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CONTENTS

<i>Authors</i>	<i>Articles</i>	<i>Page</i>
Mrs. F.V. Falaye	Enhancing Classroom Teaching and Learning using Team Teaching.....	1
Odinko, M.N. and Osokoya, M.M.	A Survey of Instructional Needs of Primary School Teachers in Nigeria.....	11
Ibode O. Felix	Classroom Management and Use of Instructional Aids.....	22
T. W. Yoloye	Restoring Confidence in the Nigerian Education System Through Standard Evaluation Strategies.....	30
E. A. Adenike Emeke and B. Biodun Odetoynbo	Evaluation of Teachers' Knowledge of the Objectives of the Nigerian Integrated Science Programme and Implementation Strategies: Implications for Pedagogical Practices.....	43
Heoma Isiugo-Abanihe and Olubunmi Serifat Labo-Popoola	School Type and Location as Environmental Factors in Learning English as a Second Language.....	55
C.V. Abe and O.A. Adepoju	School, Teacher and Student factors as correlates of Environmental Knowledge.....	64
Esther A. Odulowu	Early Childhood Education in Nigeria: A slogan or a reality?.....	72
Ayo Ojebode and Sola Sonibare	A Little more than a Strong Urge: An Investigation into the Influence of Radio Reading Programmes on Listeners' Practice of Reading.....	79
Martins Fabunmi	The Role of Gender on Secondary School Students Academic Performance in Edo State, Nigeria.....	90
J. Ghenga Adewale	Are Head Teachers' Leadership Techniques Predictors of Classroom Teachers' Motivation to Work? A Study in School Effectiveness.....	99
Olusegun Akinbote and C.M. Ogunranti (Mrs)	Nigerian Teachers' Perception of Creativity Among Pre-School Children.....	107
Adeyoju, C. Adetola, Oluwole, D. Adebayo and Aremu, A. Oyesoji	Comparative Study of Creative Potentials of African and European 8-10 year old Pupils.....	115
Onuka, A.O.U.	Achievement in Common Entrance Examination as a predictor of achievement in Junior Secondary School Business Studies.....	126
Abu Peter Brai	Non-formal Education and Emancipation of the Adult Learners.....	135
Joseph A. Adegbile	Application of the 'ATO' Model In The Evaluation of the Junior Secondary School Programme.....	142
Peter B. Abu and Akintayo D. O.	Measuring Human Organization in Adult Education: Application of Likert principles.....	150
Ajibola O. Falaye	The Development and Validation of the Falaye Adolescent Sexual Behaviour Inventory (FASBI).....	158
Ibeagha, P. N.	Parenting styles as predictor of adolescent coping strategies among peers in Ibadan.....	171
Osiki Jonathan Ohiorenuan	Adolescents in Cacodaemonomania: The African Sub-Regional Review to the Psychopathology and the Challenge to Clinical Counselling.....	179
J. O. Olukotun	Ophthalmologic Pathologies and their Phenomenal Antecedents on a Sample of the Blind and Partially sighted Learners.....	188
'Supo Jegede	Knowledge and Attitude of Nigerians Concerning Immunization. A case study of Ekiti State Residents.....	199

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Dr. G. H. Adenuga
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West African Journal of Education (WAJE)

(For enhanced quality of research and discourse on Education)

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CONTENTS

1.	Enhancing Classroom Teaching and Learning using Team Teaching - <i>Mrs. F. V. Falaye</i>	1
2.	A Survey of Instructional Needs of Primary School Teachers in Nigeria - <i>Odinko, M. N. and Osokoya M. M.</i>	11
3.	Classroom Management and Use of Instructional Aids - <i>Ibode O. Felix</i>	22
4.	Restoring Confidence in the Nigerian Education System Through Standard Evaluation Strategies - <i>T. W. Yoloye</i>	30
5.	Evaluation of Teachers' Knowledge of the Objectives of the Nigerian Integrated Science Programme and Implementation Strategies: Implications for Pedagogical Practices - <i>E. A. Adenike Emeke and B. Biodun Odetoyinbo</i>	43
6.	School Type and Location as Environmental Factors in Learning English as a Second Language - <i>Ifeoma Isiugo-Abanihe and Olubunmi Serifat Labo-Popoola</i>	55
7.	School, Teacher and Student factors as correlates of Environmental Knowledge - <i>C. V. Abe and O. A. Adepoju</i>	64
8.	Early Childhood Education in Nigeria: A slogan or a reality? - <i>Esther A. Odalawu</i>	72
9.	A Little more than a Strong Urge: An Investigation into the Influence of Radio Reading Programmes on Listeners' Practice of Reading. - <i>Ayo Ojebode and Sola Sonibare</i>	79
10.	The Role of Gender on Secondary School Students Academic Performance in Edo State, Nigeria - <i>Martins Fabunmi</i>	90
11.	Are Head Teachers' Leadership Techniques Predictors of Classroom Teachers' Motivation to Work?: A Study in School Effectiveness - <i>J. Ghenga Adewale</i>	99
12.	Nigerian Teachers' Perception of Creativity Among Pre-School Children - <i>Olusegun Akinbote and C. M. Ogunranti (Mrs)</i>	107

13.	Comparative Study of Creative Potentials of African and European 8-10 year old Pupils - <i>Adeyoju, C. Adetola, Oluwale, D. Adebayo and Aremu, A. Oyesoji</i>	115
14.	Achievement in Common Entrance Examination as a predictor of achievement in Junior Secondary School Business Studies - <i>Onuka, A.O.U.</i>	126
15.	Non-formal Education and Emancipation of the Adult Learners - <i>Abu Peter Brai</i>	135
16.	Application of the 'ATO' Model In The Evaluation of the Junior Secondary School Programme - <i>Joseph A. Adegbile</i>	142
17.	Measuring Human Organization in Adult Education: Application of Likert principles - <i>Peter B. Abu and Akintayo D. O.</i>	150
18.	The Development and Validation of the Falaye Adolescent Sexual Behaviour Inventory (FASBI) - <i>Ajibola O. Falaye</i>	158
19.	Parenting styles as predictor of adolescent coping strategies among peers in Ibadan - <i>Ibeagha, P. N.</i>	171
20.	Adolescents in Cacodaemonomania: The African Sub-Regional Review to the Psychopathology and the Challenge to Clinical Counselling - <i>Osiki Jonathan Ohiorenuan</i>	179
21.	Ophthalmologic Pathologies and their Phenomenal Antecedents on a Sample of the Blind and Partially sighted Learners - <i>J. O. Olakotun</i>	188
22.	Knowledge and Attitude of Nigerians Concerning Immunization: A case study of Ekiti State Residents - <i>Supo Jegede</i>	199

Editorial

It is with great pleasure, enthusiasm and hope that the resuscitated edition of the West African Journal of Education (WAJE) is presented to our readers and potential contributors. We are glad to announce that a number of the problems which made to "giant" in the comity of Journals - almost go into extinction, are being taken care of.

Although a specific theme was not attached to this edition, issues centering around instructional techniques, evaluation methods, reading enhancement, creativity, the place of factors such as school, teacher and student factors in academic performance emerged from the articles. Other issues like parenting, immunization, adolescent sexuality and psychology of some "bizarre" phenomena were also covered.

In exploring ways of enhancing pedagogical outputs, Falaye recommended cooperative teaching strategy (team teaching) as a veritable approach. Odinko & Osokoya, convinced of the need to enhance teaching effectiveness, especially at the primary school level, sought to establish the profile of perceived instructional needs of primary school teachers so as to provide empirical basis for curriculum input in teacher training and in-service programmes directed at increasing the number and quality of primary and secondary school teachers.

Evaluation strategies adequately conceived and properly used can, as opined by Yoloje, restore confidence in an educational system, thereby promoting educational development. As if to give credence to the above, Emeke and Odetoyinbo evaluated teachers' knowledge of the objectives of the Nigerian Integrated Science Programme and found that though teachers have adequate knowledge, their present practice of problem and project - based strategies need to be highly improved upon. Environmental knowledge is an important component of a school curriculum and this, probably is the reason why Abe and Adepoju examined how some school, teacher and student variables predict students' environmental knowledge.

English Language learning and promotion of the culture of reading took the attention of Isiugo-Abanihe and Labo-Popoola and the duo of Ojebode & Sonibare. While Isiugo-Abanihe and Labo-Popoola found significant effects of school type and location as environmental factors in the learning of English

as a second language, Ojebode & Sonibare, using the in-depth interview technique found that radio reading programmes promoted the culture of reading within the population studied.

Three of our featured articles focused on early childhood education and the issue of creativity among pre-and primary school children. Oduolowu, after examining government's efforts in the realm of provision, supervision and control, concluded that childhood education programme in Nigeria is a reality and not a mere slogan. The duo of Akinbote and Ogunranti realizing the important role of the school, and indeed the teacher, in the development of creativity in school children, studied teachers' perception of creativity among pre-school children in twenty-five approved schools, and found that male & female teachers differ significantly in their perception of creativity in pre-school children. Jointly working on the comparative study of creative potentials of African and European 8-10 year olds, Adeyolu, Oluwole and Aremu found significant differences in the two indices of creativity (academic potentials and problem - solving skills) among African and European children. At the secondary school level, Onuka in his study of the predictive validity of the Common Entrance Examination for achievement in the second year of secondary school, found a positive correlation between the common entrance examination and achievement in the first year of secondary school.

Moving from the formal to the non-formal educational sector, Abu examined the impact of non-formal education on adult learners. The study revealed that non-formal education had promoted, within the population studied, self-reliance, enhanced participation in socio-economic development and relevance in various vocational jobs. Still focusing on adult education, Abu and Akintayo in their study found that the Rensis Likert's Human Organization Measurement approach is relevant and is capable of enhancing financial management in adult education programmes.

The adolescent period has attracted attention over the years and researchers keep studying the central figure of this period — the adolescent. Three of our contributors devoted their studies to the adolescent. Ibeagha studied the relationship between parenting styles and coping strategies of adolescents in the final year of secondary school education. The results indicated among, other things that emotion - focused coping strategy — had an inverse relationship with authoritarian parenting styles. Falaye in her own contribution to the adolescent study, developed and validated an instrument appropriate for research and counselling in adolescent sexual behaviours. Osiki in his own study looked at the situation of adolescents in Cacodaemonomania and

concluded that while clinical practice should be actively directed to divert the African position to its beliefs, professionals need continuous training to be relevant.

Our last two featured contributors focused on special areas. Olukotun studied ophthalmologic pathologies and their phenomenal antecedents on a sample of visually impaired learners. He found that though the ophthalmologic pathologies have adverse effects on various spheres of these persons' lives, the differences between the blind and the partially sighted learners were not significant. Jegede in his bid to remind all that health is a basic need of life which enables full utilization of all facilities that can make life better, richer and more meaningful, studied the knowledge and attitude of mothers in a community concerning immunisation. Results indicate that while majority of the mothers have adequate knowledge and positive attitude towards immunization, a significant difference existed between mothers that respond positively to immunization and those that do not.

In all, this resuscitated edition is rich, and is an indicator to what to expect in the future. We hereby encourage you to send in your well researched articles as well as position papers to the West African Journal of Education.

- Editor

Evaluation of Teachers' Knowledge of the Objectives of the Nigerian Integrated Science Programme and Implementation Strategies: Implications for Pedagogical Practices.

Dr. E. Adenike Emeke and Dr. B. Biodun Odetoyinbo
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Abstract

The study which is essentially exploratory, investigated Integrated Science teachers' knowledge of the objectives and implementation strategies of the Nigerian Integrated Science Curriculum. Fifty two teachers randomly drawn from the schools within the eight educational zones in Oyo State were involved. The results showed that teachers have the knowledge of the objectives of the programme. The implementation strategies also employed are purely lecture and enquiry. The implications for pedagogical practices are discussed.

Introduction

The hurried introduction of Integrated Science into Nigerian secondary schools is no longer news, for this is well documented in literature (Bajah, 1978; Mani, 1981; Jegede, 1983; Ogunniyi, 1983; Boyejo, 1990; Egbugara, 1992). What is, however, crucial is that after over three decades of its introduction into Nigerian schools, the training of specialists in this subject area is still a source of concern (Balogun, 1983; Maduabum, 1990; Onwu, 1992; Ezech, 1999). The issue to be addressed here is, "if Integrated Science can be taught by any science teacher, why is it that it has been made a separate science subject and has even been proposed as a core subject for Senior Secondary Schools?" (NPE, 1998). This issue of the proposed new status further underscores the importance of Integrated Science as a subject with its own distinct objectives as a curriculum of instruction.

Though Integrated Science has suffered from a conceptual definition, The Biological Sciences Curriculum Study's view of Integrated Science is:

a course which presents students with opportunities to uncover concepts from each of the sciences during the year in a substantial way and to make coherent connections between them. (BSCS 2000)

Integrated Science is also a process approach to the study of science and the definition given to it by Bajah, Emeke & Yoloje (1988) is still relevant today. They defined Integrated Science as "a process of description and classification of all forms and processes of life and matter in such a way as to show unity in science".

The objectives of the curriculum also lend support to this view and this is broadly stated below. Integrated Science is a course which should help the child to:

- (a) gain the concept of the fundamental unity of science
- (b) gain the commonality of approach to problems of a scientific nature
- (c) gain an understanding of the role and function of science in everyday life and the world in which he/she lives (FME, 1985, p. 3).

Expressed in another way, Integrated Science is a course that is presented in such a way that it:

- (i) is relevant to the child's need and experience
- (ii) stresses the fundamental unity of science
- (iii) lays adequate foundation for subsequent specialist study
- (iv) adds a cultural dimension to science education (FME, 1985, p.3)

The introduction of Integrated Science into schools implies a change from the status quo and the status quo can only be changed if the agents of change themselves are informed. The knowledge of the objectives of a curriculum is central to its implementation for objectives or aims of any programme are expected outcomes or goals and the appreciation of this knowledge only comes through training. It is also to be noted that to actualize the objectives, the content is the vehicle hence the objectives weaved around the child's environment.

Also related to the issue of the knowledge of objectives are the implementation strategies employed by teachers of Integrated Science. In line with the objectives, the curriculum planners expected among other things that the teachers of Integrated Science will "be willing to improvise materials and explore the environment with children without being afraid of failure" (FME, 1985, p.3). It was also recommended that two double periods of forty minutes per period be allocated to Integrated Science per week so as to allow for children's activities, discussions and out-of-classroom work (FME, 1985, p.4). The obvious truth is that teachers are central to implementing the vision of a project. Researchers over the years have reported the use of expository method as the main strategy employed by the Nigerian teachers of Integrated Science (Odubunmi, 1981; Olarewaju, 1982; Boyejo, 1990; Ibrahim, 1999). Has this practice changed? Will teachers' knowledge of the objectives affect the strategies they employ? What are the implications of all these for pedagogical practices? These are the posers the study intends to empirically seek answers to.

Research Questions

1. Are the teachers of Integrated Science acquainted with the objectives of the Integrated Science Curriculum?
2. What strategies do teachers adopt in the teaching of Integrated Science?
3. What are the implications of 1 and 2 for pedagogical practices?

Methodology

(a) *Sampling procedure and Sample*

Oyo State is stratified into eight educational zones consisting of thirty three local government areas. Simple random sampling was used to select forty percent of the local government areas thus resulting in the choice of thirteen local government areas. Simple random sampling was again used to select two schools from each local government area and two teachers from each school. The total sample consists of fifty two teachers from twenty six schools within thirteen local government areas from the eight educational zones in Oyo State.

(b) *Instrument*

Three instruments were used for the study. The Integrated Science Objective Scale (ISOS) constructed by these researchers consists of ten items weaved around the objectives of Integrated Science as stated in the Core curriculum for Integrated Science and it is designed to measure Integrated Science teachers' knowledge of the objectives of the programme. The reliability coefficient using Cronbach alpha method after administering to a representative sample of thirty teachers of Integrated Science yielded a value of 0.72. Implementation Strategies Scale (ISS) was also developed by the researchers and it consists of ten items and this is designed to measure the strategies employed by the teachers in the implementation of the programme. The reliability coefficient using Cronbach alpha yielded a value of 0.78. Since it is known that teachers at times pay lip service to some laudable objectives when asked to fill questionnaires, the researchers decided to observe the teachers using Integrated Science Classroom Observation Schedule (ISCOS).

ISCOS is an instrument developed and validated by the 2000/2001 M.Phil. / Ph.D. students of the International Centre for Educational Evaluation (ICEE) along with the lecturer—Dr Isiugo-Abanihe to measure reading instructions with inter rater reliability of 0.60 using Scott's formula. It was modified and adapted for Integrated Science classroom practices. It consists of three categories and twenty-six subcategories. Category 1 is designed to measure instructional behaviours of teachers and it consists of ten subcategories; Category 2 is the methodology aspect and it has five subcategories while Category 3 in the instrument is designed to elicit information on pupils' engagement in the class and it is made up of ten subcategories. Employing Flanders' method, coding was done every three seconds in a forty minutes lesson with a subcategory for other activities not specified to make it an all inclusive instrument. Six lessons were observed in order to compute the inter rater

reliability using Scott's formula and this yielded an inter rater reliability coefficient of 0.73.

Data collection and Analysis

The two questionnaires were administered to the teachers with the help of two assistants apart from the researchers while the observation schedule was used to observe three teachers from three schools randomly selected. Each was observed on three occasions in order to further authenticate the submissions of the teachers in the ISS. In all, nine observations were carried out. Frequencies, percentages and mean were the statistical tools used to analyze the information gathered from ISOS and ISS while ISCOS was analyzed qualitatively.

Results

RQ1: Are the teachers of Integrated Science acquainted with the objectives of the Integrated Science Curriculum?

Result: Numerical strength was attached to the scale in order to enable us calculate the mean on each item and as such, 4,3,2, 1 were attached to positive statements while the reverse was done for negative statements. The result is presented in Table 1.

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Table 1: Teachers' knowledge of the objectives of Integrated Science

Serial No	Statements	Strongly Agree SA	Agree A	Disagree D	Strongly Disagree SD	Mean X
*1.	An Integrated Science (IS) teacher should feel confident teaching his/her subject area only	10(19.2%)	4(7.7%)	6(11.5%)	32(61.5%)	2.12
2.	Integrated Science should be organized around themes like systems, energy, water, regardless of the scheme of work	13(25.0%)	8(15.4%)	5(9.6%)	26(50.0%)	2.58
3.	Integrated Science is for all students regardless of their future choice of career	33(63.5%)	8(15.4%)	2(3.8%)	9(17.3%)	3.50
*4.	Decisions about what to teach the Students should be based on the content of the recommended textbook	17(32.7%)	7(13.5%)	5(9.6%)	23(44.2%)	2.90
5.	An understanding of the connections that exist between the disciplines of science is essential to the development of a student's scientific literacy	27(51.9%)	12(23.1%)	3(5.8%)	10(19.2%)	3.50
*6.	Students should be tested for factual information only at the end of the term due to time constraint	24(46.2%)	2(3.8%)	8(15.4%)	18(34.6%)	2.92
7.	Curriculum that helps to accomplish the goals of teaching should be selected and adapted.	24(46.2%)	12(23.1%)	3(5.8%)	13(25.0%)	3.29
8.	Opportunities to engage in scientific discussions and debate should be provided to Integrated Science Students	30(57.7%)	9(17.3%)	3(5.8%)	10(19.2%)	3.50
9.	Integrated Science teaching should focus on students' understanding and use of scientific knowledge, ideas and inquiry process	33(63.5%)	9(17.3%)	3(5.8%)	7(13.5%)	3.63
10.	The content of Integrated Science weaved around the child's environment makes application to real life possible	33(63.5%)	7(13.5%)	-	12(23.1%)	3.54

* Negative items

From Table 1, it would seem that teachers of Integrated Science have the knowledge of the objectives of the programme. Sixty three point five (63.5%) percent of the teachers strongly supported the fact that the subject is to be taken by all students (item 3). The broad objective of Integrated Science is the promotion of science literacy especially at the junior level and 51.9% strongly agree that teaching the sciences as a connected whole is central to achieving this aim (item 5). Again 57.7% of the teachers claim to provide opportunity for interaction while 63.5% also lay claim to the use of inquiry process which is basically the "expected" in Integrated Science. While 61.5% express confidence in their ability to handle all aspects of the course 50% of the sample decried the testing of factual information all in the name of time constraint. These responses indicate that teachers have the knowledge of the objectives of Integrated Science. The average mean of the items is 3.15. It can therefore be safely concluded from the result above that the teachers of Integrated Science are acquainted with the objectives of Integrated Science.

RQ2: What strategies do teachers adopt in the teaching of Integrated Science?

Result: Numerical strength was also attached to the scale in order to enable us calculate the mean on each item and as such, 3,2,1 were attached to positive statements while the reverse was done for negative statements. The result is presented in Table 2.

Table 2: Teaching strategies adopted by teachers of integrated science

Serial No	Statements	Frequently F	Occasionally O	Never N	Mean \bar{x}
1.	Allowing students to find out things for themselves	27(51.9%)	24(46.2%)	1(1.9%)	2.50
2.	Allowing students to use local materials for science experiment	22(42.3%)	26(50.0%)	4(7.7%)	2.35
*3.	Postponing some activities to allow students to read their textbooks in the class for better understanding	4(7.7%)	24(46.2%)	24(46.2%)	1.62
*4.	Teachers ensuring that all projects are carefully selected and planned by him for the students	35(67.3%)	10(19.2%)	7(13.5%)	2.54
5.	Encouraging students to always work on their own rather than group work	23(44.2%)	27(51.9%)	2(3.8%)	2.40
*6.	Teacher using the lecture method to cover many topics.	9(17.3%)	20(38.5%)	23(44.2%)	1.73
7.	Teacher demonstrates while students observe carefully	32(61.5%)	17(32.7%)	3(5.8%)	2.56
8.	Allowing students to formulate hypotheses, control variables and set up experiments to test hypotheses	11(21.2%)	28(53.8%)	13(25.0%)	1.96
9.	Giving students much time (at least 1/3 of the period to observe, record, organize, generalize and then report on their activities	15(28.8%)	29(55.8%)	8(15.4%)	2.13
10.	Encouraging individual students to proceed further with a particular activity he/she has interest in privately.	21(40.4%)	25(48.1%)	6(11.5%)	2.29

*Negative items

The teaching strategies recommended for the teaching of Integrated Science are supposed to be research oriented, activity based and child centered. Statements 1, 2, 5, 8, 9; and 10 in Table 2 reflected these. Whereas 27 (51.9%) of the teachers claimed to allow students to find out things for themselves on a frequent basis, 22 (42.3%) agreed to the use of local materials by students frequently. On a regular basis, 23 (44.2%) claimed to encourage students to work on their own while 11 (21.2%) submitted that they allow students to formulate and test hypotheses frequently. The idea of independent work is also alluded to in items 9 and 10 as 15 (28.8%) and 21 (40.4%) respectively of the teachers claimed to do this frequently.

Items 3, 4, 6, 7 pointed to teacher oriented approach. Surprisingly however, 9 (19.3%) of the teachers claimed to use lecture method frequently. In order words, strategies other than lecture method are used by the teachers as claimed by them.

Classroom observation carried out revealed otherwise as presented in the Tables below where A, B and C represent/ three teachers from three different schools. Three lessons were observed per teacher giving a total of nine lessons. Each lesson has a duration of forty minutes, thus for the nine lessons, three hundred and sixty minutes or twenty one thousand six hundred seconds was the total amount spent on the observation. Since coding was done every three seconds, a total of seven thousand two hundred clerking is expected for the nine teachers on each category. Tables 3a, 3b, and 3c representing the three categories are presented below:

Table 3a: Results of Classroom Observation of Instructional Behaviours

Category	A	B	C	Total (%)
Lecture (L)	1000	1520	1440	3960(55.00)
Explain concept (EC)	480	40	420	940(13.06)
Give Directive (GD)	130	170	50	350 4.86
Question low order (L)	420	670	280	1370 19.03
Question high order (QH)	70	-	-	70(0.97)
Treatment of pupils' responses (PR)	60	-	80	140 1.94)
Ask pupils to comment (PC)	240	-	-	240 3.33
Make reference (Chart, model) (REF)	-	-	-	
Assess pupils (AP)	-	-	130	130 1.81
Give practical work (PRA)	-	-	-	

From Table 3a, lecture method dominated the strategies followed by explanation of concepts. The questions asked were mainly low order ones that do not require much thinking. Practical work was neither conducted nor references made to any chart or model. This is quite contrary to expectations in a science-based class.

Table 3b: Result of Classroom Observation of Methodology Adopted

Category	A	B	C	Total (%)
Chalk and talk (CT)	1280	1760	2120	5160(71.67)
Discussion (DI)	320	-	50	370(5.14)
Enquiry (EN)	800	640	230	1670(23.19)
Demonstration (DE)	-	-	-	-
Practical (P)	-	-	-	-

The teaching method is mainly expository with recourse to enquiry occasionally as revealed in Table 3b. Discussions were rarely held while demonstrations and practicals were alien to the classrooms observed.

Table 3c: Results of Classroom Observation of Pupils' Engagement

Category	A	B	C	Total (%)
Listen to teacher (LT)	1760	1720	2080	5560 (77.22)
Copy from chalk board (CC)	-	-	-	-
Make observation	-	-	-	-
Set experiment (SE)	-	-	-	-
Handle equipment (HE)	-	-	-	-
Take measurement (TM)	-	-	-	-
Record observation (RO)	-	-	-	-
Work out example (WO)	-	-	-	-
Answer teacher's question (AQ)	560	680	280	1520(21.11)
Ask self initiated question (SQ)	80	-	40	120(1.67)

Table 3c reveals that the students are passive participants in the classroom and this is contrary to expectation. An ideal Integrated Science Class is supposed to be a beehive of activity and not a graveyard but the teacher has the role of making the class lively.

Discussion

The discussion will focus on research question 3, posed as: What are the implications of research questions 1 and 2 for pedagogical practices?

The results obtained from this study indicated that though the teachers have the knowledge of the objectives of the programme, this does not translate into better implementation. The implications of all these are discussed presently. The Students offering Integrated Science are between the ages of twelve and fifteen. Though in Piaget's theory of learning, this is the formal operational stage in which they are expected to think in abstract terms; in reality many of the students have not

outgrown the need for concrete referents. Even adults resort to concrete operational behaviours at times. A good pedagogical practice will prioritize intellectual activity based on actual experiences rather than on language. The implication of this is that Integrated Science will be effectively taught if concrete referents are used and this is definitely not through lecture method. In actual fact, the expository method employed by the teachers does not reveal the revisionary character of the programme though in their response to the items on knowledge of the objectives, they agreed that Integrated Science students should be actively involved in classroom activities by providing them with opportunities to engage in scientific discussions and debates. Similar studies carried out by Odubunmi (1981), Olafewaju (1982) and Boyejo (1990) also corroborated the fact that teaching methods employed are basically expository, borne partly out of lack of training. Ogunniyi (1983) is of the opinion that only teachers who are aware of the logic of the programme through training are in a better position to implement the programme.

Another plea is that children be allowed to do their own learning. Good pedagogy according to Piaget must involve presenting the child with situations in which he/she experiments in the broadest sense of the term—trying things out to see what happens, manipulating symbols, posing questions and seeking his/her own answers, reconciling what he/she finds one time with what he/she finds at another time (Constance, 1974). This is in line with the recommendation of the core curriculum in which it is stated that “the teachers of Integrated Science will be willing to explore his environment with children without being afraid of failure” (FME, 1985, p.3)

A teacher of Integrated Science is supposed to help the students develop the spirit of inquiry through various activity-based strategies. Pupils have to reinvent science rather than merely following its findings. The thematic approach of the content of Integrated Science has an underlying assumption that the structural ideas consists mainly of critical or regenerative concepts from which the whole edifice can be reproduced without the need to cram multitude of facts. This presupposes that a course in Integrated Science should teach the child what science is and how a scientist works. The modern day concept of science is one that is a continuous dubitable process and not just an epitome of truth that is not open to question. The implication of the foregoing is that teachers should encourage acquisition of knowledge in such a way that it leads to the discovery of other knowledge. In fact, the society is in need of process-oriented persons or persons who are able to handle themselves and the situations of which they are a part with adequacy and ease, since such persons are the contributors to as well as the recipients of society's resources. In essence, no matter the level of awareness of the teachers with regard to the objectives of the programme; a formal training that will equip the teacher with the logic and practice of integration is necessary for better implementation through the use of appropriate strategies.

Conclusion and Recommendation

When Integrated Science was introduced into Nigerian junior secondary schools, it was the hope of the proponents that it might just be the needed tonic towards the technological breakthrough the nation so much desired. This assumption is premised on the following:

- It is a valuable and viable alternative because it engages a greater diversity of students
- It reflects the reality of the natural world — (Global village)
- It makes science relevant and connected to the lives of a diversity of students—it takes science out of the classroom into the immediate environment of the students.
- Problem and project- based strategies recommended for implementation of integrated approach blur the boundaries of the sciences and allow students to investigate a range of concepts across the disciplines thus presenting the students with “a need to know”
- Not all are personally or academically inclined to go into the sciences, hence integrated science is a viable option for meeting the science literacy needs of a diversity of students.

Much of what obtains in our classrooms, as further corroborated by this study, shows that the implementation strategies are a corruption of the intentions of the programme. We will like to conclude our findings on the note that though there is a programme in place for the training of pre-service teachers of Integrated Science, a further step should be taken to ensure that these teachers are not trained by specialists in the separate disciplines for it goes without any gainsaying that teachers teach as they are taught. In a study carried out by Ibrahim (1999) on evaluating the pedagogical competence of JSS Integrated Science teachers he submitted that the lessons were inconsistent with the nature of the subject and the learner. If the so much desired technological breakthrough is not to elude Nigeria, there is a need to appraise the whole enterprise of ‘sciencing’ through Integrated Science. This approach remains the only viable option for catching the young generation and thus producing a scientifically literate society.

References

- Bajah, S. T. (1978). *Meaning and philosophy of integrated science*. Journal of STAN. 16, pp 26-32
- Bajah, S. T. Emeke, E. A.; & Yoloye, T. W. (1988). *Integrated Science*, Ibadan: Heinemann Educational Books (Nig.) Ltd. pg. 1.
- Balogun, T. A. (1983). Training of teachers of integrated science. Annual conference proceedings of STAN. 24, 29-44.
- Biological Sciences Curriculum Study (2000) *Making Sense of Integrated Science. A guide for High Schools*. Colorado Springs, CO: Author.
- Boyejo, B.B. (1990) *Integrated Science objectives and students disposition to science*. An unpublished M.Ed project, University of Ibadan.
- Constance K. (1974). Pedagogical Principles derived from Piaget's Theory: *Relevance for Educational Practices* in Milton Schwebel and Jane Raph (eds); *Piaget in the classroom* (Rutledge and Kegan Paul London) pp. 199-215.
- Egbugara, U.O. (1992).. Pre service education of Integrated Science teachers in Nigeria. A paper presented at the international workshop on Integrated Science teaching, College of Education, University of Ibadan.
- Ezeh, D. N. (1999) Evaluation of the implementation of the Integrated Science programme in the state owned Colleges of Education. Annual conference proceedings of STAN. 40, 162-166.
- Federal Government of Nigeria, National Policy on Education. NERDC Press, 1998.
- Federal Ministry of Education (1985) *National Curriculum for Junior Secondary Schools*.
- Ibrahim, A. (1999) Evaluating the pedagogical competence of JSS Integrated Science teachers. Annual conference proceedings of STAN. 40, 138-142.
- Jegede, O. J. (1983) *Integrated Science in Nigeria: A review of the problems and prospects*. Annual conference proceedings of STAN. 24, 209-219.
- Maduabum, M. A. (1990) *Crisis in Integrated Science classroom. Reflection on Integrated Science teacher education in Niger*. JSTAN; 26, (6) 19-24.
- Mani, T. C. (1981) *The gap between the intended and the operational forms of NISP*. Annual conference proceedings of STAN. 22.
- Odubunmi, E. O. (1981) *Integrated Science teaching strategies and pupils attitudes to the subject in some secondary schools in Oyo State of Nigeria*. An unpublished M.Phil project, U.I.
- Ogunniyi M.B. (1983) *The Logic and Practice of Integration in Science in Nigeria*. Annual Conference Proceedings of STAN, 24, pp 47-50.
- Olarewaju, A. (1982) *Attitudes and teaching methods of some Integrated Science teachers relative to the NISP and students achievement*. An unpublished M.Ed project, U.I.
- Onwu, G.M. (1992) *In service education of Integrated Science teachers in Nigeria*. A paper presented at the international workshop on Integrated Science teaching, College of Education, University of Ibadan.
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