saskatchewan (1998) outlines the following implicit advantages of instructional graphics in achieving set learning goals these includes: attracting attention developing interest, adjusting the learning climate and promoting acceptance (of an idea). It has also been established by various researches; that the use of graphics enhances teaching and learning; giving credence to the saying that” A picture is worth more than a million words”.

Statement of the Problem

“The first principle of the design of instructional graphics is this: There are times when pictures or illustrations can aid learning and times when pictures do not aid learning but do no harm, and times when pictures do not aid learning and are distracting “this is an underlying philosophy of instructional graphics and instructional technology. This philosophy is very important as it sets the tone and guides every attempt at designing graphics when the purpose is to guide, aid, enhance or support learning (Rieber, 2004). This is true because research efforts overtime has shown that instructional delivery failed to achieve the desired objective because of wrong use of media, or misapplication of instructional media.

The misuse of media could be as a result of:

1. lack of adequate knowledge of the instructional materials by the teacher,
2. wrong application of the materials, Material or media not been relevant to the content of the lesson, Failure of the material to stimulate interest of the learners (pupils) and when the material is over utilised, that is, forcing the media to serve a purpose it cannot normally serve (Abimbade, 1999). In another vein, Teachers do not give much thought to prior planning and thus produce materials that are unorganised and ineffective (Gbodi, 2006). Moreover, Azikiwe (2007) and Denga (2001) assert that many Nigerian teachers lack the initiative to explore and mobilize local resources towards teaching and learning of their students, whereas Hull *et al.*, (1964) opine that a learner learns better if he is motivated through the use of instructional media.

Against this background; arose the need to carry out this study; to explore and expand the horizon of knowledge in understanding the processes involved in designing and developing instructional materials. In light of the foregoing; the following question sufficed;

- a. Is the choice of colours, on the instructional materials developed appropriate?
- b. Is the illustrations visible (in terms of the basic elements of design; size, shape, texture, line, form and pattern) enough to the learners?
- c. How proportionate is the drawing to the surface provided?
- d. Which is the dominant aspect of the illustrations?
- e. What are the goals the instructional materials are designed to be achieved? e.t.c.

LITERATURE REVIEW

Learning is a complex process. It can be defined as a change in disposition; a relatively permanent change in behavior over time and this is brought about partly by knowledge. Learning can happen as an outcome of afresh attained skills, principles, perception, knowledge, facts, and new information at hand (Adeyanju, 1997). Learning can be reinforced with different teaching/learning resources because they stimulate, motivate as well as focus learners' attention for a while during the instructional process.

Visual aids arouse the interest of learners and help the teachers to explain the concepts easily. Visual aids are those instructional aids which are used in the classroom to encourage teaching learning process. As Singh (2005) defines: "Any device which by sight and sound increase the individual s' practice, outside that attained through read labeled as an audio-visual aid. Visual aids are those instructional devices which are used in the classroom to encourage learning and make it easier and motivating. The material like models, charts, film strip, projectors, radio, television, maps etc called instructional aids. (Rather, 2004).

Visual aids are effective tool that "invest the past with an air of actuality." Visual aids distribute the learners with true knowledge, which detention their devotion and help in the understanding of the ancient marvels. They demand to the mind through the visual auditory senses. When we use visual aids as teaching aid, it is one of the aspects which root participation of students in the lesson because when students look at visual model or aid, it is measured as a kind of contribution.

Also, the uses of visual aids encourage the body movement and it may strengthen the control. (Jain, 2004) There is famous Chinese proverb “one sighted is worth, a hundred words” it is fact that we take knowledge through our intellects. There is another maxim that “if we hear we forget, if we see we remember, and if we do something, we know it” so it means that use of visual aids makes teaching learning process more effective. As Kishore (2003) said “visual aids stimulated thinking and cognize.” The use of visual aids in teaching learning process has multifarious values (Mohanty, 2001). Visual aids give chance to speakers to make a more professional and consistent performance. The teaching career is full with limitless opportunities to enrich the academic survives of students, while some ideas and educational goals will be easy for students to hold, other will need you to think productively to ensure that important learning aims are met. By visual aids in teaching is one mode to enhance lesson plans and give students additional ways to process subject information (Kunari, 2006). Visual aids are devices present unit of knowledge through auditory of visual stimuli both with a view to aid learning. They concretize the information to be obtainable and help in making learning practice apple real, active and vital. They supplement the work of the teacher and help in the research of the text books. The great educationist Comenius has well said: The foundation of all learning consists in representing clearly to the senses and sensible objects so they can be appreciated easily (Singh, 2005). (Agun et al; 1977) Examples of learning resources include visual aids, audio aids, real objects and many others. Visual aids are designated materials that may be locally made or commercially produced. They come in form of, for illustration, wall charts, exemplified pictures, symbolic materials and other two-dimensional items. There are also audio-visual aids. These are teaching machines like television, radio, and all kinds of projectors with sound attributes. Television and radio programs provide another useful learning resource.

Films, likewise, are a general teaching/learning resource. In addition to helping students remember important information, teaching/learning resources have other returns. When accurately used they aid achievement and hold the attention of students. Visual aids can be very useful in supportive a topic, and the amalgamation of both visual and audio stimuli is particularly effective since the two most important senses are involved (Burrow, 1986). Teachers should keep in mind that they are like salesmen of philosophies, and many of the best sales practices that attract attention of potential clients are well worth considering. Clearly, a major goal of all

teaching is for the students to be able to retain as much knowledge of the topic as possible, particularly the main points. Frequent studies have attempted to determine how well learning resources serve this purpose. Indicate from the studies vary greatly from modest results which show 10-15 percent increase in retention to more optimistic results in which retention is increased by as much as 80 percent (Burrow,1986). Good learning resources can help solve certain language barrier problem as they provide accurate visual image and make learning easier for the student (Chacko, 1981). Another use of learning resource is to clarify the relationship between material objects and concepts to understand. Symbols, graphs, and diagrams can also show associations of location, time, size, value and frequency. By symbolizing the factors tangled, it is even possible visualize abstract relationship. Instructional aides have no value in the learning process if they cannot be seen or heard. Tapes of speeches and sounds should be confirmed for correct volume and quality in the actual environment in which they will be used (Chorley, 1966). Visual aids must be visible to the whole class. All calligraphy and illustration must be large adequate to be seen easily by the students farthest from the aids. Colours, when used, should provide clear contrast and easily be visible. The efficacy of aids can be enhanced by proper sequencing to build on former knowledge. Often, good institute and natural patterns of logic command the sequence.

According to Ranasinghe and Leisher (2009), integrating technology into the classroom begins when a teacher prepares lessons that use technology in meaningful and relevant ways. Technological aids should support the curriculum rather than dominate it. Ranasinghe and Leisher say that technology should assist the teacher in creating a collaborative learning environment. Koc (2005) says that the integration of technology into curriculum means using it as a tool to teach academic subjects and to promote higher-order thinking skills of the students. Developments in technology gave scope for innovative practices in the classroom. Practical improvements in the creation of visual aids for classroom use have been remarkable. Technological developments in Pakistan had a positive impact on students learning environment. Educational reforms for improving skills initiated by the Ministry of Higher Education elevated the classroom learning environment in Pakistan. University classrooms were equipped with world class technological teaching aids for making classroom students learning process interesting and resourceful. However, use of identical resources, comprising a syllabus, is

suggested. Sequencing also can be improved purely by using overlays on slides, doffing methods on charts and or chalk, and marker boards. Sequencing can be emphasized and prepared clearer by the use of distinct colors (Chorley, 1966).

METHODOLOGY

This is a set of systematic technique employed in research, it is a simple guide to research and how it is conducted. It also describes and analyses methods and shed more light on their limitation and resources (Igwenagu, 2016). It therefore describes the path through which the researcher conducts his research, the path through which he formulates his problem and objective and present his result from the data obtained during the period. In order to achieve the stated objectives of the research, a framework was developed to depict the flow of activities. At this level the method of selecting the materials, population for the study, sampling and sampling technique is highlighted.

Population

The population of the study was Nursery two (2) and Primary one (1) pupils of Kogi Polytechnic Staff School, Lokoja, Kogi State. The classes have a population of 45 pupils, out of which twenty (20) males and twenty-five (25) females, while the class mistress is the sole respondent to the Questionnaire developed for the teacher.

Sample and Sampling Techniques

a). Drawings: - From a pool of thirty-nine (39) instructional graphic materials, eight (8) drawings were randomly selected using simple systematic random sampling technique; i.e. taking out the illustrations one after the other in two groups of four. Out of which two different posters were chosen for the study (see appendix).

b) Pupils: - From a population of 45 pupils, 16 were drawn using systematic random sampling technique; i.e. the 16 pupils were drawn by using the class register and picking a name after every three names counted until the 16 earmarked for the study was arrived at, this is in keeping with sampling size, principles. According Gay, (1987) for a descriptive research, a sample of the population is considered minimum. As such; it follows that any proportionate number taken as a sample from a given population is representative of that population.

Instrumentation

Three-way approach was adopted to gather the relevant data needed for this study namely; Questionnaire, Oral Interview and Observation. This was done in two stages:

a. Draft and Development of the instrument(s):

The group drafted the Validity Instrument for Instructional Materials (VIFIM) (i.e.; questionnaire and structured questions for the pupils), it was then assessed and necessary corrections made to suit the cause of study by a specialist in educational graphic design. Consequently, the validity and reliability of the instrument were certified.

b. Administration of Instrument

With all the necessary tools (such as; the introductory letter to the study area, the illustrations, the Questionnaire, and writing materials) needed to carry out the study in place, the group went straight to the study area (Kogi State Polytechnic Staff School, Lokoja). The first point of contact was the head teachers office. At the front office is the deputy head teacher, who turned out to be a lady, she ushered us to the inner office which serve as the head teachers office, the head teacher received us warmly, after introducing ourselves, he was given the letter seeking the assistance and cooperation of his office towards the cause of our study, he gladly accepted and granted our request and offered the option of using Nursery two or Primary one, the option for using primary two was overwhelming because of their chronological, mental age and seemingly physical ability over the primary one pupils. The head teacher then leads us to the Nursery two class mistress who was very warm, receptive and lend her support in sampling and controlling the pupils, she offered the class register and clarified names that were not easily readable. The instruments were administered as the group worked mutually the outcome of which is this report.

DATA ANALYSIS AND DISCUSSION OF FINDINGS

This section discusses the responses gathered from the pupil's item by item to provide the basis for the judgement that was arrived at. This discussion is preceded by statistical analysis using the simple percentage as the main statistical tool.

a. Analysis of Biometrics

Table 3.1. Sample distribution according to gender

Gender	Number	Percentage (%)
Male	8	50%
Female	8	50%

The sample population used is evenly distributed i.e. ten (8) boys and ten (8) girls.

Table 3.2. Sample age distribution

Age Interval	Frequency	Percentage (%)
1-4	01	30%
5-7	12	60%
Unknown Age	07	10%

Table 3.2 indicate that only 30% of the respondent is below expected age, 60% are within the official age, and 10% do not know their age, the implication is that a good number of the pupils gave us reliable information

b. Item Analysis of pupil's responses: -

Table 3.3: Questions relating to number of objects that can be recognised on the poster

Responses	A-Illustration with one image	B-illustration with More Than 5 images
Frequency	15	05
Percentage (%)	75%	25%

From table 3.3, 75% of the pupils identified the illustration with one object correctly, also 25% identified illustration with more than five objects accurately, and thus 100% of the pupils were able to identify the number of items on the poster correctly. The inference is that; the posters depicted the contrast of size, shape, form, colour, line, space, texture and pattern which are elements of good design.

Table 3.4: Questions on whether they have ever seen any of the objects on this poster?

Responses	Yes	No
Frequency	19	01
Percentage	95%	5%

From table 3.4 indicating 95% of the pupils have seen at least three of the objects before, while 5% could not recognise any of the objects. This implies that the posters had representative features and the respondents had a previous knowledge.

Table 3.6: Questions relating to naming the object (s) identified

Responses	Correct Naming	Wrong Naming
Frequency	18	02
Percentage	90%	10%

From table 3.5, 90% of the respondents were able to mention the names of the objects on the poster while only 10% were unable to name any of the objects. This indicates that the pictures were probably clear enough and are identifiable

Table 3.6: Question relating to mentioning two uses of the objects

Responses	Two(2) Uses	One (1)Use	None
Frequency	08	08	04
Percentage	40%	40%	20%

Table 3.6, shows that 40% of the pupils were able to give two uses of objects identified, also 40% were able to give a correct use of the objects on the poster which implies consistency and validity of the instructional materials, reinforcing the fact that pupils had experiences about the object(s).

Table 3.7: Question relating to colours that can be seen on the illustration

Responses	One (1) Colour	Two(2) Colours	None
Frequency	08	10	02
Percentage	40%	50%	10%

Table 3.7, shows that 40% of the respondents identified at least one colour from the posters, and 50% of them two colours from the poster, while 10% could not name any colour, implied most of the pupils know colours.

Table 3.8: Question in relation to the colours the pupils like most about the illustrations (Pictures)?

Responses	Brown	Yellow	Red	Green	Blue	White	Black	Orange	None
Frequency	02	02	06	01	02	01	01	02	03
Percentage (%)	10%	10%	30%	5%	10%	5%	5%	10%	15%

The results from the table 3.8, indicates that the most appealing colour to the respondents is the Red colour, 30% picked red as their favourite, 10%, prefer brown colour, 10% yellow, 10% blue 10%, orange, 5% green, 5% white, 5% black, while 15% of the respondents couldn't make a choice of favourite colour from the poster, this means that the instructional material with red colour, which is a primary colour attracted more attention.

Table 3.9: Question in relation to favourite colour?

Responses	Yellow	Red	Green	Blue	White	Black	Orange
Frequency	02	11	07	00	00	00	00
Percentage%	10%	55%	35%	0%	0%	0%	0%

Table 3.9.shows that 55% of the pupils likes red colour the most, 35% likes green colour, while 10% prefers yellow, implied those who identified with red colour on the poster have a strong passion for the colour

Table 3.10: Question relating to how the pupils view the size of the objects?

Options	Very Big	Big	Small	Too Small	No Choice
No. Of Pupils	00	15	03	00	02
Percentage	0%	75%	15%	0%	10%

Table 3.10. indicates that 75% of the respondents are of the view that the size(s) of the objects on the poster are big, 15% views the sizes of the objects as small while 10% couldn't tell the size of the posters, this shows that those who identified with the big objects are those tested with the single object posters, while those who sees the smaller objects are those tested on the multiple object posters. On the whole the results obtained from this study shows that the materials satisfied to a large extent the elements and principles of designing instructional graphical materials, these

includes elements such as line, shape of the objects forms, space, colour and texture. While the defining principles of the materials included balance, emphasis, repetition, proportion, rhythm, variety, and harmony. According to Lester (2000) More often than not, images that are remembered are the ones that combined aesthetically pleasing design elements with contents that matters.

Table 3.11. showing distribution of favourite colour according to gender

Responses	Yellow		Red		Green		Blue		White		Black		Orange	
Gender	Male	Female	M	F	M	F	M	F	M	F	M	F	M	F
Frequency	01	01	05	06	04	03	0	0	0	0	0	0	0	0
Percentage	5%	5%	25%	30%	20%	15%	0	0	0	0	0	0	0	0

Table 3.11, indicates that 30% of the pupils that likes red colours are females while 25% of the pupils that likes red colour are males, suggesting that red colour has more feminine appeal. Also, 20% of the pupils who are males likes green colour the most, while 15% of their female counterparts likes green colour, 10% of the pupils chooses yellow as their favourite colour, the implication of these is that; even at the tender age the pupils could make Choices from colours. Thus, confirming the position of Denise (1999) who held that graphics provide the most creative possibilities for a learning session as students have a more positive classroom experience.

Table 3.12. Indicating the Questionnaire Items and responses of the class teacher

S/No	Items on The Questionnaire	Class Teachers' Responses	Remarks
1.	<i>Qualification/Subject taught</i>	<i>N.C.E/Mathematics, Social Studies Creative Arts and Writing.</i>	<i>She is the sole respondent to the Questionnaire</i>
2.	<i>Gender</i>	<i>Female</i>	
3.	<i>Do you know teaching Aids?</i>	<i>Yes</i>	An affirmation that she is familiar with teaching aids
4.	<i>Can you recognise the materials as teaching aids</i>	<i>Yes</i>	She identifies it correctly
5.	<i>What category of teaching aids are these?</i> <i>(a)projected</i> <i>(b)Non-projected</i> <i>(c)Prints</i> <i>(d)Non-prints</i> <i>(e)No idea</i>	<i>(b)Non -prints</i>	Her choice is wrong suggesting she may not know the classification of instructional materials
6.	<i>What is your rating of the size(s)of the objects</i> <i>(a)very Good</i> <i>(b) Good</i> <i>(c)average</i> <i>(d)Poor</i>	<i>(a)Very Good</i>	This choice implies that the elements of size and proportion may have been satisfied by the graphic materials
7.	<i>How would you rate the illustrations in terms of clarity?</i> <i>(a)very good</i> <i>(b)Good</i> <i>(c)Average</i> <i>(d)fair</i> <i>(e) Poor</i>	<i>(a)Very Good</i>	This suggests that the illustrations are very good for class room instructional purposes
8.	<i>How clear and legible are the Letterings?</i> <i>(a)Very Good</i> <i>(b)Good</i> <i>(c)Average</i> <i>(d)fair(e)Poor</i>	<i>(a)Very Good</i>	With respect to the labelling around the objects, the rating implies satisfying the basic element of clarity and legibility

9.	What colours appeal to you most? List according to degree of preference.....	<i>(i)Green</i> <i>(ii)Black</i> <i>(iii)Yellow</i> <i>(iv)Blue</i>	This indicates that Green colour is the most appealing to the class teacher followed by the others.
10.	How often do you use Teaching aids For your lessons (a) Very- Regularly (b) Regularly (c) Occasionally (d)Not at all	<i>(c)Occasionally</i>	This reinforces the position that teachers are not inclined to using instructional aids, as much as expected thereby limiting the success of instructional delivery in the class
11.	How would you rate the illustrations generally? (i)above A-70%(ii)B- 60% (iii) C-50% (iv)D-40% (v)below 40%	<i>(ii)B-60%</i>	The respondent rating of the instructional materials as Good (B grade) suggests the aids are good enough to be used for teaching

Class teacher's comment: “Instructional aids simplify teaching and facilitates learning. For a class of this kind; it is important to always use teaching aids that are designed with attractive colours.”

Observation(s)

In the course of the entire exercise, the following observations were recorded:

- (i) The presence of the study group and the activity presented to the pupils elicited excitement and attracted the desired attention from the pupils. According to Ajayi and Salami, (1999) the

integration of media into the process of education has had profound effect on the performance of the teacher and achievement of the behavioural objectives of the pupils.

(ii) Some of the pupils in attempt to identify the number of objects on the instructional materials, counted the captions as objects because those typefaces were about the same size with the objects. The implication of this is that; in designing graphic instructional media care must be taken not to include things around the message that could distract from the specific objectives of the graphic materials.

(iii) It was also observed that, some of the pupils could not tell one type of colour from another (they seem to be colour-blind) as they could only identify only one colour repeatedly.

(iv) Most of the colours identified by the pupils were their favourite colours, indicating that perhaps they were attracted by colours that they like most.



Design/Development Process

Plate 3.1, Graphical Illustration of Colours using Objects



PATE 3.2 Graphical Illustration of Shapes in colours

ANALYSIS OF THE WORK

This research gave birth to two (2) teaching aid/instructional material to be used in the Polytechnic Staff School, Lokoja. The materials are made of FLEX and PVC materials with graphics illustrations on them. They are both 4by6 feet each and scrollable to save space.

Instructional Graphics

Instructional graphics which can be defined as the pictorial expression of content designed to promote learning and improve performance in work setting (Association for programmed learning and education technology, 1972) it is a means by which clear description or highlight of an instructional content/item is presented to the target audience or learners. This has to do with posters, photography, motion pictures, paintings, artwork, road signs and so on are very important in teaching and learning situation because they facilitate the direct association between words and the object they represent (Jacob, 2010). They also help to vividly illustrate meanings of things because they are associated with the materials used by the teacher to improve the quality of his teaching. One of the specific ways educational institutions can contribute to societal evolution and development is to indigenise human and material resources for educational institutions” (Gbodi, 2006).

Composition of Texts, Illustration and Flex

Text, illustrations and flex these three combines together makes the project a unique one, beautiful, instructional and educating by all standard. “development of instructional materials for enhancing object recognition among nursery and primary school pupils of Kogi State Polytechnic Staff School, Lokoja, Kogi State.

Cost Analysis:

Table 4.1 Cost Analysis of the Teaching Materials

S/NO	MATERIALS BOUGHT	AMOUNT
1.	Bearing	₦15,000:00
2.	Rollers	₦ 2,000:00
3.	Glue	₦ 9,000:00
4.	1by1 Pipes (4)	₦ 8,000:00
5.	Caps	₦ 3,000:00
6.	3by3 Pipes (4)	₦15,000:00
7.	Printing (2)	₦28,500:00
11.	Evostick	₦ 3,000:00
12.	Catalyst and resin	₦ 6,000:00
	Total ₦	₦89,500:00

CONCLUSION

Poor academic performance in examination at all level of our education has been a matter of concern to all stake holders, several studies, research, seminars, symposia, have been organised to look into the problems (Yusuf, 1994). The result of this study reveals that among other factors teaching could be enhanced through the use of appropriate instructional media, as their uses improve the quality of instruction (Agun, 1982). Ajayi and salami (1999) posits that; educational media possesses the quality of influencing the psychological, motivational and structural position of the learners. It aids the achievement of any one of the following in the teaching/learning process: Attention and Motivation, Active participation and response, orderliness in the classroom, Recall and Remembering, Guidance and Evaluation. It is on this premise therefore that this study has the following

RECOMMENDATIONS:

1. Learning resource centres should be setup in the polytechnic for the staff school instructional graphic materials for all subjects could be produced.
2. All tiers of educational authority should provide schools with these materials that ease the burden of teaching and learning.

3. Teachers should ensure that proper use of instructional media has immeasurable benefit in teaching and learning. Teachers should not rely on words only to explain ideas, facts and concepts. The use of instructional resources makes teaching both lively and interesting to the students.

The instructional materials used in this study have satisfied the minimum requirement for the use of instructional graphic designs in teaching and learning process. The study reveals that it stimulated the interest of the pupils and made learning experience meaningful, therefore provision of such materials in variety is essential for a successful teaching and learning to take place.

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