OVERCOMING THE LANGUAGE BARRIER: AN IN-DEPTH STUDY OF THE TANZANIA SECONDARY SCHOOL SCIENCE TEACHERS' INITIATIVES IN COPING WITH THE ENGLISH-KISWAHILI DILEMMA IN THE TEACHING-LEARNING PROCESS.

A Research in the Making

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Abstract

The importance of proficiency in the medium of instruction on the part of teachers, as a crucial tool in facilitating effective teaching/learning, can not be overemphasized. This study focuses on the MOI - English/Kiswahili dilemma that secondary school science teacher in Tanzania face and how they cope with in order to make teaching and learning meaningful and effective. Key concern is to find out the kind of coping initiatives these teachers employ, why they do so and the effect such strategies have on student participation and performance. The research is interpretative and will utilize both qualitative and quantitative approaches with a research design based on phenomenology and quasi-experimentation. Four methods of data collection will be used:

1. The questionnaire with closed and open-ended items for teachers and students
2. Observation: (i) Classroom observation to be conducted during lessons taught in Kiswahili and in English media. (ii) out-of-class observation to be conducted when teachers and students are verbally interacting during activities pertaining to the teaching/learning process.
3. Interview: (i) In-depth face to face interview involving education officials, (ii) focus group interview involving science teachers
4. Document analysis of staff meeting minutes, department meeting minutes, teacher on duty reports, bulletin board announcements and pretests and posttests.

An iterative (nonlinear) data analysis process for qualitative data and *t* test for quantitative data will be used.

Purpose of the Study

The purpose of this study is to investigate the various initiatives taken by science teachers in Tanzania secondary schools in coping with the problem of the medium of instruction (MOI) arising from poor mastery of English by teachers and students. Especially the study focuses on the linguistic interactions that take place in the process of teaching and learning science.

Research Objectives

This Study aims at attaining the following objectives:

1. To find out the extent of the problem of English proficiency in science teachers and students in Tanzania secondary schools

2. To investigate how science teachers cope and how they help students to cope with the MOI problem during the teaching and learning of science

3. To find out how science teachers initiatives influence student participation and performance in science

4. To examine the contextual factors that influence the linguistic interactions during science teaching and learning

Significance of the study

It is hoped that this study will throw further light on how teachers and students in secondary schools cope with the MOI dilemma use the teaching and learning of science and that the insights gained will be instrumental in the rethinking of the education language policy

Rational of the Study

Although some data already exist on the long standing problem of MOI in Tanzania, most of it is focused on participant observations and on interviews with various stakeholders. There is yet little data based on experimentation. According to Mtana (1999) the reluctance of policy makers to Swahilize the MOI in secondary schools can be attributed partly to the failure of educational researchers to make convincing clarification on the issue. Currently a project involving experimentation has been initiated in Tanzania (and South Africa) aimed at expanding our knowledge on the consequences of using a familiar medium in contrast to an unfamiliar medium as language of instruction in secondary school science teaching and learning. The project's name is LOITASA (Language of instruction in Tanzania and South Africa), 2002 – 2006. Since my study will take place concurrently there can be a sharing of information that could have a positive effect on the final outcome of both this study and LOITASA activities.

Research Questions

The overriding question of this study is concerned with the ways Tanzania secondary school science teachers surmount the problem of MOI: What initiatives do they take to cope with the linguistic hurdles so as to make learning more effective and hence improve academic performance. This concern is addressed by the following specific questions and sub-questions:

1. Why is proficiency in the MOI important for effective classroom interaction and positive learning?

2. What is the extent of the problem of English proficiency in Tanzania secondary school science teachers and students? (What is their linguistic background? What common linguistic mistakes do they make?)

3. What initiatives do Tanzania secondary school science teachers take to promote linguistic interactions (teacher-student and student-student) that promote effective science teaching and learning?

4. What is the reason for taking such initiatives?

5. How do Tanzania secondary school science teachers encourage out-of-class linguistic interactions pertaining to science teaching and learning activities? (Do they support students' attempts to communicate in English? How do they react to the use of Kiswahili?)

6. In what ways do science teachers initiatives in coping with the MOI barrier influence student participation and performance in the learning of science?

7. How does the MOI dilemma influence teachers' professional performance? (Are they able or not able to meet set long and short term objectives? Can they effectively use language as a tool to motivate students?)

Literature Review

Background to the Study

The language situation in Tanzania

Tanzania like many other African countries is linguistically heterogeneous. However, she is blessed with a unifying neutral language – Kiswahili – that is spoken by more than 90% of the population.

After independence in 1961 Kiswahili was declared a national language and in 1967 it became the official language and the MOI at the primary level of schooling. Today Kiswahili is also the MOI for pre-primary schools and Grade A teacher training colleges. English however, has remained the *de jure* MOI at secondary and tertiary levels of education albeit the various calls from researchers, educators and other concerned Tanzanians to change the situation. This status quo still persists in spite of the recent policy- Sera ya Utamaduni (Cultural Policy) of 1997 from the cultural arm of the Ministry of Education and Culture

which talks of a special programme through which Kiswahili can be used as a MOI while the teaching of English is strengthened.

Ishumi (1994) argues that mastery of language is a key in the efficiency and eventual effectiveness of the teaching and learning process. He warns that a dilemma over usage options can seriously stifle the acquisition of knowledge and skills. What language is well mastered in any given society if not an indigenous tongue? In a similar vein of argument Mutasa (2002) asserts:

> If pupils do not understand the language used in teaching it means they do not and cannot receive education. That means new ideas and knowledge cannot be transmitted to them. (Mutasa, 2002.7).

The chronic Case of Declining Academic Performance

Since the '70s there has been an alarming decline in the level of participation and performance in science in secondary schools. "Where does the root cause lie?" This has been the big question. While the reasons given generally range from curriculum, resources, management, teachers' capability and pupils' background, the language barrier can certainly not be ruled out (Rubanza, 2002). Indeed even with the best of resources, curricula, management, etc., if students and teachers are unable to communicate effectively, then all the other improvements are in vain. It is now becoming evident that the official MOI – English is a barrier to effective teaching and learning and especially to the conceptualization of the intricate science concepts that calls for mastery of the MOI. Writing about a similar situation in Sri Lanka, Ranaweera, 1976 (in Brock-Utne, 2000) argues that there is a great need to adopt the national languages in science subjects because using a foreign language is a great constraint which hinders acquisition and expansion of science education.

During the 1987 Heads' of Secondary Schools' Annual Conference the problem of MOI in secondary schools was a top agenda. It was acknowledged that the low level of English language proficiency in pupils greatly incapacitated their understanding. Mahai, a MoEC official 1999 admits that secondary school teachers do code- switch because of their low English proficiency

The problem of MOI seems to be getting worse in Tanzania albeit the various efforts (such as the Baseline English course, the English Language Teaching Support Project, and currently in

practice the Form I six-week English orientation course) undertaken to improve English proficiency. Roy- Campbell and Qorro (1997) describe the situation as a crisis. The result of the low proficiency in the MOI is that students are tongue tied and teachers' professional confidence is undermined, the final outcome is poor performance in tests and examinations. In the case of Biology for example, performance for the certificate for Secondary Education Examinations (CSEE) candidates, using GPA (Grade Point Average, based on the ratingA=1, B=2, C=3, D=4, F=6) gradually changed from 4.25(1989), 4.48 (1991, 4.54 (1993), 4.56 (1997) and 4.63, (1998), NECTA (1998).

The Case of Teachers in the MOI Issue

Student performance is a measure of the effectiveness of a teacher. According to Borich (1992) one of the key attributes of an effective teacher is lesson clarity. Is the lesson clear and interpretable to the class? Are the concepts clearly explained and easy to follow in a step-by-step logical order? These questions lead to a key question: Are teachers able to communicate fluently in the language used as MOI? If not how do they cope?

Commenting on the current situation Brock-Utne and Holmarsdottir (2002 observe that teachers who have been trained in subjects other than language subjects are normally more concerned about teaching subject matter to students. They often code switch and/or code mix to make students understand. This solution however, creates another problem – students understand when teachers use Kiswahili because it a language the understand – but teachers have to set all tests and examinations in English and students' answers have to be in English – from the same students who could not cope due to the English language during lessons! According to the study conducted by Mwinsheikhe (2001) 80% of teachers who encountered examination questions answered in Kiswahili awarded them a zero mark as per government regulations. When teachers and students fail to interact and communicate effectively during lessons they get demoralized and frustrated – conditions which impair teaching and learning.

Persistent Use of English as MOI

The Dean of the Faculty of Education at the University of Dar es Salaam George Malekela (2002) claims that the continued usage of English as MOI in post-primary education is for prestige purposes of a few. I personally took part in a training workshop for science teachers where an American Peace Corp facilitator used Kiswahili to get teachers to be actively involved. The Dean of the Faculty of Education at the University of Western Cape in South Africa Dirk Meerkotter (2002) asserts that although evidence in favour of mother-tongue

instruction is overwhelming and convincing the myths and beliefs about English and upward economic mobility remain persistent. In Tanzania the hot debate on whether or not to Swahilize MOI in secondary schools still rages. Brock-Utne (2002) who has recently summarized the various policy declarations coming from the MoEC characterizes them as ambivalent contradictory and ambiguous. The persistence to use English as MOI is illustrated by the following resolution quotation from the Education and Training Policy (1995):

> Currently English is a medium of instruction at secondary school level and most instructional media and pedagogical materials available at this level are also written in English. This situation is likely to remain so for a long time in the foreseeable future. (ETP, 1995:44)

Osaki (2000) refers to this persistence as an obsession. There are many countries in the world (Japan, Malaysia, the Koreas, China, to name but a few) that are advancing in science and technology using their own languages.

Related Studies

It is stated in the NUFU, LOITASA project document (2002) that the attitudes of both South Africans and Tanzanians regarding MOI, are often shaped by uninformed views a consequence of a shortage of a empirical data. Mlama and Matteru (1978) investigated the situation regarding the use of the MOI and how it affects learning in Tanzania secondary schools. Their study revealed a great deficit in English language proficiency which barred students from learning effectively. They recommended Swahilization of MOI and strengthening the teaching of English as a foreign language. Criper and Dodd (1984) carried a study that investigated the English proficiency level in Tanzanians students. Their findings showed that the level of English proficiency among students had dropped down so drastically that it hindered learning to an alarming extent. In spite of this revelation they recommended strengthening English language so as to continue using it as MOI. In Botswana Rollnick (1990) undertook a study to find out how learners play an active role in the learning process by constructing their own meaning for concepts by using a combination of Setswana and English. The findings showed Setswana was used for several important roles such ad clarifying concepts. Rubagumya (1993) conducted a study to determine the way Kiswahili and English were used during the course of teaching and learning in secondary schools. He found out that English was supplemented by Kiswahili. Mtana (1998) carried out a study to

determine situations whereby secondary school students fail to communicate effectively in English. He reports that many students showed problems in communicating in English during lessons. Students demanded to use Kiswahili as an alternative in many incidences. Some teachers complied while others refused he adds.

Focusing on the impact of MOI on performance in secondary schools science learning in Tanzania Mwinsheikhe (2001) using a multiple research design showed that the experimental group (taught and tested in Kiswahili) performed better than the control group (taught and tested in English). Practically all questions which called for explanations were either skipped or were very poorly attempted, while students expressed themselves well in similar questions in Kiswahili. Osaki in (1999) showed that teachers readily switched to Kiswahili so as to enable students to participate in discussions.

NECTA's (1993) analytical study of examination results of candidates' responses to 1993 CSEE showed that students' answers were poorly expressed due to lack of English proficiency. In 2000 Malekela conducted a similar study using the 1991 – 1995 Form four national examinations results and came up with similar findings (Malekela, 2000).

Theoretical Framework

The issue of MOI practice at the grassroots level by both teachers and students in Tanzania as in many other African countries is influenced by political, socio-cultural, economical and pedagogical considerations, not to mention the colonial hangover. There is no single theory that is all encompassing and comprehensive enough to capture the interplay of these factors upon various linguistic interactions taking place in the teaching and learning process. An eclectic approach therefore, will be employed to formulate a theoretical framework that will guide the study and help to draw in important philosophical concepts from various perspectives.

The theories adopted for this study are drawn from different types of theoretical and empirical literature relating to language in relation to teaching and learning within the constructivist paradigm. The theories include those by the renowned educational psychologist Piaget and Vygotsky. According to Piaget (1961) child development occurs in four stages and it is during the fourth stage of formal operations that language becomes progressively instrumental in shaping rational scientific thinking of an adult. Moreover, language use acquires a greater

importance as the child's initial personal and autistic thinking becomes gradually socialized. Kozulin (1990) recapitulating on Vygotsky's ideas on mental development in children explains how Vygotsky's theory of Zone of Proximal Development (ZPD) claims that children learn through their interception with adults or more capable peers. The theory holds that because learning occurs in a social context language plays a very important role. There are many language roles going on in a given classroom; some are easily noticeable, while others are not. These activities include group and plenary discussions, memory storage, rewarding and motivating students, exercising control, giving feedback, socializing, creating humour, reflecting and questioning. It is though these roles that classroom discourse is established and maintained.

Another category of theories relate to studies conducted by educators such as Freire (1972) which emphasize critical dialogue as the essence of problem-posing pedagogy which is facilitated by mastery of medium of communication by students and teachers. Freire (1985) criticizes the practice of imposing upon the learners a foreign language as a MOI for learning other subjects. This he asserts defies natural laws of learning. Freire's emphasis on dialogue in teaching and learning cannot be overemphasized. His work focuses on problem- posing as the basis of critical dialogue in education. Ira (1993) reflecting on Freier's work underscores the importance that Freire placed on problem- posing as the key to critical dialogue. He highlights what Freire considered to be the main features of critical dialogue. During this engagement not only does the teacher pose thought-provoking questions, but s/he also encourages students to do the same; students learn to question answers rather than merely to answer questions; students experience education as something they do, not merely as something done to them, and they are not regarded as empty vessels to be filled with facts. This as we can see is a student- centred dialogue which problematizes learning

Constructivism will be used because it provides a broader scope for interpreting and relating ideas from other perspectives such as contextual influence on interactions taking place in learning situations. This approach has many implications for the process of teaching and learning science. It perceives learners as active entities able to shape their own knowledge given good guidance by teachers. Brooks (1993) outlines the roles of a constructivist teacher as mediating teacher-student and student-student interactions hence helping students to be learners and not merely followers. It is obvious that language of instruction plays an important role in constructivist teaching-learning process because of its emphasis on participation.

Research Methodology

Research Approach

The research will be interpretative. In order to address the research questions as deeply as possible a research methodology that uses both qualitative and quantitative approaches, with a research design based on phenomenology and quasi-experimentation will be adopted. The qualitative approach is suitable for studying the various verbal/linguistic interactions that take place in and out of the classroom (Bogdan and Biklen, 1992). Brock-Utne (1996) asserts that the sole use of the traditional quantitative input-output research approach may lead to misleading conclusions. However, the quantitative research approach is better suited for strengthening comparisons, Cook and Reichard (1979).

Qualitative Methods

These will include: (i) participant observation (in and out of classroom), (ii) personal in-depth interviews by using open ended interview guides, semi structured teacher and student questionnaires and (iii) documentation. Tools for collecting data (in addition to questionnaires and interview guides) will include observation forms and recording devices such as video machine and audio- recorder
Discourse analysis will be deployed to examine language function of both spoken and written texts focusing on large chunks of language as they flow together.

Quantitative Methods

Correlation methods will be used to investigate whether a correlation exists between Kiswahili as MOI and effective teaching and learning of science and compare these results to those concerning English as MOI in teaching science. Data will be collected using a quasi-experiment design - the pretest-posttest non-equivalent control group design. Tools for data collection will include: pretests and posttests and their marking schemes in Kiswahili and in English, lesson plans for the experimental and control groups and texts on which lessons will be based also in Kiswahili and English version

Type and Size of the Sample and Sampling Procedure

Teachers

All science teachers in the selected schools will be questionnaire respondents. They will also be targeted for observation of linguistic interactions out of class but within the academic

premises. Biology teachers of the selected forms for experimentation will be observed during their normal teaching and during the experimental classroom activities.

Students

These will be drawn from three schools purposely selected from two zones also purposely selected. Three classes: Forms I; II and III will be chosen. Streams in these forms will comprise the natural research units and they will be randomly selected for the research activities viz. taking part in the experiments and responding to the questionnaire. Three streams from each form will be chosen. Only twenty randomly selected students in each of the forms targeted for the questionnaire will constitute the questionnaire respondents. One stream in each of the forms will constitute the experimental group and one stream the control group.

Interviews

Officials from various institutions will be interviewed. The names of the institutions identified and the number of interviewees are as follows:

National Examinations Council of Tanzania (NECTA) – 1

University of Dar es Salaam – (from faculties of Education and Science, plus Kiswahili Research Institute)

MoEC – 2 (from the education arm and the culture arm)

Inspectorate of schools – 1

Commission for Science and Technology – 1

Teachers Service Commission – 1

Tanzania Teachers Association – 1

SESS (Science Education for Secondary Schools) and STIP (Science Teaching Innovation Programme) – the training officer for each project

The selected schools – school heads

Tanzania Institute of Education (TIE) – Director or curriculum developer for one of the science subjects.

Data Analysis

Qualitative data verbally expressed will be logically analysed by following steps as outlined by Charles (1998): identifying topics, clustering topics into categories, forming patterns from categories, giving explanations from the patterns, and answering the research questions by using the explanations.

Quantitative data mostly numerically expressed will be analysed statistically by making description of the data with regards to central tendency, variability and correlations, and

finally making inference about the population by means of confidence limits and significance levels.

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