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### **Teaching and Learning Primary Science in Mother Tongue: Problems and Prospects**

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#### **Abstract**

*This paper looks at language as a vehicle for thought processing and therefore sees mother tongue as being very useful in teaching primary science. In spite of the plausible merits, the paper, however, discusses some fundamental and inherent problems involved in teaching and learning science in mother tongue. Implications of teaching science in mother tongue are also discussed. In conclusion, a fusion of languages is proposed for primary science teaching.*

#### **Introduction**

The fact that mothers, on the average, spend more time with their children than fathers makes mother tongue more popular than "father tongue". Mother tongue is not necessarily the language a mother uses most frequently to communicate with her children. Moreover mother tongue may be different from the mother's actual language derived from her family of orientation. This occurs mainly when there is a cross-cultural and cross-lingual marriage. The effortless learning of mother tongue by special ability to speak any particular language. Exposed to any language, every child is capable of speaking it.

The importance of teaching and learning in mother tongue during the formative years of a child has been well comprehended and encouraged by government. In the National Policy on Education (1977, 1981), it is clearly stated that:

government will see to it that the medium of instruction in the Primary School is initially the mother-tongue or the language of the immediate community, and, at later stage, English.

The use of mother tongue as a medium for teaching in lower primary schools did not start with the government policy on Education. Prior to this policy, teachers at this level taught all subjects, except English Language, in mother tongue. The policy only re-emphasized what had already been practised. The rationale for practice emanates, perhaps, from the fact that at the early stage of human development, thought processes are carried out in an unverballed mother tongue. That is, mother tongue serves as a vehicle of thought, concepts are formed and impressions are made and communicated in one's mother tongue. To be of



ultimum benefit therefore, instructions are given in mother tongue which is the language a child is most familiar with.

Based on this understanding, Strevens, as quoted by Abdullahi (1980) investigated the problems of teaching/learning science through a foreign language. Among other things, the difficulties of mutual comprehension between teachers and pupils as well as lack of precision in the teacher's/pupil's use of English Language, were found out. On a more practical side, Fafunwa, as quoted by Alabi (1976) and Abdullahi (1982), developed and taught a primary science curriculum of commendable impact, in Yoruba. He used local and inexpensive materials to facilitate learning. No significant difference was found between those taught primary science in Yoruba and those taught in English language.

It is perhaps due to such plausible merits that most researchers in the area of language of instruction for primary science tend to often discuss either the difficulties involved in teaching/learning primary science through foreign language or the advantages accruable to teaching and learning it in mother tongue (Afolayan, 1974; Bamgbose, 1976; Oyelaran, 1982; Nwokedi, 1984).

While much, could be derived from learning primary science in mother tongue, there are however, some intrinsic problems associated with such successes. It is therefore the aim of this paper to uncover some areas or problems and prospects of teaching/learning primary science in mother tongue. Implications of this venture for teachers, teacher-training institutions, curriculum designers as well as researchers in primary science, will also be discussed.

## **Primary Science**

Before going ahead to discuss the probable and palpable problems and prospects of teaching/learning primary science in mother tongue, it is pertinent to remind ourselves of what primary science is all about. Science is a body of knowledge that has been objectively and systematically acquired; and that is subject to further observation and experimentation. It is man's relentless effort to search for variables, patterns, concepts, theories and generalizations that can foster description and explanation of natural phenomena. It is therefore obvious, for this conception, that science has both process and product dimensions. While product dimension has to do with factual knowledge like principles, concepts, generalizations, etc., process dimension is concerned with scientific ways and method of acquiring the product of science. It should however be noted that the two dimensions are mutually related.

The concept of science is universal and this applies to all levels of education. Whatever is to be considered as 'science' must go beyond cultural and institutional barriers. The term 'primary science', therefore, only qualifies science as it is taught at the lower (primary) level rather than being a type of science. In other words, primary science is as scientific as university science. It is on this premise that we wish to discuss the problems and prospects of primary science teaching/learning through mother tongue.

## **Problems of Teaching/Learning Primary Science in mother tongue**

Of all subjects taught in the primary school in mother tongue, science seems to pose the greatest problem. This is perhaps due to the following factors:

- (a) the nature of science;
- (b) a little familiarity of most primary science teachers with the subject; and



(c) lack of equipment in primary schools for science teaching.

Primary science is expected to be an integrated science for primary schools; an analogue of what is obtained in the Junior Secondary Schools. Unfortunately, in spite of the attempt to attain such integration, there are still obvious traces of the nature study (Biology), Physics and Chemistry in the primary science modules, especially at the Senior Primary levels. Most teachers seem to be more comfortable with biology related concepts like plants, nutrition, food, respiration, etc., than physics related ones e.g. sound, heat, energy, electricity, magnetism, etc., as found in the primary science modules. Interaction with primary science teachers during various Seminars and Workshops has shown that only grade II teachers who went through secondary schools have significant interest in science teaching. It is also a common knowledge that even the few teachers who are interested in meaningful teaching of primary science are incapacitated by lack of appropriate equipment.

Besides these fundamental problems is the problem posed by the language of instruction itself. These are discussed as follows:

**(a) Lack of equivalent scientific words in mother tongue**

While it could be accepted that the degree of complexity of this problem varies with mother tongue, it would be noted generally that it takes only language experts to coin out generally acceptable, equivalent and befitting scientific words in mother languages (Igbo, Yoruba and Hausa), other mother tongues are either without written forms or are poorly developed. With this obvious absence of most mother tongues in written form, there is bound to be problems in the teaching of primary science. This is because teaching science in mother tongue will involve giving and making all explanations, scientific words, experiments, observation and inferences in mother tongue. The stage of development of a mother tongue will definitely influence the quality of science taught through it. At primaries one (1) through three (3) where science is currently taught in mother tongue, the practice is that explanations are made in mother tongues while scientific words are retained and studied in foreign language. There is therefore a mixture of tongues in primary science teaching at the lower levels. To teach in mother tongue requires localization of scientific words a situation which poses a great problem. This problem is more acute at the senior primary levels.

**(b) Lack of science textbooks written in mother tongues**

Teaching science in mother tongue demands that textbooks written in the mother tongue to be used. Such texts is expected to make use of local example and materials for illustrations and experimentations, if a meaningful science teaching/learning is to be obtained within a cultural context. Books are not usually written overnight, especially writing in a language whose linguistic structure is either undeveloped or poorly developed. It will therefore require prospective authors to undertake close studies of their mother tongues or to employ the service of a linguist in their respective mother tongues to undertake the translation. None of these is a convenient thing to do. Moreover, according to Williamson (1983) there are about four hundred (400) indigenous languages in Nigeria. This will therefore implies that primary science textbooks should be written in about the same number of mother tongues. This is not only impracticable but unnecessary.

**(c) Proactive inhibition**

If children in primary school learn science entirely in mother tongue with foreign



words localized, there will likely exist a proactive inhibition in the future learning of science concepts that related with those localized, at secondary or tertiary institutions. This is anticipated due to a change in the language of thought processing involved; a change from mother tongue to English. This problem may not exist if science is also taught in the mother tongue at secondary and tertiary levels. But how realistic can this be with reference to the linguistic problems discussed so far. Such problems will become complicated and sophisticated at higher levels and would render a meaningful teaching of science impracticable or almost so.

**(d) Problems of transfer of schools**

Workers in a state are often transferred across tribal and dialectical barriers. In most cases this involves movement of one's family. In states such as Bendel, Cross River and Akwa Ibom etc. within which there are major and numerous dialectical differences, there is bound to be a problem in science teaching/learning for children who have to change their schools as a result of the transfer. The severity of such problem increases with inter-state transfer.

**(e) Problem in Communicating Research Findings**

If primary science is taught in mother tongues, it would only be proper that researches be conducted in mother tongues. Moreover, research information and findings should also be communicated in mother tongues. This will certainly delimit the scope and readability of such information and research work.

Considering the above mentioned and similar problems involved in the teaching of primary science in mother tongue, it could be concluded that in spite of the plausible merits associated with such venture, it is still doubtful if primary science can be meaningfully taught entirely in mother tongue.

**Implications of teaching primary science in mother tongue**

If primary science modules must be taught in mother tongue, teachers, school authorities, examination bodies and all other institutions involved in education at that level, should, of a necessity, decode and analyse the implications for adopting such a programme. Some of these implications are discussed as follows:

(a) *Teachers:* To teach effectively in the child's mother tongue the teacher must have a good working knowledge of the same mother tongue or at least possess a linguistic competence in the language of the child he is to teach. Moreover, the teacher is expected not only to speak the language but also to be able to write in it. This requirement could be hard to meet because experiences has shown that many educated people are often unable to write in their mother tongues although they can speak fluently. Further implication from this is that teachers will be restricted to teach only within their immediate locality where they have good mastery of their mother tongues even when their services are needed somewhere else.

(b) *Teacher Training Institutions:* For meaningful and pragmatic teaching of science in mother tongue, it behoves that teacher training institutions embark on the teaching of mother tongues in a more elaborate and objective way so as to incorporate scientific words and languages. Emphasis in such institution should be placed on writing in the mother tongue. Because of the numerous mother



tongues in certain Local government areas or states, an obvious problem would be that many teachers of mother tongues would be needed in a particular training institution expected to serve the need of the state. For example in Akwa Ibom State, the NCE and B.A (Ed.) programme in Efik/Ibibio run by the Akwa Ibom State University, will be decentralized to form NCE and B.A. (Ed.) in Ibibio, Oron, Annang, Eket, Ibeno, Itu Mbonuso, Mbo and Okobo. It is obvious that this is not convenient, besides being impracticable for now, that is.

(c) *Curriculum designers*: The implications of teaching/learning primary science in mother tongue cannot be overlooked by curriculum designers. Three principal areas of knowledge that integratively enlighten curriculum designers and renovators in their endeavours have been philosophy, psychology and sociology. While philosophy takes the questions — what should be taught? What experience is necessary? Why are these and that experiences necessary? etc. psychology deals with the hows of teaching what should be taught. It tackles such questions as — what method or technique is most appropriate for teaching such and such concepts? What are the characteristics, disposition, aspirations, etc. of learners? Sociology is basically useful in the area of knowing the values and norms accepted by the society, to include culture, language and the societal needs. Hence, Sociology seems to provide check and balances in respect of 'what' and 'how' to teach.

In considering the primary science module to be taught in mother tongue therefore, curriculum designers should evolve a science programme that is cored on the immediate locality and African cosmology. This moreover implies that science curriculum for Primary School will cease from being uniform in all states.

(d) *Researchers*: Teaching/learning science in mother tongue is not without implications to researchers. Among other things, it behoves that researcher in the areas of primary science thoroughly and experimentally investigate the influence of language, mother tongue, that is, on science. Language in this case may be weighted against other factors and the experiment carried out different levels of primary science teaching. Furthermore, the researcher would need to be conversant with the languages of the communities within which he conducts his research in order to reduce the influence of extraneous variables.

## Conclusion

Having considered the problems and implications of teaching/learning primary science in mother tongue, it seems obvious that things hitherto regarded as merits for undertaking such venture would be beclouded with multifarious problems that is likely to jeopardize the good intentions of government and educators. The prospect of teaching science generally and entirely in mother tongue at whatever level, does not seem promising. I would rather advocate that while teaching concepts like 'magnetism', 'electricity', photosynthesis and similar ones, explanation and descriptions be made in mother tongue at the primary schools. Moreover, while localizing the scientific words that are foreign, the words in their original form should be taught alongside with their equivalents in mother tongue. This is because children are bound to come across such and related concepts in their future studies of science. The localization of words will enable children to know about their environment. Experience has shown that many pupils do not know names of leaves and flowers, for instance, in their mother tongue, though they do know their botanical and English names.



However retaining the words alongside with this will make for continuity in the study of science a wider content and community. It also reduces the possibility of proactive inhibition mentioned earlier.

Such fusion of languages in the teaching of primary science should be encouraged for both junior and senior levels. In fact it can also be used in teaching integrated science at junior secondary level.

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