

Adaptation of Local Play for Primary School Pupils’ Instructional Interactions in Number and Shape Recognition

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ABSTRACT: *This paper demonstrates the adaptation of local plays into relevant instructional games for teaching number recognition. Review of related literature has revealed the fact that the teacher led instructional interactions is the only form of interaction in the public primary schools and as such pupils lack opportunity for practice and application of knowledge gained. Local plays have been found to form part of children’s preoccupation with significant learning opportunities. Thus, a pre-test and post-test, non randomized experimental design was adopted for the study. The population comprised four thousand, one hundred and sixteen (5,126) primary one pupils in Ikot Ekpene Local Government Area of Akwa Ibom State while two hundred and thirty-six primary one pupils formed the sample for the study from intact classes. One class was exposed to a lesson on number and shape recognition from adapted local plays while the other was exposed to the teacher-centred instructional approach. A pre test and post test was used to collect data before and after each lesson. A t-test statistical analysis revealed significant difference in the post-test performance of pupils exposed to both strategies indicating that pupils in the experimental group benefited more than pupils in the control group. Local plays are recommended as useful resources for learners’ maximum participation during lesson delivery*

Keywords: *Adaptation, Local Play, Instructional Interactions, Number/Shape Recognition, Child-centred strategy*

Date of Submission: 13-07-2018

Date of acceptance: 29-07-2018

I. Introduction

The teaching of recognition of numbers and other mathematical concepts requires strategies and resources that will reduce abstraction to the barest minimum. This calls for the need for the pupils to be given opportunity to interact with the objects of instructional situation apart from the teacher. Instructional games have been found to provide such opportunities but unfortunately these are hardly used by many teachers, probably for lack of such games or the ability to create, design or adapt some for the purpose of instruction. Mathematical games have been found to arouse such interest for learning and increase opportunity for interaction (Azuka, 2005; Ogbodo, 2005, Ekpo & Ekukinam, 2010). The fact that games have the element of competition sustains the players desire to be totally committed to the learning experiences provided through the game procedures (Agwagah, (2001). Mathematical games can be designed or modified from existing game structures to teach mathematical concepts.

Ekpo and Ekukinam (1998) confirmed the fact that local plays could be adapted as relevant instructional games for teaching different content areas effectively at the primary school level. These games are full of activities and also exhibit opportunities for greater interaction to occur between the player and objects of the game. Pak(n.d.) posits that games are highly interactional as most games are played by more than one player to make a game. Even when a lone player engages an assumed playmate, the player has the opportunity of interacting with the material (substance/object) of the game, which may likely be verbal cues, or physical objects. Thus a player has the opportunity of interacting not only with other players but also the game content, symbols, situation factors, material and tools (Ekukinam, 2010; 2003 Ekpo & Ekukinam, 1998; Klein, & Freitag, 1991; Koran,1990).

It is the place of the teacher to facilitate learning by creating various opportunities for learning to occur in an instructional situation. The need for a wide range of materials to be provided in an instructional situation cannot be overemphasized. Apart from the existence of individual learning capabilities and needs, the pupils also exhibit different learning styles which the teacher needs to work hard to accommodate. Thus, a purposeful plan for interaction between learner and the major components of an instructional plan should be incorporated into an instructional package.

The basis of planning for greater interaction between the learner and other components of the instructional situation apart from the teacher is the fact that there are chances for more than one sense organ to

be affected during the instructional delivery process. The writer defines interaction as the situation whereby the learner physically manipulates or relates with the different components of the instructional situation while mentally processing information. Each form of interaction is equally important for maximizing positive learning results. It is the place of the teacher to adequately plan and utilize strategies that enhance such interactions. This is very necessary for the teaching of number recognition and shapes to avoid teaching children through verbal communication which may sound very abstract. The pupils require some concrete objects adopted under suitable learning conditions that can encourage and incite the children's interest to learn. This study is based on Jean Piaget's theory on the developmental process of understanding knowledge and working of the child's mind. He notes that the child is perceptually oriented, does not use logical thinking and therefore cannot reason by implication. The child is goal directed and employs the principles of trial and error in solving problems. He lacks the ability to co-ordinate variables and has difficulty in realizing that an object has several properties. He equally lacks operational reversibility in thought and action (Chauhan, 1983). Therefore in teaching children at this stage, there is need to include practical activities to reduce abstraction as much as possible. Guido (2016) points out that if the teacher plans to use games, issues such as teacher control, intuitiveness, engagement, content types and levels as these ensure appropriateness of the choice of a game. He added that games should be easily adaptable by the learners.

Learning at most Nigerian public primary schools is largely the teacher centred approach to instruction. Several studies have revealed that primary school teachers do not utilize instructional materials. An attitude which they completely attribute to lack of sufficient government funding of education but which is partly lack of resourcefulness on part of the teachers (Ekpo, 2010 & Ibe-Bassey, 2012). Ekukinam (2009) conducted a study to assess the relevance of learning resources utilized by teachers to selected instructional objectives in English language in the upper basic Primary level. The study revealed that for the learning resources utilized by teachers, pupils are provided little or no interaction with other pupils and even the learning materials. The few interactions indicated a linear form of communication where information is sent out and is received with no interaction to ensure that the recipient has reacted favourably to information received. This step only allows information to leave one object to another without a feedback on the reaction of (or) on the receiving object. An indication that the learning resources utilized during an instructional session only present content area to students without opportunity for recall and recognition of facts. In a situation where pupils are not exposed to learning experiences through the use of other learning materials apart from the teachers, the level of interaction is limited. Consequently the performance of the pupils is limited and proper learning is not guaranteed. Obanya, (2013) makes it clear that it is pertinent to provide a positive start for children rather than answering the call of 'Education for All' without corresponding schemes to accord a smooth transition from home to primary school as stipulated by National policy on Education. It is based on this backdrop that the researcher looks at the aptness of adapting local play for effective teaching and learning and increasing interactions between the learner and the other components of an instructional situation for the improvement of learning.

II. Objective Of The Study

Specifically, this paper seeks to:

1. Adapt 'In One Full Stop Comma' as a Mathematical game on recognition of number (1-20) for increasing interaction within the instructional situation.
2. Adapt the 'Blocking game' as a mathematical game on shape recognition for increasing interactions within the instructional situation.
3. Examine the difference between the post test performance of pupils exposed to adapted instructional game and those exposed to teacher-centred instructional approach.

Significance Of The Study

The study will expose teachers to the availability of local content material which could be adopted for the purpose of meaningful and concrete learning experiences at no cost apart from creativity and resourcefulness. Teachers will be enlightened on the importance of creating opportunities for different forms of instructional interactions while the learners will have greater opportunity of learning for permanency instead of rote learning.

III. Research Design

The study adopted a non-randomised control group pre-test-post-test design with an intact class selected on the basis of three criteria to ensure relative homogeneity of members of the group. Four classes were selected from two different schools located in the rural areas of Ikot Ekpene Local Government area with 39 public primary schools. That means two from each school with one categorised as an experimental class and the other the control group class through the toss of a coin. Firstly, the schools that were selected had at least only between 40 to 50 pupils in the classroom to avoid the overcrowded classes which in most cases are between 70

to a 100. Secondly, the schools had trained teachers. Thirdly, those who have practiced for at least 5 years and above. The game design and full lesson plan was shown to two instructional designers in the Department of Educational technology in the University of Uyo. The sample comprised of one hundred and ninety pupils. The adopted instructional game and full lesson plan was pilot tested on pupils in a different school to ensure its workability. One research question and one hypothesis were set to guide the study. The result of the trial testing on the pupils' performance in number and shape recognition revealed a reliability coefficient of 0.88 analysed with the Kudar Richardson statistical tool.

IV. Procedure for Data Collection

A tabulation of the features of each local play and instructional value of each feature for ensuring greater interaction was provided. The two local plays were adapted the study are 'In one full stop comma' and the 'Blocking game'. An outline of lesson plan for both adapted instructional game with variations only at the point of providing pupils activity was also provided. The classroom teacher was given orientation on the utilization of the adapted instructional game. The pupils were exposed to test on number and shape recognition before and after their exposure to the instructional situation. The results from test on number and shape recognition were merged for both control and experimental groups for analysis. The results were analysed using the t-test statistical tool.

V. Findings from the Study

Table1: Adaptation of 'In One Full Stop Comma' as a Mathematical game on Recognition of Numbers (1-20) for Increasing Instructional Interaction

Features	Description of Local Play	Adaptation of Local Play
Objective	Fun, entertainment, competition	Creates interest and sustains attention.
Action	Counting, tracing numbers	Adapt activities for practice of knowledge gained
Players	Number not limited	Suitable for a large class
Object	Hard surface – cardboard provide concrete surface.	Use discarded cartons and cardboards..
Verbalcues	Counting numbers from 1-20	Suitable for lower basic class
Procedure	The sheet of paper is placed on a table. Players have to count and trace the numbers with the third finger; the base of the players' palms also beats on the table alternately. This beating produces a rhythm that sustains the tempo of the game. The players count and trace the numbers from 1-20. Players only pause for the next number in sequence. The beating does not stop while the player pauses only the wordings change.	The procedure provides opportunity for the teacher to form class pairs for learning identification of numbers.
Rules and constraint	Players have only one chance each time it is their turn to trace the numbers.	The rules are flexible and can be adapted to suit different situations by teachers.
Winner	Player that is able to complete the tracing without repeating the chorus beyond 3 times for each game	Mode of winning can be adapted for an instructional situation depending on the teacher's skills.
Interaction	Players interact with other players and objects of game.	Adapt activity to reinforce pupils' learning.

Table2: Adaptation of 'Blocking Game' as a Mathematical game Recognition of Shapes for Increasing Instructional Interaction

Features	Description of Local Play	Adaptation of Local Play
Objective	Fun, entertainment, competition	Creates interest, sustains attention and provides
Action	Blocking other players with different shapes	Provides activities for practice of knowledge gained
Players	Number Not limited	Suitable for pairing/large class
Object	Hard surface – Normally on the floor drawn with chalk or charcoal or on cardboard.	Discarded cardboards/cartons can be utilized in classroom to provide concrete game boards
Verbal cues	Names of shapes: triangle circle, square, rectangle.	Suitable for lower basic and provides all levels of interaction.
Procedure	The prepared game board is placed on a table. The chips which are cut out shapes are placed in a pile for players to pick and fill the marked points on the board. Players try to align a particular shape without being blocked by another player.	The procedure provides opportunity for the teacher to form class pairs for learning identification of numbers.

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Rules and constraint	Players have only one opportunity each time it is their turn to add a chip of any shape.	The rules are flexible and can be adapted to suit different situations by teachers.
Winner	Player that succeeds in aligning a particular shape without being blocked wins a particular round of game.	Mode of winning can be adapted to suit an instructional situation depending on the teacher's choice
interaction	Players interact with other players and also with the objects of the game	Suitable for creating classroom interactions for greater learning opportunities.

NOTES OF LESSON ON COUNTING FROM 1-20

Lesson notes	EXPERIMENTAL	CONTROL
Subject/ topic	Mathematics/ Counting numbers from 1-20	Same
Time, No.in class, Gender, School, Setting	30 minutes, 35 Pupils, Mixed, Urban	Same, 93 Pupils
Entrybehaviour	The pupils can count verbally from 1-20.	Same
Teaching aids	Blackboard	Same
Resource	Adapted Instructional Game: In One Full Stop Coma.	Blackboard, pupils work bk
Introduction:	Activity 1:Ask pupils number related questions: How many fingers do you have? How many eyes do you have? How many pencils? Etc.	Same.
Presentation	Activity 2: Write numbers out randomly on the board, ask the pupils to say the numbers.	Same
	Activity 3: Draw objects of varying numbers on the board. Ask pupils to write the numbers.	Same
	Activity 4: Pair the children up and let them play the instructional game	Pupilsuse the workbook
Evaluation	Write out the test items on number recognition on the board for pupils	Same

NOTES OF LESSON ON RECOGNITION OF SHAPES

Lesson notes	Experimental	Control
Subject/topic	Mathematics/ Recognition of shapes	Same
Time, No. In class, Gender, Sch. Setting	30 minutes, 35 Pupils, Mixed, Urban	Same 97 Pupils
Entry behaviour	The pupils can say the name some shapes	Same
Teaching aids	Blackboard.	Same
Instructional materials	Adapted instructional game: Blocking.	None
Introduction: Activity 1:	Ask the pupils some questions like. What is the shape of the blackboard? Say the name of an object in your house that has the shape of a circle shape? Etc.	Same.
Presentation: Activity 2:	Pick up some objects like duster, sharpener, cup, small basin, etc. Place the surfaces on the board and trace out the shapes. Ask the pupils to say what shapes they are	Same
	Activity 3: Cut out some shapes, mix them up and place them on a table. Call the pupils individually identify the shapes.	Draw shapes on board and help pupils identify
	Pair the pupilsto play the instructional game	Activity3
Evaluation	Write out the test items on number recognition on the board for pupils	Same

Table 3: Mean Performance scores of students taught with adapted instructional game and those taught with the conventional N= 190

Group	School	N	Mean	SD	Group Mean	Group SD
Experimental	SCHOOL ONE	48	85.23	6.40	81.06	8.27
	SCHOOLTWO	45	76.89	9.02		
Control	SCHOOLTHREE	50	57.83	3.34	53.24	10.21
	SCHOOL FOUR	47	48.66	3.14		

Table 3: The t-test showing difference between pupils taught with adapted instructional game and those taught with teacher-centred approach.

Group	N	Mean	Std	Std Error	Mean Difference	df	t	Decision
Experimental.	93	82.23	8.67	1.53				
Control	97	51.54	10.63	1.76	28.73	188	12.34	Significant

The presentation of result of the mean score analysis on table 1 reveals that the pupils in the experimental group had a mean score of 81.06 while the control group had a mean score of 53.24 indicating that the pupils exposed to adapted instructional game performed significantly higher than pupils exposed to the teacher-centred approach. The t-test analysis in table 2 indicates a significant difference of the t-cal. over the t-crit. at .05 level of significance. Thus the null hypothesis which stated that there is no significant difference between the experimental and control is rejected.

VI. Discussion Of Findings

The adaptation of local play for number and shape recognition provided the features of competition and fun which are necessary ingredients for arousing excitement and interest. These are attributes confirmed by Obodo (2005) and Agwagah (2001) to be requirements for sustaining interest and consequently improved learning. The difference in the performance of pupils in the post test of the experimental and control groups were significant as the experimental group performed significantly better. This corresponded with earlier findings of Obodo (2005), Agwagah (2001), Obioma (1992), Azuka (2005).Ekpo & Ekukinam, (2010). This showed that the adapted mathematical game created adequate instructional interaction thereby leading to improved performance. The pupils had the opportunity to interact with the objects of the game situation and also other members of their class The appropriateness of the game in exposing the pupils to interactions meets Guido's, (2016) suggestions of issues for effective adaptation games for class activity.

VII. Conclusion

The adapted number and shape recognition games provided greater opportunity for the pupils to interact with other components of the instructional situation apart from the teacher. The elements of competition and fun were also provided through the adaptation for the sustenance of interest on the lesson. This has resulted in improved performance by the pupils in the test with pupils in the experimental group scoring higher than pupils in the control group.

Recommendation

Drawing on the findings of the study, the following recommendations were made:

1. Teachers should utilize available and relevant local contents for the creation and or adaptation of instructional games for mathematics lessons.
2. Curriculum planners should incorporate mathematical games in the scheme of work for easy reference by the teachers.

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Ekukinam, Thelma U. "Adaptation of Local Play for Primary School Pupils' Instructional Interactions in Number and Shape Recognition". IOSR Journal of Research & Method in Education (IOSR-JRME) , vol. 8, no. 4, 2018, pp. 09-14.