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NURSERY MATHEMATICS EDUCATION IN NIGERIA: A SURVEY

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Abstract

The study surveyed the objectives, scope and methods for mathematical activities in Nursery Schools. A total of two hundred and ten nursery school teachers, randomly and proportionally sampled from the participating schools in each of the five sampled states, were used for the study. The instrument for the study was a Nursery Mathematics Questionnaire (NUMAQ). Major results of the study revealed among others, great variations in the procedures and methods used by nursery schools teachers in the provision of mathematical experiences to nursery children. It was therefore recommended that the Federal Ministry of Education could provide nursery school curriculum for use by nursery school staff.

Introduction

Nursery Education is seen by many as panacea for all our social problems (Curtis, 1979). It helps to form a bridge between home environment and primary school environment (Choat, 1979). Thus children who have nursery school experiences tends to socialize better in primary schools than those who do not have the experiences. In addition, evidence (Aiyedun, 1990; Agwagah, 1994), as shown that pupils who attend nursery school perform better academically in mathematics both at the primary and secondary school levels, than those who do not attend, one wonders then the mathematics concepts that are mastered by the nursery school pupils.

Whereas it is easy to identify the mathematics concepts that primary school pupils should master, it is not all easy to identify those that are to be mastered by nursery school children. This is because formal mathematics teaching is clearly inappropriate at this level, and so, "there is pervasive but unjustified pessimism about what mathematics young children can learn" (Bell, 1980: 2). Also, there is the primary mathematics curriculum guide for primary schools which shows the scope and sequence of the years work in a meaningful progression. But it doesn't seem there is such a guide for nursery schools. Based on this, there seems to be differing approaches to nursery mathematics education here and elsewhere.

In the primary schools in Nigeria, 30 - 35 minutes are commonly allocated each day to mathematics, but in the nursery school the time spent for mathematical activities seems to vary considerably. For instance the results of some interviews conducted with some nursery school teachers showed that whereas in some nursery schools mathematics is taught as a special subject each day, in others there are no mathematics period. However, the respondent they have overlooked the casual and incidental works with numbers that teachers include in daily activities. Hence how extensive is the existing variation in the standards and goals of the teachers who teach nursery mathematics in Nigeria. It is very important that standards are set and goals stated for nursery mathematics, otherwise it becomes difficult to evaluate the nursery mathematics programme. Since, from materials available, there is a paucity of research on the scope of nursery mathematics in Nigeria, the researcher set out to answer for major questions:

- 1) What are the objectives of the mathematical activities in nursery schools?
- 2) What competencies in mathematics are achieved by nursery school children?
- 3) Are clear trends evident in the methods used by teachers of nursery mathematics?
- 4) To what extent are nursery schools established and owned by private individuals?

Method Sample

A total of 80 nursery schools were randomly sampled from five states composed as follows, Anambra ($n = 30$), Delta ($n = 10$), Enugu ($n = 20$), Imo ($n = 10$) and Yobe ($n = 10$). The sample structure reflected nursery schools located in urban and rural areas in each of the participating states.

A total of 210 nursery school teachers are randomly and proportionally sampled to reflect the ratio of number of participating nursery schools from each state.

Instrument

The instrument consisted of a Nursery Mathematics Questionnaire (NUMAQ) which was structured in two parts. Part A sought information on the state in which school is situated and whether school is privately owned or owned by an institution. Part B was both structured and unstructured and was limited to twelve questions. This was designed to determine (a) each teacher's assessment of the competencies that his or her children possessed at the end of the school year; and (c) other related information such as teaching methods, teaching materials, frequency of mathematics lessons and class size.

Results and Discussion

Table 1: Teachers' responses on the objectives of nursery mathematics

	Objectives	n	%
1)	To help pupils to be interested in mathematics	28	6.37
2)	For brain development	30	6.82
3)	To prepare pupil for more harder work in mathematics	58	13.18
4)	To help pupils count	184	41.81
5)	To enable pupils have good background in mathematics	50	11.36
6)	To enable pupil solve simple calculation problems	40	9.09
7)	To enable pupils have fundamental knowledge of number work	26	5.91
8)	To enable pupils read and recognize numbers	24	5.45

From the results in Table 1, it is evident that nursery school teachers have varying objectives for nursery mathematics education. That is, teachers are not agreed on what should be the objectives on what should be the objectives of the mathematical activities at the nursery school level.

However, greater percentage (about 42%) of the teachers stated that an objective of the mathematical instruction in nursery schools is to help pupils count. One implication of this result is that nursery school teachers do not even have information on the objectives of nursery mathematics according to Choat (1980), the fact that a child can count does not necessarily mean that he has grasped the ideal of 'numberless of number'.

Thus a better statement of objective of mathematical activities at this level is to enable pupils develop number concepts.

Table 2: teachers' responses on mathematical competencies achievable by nursery school children.

Reaching Competency	Percentage of Children			
	0-25	26-50	51-75	76-100
Can count to 50	2	3	10	85
Recognition of numerals to 50	0	2	3	95
Can write numerals 1-10	2	2	3	93
Can write numerals 11-20	10	13	20	57
Recognize ascending/descending order in numbers up to 30	83	12	4	1
Has concept of set	68	26	5	1
Understands 'more', 'less', 'equal' when applied to numbers	83	7	0	0
Can identify circle, square rectangle and triangle	3	4	7	86
Add numerals to sum of five	8	10	18	64

Table 2 shows that 85% of the teachers reported that at the end of the school year, 76-100% of their nursery school children could count to 50; 10% of the teachers reported that 51-75% of the children could count to 50; 3% of the teachers reported that 26-50% of the children could count to 50, while 2% of the teachers reported that only 25% of the children could count to 50. This shows that the percentage of teachers in the two percentages of children reaching competency is 95%. It therefore indicates that almost all children do well in this competency. In similar analysis, the table shows that the competencies which are achievable by Nigerian nursery school children include: recognition of numerals to 50; writing of numerals from one to ten; writing of numerals from eleven to twenty; identification of circle, square, rectangle and triangle, and addition of numerals to sums of five. This finding is contrary to that of Kurtz (1978), who categorized writing of numerals from eleven to twenty and adding numerals to sums of five as "questionable kindergarten competencies", and recognition of numerals to fifty as "clearly not kindergarten competency".

Table 3: Summary of teachers responses on classroom methods

I	t	e	Yes		No	
			n	%	n	%
Do you teach mathematics as a special subject in your school						
			109	51.9	101	48.1
Do you have any specific periods for mathematics in your school?						
			96	45.7	114	54.3
Is there any nursery mathematics curriculum for use in your school?						
			65	31.0	145	69.0
Do you have any adopted series for teaching mathematics?						
			155	73.8	55	26.2
Do you use manipulative materials for the mathematical activities?						
			158	75.2	52	24.8

Table 4: Summary of teachers' responses on number of periods of mathematical activities per week

Number of periods	n	%
One	9	1.4
Two	14	6.7
Three	15	7.1
Four	28	13.3
Five	150	71.4

Table 5: Summary of teachers' responses on time allotment for mathematical activities

Time	n	%
15 minutes	8	3.8
20 minutes	49	23.3
25 minutes	44	21.0
30 minutes	82	39.0
Above 30 minutes	27	12.9

Table 6: Summary of teachers' responses on class-size

Class-size	n	%
1 - 20	67	31.9
21 - 30	67	31.9
31 - 40	52	24.8
Above 40	24	11.4

Tables 3,4,5 and 6 reveal the great variation in the approaches adopted by nursery school teachers towards nursery mathematics education. A careful analysis of data in Table 3 reveals that almost the same percentage of teachers (52 and 48 respectively) reported that they teach or do not teach mathematics as a special subject in their schools. The percentage of teachers who reported that they have nursery mathematics curriculum is low (31%). This means that a higher percentage (69%) do not have nursery mathematics curriculum. In addition, the number of teachers who reported that they have an adopted series in high (about 74%). This also means that almost one quarter of the kindergarten teachers do not have an adopted series. Also greater percentage of the teachers (75%) use manipulative materials. These findings are similar to that of (Kurtz, 1978). Table 4 also indicates that the number of periods per week used for mathematical activities varies from school to school. The variation ranges from one period per week to five periods per week. Similar variation is observed in the time allocated per period, (Table 5) and also in the class-size (Table 6). These findings imply that there is no standard procedure used for nursery mathematics education in Nigeria nursery schools. This findings is confirmed by some observations made by the researcher, on mathematics lessons in some nursery schools. For instances, it was observed that while some teachers involved pupils in real activities that would enable them to develop the number concept, others use formal methods as if they are teaching older primary school pupils.

Table 7: Summary of teachers' responses on the ownership nursery schools

Ownership	n	%
Privately owned	146	69.5
Owned by institutions	64	30.5

Table 7 reveals that most nursery schools in Nigeria are privately owned.

About 70% of the teachers reported that their nursery schools are privately owned. This could be as a result of governments' encouragement of private efforts in the provision of pre-primary education (F.R.N, 1981:10).

Conclusion and Recommendation

Major results of this study have revealed that there are great variations in the procedures and methods used by nursery school teachers in the provision of mathematical experiences to nursery school children. Also, most nursery schools are established and owned private individuals. Based on these findings the following recommendations are made:

1) Federal and state governments and institutions should help in the establishment of nursery schools in Nigeria. It has been observed that as a result of the maximum profit which must be made by private proprietors of nursery schools, untrained and unqualified staff are employed to care for the children in these schools (Agwagah, 1994).

2) Federal Ministry of Education should provide the nursery school curriculum in which the objectives of nursery school experiences are clearly stated, for use in nursery schools just as in the case of other levels of education.

3) Nigerian authors should provide text for use by nursery school staff in Nigeria. It was observed that most of the adopted series used have foreign background.

4) Mathematics hand books should be produced by mathematics educators for day to day use by nursery staff. This offers teachers a working document which can be modified to meet the needs of their own children.

5) Regular supervision of all nursery schools (whether privately owned or owned by an institution), by staff of Ministries of Education, is necessary.

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