ANALYSIS OF THE ROLE OF ENGLISH LANGUAGE ON SCIENCE STUDENTS'FAILURE IN SENIOR SECONDARY SCHOOL CERTIFICATEEXAMINATIONS(SSCE) IN MINNA METROPOLIS, NIGER STATE, NIGERIA

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Abstract

This study analyzes the role of English language in science students' failure in Senior Secondary School Certificate Examinations in Minna Metropolis, Niger State. The sample of the study was 240 respondents - comprising Eighty (80) science students, eighty (80) parents and eighty (80) science teachers. The sample was randomly selected for the study. Three instruments were used which included: 1. Questionnaire for students on the role of English language on science students' failure in senior secondary school certificate examinations (Q-STRELASS- FASSCE). 2. Questionnaire for teachers on the role of English Language on science students' failure in secondary school certificate examinations (Q-TTRELASS-FASSCE). 3. Questionnaire for parents on the role of English language on science students' failure in secondary school certificate examinations (Q- PTRELASS- FASSCE). The instruments were validated by experts and certified to have content validity. The reliability of the instruments was determined using split half method with the application of statistical package for the social sciences (SPSS) version 20.0. The reliability coefficients (r) for each of the instruments were found to be r= 0.82, r= 0.85 and r = 0.80 respectively. There were six research questions and two hypotheses. It was found that majority of the respondents agreed that English language is a factor that affects science students' failure in Senior Secondary School Certificate Examinations (SSCE). It was recommended that indigenous language should be encouraged to be used in teaching science in secondary schools.

188

This could assist in improving students learning of scientific concepts and consequently improve performance.

Background to the Study

The selection of language of instruction is vital for academic institutions and learners as well. Language policy for academic institutions in a centralized federal education system of Nigeria is often enforced by a governing body such as Ministries of Education, Education Boards or any other such body empowered by law. Such policy decisions impacts on teachers and learner's academic performance in all subjects including science. Unfortunately, learners' opinion and beliefs are rarely considered for those policy decisions. Consequently, teachers and students use language to communicate and to understand scientific concepts. It influences student's thought, mold their perception and structure their ideas. (Bamgbose, 2004). However, science in secondary schools has been taught in English language for several years in Nigeria. English language plays a central and strategic role in the Nigerian school system because almost all the school subjects are taught using English language. All over the world groups of people are identified by their various languages. Some of these speech groups are homogenous while others are heterogeneous. A society that is homogenous speaks one common language and hardly faces serious problems of communication since the members of the community can always interact and relate with one another without difficulty (Lee, 2005).

A heterogeneous society on the other hand consists of many ethnic groups with diversity of languages, thus, giving rise to multilingualism. Nigeria belongs to this category. The multilingual problems of Nigeria have posed serious problems in the selection of lingual Franca and the language of instruction. These twin issues of Lingua Franca and language of instruction have been subjects of public debate for quite some time by both male and female parents, students and major stakeholders in education such as organized labour, professional bodies and Non-governmental organizations. The role of English language as a foreign language has acquired a high status than almost all Nigerian languages in the sense that it is the official language of communication and of course the medium of instruction in schools (Rufa'l, 2000). Consequently, it exact tremendous influence on Nigeria's public and private lives positively or negatively.

Nevertheless, Zahiah (2001) attested that a child cannot learn most of the elementary facts or ideas unless he/she understands the language in which ideas are expressed. Thus, at the senior secondary

school certificate examination level, a credit pass or failure in English language underscores the students' understanding and fluency in English language and consequently the rate of performance at examinations such as SSCE, which determines to a great extent the educational advancement of the students in the sciences beyond secondary level. The National Policy on Education (FRN, 2004) provides that at the senior secondary school (SSS) level, English language, Mathematics and Biology, Chemistry and Physics are to be offered as core subjects in the nation's development efforts in Science and Technology. Subjects are taught in schools from Kindergarten to Primary, Secondary and Tertiary education levels in English language and students are performing very poorly year in year out. So, what role has English language played in this regard as a language of instruction in schools? This necessitate the need for this research in Minna Metropolis.

Statement of the Problem

It has been observed from literature and other researches that many factors lead to science students failure in Senior Secondary School Certificate Examination (SSCE) which include inadequate qualified teachers, lack of/inadequate laboratory equipment, negative attitude of teachers and students to the teaching and learning of science and the problems associated with appropriate and adequate language of instruction.

Many science students abandon the study of science in secondary schools because of problems related to language of instruction in science. The National Examination Council (NECO) announced 80% failure rate in sciences in its November/December 2010 Examination. The West African Examination Council (WAEC) has also, in the last three years announced not less than 60 percent failure rate in English language in both its internal and external examinations which cut across all categories of students offering science, arts and commercial subjects etc. There are so many factors that have been attributed to these. Some of which include; teacher quality, quality of instruction, teaching methods application and the use of language of instruction. These necessitate the need to investigate the role of English language on science students' failure in SSCE in Minna, Niger State because English language is the official language of instruction in Nigeria (FRN, 2004).

Objectives of the Study
The study pursues the achievement of the following objectives:

i.   To find out whether English language is a factor for science students' failure at Senior Secondary School Certificate Examinations (SSCE).

ii.   To find out whether science teachers prefer teaching in the language of the community than English language for efficient understanding of students.

iii. To find out whether science students prefer teaching in the language of the community than English language for efficient learning.

iv.   To find out whether parents prefer their children to be taught in the language of the community than English language for efficient learning.

v.   To find out whether there is a difference in the preference of parents, science teachers and science students on the use of language of the Community (native) for teaching in secondary schools.

vi.   To find out whether there is a difference in the preference of male and female parents, science teachers and science students on the use of native language than English language for teaching in schools.

Research Questions

The study pursued answers to the following research questions:

1. Could English language be a factor for science students' failure at Senior Secondary School Certificate Examinations (SSCE)?

2. Could science teachers prefer teaching in the language of the community (native) than English language for efficient learning of students?

3. Could science students prefer teaching in the language of the community than English language for efficient learning?

4. Could parents prefer their children to be taught in the language of the community than in English language?

5. Does any significant difference exist in the preferences of parents, science teachers and science students on the use of native language than English language for teaching science in secondary schools?

6. Does any significant difference exist in the preferences of male and female parents, science teachers and science students on the use of native language than English language for teaching science in secondary schools?

Null Hypotheses

The following null hypotheses were formulated and tested at 0.05 alpha levels.

HO_1: There is no significant mean difference between the preferences of parents, science teachers and science students on the use of native language than English language for teaching science in Secondary Schools.

HO_2: There is no significant mean difference between the preference of male and female parents, science teachers and science students on the use of native language than English language for teaching science in Secondary Schools.

Methodology

The design for this study was the descriptive research design using survey method. Majority of the parents used in this research are residence in Minna metropolis and had some basic form of formal education and are civil servants. All the 12 Secondary Schools in Minna metropolis, 150 teachers, 850 parents and 850 students of Chemistry, Physics, Biology, Mathematics, Health Science etc constitute the population for this study.

For the purpose of this study, four public schools were selected. A sample size 240 which constitute of 80 students, 80 teachers and 80 parents were selected randomly from the selected schools through the simple random sampling technique. The parents of the students selected were used for the study. The four public schools which were randomly selected are: Zarumai model school; Ahmadu Bahago secondary school; Day secondary school Tunga Minna and Bosso secondary school Minna. There are three (3) instruments for this study:

1. Questionnaire for students on the role of English language on science students' failure in Senior Secondary Certificate Examination (Q – STRE LASS – FASSCE).
2. Questionnaire for teachers on the role of English language on science students' failure in Senior Secondary Certificate Examination (TTRELASS – FASSCE).
3. Questionnaire for parents on the role of English language on science students failure in Senior Secondary Certificate Examination (Q – 1 PTRELASS _ FASSCE).
1. **Q - STRELASS – FASSCE**: The questionnaire consists of two sections; section A and B. Section A consist of Students Bio data such as students' name, name of school, class and sex. Section B consists of 20 questions on the analysis of role of English

language on science performance in senior secondary school certificate examination. Four out of the questions were specifically for generating responses to answer research questions one to four (1 – 4) respectively. While the aggregate scores of the 20 items in the questionnaire provided the individual score of each respondent, which was used as data for testing the two hypotheses generated.

2. **Q – TTRESLASS – FASSCE:** This instrument is a questionnaire that consists of section A and B. Section A consist of the teachers Bio data which include name of school. Teaching subject, areas of specialization, Qualification, Sex and marital status. Section B consists of 20 questions on the analysis of the role of English language on science student failure in senior secondary certificate examination. Four out of the questions were specifically for generating responses to answer research questions one to four (1 – 4) respectively. While the aggregate scores of the 20 items in the questionnaire provided the individual score of each respondent, which was used as data for testing the two hypotheses generated.

3. **Q – PTRELASS – FASSCE:** This instrument is a questionnaire for parent which consists of sections A and B. Section A is the parents personal data which include; name of parents, Sex, age and relationship with students. Section B comprises of 20 questions on the role of English language on science students failure in SSCE. Four out of the questions were specifically for generating responses to answer research questions one to four (1 – 4) respectively. While the aggregate scores of the 20 items in the questionnaire provided the individual score of each respondent, which was used as data for testing the two hypotheses generated.

Validity of the Instruments

The three instruments were validated by three professionals, two lecturers from Department of Science Education, Federal University of Technology, Minna, and a science Education expert from the University of Abuja. Thirty (30) items were submitted for each of the three instruments out of which 20 were certified to have content validity respectively.

Reliability of the Instruments

To determine the reliability of the instruments, the schools which were not part of sampled schools were used to pilot test the three instruments.

1. Hill Top Model School Minna.
2. Maryam Babangida Girls Science College, Minna

Spit half method was used to determine the reliability of the three (3) instruments (Q – STRELASS – FASSCE, Q – TTELASS – FASSCE, and Q – PTRELASS – FASSCE). The statistical package for social science (SPSS) version 20.0 was used to determine the coefficient of the two groups for each of the instruments. The coefficients of reliability for Q – STRELASS, Q – TTRELASS and Q – PTRELASS were $r = 0.80$, $r = 0.82$ and $r = 0.86$ respectively.

Procedure for Administration of the Instruments

Permission was sought from the principal of the selected schools to administer the questionnaires to SS III science students. 80 questionnaires were given to 80 students in the four selected schools and 80 were given the students to give their parents, 80 copies were also given to science teachers to fill and return on the spot while some others were collected afterwards. A total of 240 questionnaires were administered out of which 15 were not returned; so, only two hundred and twenty five (225) were used for analysis. The questionnaires were scored and the scores formed the basis for answering the research questions and testing the null hypotheses.

Method of Data Analysis

The Analysis of Variance (ANOVA) statistics was used to test the two hypotheses generated with the aid of statistical package for the social sciences (SPSS). The total sum of SA and A gave the total agreed responses. The sum of D and SD gave the total disagreed responses and from these totals, the percentages for agreed and disagreed responses where determined.

RESULTS

Answering Research Question One: Could English language be a factor for science students' failure at Senior Secondary School Certificate Examinations (SSCE)?

Table 1: Analysis of English language as a Factor for Science Students Failure at Senior Secondary Certificate Examination(SSCE)

Item on research question One only	Respondents	N	Total Agreed (SA + A)			Total Disagreed (SD + D)			Percentages (%)	
Quality of each item	Responses to		SA	A	Total	SD	D	Total	Agreed	Disagreed
I agree that English Language is one of the factors that are responsible for students' failure in SSCE.	Parents	72	33	24	57	4	11	15	79.16	20.83
	Science Teachers	78	29	28	57	10	21	21	73.07	26.92
	Science Students	75	35	28	63	2	10	12	84.00	16.00
	Total	225	97	80	177	16	42	48	78.7	21.33

From the table above, 225 respondents filled the questionnaire out of which 72 parents representing 79.16% agreed that English language is one of the factors responsible for science students' failure in SSCE. While 20.83% of the parents disagreed. In the case of science teachers, 73.08% agreed while 26.92% disagreed. Also, 84.00% of science students agreed while 16% of them disagreed. Generally, 177 of the respondents, representing 78.7% of all the respondents agreed that English language is one of the factors that are responsible for science students' failure in Senior Secondary School Certificate Examination (SSCE). Therefore, English language is one of the factors that are responsible for science students' failure in SSCE.

Answering Research Question Two: Could science teachers prefer teaching in the language of the community (native) than English language for efficient learning of students?

Table 2: Analysis of Science Teachers Preference to Teaching in the Language of the Community rather than English Language for Efficient Understanding of their Students

Item on research question Two only	Respondents	N	Total Agreed (SA + A)			Total Disagreed (SD + D)			Percentages (%)	
Quality of Responses to each item			SA	A	Total	SD	D	Total	Agreed	Disagreed
I prefer teaching in the language of the community rather than in English language for efficient understanding of your students.	Science Teachers	78	13	19	32	20	26	46	41.03	58.97

From table 2 above, it was deduced that 58.97 percent of teachers disagreed on the use of language of the community (Native)rather than in English language for efficient understanding of science students. The percentage of teachers who prefer teaching in the native language was found to be 41.03% while the percentage of teachers who do not prefer teaching in the native language was found to be 58.97%. Therefore, science teachers do not prefer teaching in native language.

Answering Research Question Three: Could science students prefer teaching in the language of the community than English language for efficient learning?

Table 3: Analysis of Science Students Preference to Teachers Teaching in the Language of the Community (Native) rather than English Language for Efficient Learning

Item on research question Three only	Respondents	N	Total Agreed (SA + A)			Total Disagreed (SD + D)			Percentages (%)	
Quality of item	Responses to each		SA	A	Total	SD	D	Total	Agreed	Disagreed
I prefer to be taught science subjects in the local (native) language rather than in English language for efficient learning	Science Students	75	15	27	42	14	19	33	56	44

From table 3 above, 56 percent of the students prefer to be taught science subjects in the local (native) language rather than in English language while 44% of the students disagreed. Therefore, science students preferred to be taught science subjects in the local (native) language rather than in English language for efficient learning.

Answering Research Question Four: Could parents prefer their children to be taught in the language of the community than in English language?

Table 4: Analysis of Parents Preference on the Use of Language of the Community to teach Children Science rather than English Language

197

Item on research question Four only	Respondents	N	Total Agreed (SA + A)			Total Disagreed (SD + D)			Percentages (%)	
Quality of item	Responses to each item		SA	A	Total	SD	D	Total	Agreed	Disagreed
I prefer my child/ward to be taught science in the local (Native) language rather than in English language	72	72	9	29	38	16	18	34	52.78	47.22

From the table above, 52.78 percent of the parents preferred their children/wards to be taught science in their native languages rather than English language while 47.22% disagreed. Therefore, parents preferred their children to be taught Science in the language of the community rather than English language.

Hypothesis One (Ho.$_1$): There is no significant mean difference between the preferences of parents, science teachers and science students on the use of native language than English language for teaching science in Secondary Schools.

Table 5: Analysis of Variance on the Preference of Parents, Science Teachers and Science Students on the use of Native language rather than English Language for Teaching Science in Secondary Schools

Source of Variation	Sum of Squares	df	Mean Square	Fcal	Significance
Between groups	540.136	2	270.068	6.711	0.001
Within groups	8933.224	222	40.240		
Total	9473.360	224			

Table 5 shows the ANOVA comparison of the mean responses of parents, science teachers and science students on the use of native language as against English language. From the table, $F_{cal} = 6.711$; df = 2, 224, $p < 0.05$ significance level. Therefore hypothesis one is rejected. Hence, there is significant difference in the preference of parents, science teachers and science students on the use of native language than English language for teaching science in secondary schools.

Hypothesis Two(HO_2): There is no significant mean difference between the preference of male and female parents, science teachers and science students on the use of native language than English language for teaching science in Secondary Schools.

Table 6: Analysis of Variance on the Preferences of Male and Female Parents, Science Teachers and Science Students on the Use of Native Language rather than English Language for Teaching Science in Secondary Schools

Source of Variation	Sum of Square Significance	df	Mean Square	Fcal
Between groups	607,018 0.012	5	121.404	2.959
Within groups	8984.11	219	41.023	
Total	9591.129	224		

From the table, there is significant difference in the mean responses of the groups at 0.05 level of significance ($F_{cal} = 2.959$; df = 5,219; $p < 0.05$). Therefore, hypothesis two is rejected. Hence, there is significant difference in the preferences of male and female parents, science teachers and science students on the use of native language rather than English language for teaching science in secondary schools.

Summary of Findings
The following submissions are the summary of findings for this study:
1. English language is a factor for science students' failure at SSCE.
2. Science teachers do not prefer teaching in native language.
3. Science students preferred to be taught science subjects in the local (native) language than in English language for effective learning.
4. Parents preferred their children to be taught Science in the language of the community than English language.

5. There was significant mean difference in the preference of parents, science teachers and science students on the use of native language than English language for teaching science in secondary schools.

6. There was significant mean difference in the preferences of male and female parents, science teachers and science students on the use of native language than English language for teaching science in secondary schools.

Discussion of Findings

The result of the analysis indicates that majority of the parents; science teachers and science students believe that the use of English language as a medium of teaching science is a factor for science students' failure at SSCE. This result is in line with a study by Torres and Zeidler (2002) who found that students struggling to learn science in a second language lose at least 20 percent of their capacity to reason and understand in the process. It also confirmed the assertion of Bamgbose (1992) and Araromi (2005) that mother – tongue education also leads to more effective teaching of science and mathematics at primary and secondary school levels and even to more effective teaching of official or foreign language as areas of learning.

Moreover, not minding the fact that it was agreed by majority of the respondents that English language is a factor for science students' failure, majority of the science teachers prefer teaching science in English language than the native language. The result indicated that majority of the science students preferred to be taught in the language of the community (native) than in English language for better understanding as was also stated by Ikara(1982) opined thatlearning is enhanced indeed and made possible when it occurs in a context that are culturally, linguistically and cognitively meaningful and relevant to students.

The learners, who are the ultimate concern, prefer to be taught in the local language than in English language. When taught in the local language, they tend to understand and comprehend more, since the learners are mainly affected by the language of instruction in science, their opinions and believes ought to be considered in selecting a language for the teaching and learning of sciences in schools.

Consequently, a higher percentage of the parents prefer their children to be taught science in the local language for better understanding. This is also in line with a statement by Heugh, (2005) who said that utilizing a second language to teach students subjects such as

science, is therefore, what is probably resulting in their low achievement/academic abilities.

It was indicated that there was significant difference in the mean responses of parents, science teachers and science students on the use of native language as against English language for the teaching and learning of science in schools. The differences in opinion are between the teacher and students. The teachers prefer using English language for teaching science while the students prefer to be taught in the local language.

Conclusion

The result of the study reveals that majority of the respondents (parents, teachers and students) agreed to the fact that English language is a factor for science failure in SSCE. The parents and science students preferred that science should be taught in the native language rather than in English language for better understanding. There was significant difference in the preference of parents, science teachers and science students on the use of native language as against English language for teaching of sciences in schools.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Indigenous language should be used in teaching science in secondary schools. This could assist in improving students learning of scientific concepts and consequently improve achievement. This implied that all activities should be conducted in native language at school.

2. Language policy which recognizes teaching and learning sciences in indigenous language should be put in place particularly Minna metropolis which is dominated by Hausa as a language of communication.

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