

# THE PRIMARY SCHOOL MATHEMATICS CURRICULUM MODULES AND EVALUATION OF PRIMARY MATHEMATICS INSTRUCTION

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## ABSTRACT

The Primary Mathematics Curriculum module was developed to enable teachers teach the same topic with the same methodology which is principally activity-based. The **module** helps the teacher to introduce each topic in mathematics from concrete level through semi-concrete or semi-abstract level to abstract level on which **the basic mathematical** principles are based. So for teachers to effectively teach Primary Mathematics, they must adhere strictly to demands of the module, and it involves adequate preparation of teacher's **and pupils'** activities. The module **also** ensures that auxiliary and terminal performance tests are properly assessed. To ensure adequate assessment, the author has emphasized that each correct step a child makes towards getting a correct answer should be adequately rewarded by awarding marks to methods/ steps and not just to the final answer. Finally, the primary school teachers, are urged to imbibe the ten commandments for primary school teachers, for effective teaching of mathematics at this level of our educational system.

## INTRODUCTION

### THE NEED FOR THE PRIMARY CURRICULUM MODULES

To make the use of the Nigerian Primary Mathematics Curriculum uniform and for effective teaching and uniform continuous assessment practice in all primary schools in Nigeria, the curriculum was programmed into curriculum modules. I consider the programming of the Primary Mathematics curriculum into modules the greatest thing that has happened to the primary mathematics in this country. According to Sofolahan, the Chairman, Implementation Committee for the National Policy in Education, "The composition and structure of the module will enable all teachers to teach the same topic in detail aiming at achieving the same objectives and practicing the same learning activities. This ensures uniformity in educational practice in different parts of the Federation".

### THE NEW METHODOLOGY THAT THE MODULE DEMANDS

The new methodology says that teaching is not loading the young minds with things to remember but guidance of the pupils through learning activities. On the old method Ohuche (1990:10) says:

Teachers do a lot of teaching, often struggling against the nature of the children, but the children do not do a lot of learning. What many of them do learn is to dislike mathematics, a most exciting, interesting and useful subject. Only a few children manage to survive the battle and learn to enjoy and understand mathematics.

The aim of the module is to redress the situation so that most children will find mathematics exciting, interesting and useful. To achieve this the module is filled with learning activities which includes practical work, experiment, inquiry, research work, etc. These activities make children to be active learners and discoverers. The learning activities in each level of the primary school are all appropriate to their stages of development for they have been developed as a result of research work. For effective teaching of most topics in mathematics, the topics should be introduced as suggested by the module through physical manipulation of objects -practical work. This is in agreement with the old Chinese adage which states:

I hear, I forget I see,  
I remember I do, I  
understand.

This is why the module adopted the three-stage approach for effective teaching of most topics in primary mathematics. The approach as demanded by Piaget's theory of intellectual development has been advocated by Fakuade (1981) and Ohuche (1992) includes: i) the concrete operational stage involving demonstration, manipulation, dramatization or use of games with real concrete objects. (ii) the semi-concrete or semi-abstract stage, during which pictures, drawings, models or charts are used. (iii) The final stage- the abstract symbolic stage when mathematical symbols are used.

So in introducing numbers - counting; basic operations, addition, subtraction, multiplication and division; fractions, measurements, etc. the children start initially with manipulation of concrete objects. After this stage, the concept is further elucidated with semi-concrete visual materials -pictures, drawings, models or charts. Finally, the symbolic stage accommodates introduction of symbols to replace drawings or pictures of models (Ezekute, 1995).

Example:

In primary one, the fractions half and one quarter are introduced using oranges, circular and rectangular sheets of paper this is at concrete level. At semi-concrete stage the teacher uses drawings on the chalk board or charts to show half and one quarter of objects. Finally the symbol for half -  $\frac{1}{2}$  or one-quarter -  $\frac{1}{4}$  is introduced at third and abstract stage.

### **PREPARATION FOR TEACHER'S AND PUPILS' ACTIVITIES**

The note to the teacher on Primary School Curriculum modules demands that the teachers before teaching a particular module should:-

- (a) Study each module carefully;
- (b) Prepare thoroughly pupils' learning activities that will lead to the achievement of the objective by;
  - (i) getting all the materials pupils will need for performing the activities ready;
  - (ii) get pupils to also prepare for the lesson by collecting necessary aids or perform some home work.
  - (iii) set the stage for all pupils' activities, (iv) Get all the 'leading' questions you wish to ask ready.
- (c) The teacher's role includes the following:
  - (i) prompt to start on their activities
  - (ii) guide them step by step to work towards the achievement of the objective(s).
  - (iii) provoke them to think (for themselves)
  - (iv) use the appropriate assessment techniques as they perform the learning activities.

The module also requires that you should note the following:

- (a) Do not tell the pupils what they can find out for themselves (they can however, find out from the teacher).
- (b) Suggested assessment technique are also teaching devices. Have you as a teacher been following the above guides especially while preparing to teach a lesson in mathematics? If you have not been doing that you ought to start now otherwise you may have been over teaching the children. The children should be guided through learning activities with skilful questions. Also if you find some topics difficult to teach, it is because you have not prepared adequately for the topic. A topic is difficult to teach because the teacher has not adequately prepared for the topic very well,

### **THE MODULE AND MATHEMATICS CORNER/STORE**

We now found that for effective teaching of primary mathematics we must involve pupils

in practical activities at concrete and semi-concrete stages of the learning process. Hence concrete and semi-concrete materials must be provided in the mathematics corner or store of each classroom. What to collect and keep in the corner/store are listed under teaching aids of each module.

The pupils will help the teacher in collecting counters: bottle tops, gravels, seeds, pieces of sticks, etc; containers of various types - cylinders, cubes, cuboids, ball, cartons, etc. The teacher prepares charts and tables of various types, while the proprietor with the help of the Parents Teachers' Association (P.T.A.) should provide modules, durable charts, cards, tapes, ludo, snake and ladder, chalk board instruments (protractors, rulers, pair of dividers and compasses), geoboards and other costly aids like projectors, calculators, even computers that the teacher and the pupils cannot afford.

## **ASSESSMENT**

Teachers are involved in testing pupils' performance, also called auxiliary performance test to know if the objectives of the lesson have been achieved. The second type of assessment is the terminal performance test to assess if the objectives of a module has been achieved. The third type of assessment is the summative evaluation administered at the end of each term, this assesses the performance of the pupils in all the topics and in all the modules taught within the term.

It is well known that the scores obtained by the pupils in mathematics examinations are usually the lowest compared with other subjects. This could be attributed to the fact that teachers usually give all the marks in a question to the final answer, even if a question demands sequential steps leading to the final answer.

The marking guide issued to teachers by the Anambra State Primary Education Board (A.S.P.E.B.) which set questions and prepare marking schemes for the marking of 1997/98 end-of-section examination in Mathematics in Anambra State Primary Schools, serves as a good example that encouraged awarding marks only to the final answer. No one would have passed the T. C. II examination in Arithmetic/Mathematics or the W.A.E.C. examination in school certificate ,mathematics, if all the marks for questions that require step by step solution leading to the final answer marks are broken down and allotted to each correct step that leads to the answer. If an answer is given zero. For example:

Suppose a primary six pupil is given a problem to find the area of a triangle whose base is 10cm and height 6cm.

The solution of the problem is in two steps:

Substituting correctly into the formula -  $\frac{1}{2} \times \text{base} \times \text{height}$  i.e -  $\frac{1}{2} \times 10\text{cm} \times 6\text{cm}$ .  
getting the correct answer.

So each step should get one mark each. If each step (i) earns zero, mark due to wrong use of the formula then obviously the second step. also get a zero mark.

Second example: Given the question: Find (1) the mean of the following scores: 2, 3, 2 3. 2, 1, 0, 3, 2, 4, 2, 5, 0. The solution involves adding the scores and dividing by the number of scores. Adding the scores gets one mark, for knowing that the scores should be divided by the number of scores gets another one mark and finally another one mark for getting correct answer. Hence three marks in all instead of one mark usually given to such problem by teachers. This method of evaluation;

(i) ensures that any positive effort towards getting the answer gets a reward; (ii) discourages cheating, for a pupil could just write down the answer he/she gets from a neighbour.

## **RECOMMENDATION**

It is high time this method of evaluating primary mathematics is adopted in the interest of

primary mathematics education. Scoring only the answer makes the pupils to obtain low marks, this gives the impression that mathematics is a very difficult subject reserved for the gifted. The resultant effect is that the pupils give up interest in the subject and this continues into the secondary school. So effort must be made to develop marking schemes for marking of the students scripts in either class or end of term test.

## CONCLUSION

In conclusion, each Local Education Authority is employed to provide each teacher with mathematics texts and the module of the class he/she teaches. The module should be the teacher's 'Bible'. Effective use of the module in teaching will result in effective teaching of Mathematics provided that teachers exhibit positive attitudes to the children by encouraging and rewarding them rather than employ negative attitudes, such as flogging, scolding and abusing them, for this will make them to hate the subject. The teacher should also follow the three stage-approach in introducing any topic to his/her class and should also reward every stage of the pupils' efforts that leads to the correct answer.

Finally, primary school teachers, should learn the 'Ten Commandments' for primary school teachers for effective teaching of mathematics to primary school pupils.

1. Be interested in Mathematics,
2. Know what you are to teach by preparing and getting ready all aids for pupils' activities for this will make you a confident teacher.
3. Know that the best way for pupils to understand a concept is for them to discover it themselves.
4. Read the faces of your pupils, try to see their expectations and difficulties, put yourself in their places.
5. Give them problems on real life to solve so that they can appreciate the value of mathematics in life.
6. Urge your pupils to continue to solve a problem even if they fail it at first, second or even third attempt, do not lose patience, never use abusive language on your pupils.
7. Suggest clues/hints that can help your pupils get at the answer to the problem.
8. Vary your questions from simple to difficult; questions that require recall and those that require thinking also questions that require use of hands like drawing shapes, using instruments or drawing graphs.
9. If pupils could not solve a problem, lead them gradually to the answer, do not give away your secret at once. Let them think and guess - let them find out by themselves as much as feasible,
10. Suggest the step(s) leading to the answer, do not force it down their throat for they should discover the answer (adopted and modified from Polya's *Ten Commandments for Teachers*, Sinicrope, 1995).

## REFERENCES

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**APPENDIX**

**AN EXTRACT OF PRE-PRIMARY MATHEMATICS EDUCATION CURRICULUM MODULE  
YEAR ONE – THREE YEAR OLDS FIRST TERM**

MODULE	TOPIC	UNITS OF THE TOPICS	MEASURABLE OBJECTIVES	PUPILS'S ACTIVITIES	TEACHING AIDS (A) TEACHING HINTS (H)	SUGGESTED ASSESSMENT TECHNIQUE		DURATION
						ACTIVITY	ASSES. TECHNIQUE	
ONE	Sorting and classification of assorted kinds of objects	<ol style="list-style-type: none"> <li>Sorting, classification and grouping of different kinds of objects e.g. nuts, gravels, stones, cashew nuts, bottle tops, etc.</li> <li>Sorting and grouping according to colours:- Coloured flags, various fruits, leaves, buttons seeds, etc.</li> </ol>	<ol style="list-style-type: none"> <li>Search, sort and bring together objects of the same kind.</li> <li>Search and identify by name, the objects before the class.</li> <li>Search and identify by name the colour of a named object.</li> </ol>	<ol style="list-style-type: none"> <li>Search, sort and bring together objects of the same kind.</li> <li>Search and identify by name and colour each of the objects placed before the class.</li> <li>Search and identify by name colour, a named object.</li> </ol>	<p>A)</p> <ol style="list-style-type: none"> <li>Assorted objects – palm nuts, yam seeds, bottle tops, sticks, cashew nuts gravels etc.</li> <li>One-colour objects – flags leaves, fruits, buttons, seeds, etc.</li> </ol> <p>H)</p> <ol style="list-style-type: none"> <li>Ensure that each child is involved in sorting, grouping and naming each object.</li> <li>Ensure that the colours are limited to red, yellow, green, blue, black and white.</li> <li>Accept the local name for each colour and then introduce the English Equivalent.</li> </ol>	<ol style="list-style-type: none"> <li>Ability to sort, search and bring together.</li> <li>Sort, search and name</li> <li>Sort, identify, and name the colour.</li> </ol>	2 weeks	

