



Science Teachers
Association of Nigeria

REFOCUSING RESEARCH IN SCIENCE, TECHNOLOGY AND
MATHEMATICS (STM) EDUCATION



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PAPER 17

**TOWARDS AN OPTIMAL APPLICATION OF STM EDUCATION RESEARCH IN SOLVING
THE PROBLEMS ASSOCIATED WITH DEVELOPMENT IN NIGERIA**

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Abstract

A rapidly developing nation like Nigeria is beset with a lot of problems, which STM education research with its multidisciplinary nature, could help to solve. This paper emphasizes that STM educational research should focus on solving known problems which exists from classroom teaching to the society at large, in a developing country such as Nigeria. Some of the commonly existing problems from which STM educational research problems can be formulated are delineated. Suggestions on how significant STM education research results can be made available to target users are also provided, as strategies for using them optimally to aid development in Nigeria.

Introduction

On the problems of Educational research in Nigeria, Chike-Okoli (2003) wrote “Nigeria has achieved quantitative expansion of publications in Education issues that end with mere presentation of facts and knowledge without the ability to apply them to the problems of the society”

The STM Education aims at providing opportunities for the acquisition of appropriate skills, abilities and competencies both mental and physical as equipment for the individual to live in and contribute to the development of his society. This is one of the national educational aims of Nigeria as a developing nation FME (1981). STM education research in Nigeria will assume a right focus if it becomes an instrument for achieving the laudable aim of providing knowledge to enable individuals contribute to the development of the society, at such a time. One essential ingredient of development is the solving of teething problems in a nation. In this vein, the meaning of research must come into view. The words chosen by Onwioduokit (2003) to describe research suits the emphasis considered in this paper as he wrote:

“It is a systematic and objective intellectual activity undertaken for the purpose of either solving a known problem or expanding the body of existing knowledge”(Onwioduokit,2003).

The etymology of the word research, that is to search again, places no limitation to the activity, which leads to the acquisition of knowledge that is continually, needed for man's profitable existence. The two-prong purposes in the definition of Onwuoduokit (2003) above, imply that in a research activity, one may focus on solving a known problem or on expanding already existing knowledge which may not be for an immediate use. Part of this expansion of knowledge may be to cross-validate it. Such focus underlies the question, which a person who has completed a piece of research work faces: “what is your contribution to knowledge in your field of research?” The acquisition and advancement of knowledge are more relevant when it is being used to solve the problems, which makes a nation develop, along desired directions.Hence for a developing nation like Nigeria, in her present status the indispensable focus of STM education research should be on solving teething problems and the question any researcher in the

field should answer is “what known problems, have been (or could be) solved by the research carried out?”

Some Existing Problems of STM Education in Nigeria

“Without some sort of statements of the problem, the scientist can only rarely go further and expect his work to be fruitful”(Kerlinger 1973, p-12)

With this Kerlinger (1973) expressed an inherent problem-obstacle idea in scientific research, and the necessity of intellectualizing the problems. These problems are usually conceived from specific fields of study, vis-à-vis the environment of study also. Hence STM educational research must focus on problems of STM education.

From classroom teaching to the nation's policy making, there exists a myriad of problems in STM education, many of which have attracted attention of researchers. In addition, everybody in the society overtly experiences many of the problems. I chose to present some of them here in very simple terms as they affect our developing society.

1. Problems associated with classroom teaching of STM. These include;
 - Large class size
 - Underachievement in both cognitive and non-cognitive domains.
 - Poor preparation of teachers
 - Poorly motivated teachers
 - Lack of teaching aids, facilities and equipments
 - Effective teaching in public schools, etc.
2. Problems associated with teacher education programmes and teaching profession. These include;
 - Poor professional preparation of teachers of secondary school levels
 - Poor academic content of some programmes
 - Poorly defined professionalism in teaching.
 - Poorly defined curriculum suitable for preparing teachers for various levels of the school system, etc.
3. Problems associated with curriculum in packages used. Some of them are:
 - Examination oriented syllabus
 - Unreliable assessment procedures (e.g. upsurge of examination-malpractices in external examinations).
 - Poor quality textbooks (in some cases)
 - Curriculum, which does not enhance capacity for producing job makers as against job seekers.
4. Societal influence, Home Environments and use of STM education in everyday living. Problems in these areas include:-
 - poor scientific attitude even among many literate persons
 - poor application of knowledge of STM education to healthy living (e.g. dirty environment, self-medication, insufficient food with high nutritional value),etc.
 - Dirt of modern technological amenities for more comfortable living Poor maintenance culture, etc.
5. Problems associated with policy making on STM education. They include:-
 - Lack of use of real data, objective and patriotic considerations for national plans for STM education.
 - Ineffective dissemination and use of valid research results generally in the system etc.

Using STMM Education Research Optimally in Solving Known Problems-Some Suggestions

“Changes in national and international science and technology policies entail efficient application of research findings to planning and decision - making”
(M.E.A.F.(2004)P-1)

Apart from national and international STM policies, the use of science and technology in our daily lives is increasing exponentially, in the present dynamic society. Research results should not be for future researchers, few privileged teachers who can afford owning journals and/or attend conferences, but for the generality of the citizenry and especially the teachers and students of STM education. Two questions come to mind on this issue.

- (i) Do research results really reach the grassroots, the appropriate users who should be influenced by it in fruitful ways?
- (ii) Are research results communicated in approachable, informative, usable, and less technical ways to the target users?

While the answers to these questions are left as food for thought, some suggestions for using research results optimally are provided as follows.

Channels of Communication

There should be effective channels of communication between academic STM education researchers, science educators in ministry of education and principals, science teachers and the general public (i.e. the STM education community).

Usable Research Results

Through the channels, published significant research results should be downloaded to the wider community in usable forms such as:

- (i) shorter less technical reports from original authors;
- (ii) less detailed reviews, which gives an overview rather than critical analysis;
- (iii) brief notes of the reports, highlighting results in simple terms.

Influence on Teaching

Through the channels, teachers could obtain relevant research results in their subject areas. The Ministry of Education could see that such results are adopted/adapted as novel practices in the schools. This could be a measure of the teachers' professional self-improvement.

Research Results in Textbooks

Since teachers make use of textbooks in their subject areas to a great extent, publishers and authors could be encouraged to include such relevant research results in the texts. It could be a condition for recommendation of such books, for use in schools

Research Results in teacher training

STM education research results can be simplified as 'digests' for use in teacher education institutions. The knowledge and use of the results can be part of the curriculum content, of teacher education programmes in relevant subject areas.

Influence on Policy-Making

Policy makers should not only be lobbied to use significant research results but be made to sponsor STM education research which may have influence on decision making. Professional organizations such as STAN will play useful roles in this case.

Conclusion

In Nigeria STM education research should focus on solving known problems so as to develop the nation. Hence the results should be made available to target users, especially the wider community who are not interested in the highly theoretical, statistical and technical published papers. The results could be in form of brief notes, appetite whetting reviews or digests, which address the improvement of aspects of teachers' professional experiences so as to influence STM teaching. Infact, significant research results should be identified, certified and advertised by appropriate professional bodies. They should be disseminated through appropriate channels to reach all groups of target users. This will definitely aid scientific and technological development in all aspects of the society.

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