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LEA 2006 Conference Papers

During the LEA Conference, close to 100 participants presented papers based on their individual or group research during the parallel sessions (see Program below). These participants had the opportunity to submit their papers to be published on-line or in the upcoming LEA Conference book which will be published in March 2007. Below are the participants who agreed to have their papers published on this web-page. Please click on the author's name and paper title to view the document. The papers are listed in alphabetical order.

Heidi BISETH, South Africa's Education Language Policy and Practice: The Perspective of the "Other"

Anne-Marie DAUPHINE-TINTURIER, Langue, Culture et Education

Jeanne DINA, Le Malgache, langue ecrite depuis l'epoque precoloniale

Øyvind EIDE, Who takes care of the legacy? Archiving the digital outcome of the ALLEX project

Godwin IROKABA, Effectiveness of the Application of the ASL/English Bilingual Philosophy in the Pedagogy in Deaf Education in Africa

Safarani KALOLE, Language Problems in Tanzania Secondary Schools. Experience in Answering Essay and Summary Questions in the Certificate of Secondary Education Examination

Nobutaka KAMEI, The Birth of *Langue des Signes Franco-Africaine*: Creole ASL in West and Central French-speaking Africa

Andrea KISO, Focusing on language structure: A literacy project in Malawi

Azaveli Feza LWAITAMA and Anna Martha van GREEKEN, Language choice, empowerment and the administration of justice in Tanzania: Salient features and key questions

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Birgitte RASMUSSEN, About "Storytelling" as an educational approach in an inclusive setting for all children

Francoise UGOCHUKWU, Dictionaries and Language Education - the Igbo case

Program from LEA 2006 Conference

EFFECTS OF YORUBA AND ENGLISH MEDIA OF INSTRUCTION ON STUDENTS' ACHIEVEMENT IN BIOLOGY IN SELECTED LAGOS STATE SECONDARY SCHOOLS OF NIGERIA

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Paper presented at the Languages and Education in Africa (LEA) Conference held in the Institute for Educational Research, University of Oslo, Norway between 19 – 22 June 2006.

Abstract

The study determined the effect of Yoruba and English languages as media of instruction on students' achievement in Biology in four randomly selected secondary schools in Ojo Local Government Area of Lagos State, Nigeria. Using a 2 x 2 pretest, post-test, control quasi experimental design, an achievement test in Biology (ATBIO) and a questionnaire on Students' Attitude to Biology (SATBIO) were administered to a total of 120 randomly selected senior secondary III students. Teaching and learning guides in Yoruba and English languages respectively were also prepared and used in the study. Two hypotheses were generated and tested in the study at 0.05 level of significance. Data collected were subjected to the students' t-test. Results showed that students taught using Yoruba performed better than their counterparts in the English medium class (t (118) = 10.92; P <.05). Attitude was found not to be significant (t (118) = .98; P > .05). It was therefore recommended that government should make the use of mother tongue as medium of instruction policy go beyond the lower primary level.

Introduction

Biology occupies a special position in the senior secondary school curriculum in Nigeria. In the National Policy on Education (2004), each secondary school student is expected to study at least a science subject (one of Biology, Chemistry, Physics or Health Science). Biology is mostly registered for in the Senior Secondary Certificate Examination (SSCE) of West African Examination Council (WAEC) and the National Examination Council of Nigeria (NECO) by science, arts technical and social science oriented students.

Evidence, however abound that students are not performing well enough in Biology and other science subjects at SSCE. Ali (1990), Ogunleye (2002), Oshokoya (2005), Adesemowo (2005) and Odubunmi (2006) noted that there had been a steady increase in failure rates of secondary school students in these science subjects (Biology, Chemistry and Physics) over the years. Odubunmi and Tsepa cited in Odubunmi (2006) reported that Basotho students perceived the genetics, evolution and microbiology of their biology learning as difficult. They noted that when students find the learning of concepts difficult in a subject, they might end up hating that subject. The declining performance of students in Biology, Chemistry and Physics in SSCE of

WAEC in Nigeria between 1994 – 2004 is hereby presented in the following table:

Table 1: Performance of Students in SSCE Science Subjects 1994 - 2004

Year	Biology		Chemistry		Physics	
	Total Entry	% of Credit Pass	Total Entry	% of Credit Pass	Total Entry	% of Credit Pass
1994	508,384	11.40	151,232	23.70	146,000	14.7
1995	351,353	18.90	133,188	36.70	120,768	18.9
1996	506,628	15.90	144,990	33.50	132,768	12.8
1997	609,026	15.80	172,383	23.60	157,700	9.4
1998	637,021	34.45	185,430	21.40	172,223	11.34
1999	745,162	27.81	223,307	31.08	210,271	36.57
2000	639,020	19.31	201,369	31.89	193,052	30.06
2001	995,345	23.25	301,740	36.25	287,993	34.46
2002	1,047,232	31.39	309,120	34.89	298,059	47.66
2003	931,219	43.14	288,324	50.98	280,880	47.56
2004	838,945	30.83	275,078	38.97	270,028	51.02

Source: WAEC ANNUAL REPORTS

One of the impediments to the effective science teaching and learning in Nigeria according to Abdullahi (1980) is the use of foreign language – English as medium of instruction. Oshokoya (2005) reports that science educators believe that students are under-achieving as a result of the language of instruction. Language, as a medium of communication according to Umoru-Onuka (2002) determines largely the success of any educational programme. Language is the vehicle of thinking that helps a child to understand whatever knowledge is being imparted to him, hence language and thought like body and soul are intricately interwoven.

To prevent a child from stunted academic growth and development, the child must acquire a high degree of linguistic and communicative competence in the language of instruction (Makinde, 2004). The language of instruction should necessarily be the child's mother tongue – a language in which the child has the highest linguistic facility for effective oral and written communication. This is attested to by Fafunwa (2003) – leading figure in mother tongue education crusade in Nigeria; that for the past 40 years UNESCO has been pioneering and promoting the use of mother-tongue as a medium of education and more actively so in the last decade.

The Nigerian government too realized the potency of a child's mother tongue in facilitating meaningful learning and therefore provides in the National Policy on Education (2004) that the mother tongue or the language of the immediate environment should be the medium of instruction in the first three years of primary education and that from primary four, the medium of instruction shall be English. Oderinde (2005) notes that the practice of introducing the foreign language too early to the Nigerian child and weaning them on the mother tongue too early in school alienates the children from their mother tongue and the indigenous culture. Such alienation according to him leads to confusion of thought and language and adoption of non-

discriminatory attitude towards foreign cultural influences. This restriction of the role of the mother tongue as medium of instruction to the lower level of education has been described as being rather unfortunate and basically a perpetuation of the colonial spirit by the ruling elite (Adegbite, 2004).

In Hong Kong most primary education is in the mother tongue (Cantonese) while a great deal of secondary and university education involves a considerable amount of English. The decision to increase the use of Cantonese was greeted with protests from parents, students, teachers and administrators. However, research findings reported by the Hong Kong Department of Education reveal that while students in English-medium-instruction (EMI) were more passive in classes, those in the Chinese-medium schools were more active and creative in class discussions. It is also reported that students in the Chinese-medium classes performed better than those in English-medium classes in both Chinese and English on the Hong Kong Certificate of Examination (Lao and Krashen, 1999).

Some scholars in Nigeria believe that science and other school subjects should totally or purely be taught in the mother tongue. These include Fafunwa (2003) and Makinde (2005). The Ife Six Year Primary Education Project of 1970 – 1978 reported in Fafunwa, Macaulay and Sokoya (1989) has been the boldest experiment in the use of mother tongue (Yoruba) as a medium of instruction in Nigeria. In the project, the operators employed new methods of coining, borrowing, changing coverage and translation of words in order to make Yoruba language accommodate and absorb new terms and phrases. Yoruba language was used as medium of instruction from primary one to six for the experimental group while the control group switched from Yoruba to English in primaries three to six. A comparison of the achievement scores from primary three to six indicated a consistent statistically significant superiority of the experimental group over the control group (Yoloye, Ojerinde & Taiwo, 1985).

Meanwhile, Yoruba is one of the three major Nigerian languages, the other two being Igbo and Hausa. The minor languages are too numerous to mention in this paper. Yoruba language is spoken by mostly people of the south-western part of Nigeria including some communities in Edo and Delta states as well as in many of the West African countries, West Indies, South-America etc. The number of languages in Nigeria range between 250-550 and are classified into major and minor (Ayelaagbe, 1998).

A similar study conducted by Kocakulah, Ustunluoglu and Kocakulah (2005) in Turkey indicated that students who were taught "Energy" in a foreign language, English had more misconceptions, that those in the Turkish-medium group. Thus, the mother tongue of the learner seems to be more effective in comprehension and application of science concepts than a non-indigenous language. Fafunwa, et al (1989) note that instruction in the mother tongue would

encourage a child to acquire desirable skills and attitudes. Others such as Olarewaju and Akinwumi (1988) and Olarewaju (1991), found that instruction in the mother tongue facilitated more meaningful learning than that received in English.

In the study of Olarewaju and Akinwumi (1988) some Junior Secondary School (JSS) students were exposed to a treatment of teaching integrated science in Yoruba. The researchers found that the experimental group performed significantly better than the control group who received instruction in English. Also in his study of (1991), Olarewaju exposed some senior secondary school (SSS) one students to a treatment of teaching mathematics in Yoruba and English language and found that those who were taught in Yoruba performed better than those taught in English language. Earlier, Okonkwo (1979) and Umaru (1983) cited in Akinbote, Odolowu and Ogunsanwo (2003) also found Igbo and Hausa languages to be more facilitative to learning than English among school children in the areas where these indigenous languages are widely spoken. Ehindero (1980) also compares students' achievement in elementary science between children who were taught in Yoruba language and those who were taught in English language. It was found that children who were taught in Yoruba performed significantly better than those taught in English language. Orji and Orji (1998) using a set of Igbo speaking students found out that the use of Igbo language facilitated higher students' performance and more favourable students' attitude towards Physics than using English.

Obemeata (1988) also conducted a longitudinal study on primary school students and exposed a group to the mother tongue instruction and the other group taught all the subjects in English language. The results of the students in their first school leaving certificate examinations did not reveal any statistically significant differences. However, at the end of primary three and primary four, some differences in performance were noticed between the two groups in some subjects, excluding English language. Obemeata therefore opines that it is not enough to teach throughout in the mother tongue while trying to help pupils understand science, English language is still needed to explain some scientific concepts which our various mother tongues may not be able to explain satisfactorily. In spite of the available empirical and the universally agreed fact that children learn best when taught using the mother tongue, Akinbote and Viatonu (1996) note that many Nigerians still prefer the use of English language not only as the medium of instruction in primary school but also as the language of communication at home.

Apart from the language of instruction, attitude has been identified as another factor that affects students' achievement in science (Odubunmi, 1987; Ohuche and Nnzewi, 1994). Attitude is a major factor in the teaching-learning process which affects a learners' academic achievement (Makinde, 2004). Neall, (1969) cited in Makinde (2004) asserts that while attitude affects achievement, achievement in return affects attitude. Attitude could be positive, negative or

ambivalent. Positive attitude will most likely result in high achievement, ambivalent attitude could be associated with medium achievement while negative attitude will most likely lead to low achievement. Olagunju (1996) notes that attitude determines the way an individual interprets ideas, concepts and information within his own reach, it therefore affects one's performance. Orji and Orji (1998) found in their studies on the use of Igbo and English as media of instruction for Physics that those taught in Igbo were more positive in their attitude towards Physics than their counterparts who were taught in the English medium. It is not out of place to determine the attitude of subjects towards Biology in this study.

Nigeria operates two-tier secondary education system – Junior Secondary School (JSS) and Senior Secondary School (SSS). As earlier indicated, Yoruba language has been found to be effective as a medium of instruction. This study determines the effect of Yoruba and English languages as media of instruction on students' achievement in and attitude to Biology. The following hypotheses were therefore tested in this study.

1. There is no significant difference in achievement of students taught Biology using Yoruba and English languages.
2. There is no significant difference in attitude to Biology of students taught using Yoruba and English languages.

Method

The sample consisted of 120 randomly selected SS III Yoruba students from four co-educational schools in Ojo Local Government Area of Lagos State, Nigeria. Subjects were randomly assigned to treatment and the control groups. The four schools belong to the Lagos State government. A 2 x 2 pre-test, post-test, control group quasi-experimental design was used. The experimental group was exposed to treatment in selected biological topics in Yoruba language while the control group was exposed to the same biological topics in English language. 60 students were in the experimental group and 60 also made up the control group. Four teachers who were degree holders in Biology Education were involved in the study. All the four teachers had over five years' teaching experience in Lagos State Government owned schools. They were trained for two weeks with the teaching guides in Yoruba and English versions. Two of them taught Biology in the Yoruba-medium schools while the other two taught Biology in the English-medium schools. There were five lessons prepared for each of the groups. Each of the lessons was of 40 minutes duration. While discussion method was held constant in both the experimental and control groups, teachers used charts where necessary. Meanwhile, an expert in Yoruba language and an expert in Biology translated the Teaching Guide in the English version into Yoruba. Human skeletal system was the main topic taught. This unit was subdivided into five sub-topics as follows:

1.1 Skeleton, Forms and Components

1.2 Types of Skeleton

1.3 Bones of Axial and Appendicular Skeleton

1.4 Joints – Definition, Types, Locations and Examples

1.5 Functions of Skeleton in Man

The human skeletal system was selected because it is related to what living organisms need to carry out life processes such as movement, respiration, etc. (Michael, 2005). In this regard, every student can experience and feel the presence of tissues and supportive system in his or her body. Not only that, the topic had never been taught in any of the four schools.

The first design of the Achievement Test in Biology (ATBIO) consisted of 30-multiple choice items about the topics taught. The items were selected from standardized tests (past questions of WAEC and NECO) but they were made to undergo a process of refinement and validation. The ATBIO was constructed in English language. The face and construct validation of the instruments were ascertained by three experts in the teaching of Biology. The ATBIO was however revised to 25-multiple choice items after determining the item difficulty and item discriminatory indexes. The reliability of the final version of the ATBIO was established at .72 using the Kr-20 formula and it had average item difficulty index of .63.

The questionnaire on students' attitude to Biology (SATBIO) was initially a 26 four-point Likert-scale instrument. The scales are Strongly Agree (SA = 4); Agree (A = 3); Disagree (D = 2); Strongly Disagree (SD = 1). The questionnaire items were generated with inputs from Biology, language and test construction experts from a Nigerian university. The Crombach Alpha was used to determine what each item contributes to the construction as well as the reliability of the instrument. Those items whose item total correlation was less than .1 were deleted. Thus six items were deleted thereby reducing the SATBIO to 20 items. The reliability of the final version of the SATBIO was established at .68

The instruments were administered as pre-test and post-test to the treatment as well as the control groups. The instruments were constructed in English language because Biology in the SSCE of WAEC and NECO is usually written in English language. The students' t-test was used to test the two hypotheses at .05 level of probability.

Results

Ho_1: *There is no significant difference in achievement of students taught Biology using Yoruba and English languages.*

Table 2: t-test comparison of achievement scores of Yoruba and English language groups

Groups	N	0	SD	DF	Calculated t	2 tail prob.	Remarks
Experimental (Yoruba)	60	9.84	1.34				P < .05
Control (English)	60	6.93	1.46	118	10.92	.000	* Significant

English.

Olarewaju (1991) notes that science teaching aims at inculcating the spirit of science in students and students in turn are expected to learn science well and perform satisfactorily when tested. In this regard, it is expedient that science teaching and learning should be done through a language the learner is very familiar with and that which presents minimum difficulty to the student. Science teaching can only be effectively done when learners are able to express themselves, ask questions, clarify pertinent issues and organize their thoughts.

This study therefore seems to be in support of the idea that science should be taught in learners' mother tongue in order to facilitate better achievement. It can also be inferred from the study that when learners are taught in their mother tongue, they are likely to perform well in an achievement test written in a second language.

Conclusion and Recommendations

This study has established a significant positive effect of teaching Biology in Yoruba. Consequent upon this, it might be necessary to conduct further studies on the effect of other Nigerian languages especially the other major languages (Igbo and Hausa) and other relatively popular ones such as Efik, Itshekiri, Ibibio, Edo and Igala. The effect of mother tongue as medium of instruction on students' attitude to the subject also needs further research.

Based on the findings of this study and similar studies reported, it is therefore recommended that the government should revisit the language provisions in the Nigerian National Policy on Education. The use of mother tongue as medium of instruction policy should be made to go beyond the lower primary level to the upper primary post-primary and the tertiary levels. Oderinde, (2005), remarks that Nigeria should learn from India which has 14 major languages of instruction, 11 of which are regional while two are non-regional and one is foreign (English).

Experts in the various indigenous languages as well as Language Associations should do more in the area of constructing and formulating more scientific words and phrases in those languages. Technical terms that are in English should be translated or coined to be in conformity with the writing of Yoruba words. Experts should emulate Fakinlade (2001) who published a translation of modern and scientific English terms in Yoruba language. In the dictionary, concise and precise terms are given to frequently used words and terms in the scientific disciplines like Physics, Chemistry, Biology and Mathematics. The government should encourage many and more people to be interested in studying the local languages to the tertiary level by giving admitted students' bursary awards and scholarships. Linguistic communities should also collaborate with research institutes for the codification of every unwritten language in Nigeria. It is a universal right for every child to receive basic education in his or her mother tongue.

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