AN EVALUATION OF THE PRIMARY EDUCATION IMPROVEMENT PROGRAMME (SCIENCE) IN SELECTED SCHOOLS IN JALINGO LOCAL GOVERNMENT AREA OF GONGOLA STATE OF NIGERIA

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This study has been read ard approved as meeting the requirements of the Department of Education, Ahmadu Bello University, Zaria.

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Supervisor

Date: _____

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Staff Evaluator

Date: _____

DEDICATION

This work is dedicated to my causin the late SIMON SAIDU H. ZAKU, Who, throughout his life-time, was very concerned with the welfare of his people.

May his soul rest in perfect peace

AMEN.

ACKNOLWEDGEMENTS

I wish to register my prefound gratitude to the following people.

Dr. D.P. Brown my project supervisor who in addition to supervision allowed me to use the test he developed for children. Dr. Aminu Dorayi of the Department of Education Ahmadu Bello University encouraged me to undertake the Post-Graduate work, and was always available to listen and advice on even the most trivial problems I encountered. Prof. J. Reed, Head of department of education did not only provide the moral encouragement throughout the course but also took time, despite his very crowded schedule of duty, to read and correct the scripts, thus bringing it to its final shape. Dr. M.J. Shuaibu was very patient and understanding thus giving me the courage to continue when all else seemed impossible. I also wish to thank all the staff and students of the schools I visited for the study. Thanks also go to my friends Mr. A.D. Barau of the Department of Agriculture Economics, Mr. A.A. Abede

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ABSTRACT

The Primary Education Improvement Programme (Science) took off in 1970. Three teachers guides entitled Primary Science one, two and three including work books for children had been written by 1978.

No evaluative study of the programme was made in Jalingo Local Government area of Gongola State.

This study investigated the availability of books and other instructional materials and the attendance of teachers at training sessions designed to acquaint them with the programme. It also investigated the performance of project and non-project school children on a test of process skills.

Two instruments were used to collect data in the study. They are: A questionnaire for teachers and a process test instrument for children.

The results indicated that most of the teachers were improperly trained for the programme. The result also indicated that children attending the PEIP Project schools did not perform better than

children in non-project schools.

It was recommended that teacher training be carried out at the curriculum development centre of the Institute of Education, Ahmadu Bello University Improper training of teachers seemed to be the limiting factor to the success of the programme.

CHAPTER I

1.1 INTRODUCTION

Throughout the last decade and continuing into this one Science teaching and curriculum design have witnessed great changes. The new Science curricula stress the importance of a child's discovering science concepts and principles by being involved in experiences requiring critical thinking processes.

Consequently new primary science programmes have been developed to adapt to these changes. In the United States of America, such programmes include science. A Process Approach (SAPA), conceptually Oriented Programme in Elementary Science (COPES), Elementary Science Study (ESS) and Science Curriculum Improvement Study (SCIS).

Those developed in Africa include the African Primary Science project, developed for use in East and West Africa. The Midwest Primary Science project (MPSP) and Primary Education Improvement Project (Science) PEIP) were each developed in Nigeria.

1.2 GENERAL INFORMATION ABOUT THE PRIMARY EDUCATION IMPROVEMENT PROJECT (PEIP)

The question of falling standards of education in the country in general and the northern states in particular, acted as a catalyst for starting the PEIP. It's main objective was to improve the educational standard of primary schools throughout the Northern States of Nigeria.

There are ten states in the North namely, Bauchi, Benue, Borno, Gongola, Kaduna, Kano, Kwara, Niger, Plateau and Sokoto.

The major agencies concerned with the planning and execution of the project are UNESCO, UNICEF. The Institute of Education of Ahmadu Bello University and the Governments of the Northern States.

Consultations amongs these agencies stated as far back as 1968. However it wasn't until 1970 that the first set of materials were produced and sent to schools.

1.2.1 OBJECTIVES OF THE PROJECT

The general objectives of the project were stated at initial stage of the project as follows:

1. To develop a curriculum that is more modern in its approach.
2. To create a curriculum that is for Nigerians in Nigeria, suitable for life in towns and in rural areas.
3. To develop children as individuals; imparting self-discipline, basic skills and strengthening literacy.
4. To encourage utilization of the environment
5. To accept that primary education for some 90% of the children is terminal and to establish an education that will see to their development as useful citizens in town or country.

1.2.2 CURRICULUM DEVELOPMENT

For developing the curriculum in different disciplines, subject panels were created in form of sub-committees. The disciplines include Primary Mathematics, Primary Science,

English, Vernacular, History, Geography, Physical and Health Education, Cultural Activities, Art, Music and Drama.

1.2.3 ADMINISTRATION OF THE PEIP

Administrative units were set up in each state to accept responsibility for the programme, and equipped by the Institute. The Institute also helps in training their personnel.

An administrative model[1] of the PEIP is shown in Fig. 1.1

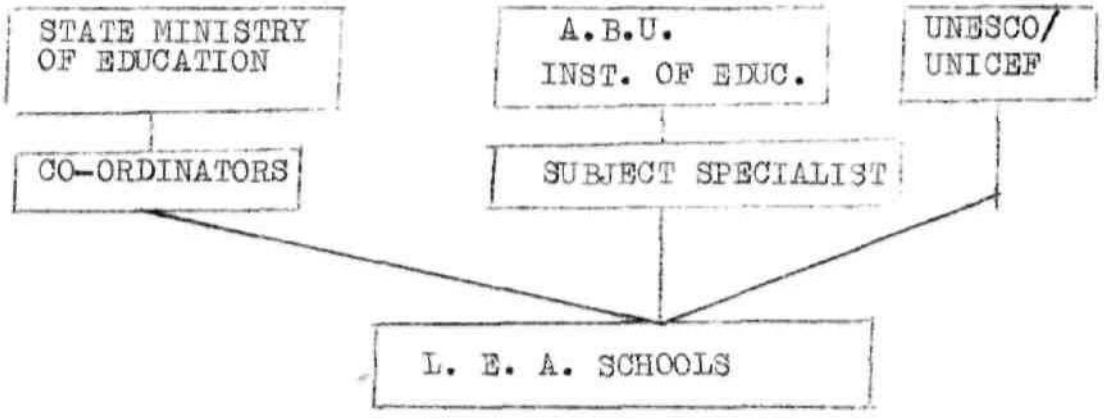


Fig. 1.1 Administrative model of the PEIP.

more, it was to collect whatever statistical data could be found in respect of children, staff, attendance at courses, results of programme participation e.g. success of teachers in improvement course.

In addition to this form of evaluation, the Institute got feedback from the schools on the quality of learning materials and their use by the teachers.

1.2.6 PEIP'S SCIENCE PROGRAMME

As in all other primary school disciplines, work on the materials for the primary science programme began in 1970. A process Approach similar to that of AAA's Science. A process Approach was used in writing the books.

By December, 1971, the first book in the form of a teachers' guide had been prepared in trial form. This book entitled primary science one consisted of detailed instructions to the teacher on how to teach the lessons to the pupils. The content of the lessons was process oriented. It envolved both teacher and pupils in activities which provided opportunities

through conferences of MTTs, which enabled them to rewrite certain lessons. The pattern of feedback in the evaluation process which took place is shown in Fig. 1.2[2]

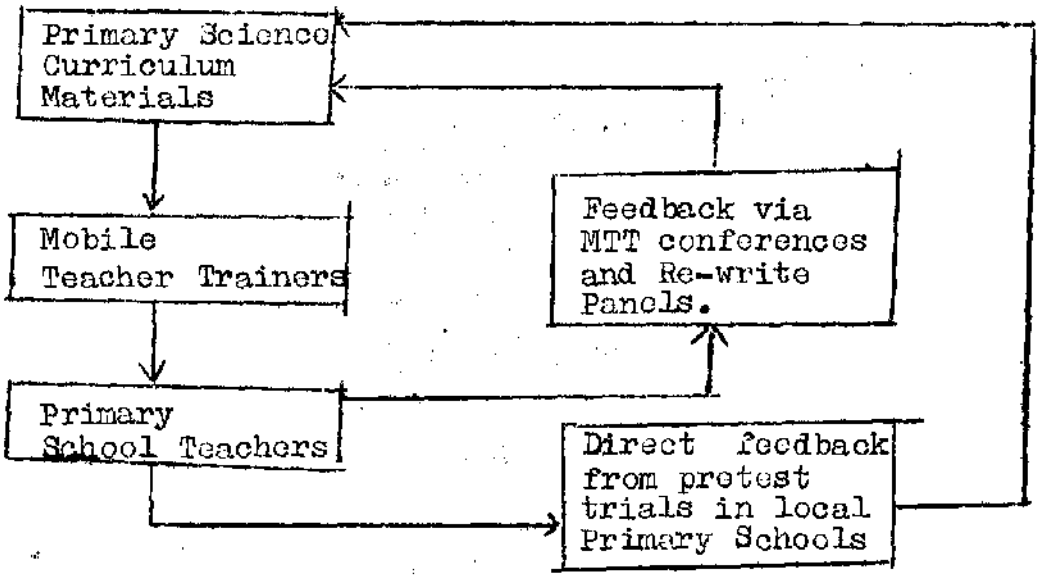


Fig. 1.2 Pattern of feedback on Primary Science One and Two.

However it wasn't until 1978, that the report of an evaluation study of the effect of the PEIP Science Programme on teacher and pupils was reported. A summary of that study carried out by

Dr. D.P. Brown of the Department of Education A.B.U. is given in chapter two of this report.

1.3 DEFINITION OF THE PROBLEM

Once a new programme was conceived and developed, the next important step was to have it evaluated. Indeed, even during the process of development of a programme it should be continously evaluated and reviewed before reaching its final form.

Evaluation can take many different forms and almost everything about the curriculum can be evaluated.

> One can evaluate anything about the schools curriculum its objectives, its scope, the quality of personnel in charge of it, the capacities of students, the relative importance of various subjects, the degree to which objectives are implemented the equipment and materials and so on.3

The PEIP (Science) was a new programme. Since its introduction into Jaligo Local Government of Gongola State no single evaluation of it has been done. The

staff at the state's PEIP centre are Concerned about the progress of the programme in this local government. When the writer called at the centre he was told by the staff, that, they would be grateful if he could help carry out such an evaluation.
Infact the writer was told to include the whole state in his study. However due to insufficient time, and inadequate financing the scope of the study was limited to one local government area. It is hoped that the study will be extended to other local government areas when time and money are no longer limiting factors.

The study is therefore an evaluation of the personnel, capabilities of students and the equipment and materials involved with the PEIP science programme in Jalingo Local Government area of Gongola State.

1.4 DELIMITATION OF THE STUDY

The study covered only Jalingo Local Government area of Gongola State, and it is limited to the first two years of primary school. Most of the project schools are just starting on the third primary science book so it could not be included in the study.

1.5 STATEMENT OF THE PROBLEM

The study sought answers to questions regarding the:

i. availability of science teachers in the primary schools

ii. availability of primary science books and other science teaching materials in the primary schools.

iii. attendance of teachers at training sessions organized for science teachers by MTTs.

iv. Science background of teachers, teaching primary science.

Also the study sought answer to the question whether or not children in PEIP project schools will perform significantly better than children in non-project schools, on a test designed to measure their ability to practice some process skills.

The following null hypotheses were tested:

Ho_1 The Primary Schools have sufficient books and Science-teaching materials.

This will be indicated by a 'Yes' response

from at least 65% of the teachers to the question whether or not they have sufficient books and materials.

Ho_2 The science teachers have been taught science when they were in school as students.

This will be indicated by a 'Yes' response from at least 70% of the respondents to the question whether or not they leanred science while at school.

Ho_3 Most of the science teachers attend ed regularly, the conferences held for science teachers.

This will be indicated by a response from at least half of the respondents, Stating that they attended the conference at least 10 times.

Ho_4 After one year's exposure to the programme, project school children will not perform significantly better in terms of total process test scores than will children in non-project schools ($\alpha = 0.05$).

Ho_5 After <u>two</u> years exposure to the programme project school children will not perform significantly better in terms of total process test scores than will children in non-project schools ($\alpha = 0.05$)

1.6 BASIC ASSUMPTIONS

The following assumptions were made in carrying out this study.

1. Children in PEIP project schools and children in non-project schools come from the same population and therefore have the same cultural background.
2. It is possible to measure the children's ability to practice process skills using the process test.
3. The responses of the teachers are accurate and reliable.

1.7 SIGNIFICANCE OF THE STUDY

As a developing country, one of the major constraints of Nigeria in carrying out its development programmes is lack of sufficient manpower, especially in the field of science and Technology. It is therefore imparative for the country to try to produce this much needed manpower by the fastest and most efficient means possible.

In this process new science programmes are developed to enhance efficient learning. A lot of money is sunk into these projects. A study like this one helps in pointing out the loopholes in these programmes and therefore makes it possible for them to be reviewed to provide better results.

Such an evaluation was carried out in some parts of the country but not in the Jalingo Local Government Area.

1.8 DEFINITION OF TERMS.

The following abbreviations and terms have been used in this write up. Their meanings are hereby given for those readers who might not be familiar with them.

ESS - Elementary Science Study

COPES - Conceptually oriented programme in Elementary Science.

ESSP - Elementary School Science Project

MPSP - Mid-West (Bendel) Primary Science Programme

APSP - African Primary Science Programme

PEIP - Primary Education Improvement Programme

SAPA - Science A process Approach

Project School - A Primary School where the PEIP programme was being used.

Non-Project School - A Primary School not using the PEIP programme.

MTT - Mobile Teachers' responsible for training and supervision of PEIP teachers.

LEA - Local Education Authority. The body charged with administration of schools at the local government level.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This chapter contains relevant literature on curriculum evaluation, a number of recently developed primary science programmes their contents and methods of evaluation.

2.2.0 CURRICULUM EVALUATION IN GENERAL

2.2.1 PURPOSE OF EVALUATION

Sponsors of programmes usually ask for the evaluation of the programmes for one of two reasons or both. They wish to find out whether the large sum of money invested in the programme is justified or is there a cheaper way of developing and running the programme. The other reason for evaluation is to find out if the programme is achieving the objective for which it had been set up to achieve.

It is assumed however, that when educationists, evaluate a curriculum they are assessing it largely from an educational point of view rather than from a political or financial one.

This study has been done purely for its educational contribution. It is done to determine the extent to which the objectives of the programme are being met and also to find out what is happening as regards staffing and provision of materials for the programme.

2.2.2. TYPES OF EVALUATION

There used to be mainly two types of evaluation. These are formative and sumative evaluation. During the process of developing a programme, the contents, materials and the methods used are continously evaluated and modifications are made on the basis of the feedback got through evaluation. This type of evaluation is known as formative evaluation, it is a part of making the curriculum. Sumative evaluation however, is done to assess the overall

value of the programme after it is has developed and used. The question it tries to answer is whether or not another approach would have been better than the one being evaluated.

In addition to the two forms of evaluation mentioned above, a new form of evaluation has been developed recently. It is known as illuminative evaluation. This type of evaluation aims at describing and interpreting what is happening in the new programme it asks the question what is happening in relation to a new programme rather than is it achieving the desired result.

Amongst other things this study intends to find out what is happening about staffing and provision of materials for the PEIP. The study therefore is partly an illuminative evaluation.

2.3 SCIENCE - A - PROCESS APPROACH (SAPA)

This elementary science programme was developed by the Commission on Science Education of the American Association for the Advancement of Science (AAAS).

It differs from the traditional science curricula in that unlike the traditional curricula planners; the planners of SAPA believe that science is much more than just a collection of facts. They believe also that children derive more from the study of science if they learn the behaviour of scientist. . They classified this behaviour into a number of process skills.

Consequently exercises for the elementary grades stressed the basic skills of observing classifying using space/time relationships, Experimenting, using numbers, communicating, measuring, inferring, predicting and manipulating. Profeciency in applying these skills provided a foundation for formulating more complex or integrated processes. Such as formulating hypotheses, controlling variables,interpreting data, defining operationally and experimenting. These integrated processes were the fundamental elements of science.- A process Approach in the intermediate grades. Success in the Programme did not depend on skills in reading but on the ability to use the processes of science.

MATERIALS FOR TEACHING THE PROGRAMME (SAPA)

Materials for teaching consisted of a kit of practical materials for children and some reading materials for the teachers only. There was no reading material for the children.

Like SAPA there were no reading materials for the children studying PEIP's primary science. This approach was adopted from SAPA having been recommended by the Nigerian Educational research contain.[5]

EVALUATION OF THE PROGRAMME

Evaluation of the long term achievement of SAPA was done by means of the science process measure. The measure was designed to assess pupils capabilities in all the basic science processes identified by the curriculum.

STUDIES INVOLVING SAPA

Numerous studies have been conducted in connection with the programme, some of these were reported by Brown.[6]

McGlathery (1968) carried out a study which contrasted the effects of instruction in SAPA and a local science programme, on the achievement of five and six year olds from different socio-economic backgrounds. He used the competency measure developed by the AAAs.

His results showed that children instructed in SAPA scored higher on the competency measure than children in the local science programme. Five and six year old children scored about equally while middle class children scored higher that lower class children on tasks requiring verbalization. However no differences were observed on non-verbal tasks.

Using the science competency measures and an investigator developed informal interest inventory. Partin (1967) found that students who have experienced SAPA scored higher on the informal inventory and the SAPA comptency measure, when compared to students who had used a textbook.

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EVALUATION OF THE ESS

Though formal evaluation of the programme was possible, the programme developers relied more on informal evaluation of the students by the teachers, who are actively involved in the study.

Many of the units also contained suggestions about independent projects to be attempted by the students. The ability of a student to carry out one of these projects on his own, they feel, is a measure of what he has learned.

> "Since much of what we hope to teach is basic to all learning, and since we offer fundamental intellectual tools and try to promote attitudes of inquiry, it is possible to judge what a child has learned from a given unit not only by the amount of information he retains, but also by his approach to new studies in science and in other fields by the skills he has acquired, and by the habits of mind he evidences8.

Like the ESS the developers of PEIP also rely heavily on feedback from teachers and Mobile Teacher Trainers. The approach might have been adopted from the ESS.

2.5 AFRICAN PRIMARY SCIENCE PROGRAMME (APSP)

INTRODUCTION

Like America, Africa has also witnessed the development of new science programmes to reflect the change in instructional strategy. One of such programmes is the African Primary Science Programme (APSP).

The APSP and PEIP being African programmes were both developed in Africa for African children. In fact some APSP materials were used as source materials for the PEIP science.[9]

DEVELOPMENT OF THE APSP

The programme was sponsored by the Educational Services incorporated (E.S.I.) later known as the Educational Development Centre (EDC) Newton Massachusetts, U.S.A.

Conferences involving science educators and Ministry officials from eleven English, Speaking African Countries, as well as from Europe and the U.S. were held in Nigeria (1965) Tanzania (1966) and Ghana (1967) to discuss the development of the programme.

Initial writing started after the Nigerian conference, followed later by further development of trial materials in Nigeria, Ghana, Kenya, Uganda, Tanzania and Malami and, as a result 40 units in form of teachers guide were produced.

Emphasis of the APSP was the child the child's participation in the learning was high. This trend was later adopted for the PEIP.

OBJECTIVES OF APSP

No clear objectives were laid down at the beginning of the programme. It was left for the people charged with the task of evluating the programme to identify some objectives of the programme for the purpose of evaluation. Thus the following list of objectives were compiled.[10]

The APSP aimed at the development of the following characteristics in children.

1. First hand familiarity with a variety of biological, physical and man made phenomena in the world around them.

2. Interest in further explaration of the world around them on their own initiative.
3. Ability to find out for themselves, to see problems and to be able to set about resolving them for themselves.
4. Confidence in their own ability to find out for themselves and do things for themselves.
5. Ability toshare in a common development of knowledge, through collaborating on problems, talking, listening and descriminating use of second hand sources.

EVALUATION OF APSP

In 1967 E.A. Yoloye of the University of Ibadan was invited to take charge of evaluation activities. Together with a group of seven experts, they identified three broad categories of events that would be evaluated. These were:

1. Relevant conditions prior to the introduction of the programme.
2. The various kinds of interactions and activities that take place during the

development and presentation of the programme.

3. Effect of Introducing the programme on various categories of people and possibly things.

Duckworth (1971) carried out a two phased study in Kenya. He compared children who had been exposed to the APSP with those who had not been exposed, in terms of the variety of ideas that the children had about what to do with materials and also in their performance on specific tests.

The results showed that children exposed to APSP performed significantly better than those not exposed to APSP in terms of the variety and complexity of what they did.

According to Mr. Yoloye (1971) the reports of evaluation showed that the key problem of the programme was teacher training. Teacher training, he contended, might well be the most crucial factor defermining the success or failure of any new programme.

It is noteworthy that Brown (1978) also states that teacher training is one of the two limitations to

PEIP (science) success, the other being availability of instructional materials.

2.6 THE MID-WEST (BENDEL) STATE PRIMARY SCIENCE PROJECT (MPSP)

Introduction

Another programme developed in Africa is the Mid-West (Bendel) state Primary Science project. It was developed by the then mid-western state government of Nigeria at about the same time as the PEIP. Like the PEIP it was assisted by UNESCO and UNICEF.

Objectives

The objectives of the programme were to enable the children to acquire

(a) a habit of keen observation

(b) an attitude of enuqiry

(c) the habit of exploring experimenting and recording data.

(d) basic concepts of cause and effect.

It was also hoped that the teacher would be able to

(a) select and organize suitable learning experiences involving simple experiments.

(b) devise different techniques and materials for teaching primary school science.

(c) Review the curriculum critically and suggest desirable changes.

The major difference between the PEIP and the MPSP was in the training of teachers. In the PEIP, classroom teachers are trained by Mobile Teacher Trainers, whereas in the M.P.S.P. the classroom teachers are trained directly at the curriculum development centre. Infact with the MPSP teacher training is one of the main objectives.

EVALUATION OF MPSP

Four douices were used to collect information for the evaluation of the programme. These were:

1. Interviews with the Ministry officials, education officiers, and personnel at the

curriculum development centre to determine the extent of the project plan implementation.

2. Questionnaires to determine the project plan implementation, the background and training of teachers, the teachers views about the units and the in-service training.
3. An achievement test to determine the impact of the project on class five children.
4. A class interaction sheet to measure interaction between children and teachers in the classroom.

2.7 STUDIES INVOLVING PEIP (SCIENCE)

In 1976, Mrs Lapai[12] and Yates[13] of the department of Education of the Ahmadu Bello University carried out a study on the evaluation of the PEIP (science) in Bida and Kagoro Local Government Areas of Niger and Kaduna States respectively. Using a process test instrument designed by Dr. D.P. Brown of the same department, they compared children in Project Schools with those in non-project schools. Their results showed that children in project schools in Kagoro performed significantly better ($\alpha = 0.01$) than

children in non-project schools. In Bida, however, there was no significant difference in the performance of children from the two groups.

In 1977, a group[14] of students from the Department of Education Ahmadu Bello University carried out a survey of qualifications, background and training of PEIP and Non-PEIP teachers in Bida, Kano, Maiduguri, Ayangba, Ilorin, Keffi and Sokoto.

Their results showed that the percentage of teachers who passed Grade II or Grade III was the same (30%) for both groups.

Amongst PEIP teachers 90.9% had studied some science, while 87.7% of the non-PEIP teachers had also studied science.

A more extensive study of the PEIP science programme was reported by Dr. D.P. Brown of the Department of Education of the Ahmadu Bello University. He evaluated the PEIPs Science programme in classes II and III. His study covered the attainment of the science objectives in terms of the children ability to practice process skills and also the children's interest, active

participation and understanding of the lessons. He also assessed the availability of materials and ease of preparing and teaching the lessons for the teachers.

Data was collected by means of teacher opinionionnaires and c children's test to measure the attainment of process skills. The test of process skills was designed to measure children's skills in observation, prediction, measurement, inference, classification, communication and formulating hypotheses and problem solving.

His results showed that some teachers did not teach science, because of lack of science materials. The results of the childrens test showed some significant differences in total test scored in favour of children in PEIP schools after one year of primary school, but none after two years.

CHAPTER 3

DESIGN AND PROCEDURE

3.1 INTRODUCTION

This chpater contains information about data collecting instruments including their design and the procedure used in administering them. Tho chapter also contains information on how the data collected will be analyzed.

THE DATA COLLECTING INSTRUMENTS

Two Instruments were used for collection of data in this study. They are:

1. A questionnaire for the teachers.
2. A process test instrument for children in classes two and three of some selected project and non-project schools.

3.2 THE TEACHER QUESTIONNAIRE.

DESIGN OF THE QUESTIONNAIRE

The questionnaire used in this study was designed by the writer. It was presented to a group of ten (10) masters degree students of the department of Education, for their comments and criticism. Their comments served as a basis for modification of the questionnaire. The modified form of the questionnaire was presented to three lecturers and five masters degree students, who agreed to within 80% with each other as to the validity of the questionnaire.

The reliability of the questionnaire was also established. Reliability of a questionnaire is the ability of the questionnaire to consistently solicit the same information from the same respondent when administered more than once. The writer interviewed some of the respondents about one month after they had filled and returned some sample questionnaires. The object was to find out if they would give the same answers, they had given in the questionnaires. About 75% of those interviewed gave the same or

similar answers to the ones they had given in the questionnaire, with only minor deviations. With these results the questionnaire was considered valid and reliable enough for use in the study.

The questionnaire sought the following information from the teachers.

1. Their teaching qualifications.
2. Teachers attendance at training sessions for PEIP Science teachers.
3. Availability of books and materials in schools.
4. Teachers' assessment of the PEIP (science).

To all the questions the respondents indicated their responses by simply putting a tick in the box which they felt best respresented their answer, out of a number of answers suggested on the questionnaire.

SAMPLING AND ADMINISTRATION OF THE TEACHERS QUESTIONNAIRE

The questionnaire was sent to almost all the schools in Jalingo Local Government Area. The writer wanted to

ensure that a substantial number of the questionnaires would be returned.

A total of fifty-six (56) questionnaires were completed and returned. This represented about 57% of the total sent out. Of these, 45 were from teachers teaching science in project schools.

PROCEDURE FOR ANALYSIS OF TEACHERS ' RESPONSES.

The responses by the teachers were tabulated and the percentage for a particular respond to a question was worked out for the purpose of comparison with the percentage of another respond to the same question.

3.3 THE PROCESS TEST INSTRUMENT USED IN THE EVALUATION OF THE PEIP.

Three tests were used to test the children's skill in observation, classification and measurement. These tests were designed by Dr. D.P. Brown of the Department of Education, Ahmadu Bello University, Zaria. Dr. Brown himself used the tests to evaluate the performance of classes I, II and III children in project

and non-project schools, as a study that was submitted as a Doctorate degree thesis.

DESCRIPTION OF THE SUBTESTS

SUB-TEST ONE - OBSERVATION

This subtest contained three items viz dog, lorry and man. Children were required to put together in a meaningful way cut up pictures of (1) a dog, (3pieces) (2) a man (6 pieces) and a lorry (6 pices). The maximum score obtained for each test item was two marks.

SUBTEST Two - MEASUREMENT.

The subtest comprised five men of different sizes drawn on paper cards. The child was asked to arrange them in order of size beginning with the shortest to the tallest.

SUBTEST THREE - CLASSIFICATION

Circular and Square shaped cards of two different colours and sizes were given to the pupil to arrange according to colour, size and shape.

SAMPLING AND ADMINISTRATION OF THE TEST.

A random selection of 10 pupils from each of classes 2 and 3 was made. This was done by taking the first three names on the class register of pupils plus three names from the middle of the list on the register plus the last four names on the register. The names of the children appeared in alphabetical order on the register.

The pupils were called one by one into an empty room provided by the Headmaster/Mistress within the school building, where the test was administered to them. (See appendix for method of administration). The child was allowed two trials for each test.

Children from three project and three non-project schools were tested. The schools are:

1. Hassan Primary School.
2. Mohammed Nya Primary School
3. Dan Lya Primary School.
4. Nukkai Primary School
5. Mohammed Tukur Primary School
6. Mafindi Primary School.

The first three are project schools while the last three are non-project schools.

The medium of instruction was Hausa this being the medium of instruction used by the teachers in the schools.

Table 3.01 Number of children tested. in Project Schools N = 60.

	School 1	School 2	School 3
	No. of children	No. of Children	No. of Children
Class 2	10	10	10
Class 3	10	10	10

Table 3.02 Number of children tested in Non-project schools N = 60.

	School 1	School 2	School 3
	No. of Children	No. of Children	No. of children
Class 2	10	10	10
Class 3	10	10	10

PROCEDURE FOR ANALYSING THE RESULTS OF CHILDREN TEST

The analysis was done mainly with the help of a calculator. The maximum score obtainable on the test of observation is six, that of classification is three and that on measurement is two.

The mean scores of children on the three tests were tabulated. The standard deviation for each child was then worked out. Using the total of the mean score and standard deviation, a one tailed t-test was used to determine whether or not, project schools performed significantly better than non-project school children.

The formula used was

$$t = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{S_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad \text{for} \quad (\quad = 0.05)$$

where $S_p^2 = \frac{(n_1 - 1)\, S_1^2 + (n_2 - 1) S_2^2}{n_1 + n_2 - 2}$

$V = n_1 + n_2 - 2$

$\bar{X}_1$ - Mean score of project school children.

$\bar{X}_2$ - Mean score of non-project school children

S_1 - Standard deviation of project school scores

S_2 - Standard deviation of non-project school scores

n_1 - Number of children tested in project schools.

n_2 - Number of children tested in non-project schools.

α - Level of significance.

CHAPTER 4

4.1 INTRODUCTION

This chapter contains (i) the results of the teachers' questionnaires (ii) the results of the children's process test and (iii) an analysis and discussion of these results.

4.2 RESULTS OF TEACHERS ' QUESTIONNAIRE

A total of fifty-six (56) teachers returned their completed questionnaires, of this number fourty five (45) indicated that they taught primary science in project schools. Since the questions were directed to mainly science teachers, the writer used those fourty five questionnaires returned by project school science teachers for analysis and discussion.

Teachers' Responses concerning their educational background.

The teachers were asked to indicate their qualfication, by putting a tick in the appropriate

box, out of a number of boxes depicting various qualifications (see Appendix for questionnaire).

Their responses showed that of the fourty five (45) teachers teaching science, S ix had the teachers grade two certificate, twenty one were pivotal grade two teachers (that is to say they had attended and passed an orientation course for non-teacher college graduates, after completing their secondary education).

Thirteen of them had completed only their secondary education three hold the teachers grade three certificate while two were primary six/seven school leavers. These results are shown below.

Table 4.01 Teachers' qualifications.

QUALIFICATION	Gr. II	Pivotal Grade II	Sec. Schools	GR.III	Primary VI/VII
Number of Teachers	6	21	13	3	2
Percentage of Total	13.3	46.7	28.9	6.7	4.4

Teachers' Responses concerning their Science background.

In this question, teachers were asked to indicate whether or not they were taught science when they were students. Fourty three teachers indicated that they had, had some training in science.

Table 4.02 Teachers' Science Background.

Total Number of teachers	Those with Science background	Percentage of total
45	43	95.6

Teachers Responses concerning attendance at PEIP training Sessions.

In this question teachers were asked to indicate approximately the number of times they had attended the training sessions held for them by the Mobile Teacher Trainers.

These training sessions were designed to acquaint the teachers with the philosophy behind

the new science programme, and also to teach them how to use the Instructional Materials provided in teaching their pupils.

The sessions were held at least once in two weeks. This had been going on for about two years. On the average about twenty five sessions had been held.

Two of the fourty five teachers indicated that they had attended at least twenty training sessions. One person attended between fifteen to nineteen sessions. Eight attended an average of ten to fourteen sessions. Fifteen teachers attended five to nine sessions while nineteen teachers attended less than four sessions.

Number of training sessions	No. of teachers who attended	Percentage of Total
Less than 4 times	19	42.2
5-9 times	15	33.3
10-14 times	8	17.8
15-19 times	1	2.2
above 20 times	2	4.4
Total	45	100.0

Table 4.03 attendance of teachers at PEIP training sessions.

Responses of teachers concerning their reasons for not attending the PEIP (science) training sessions.

Teachers who did not attend all the training sessions held by the Mobile Teacher Trainers, were asked to indicate the most important reason for their

failure to attend.

Fifteen out 45 teachers said their places of residence are too far from the training centre. Nineteen had other commitments eight said they tried at least once but could not understand what was being said and so stopped attending. Table 4.04 shows these results.

Reason	No. of teachers	% of total
I was not informed	8	17.8
I had other commitments	19	42.2
My house is too far from the training centre.	15	33.3
I tried at least once, but did not understand.	3	6.7
Total	45	100.0

Table 4.04. Teachers' Reasons for not attending Training Sessions.

4.3 ANALYSIS AND DISCUSSION OF TEACHERS RESPONSES

Teachers' Academic and Professional Qualfication.

Most (95.6%) of the teachers indicated that they had been taught science while at school. In the light of this result hypothesis Ho_2 is accepted. This hypothesis states that most of the science teachers had been taught science during their training as student teachers. The condition for its acceptance was stated in chapter 1, that is, that at least 70% of the teachers have to indicate that they were taught science when they were students.

The responses of teachers also shows that most of them (75.6%) have attended the secondary school. This also indicates that they have had at least some courses in General Science (This subject is taught to all junior forms in the secondary school).

The tendency is for the Headmasters to assign ~~those~~ grade of teachers to teach the primary science on the assumption ~~that~~, having had some training in general science they would be good science teachers.

However, it is essential to note that the type of science they learned is completely different from the way science is now being taught. In the secondary schools in this countty the stress is on science content rather than process. Therefore the fact that these teachers were themselves taught science does not quarantee their ability to teach primary science effectively.

Teachers' attendance at PEIP training Sessions.

75.5% of the teachers indicated that they attended the training sessions less than ten times. While only about 24.5% attended at least ten times. Hypothesis Ho_3 is therefore rejected. For the hypothesis to have been accepted, at least 50% of the teachers should have indicated that they attended the training sessions at least ten times.

The teachers gave various reasons for their anability to attend the training session. In most cases (75.5%) it was either because they had other commitments or their places of residence are too far from the training centre,

As I have pointed out in the previous section, the fact that a teacher was himself taught science, does not guarantee that he will do well when instructing pupils in a PEIP primary science class. The PEIP science programme represents a completely new approach to science teaching. It is an approach which the teacher himself is not familiar with. For this reason, it is essential that teachers attend regularly training sessions designed to familiarize them with the new method.

Availability of books and other instructional materials.

The responses of teachers shows that most of the schools have sufficient books and other instructional materials for teaching primary science. Hypothesis Ho_1 is therefore accepted since 71.1% of the teachers indicated that they had sufficient books and materials.

4.4 RESULTS OF CHILDREN'S TEST IN PROJECT AND NON-PROJECT SCHOOLS.

In using the test to determine whether or not there is any difference between children in project schools and those in non-project schools; it is assumed that both groups of children have the same socioeconomic background. Also it is assumed that there was no special criteria used in sending children to either project or non-project schools, thus children found themselves in either of the schools purely through a process of random selection. Under these conditions if the tests were administered to children from project and non project schools on their first day at school there would have been no significance difference in their performances. It is assumed, therefore, that any significant differences exhibited in their performances after they have had some training in school can be attributed to differences in the instructional procedure.

Mean scores of class two children in Project and Non-Project Schools (Test of hypothesis Ho_4)

The children in class two projects schools have had at least one full year of instruction using the PEIP (science) method. Those in non-project schools however had at least one full year of instruction using the traditional method. The mean total scores obtained by these two groups and their standard deviations are shown on table 4.06.

Class two	Number of children	Mean	Standard Deviation
Project Schools	60	20.56	6.72
Non-Project Schools	60	20.05	7.65

Table 4.06 Mean total scores and standard deviation for class two children.

Using the formular given in chapter three of this report, it was found that at 0.05 there was no

significant difference between the two mean scores. Therefore hypothesis Ho_4 is accepted. The hypothesis states that after one years exposure to PEIP. Project school children will not perform significantly better than children in non-project schools.

Mean Scores of class three children in Project and Non-Project Schools (test of hypothesis Ho_5)

Class three	Number of Children	Mean	Standard Deviation
Project Schools	60	26.71	7.01
Non-Project School	60	24.89	9.56

Table 4.07. Mean total scores and standard deviation for class three children.

An analysis of the results obtained by the class three children (Table 4.07) using the t-test at 0.05 shows that there is no significant difference between the total scores of children in Project and

non project schools. Hence hypothesis Ho_5, which states that after two years' exposure children in project schools will not perform significantly better than children in non project schools, is accepted.

DISCUSSION OF CHILDREN'S TEST RESULTS.

The results showed that the children in project schools do not perform any better than those in non-project schools. Even though in both classes two and three, the total mean scores of children in project schools is higher than that of children in non-project schools the difference is not significant (0.05) this means that in terms of learning of processes skills by children, there has been little or no gain made as a result of the PEIP science programme.

In trying to explain this result, it would be good look at the factors that contribute to children learning. Several factors are responsible for enhancing learning by children. However all but two of the factors are the same for the two groups of children. These are materials, Books and Teachers.

The study has shown that materials and Books for PEIP science are available in most project schools. The study has also shown that most of the PEIP science teachers are ill prepared to teach the lessons properly. Since most of the teachers were not regular in their attendance at training sessions, their performance in class as tea hers cannot be any different from their counterparts in non-project schools.

It could even be argued that non-project school teachers may perform better because they are dealing with familiar methods, whereas project school teachers have to deal with methods they might have never encountered.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION.

The Primary Education Improvement Project (Science) (PEIP) is one of several programmes recently developed for teaching science in the elementary school. Like most of the other programmes. The PEIP (science) programme is process oriented. So the child learns mostly by manupulating objects.

The PEIP science is being sponsored by the UNICEF/UNESCO, the Institute of Education of the Ahmadu Bello University and the Governments of the Northern States comprising Gongola, Bauchi, Plateau, Sokoto, Kwara, Benue, Kaduna, Kano, Niger and Borno States. The UNICEF/UNESCO provide some of the funds and axperts in science teaching, while the Institute of Education takes charge of training of personnel and production of books and other instructional materials.

So far three books on primary science have been written and are currently in use at the Primary Schools. Classroom teachers for this programme are trained by Mobile Teacher Trainers who are in turn trained at the Curriculum Development Centre of the Institute of Education.

5.2 SUMMARY OF THE PROBLEM.

After the first two years of the programme an evaluative study of the programme was undertaken by Dr. D.P. Brown of the Department of Education, Ahmadu Bello University. He covered most but not all of the Northern States. Gongola state is one of the newly created states, as such the programme had a late start in the state, before then a few number of schools run the programme in the state when most of it was part of the then North Eastern State. With the curving out of the state, more schools became involved with the PEIP Science programme. New Local Governments were formed, for some of these , even though the PEIP science programme had been in operation, it had never been evaluated. One of such local government areas is

Jalingo Local Government Area. This study is therefore an evaluation of the PEIP science programme in Jalingo Local Government Area.

The study investigated the availability of books and other instructional materials and the attendance of teachers at PEIP science training sessions held for PEIP science teachers. It also investigated the performance of project and non project school children on a test of process skills.

5.3 Summary of Procedure

Two instruments were used to colect data in this study. They are.

1. A questionnaire for the teachers.
2. A process test instrument for the children in classes two and three of some selected project and non-project schools.

The teachers questionnaire sought the following information from the teachers:

1. Their teaching qualifications.
2. Teachers attendance at training sessions for PEIP science teachers.

3. Availability of books and materials in schools.

Three tests were used to test the children's skill in observation, classification and measurement. In the subtest for observation, the child was required to put together in a meaningful way cut out pictures of (1) a dog (3 pieces) (2) a man (6 pieces) and a lorry (6 pieces). The subtest for measurement comprised five men of different sizes drawn on paper cards. The child was asked to arrange them in order of size beginning with the shortest. The subtest on classification contained circular and square shaped cards of two different colours and sizes. The child was asked to arrange them according to colour, size and shape.

Sixty children from three project schools and sixty from three non-project schools were tested. The tests were administered to the child individually from the rest of the children.

A t-test was used to analyze the result.

5.4 Summary of Results

The results of the study showed that most (95%) of the teachers had been taught science when they were

students. Also that the majority of them did not attend the training sessions organized to give them the necessary orientation for teaching the primary science. The results also showed that in most schools, books and other instructional materials were available.

The results of the children's test showed that there is no significant difference in terms of performance on a process test between project and non-project school children.

5.5 Conclusion

The inescapable conclusion one may draw from the result of this study is that the PEIP science programme is not having the desired effect upon the children's learning of science processes. Also that most teachers do not attend the training sessions organized for them.

5.6 Recommendations

The results of this study show that one cause of the poor performance of the children in project schools is lack of effective teaching. For the PEIP science programme to make any meaningful impact upon the children's learning there is need for a better organized

system of training for teachers. The present system is inefficient for the following reasons.

The writer observed that some of the Mobile teacher trainers in Gongola state are British nationals on voluntary service in the country. These people, most likely did not know of the existance of PEIP (Science) until they got to Nigeria. Yet within their short stay in Nigeria they are expected to be trained, so that they can inturn train others, In most cases they spend a maximum of two years in the country, so at the end of this term fresh people are trained to take over from them. This will certainly lead to inefficiency and lack of continuity and of course lost of valuable time.

Another problem is the translation of the instructions in the teachers guide books to the local language for the purpose of instructing the children. Most of the class room teachers are not familiar with the programme. Their own instruction is done in English, one would expect that they would find it difficult to translate what they learn, and what is written in the books into the local language. This observation is

made in the light of the fact that, the products of our teachers colleges are not very proficient in English, they may not even be able to read and write the local language properly, though proficiency in both English and the local language must have been assumed by the programme developers.

In addition to the problems mentioned above, the responses of the teachers showed that most of the teachers are reluctant to attend the training sessions.

For a short term solution of the teacher training problem the writer suggests that the Institute of Education should run the training sessions for classroom teachers on a part time basis. The teachers should be trained directly by the Institute staff at the curriculum development centre in Zaria. These sessions can be run during the summer when the schools are closed for holidays. Also the teacher trainers should try to explain to the teachers how they may give certain instructions in the local language.

The long term solution of the programme, of course lies in incorporating the PEIP training programme into the existing syllabus for student teachers, so that by the time the student graduates he is already familiar with the PEIP science programme.

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APPENDIX I

Please leave blank

THE TEACHER QUESTIONNAIRE

Please leave blank

Introduction

This questionnaire is designed to collect information, which may help in the assessment of the Primary Education Improvement (Science) Programme (PEIP).

It will be very much appreciated if you could answer the questions which follow.

You are assured of complete ananomity. You may even leave out your name if you so wish.

Thank you.

Yours faithfully,

A.B.D. Zaku
Post graduate Student
Dept. of Education,
A.B.U. Zaria.

Please Leave blank

Please Leave blank

SECTION 1.00 BIOGRAPHIC DETAILS

1.01 NAME (Optional)

(insert X in the appropriate box)

1.02: SEX. ☐ MALE ☐ FEMALE ☐

1.03 AGE

Under 25 yrs ☐ 25-30 ☐ 30-35 ☐

35-40 ☐ 40-45 ☐ 45-50 ☐

50-55 ☐ above 55 ☐

SECTION 2.00. EDUCATIONAL BACKGROUND

This section contains some questions about your educational background. Please indicate your answer by putting a check in the appropriate box.

2.01 EDUCATIONAL BACKGROUND

N.C.E. ☐ TEACHER GRADE TWO CERTIFICATE ☐

SECONDARY/I I/OTAL ☐ WASC ☐

PRIMARY SEVEN ☐ GRADE III ☐

OTHERS (Please Specify)

APPENDIX I

TEACHERS' QUESTIONNAIRE (CONT)

Please leave blank

SECTION 3.00 THE PEIP PROGRAMME

This section contains questions about the PEIP (Science). Please indicate your answer by putting a check in the appropriate box.

3.01 Do you know of the existance of the PEIP (Science Programme)? Yes ☐ No ☐

3.02 Are you interested in Science?

Yes ☐ No ☐

3.03 Do you like teaching science?

Yes ☐ No ☐

3.04 Do you teach the PEIP (Science) Lessons?

Yes ☐ No ☐

3.05 Have you ever attended the training session organized for science teachers at the T.T.C. Jalingo?

Yes ☐ No ☐

Please leave blank

If yes How many times less then 4 times [ ]

5-9 - times [ ] 10-14 times [ ]

15-19 times [ ] above 20 times. [ ]

If No which of the following reasons would you say prevented your attendance.

I live far away from the training centre [ ]

I tried at least once but did not understand [ ]

I was not informed . . . . . [ ]

I had other commitments. . . . . [ ]

3.06 Has your attendance helped you in your teaching of science?

Yes [ ] No [ ]

3.07 Do you have enough books and other instructional materials for teaching science?

Yes [ ] No [ ]

3.08 How would you assess the performance of your pupils in the science class

Very good [ ] Good [ ]

Average [ ] Below average [ ]

APPENDIX 1 Contd.

3.09 How would you assess the PEIP Science programme

Very successful ☐

Successful ☐

Failure ☐

3.10 What are your suggestions for the improvement of the programme.

(Please feel free to make whatever comment you like)

APPENDIX 2

TERM ITEM	INSTRUCTIONS TO TEST ADMINISTRATOR	DIALOGUE WITH THE CHILD.
Man	Assemble the pictures of the man, Dog and Lorry one at a time. Then ask the child to reassemble them.	Here is a picture of a man, cut up in pieces, atch how I put the pieces together to make the man. ow put the pieces to-gether like I did.
Dog	Allow 75 seconds for 1st trial and if he fails allow him another trial. 2 marks.	Now this one is a dog's picture. Look at the way I put the pieces to-gether. Okey, put the pieces together as I did.
lorry	for successful 1st trial and mark for the 2nd trial no mark for more than one trial.	Can you see this picture of a lorry. Now arrange the pieces together to make a lorry as I did.

APPENDIX 2 Contd.

TEST ITEM	INSTRUCTIONS TO TEST ADMINISTRATOR	DIALOGUE WITH CHILD
Measurement	Arrange the cards containing drawing in order shortest to longest drawing	See how I have arranged this drawings. Can you arrange them as I did starting from the shortest to the longest drawing? Okay do it.
Classification.	Mix up the card board pieces of different sizes, shapes and colours, in front of the child. Ask him to put them into 2 groups. After the first grouping ask him to put them again into another different grouping. Finally ask him to try and put the pieces into another possible 2 groups.	See those pieces of card board? I want you to put them into two groups each containing similar objects. I want you again to put them into another two groups different from the first one.

TEST ITEM	INSTRUCTIONS TO TEST ADMINISTRATOR	DIALOGUE WITH THE CHILD.
	different from the 1st 2nd groupings scoring - I mark each for successful grouping into colour, shape and size.	C n you put them into another 2 groups again different from the first two Try it and see.