STRATEGIES FOR MAKING MATHEMATICS EDUCATORS SELF RELIANT IN THE NEW MILLENNIUM

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 Abstract
This paper exposed diverse ways through which Mathematics educators from Nigerian tertiary institutions could become self-reliant after their training from the universities, polytechnics and colleges of education. It has become a known fact that government cannot provide enough employment for all these graduates that are turned out every year by these tertiary institutions. This makes it imperative that an alternative way of making these graduates, especially Mathematics educators, self-reliant should be explored. This was in fact the main focus of this paper. It is hoped that this paper would help young Mathematics educators who could not get government employment after graduation to discover how they can survive in this new millennium without government employment. This paper also suggested how such graduates could be assisted by the government to stand on their own. Recommendations were made at the end on how tertiary institutions could develop entrepreneurship education programmes in Mathematics education to help these graduates to be self-reliant after training from tertiary institutions. Other workable recommendations such as these were also made: that government should offer financial assistance to any Mathematics educator who wishes to start something on his own; that government should be willing to purchase materials developed by Mathematics educators who are on their own. All these measures, if properly implemented, would certainly make Mathematics educators self-reliant in this new millennium.
Keywords: *Strategies, Mathematics, Educators, Self-reliance and Millennium*

Introduction

Nigeria as a nation has been faced with economic depression for a long time now. The federal and state governments have been making frantic efforts to see if they can improve the economic situation. The economic depression at the moment gives concern to many Nigerians. This is evidenced as many graduates from different tertiary institutions are produced without any gainful employment from the federal and state governments. To worsen the already debilitating situation, some of the already employed graduates and non-graduates are being retrenched from their already employed sectors as a result of the nation's poor economic situation.

As a result of these ugly developments, many Nigerian graduates and non-graduates roam about the streets without any employment opportunities from either the government or the private

sectors. Some of these graduates have engaged themselves with some social vices like armed robbery, stealing, prostitution, thuggery, kidnapping, and other violent activities like Boko Haram and militancy. No nation like ours can thrive amidst of all these social vices. This is why it becomes very necessary to find an alternative way of getting these graduates, especially Mathematics educators, to be self reliant in this new millennium.

There are many Universities, Colleges of Education and Polytechnics today in Nigeria. These tertiary institutions produce trained teachers in many areas including Mathematics Education. Only few of these teachers succeed in getting teaching appointment after many years of graduation from tertiary institutions. The rest, including those graduates who studied Mathematics education remain unemployed. This situation gets worse from year to year.

Izundu (1990) identified the world-wide economic depression of the early eighties that caused rapid deterioration in Nigeria's economic situation, as one of the factors that led to the present mass unemployment of highly educated and well trained Nigerian eligible workers. This paper is limited to exposing ways through which Mathematics educators from the nation's tertiary institution could become self-reliant. It also recommended that Nigerian tertiary institutions' curriculum should be geared towards making their products to be self-reliant.

There are many ways through which Mathematics educators from various tertiary institutions in Nigeria could be self-reliant. The fact that many of them roam about the streets doing nothing is a result of lack of necessary information on how one should become self-reliant. Those who seem to have an idea of what to do will always give excuses that they do not have *enough capital* to achieve their dreams. The truth of the matter is that capital should not be a hindrance towards becoming self-reliant. The strategies that are suggested in this paper need little or no capital for their actualization. In fact, the little savings from the stipend of National Youths Service Corp (NYSC) will be enough to execute many of the strategies that will be of interest to any Mathematics educator.

The following ways have been identified as workable strategies through which young graduates of Mathematics educators could become self-reliant:

1. Developing centres for the production of Mathematics teaching resources.
2. Developing centres for the production of materials for mathematical games.
3. Writing and marketing Mathematics textbooks.
4. Consultancy services in Mathematics Education.

5. Establishing private schools for self-reliance.

Developing centres for the production of mathematics teaching resources

Mathematics teaching and learning resources are important tools the Mathematics teachers use in Mathematics teaching and learning. These resources cover all those material used in Mathematics teaching and learning process. Some of those resources are printed material, sketches, charts, pictures, objects and machines. A skillful Mathematics graduate teacher should be able to construct some of the Mathematics teaching and learning resources. There are many teaching materials for Mathematics Education. They are categorized into two main aspects viz:

(a) The teacher-made Mathematics teaching materials and

(b) The commercially-made Mathematics teaching materials.

The teacher-made teaching materials are the materials which the teacher can make or construct by himself, i.e. such materials the teacher can improvise himself. The teacher can teach the students how they could produce such teaching materials themselves. Such productions are necessary especially in schools where there are no ready-made instructional materials.

The following are some examples of teacher-made instructional materials: geoboard, chart of different types, tangram, cards, rollegraphs, cut-out shape (templates), flannel boards, weighing balance, trundle wheel, graph board, clinometers, compass bearing, mathematical set, 3-dimensional models, ladder, and a host of others.

The commercially made Mathematics teaching materials are Mathematics teaching materials which are carefully developed by experts for sale in shops and markets. The following are some examples of such teaching resources: computer, calculator, projector, television, globe, Abacus, chess board, blackboard, flannel board, film strips, slides, video tapes, cassette tapes, charts, cuisenaire's rods, tangram, geoboards, trundle wheel, measuring cylinders, card games, dice, checker chips, Ludo, graph sheets, slides, unfix cubes, Dienes block, textbooks and pamphlets, metre rules, models and templates to mention but a few.

Mathematics educators can become self-reliant by opening centres where they can be producing some of these teaching resources. The centres also could become a training ground for others. They can admit apprentices who could help them in this production. The apprentices employed should pay for their training.

Any Mathematics educator who goes into self-employment through the production of instructional materials for sale may not have any regret. The famous Professor of mathematics,

Chike Obi excelled in this regard. The produced Mathematics teaching material could be sold or marketed through the following ways:

- Supplying to the government who will in turn supply to the schools - primary, secondary and tertiary institutions as the case may be.
- Direct supplying to the schools on demand since many heads of schools may not be ready to wait for the government's protocol in terms of the supply.
- Supplying to traders in the general markets and private shops in different towns.
- The Mathematics educator should open a shop of his/her own where these materials should be sold.

According to the study carried out by Okoye and Ozigbo (2000), there is great need for supply of instructional materials in schools of different levels in recent times. These researchers identified that most teaching methods used presently in schools, present some contents in such an abstract way that majority of the students seem to gain nothing during the process of teaching and learning. Mathematics educators could do better if they could utilize appropriate instructional materials during their teaching exercises. Mathematics educators could therefore become self-reliant through developing different resource materials to be supplied to school.

Developing centres for the production of materials for mathematical games

The numerous advantages of introducing mathematical games to complement the teaching and learning of mathematics at both primary and secondary schools cannot be over emphasized. The activities involve experience, drills and even applications. Mathematics teaching and learning are also guided by rules which involve experience, drills and even practical applications.

The governments, both state and federal have the responsibility of equipping their schools with adequate varieties of mathematical games in our primary, secondary and tertiary institutions. Unfortunately almost all our schools in Nigeria have no materials for mathematical games. This is because the heads of the schools do not see any need for mathematical games in schools.

Okpala (1979) in Ozigboh (1999) confirmed this fact while reporting that the use of Mathematics teaching resource in improving teaching and learning processes have not received the attention it deserves in Nigerian secondary schools. According to the National Teachers Institute (NTI), distant learning system, (DLS) course book for the award of Nigeria Certificate in Education (1990), Games in Mathematics enhances teaching and learning of the subject –

Mathematics. Games clear boredom and then foster a lively conducive environment. Students can improve their skill and intellectual abilities through practical activities in Mathematics.

It is really sad to note that a nation like Nigeria which has the objectives of coping with other Western world in technological development do not encourage mathematical games among her students. This is because no person among the education policy makers had made any move towards the inclusion of mathematical games in the school timetable at both the primary and secondary schools nor the provision of materials for games in Mathematics in our schools (Alio, 2001).

Recently, many people are becoming aware of the provision of materials for games in Mathematics in schools as some Mathematics educators have exposed its importance. Mathematical games serve as recreation to both students and teachers. Games in Mathematics generate excitement and good spirit of competition among students. It develops ones brain as lots of reasoning are involved in it. Well organized games will serve as reinforcement to winners since those who win would strive to keep up their glory while the losers would strive to get over their defeat through constant practice. It also serves as motivating factor for students to study the subject.

There are many materials meant for mathematical games. It is expected that Nigerian graduates of Mathematics education have already been equipped with knowledge and necessary skills for constructing materials for Mathematics teaching and learning where necessary. Mathematics educators who could not get government or private employment as Mathematics teachers could become self-reliant through opening up of centres where they could produce mathematical games for sales in the markets and supply to shops for sale and to schools too.

The Mathematics educators who have decided to be self-reliant through this way can also employ apprentices who should help them in developing mathematical games; such apprentices should also pay for their training. Such Mathematics educators should be in the position to think out new games and new materials to be added to the existing ones. They should adopt the procedure used in the marketing of teaching resources in marketing their products.

Writing and marketing mathematics textbooks

Textbooks are one of the most significant sources of information for teaching and learning in schools (Ali, 1988). Most teachers rely on textbooks as the most significant source of information for their teaching. Some textbooks in Nigerian markets for teaching Mathematics at

all levels are limited in content coverage. Mathematics educators could become self-reliant through writing good textbooks in Mathematics for all levels of education, according to their intellectual abilities. These textbooks could be supplied to school libraries, both states and federal, and they should open bookshops of their own where these books should be sold. They should also utilize these books for their teaching in their private owned schools if they own any. They should solicit the assistance of the government financially and the public through launching of these books at the end of publication. They should include textbooks that should give guidance to the use of mathematical games.

Consultancy services in mathematics education

Mathematics educators could become self-reliant through opening consultancy services for those who need their advice on what they should do in order to become self-reliant. They could be consulted by those carrying out researches in Mathematics education. They could be consulted by parents who need advice with regard to Mathematics education for their children. The federal and state governments may need their services on how to improve Mathematics education in Nigeria. Proprietors of private schools may also need their services on how to improve Mathematics education in their schools.

Establishing private schools for self-reliance

A Mathematics educator who has graduated from any recognized tertiary institution can become self-reliant by starting a private school at pre-primary, primary or secondary school levels where Mathematics and other school subjects could be taught. In this case, he can employ other graduates to assist him in teaching in the school. By this, he has not only made himself self-reliant, but he has also provided employment to others.

He can open another school for those who have finished from secondary schools but could not make good result. These secondary school graduates could be tutored in that school for them to retake their Senior School Certificate Examinations (SSCE). Such schools may be organized in the evening times and he should employ other graduate teachers to assist him in the teaching exercise.

Conclusion

Briggs (1981) stated that the education we acquire from tertiary institutions should help us to understand the modern world in which we live. It should also help us to make our personal judgment and to take decisions based on our thorough understanding of a given situation.

Graduates from tertiary institutions should understand the situation in which they found themselves and be able to utilize the education they have acquired take good decisions for their self-reliance and/or self-survival in the society.

Recommendations

1. State and federal governments should provide centres at a subsidized rate which will accommodate any Mathematics educator who would decide to be self-reliant.

2. The state and federal governments should be willing to purchase materials developed by Mathematics educators who are on their own. Such materials should be supplied to the schools by the government.

3. The federal and state ministries of education should include the teaching of how to develop resource materials in tertiary institutions for their students and teachers. This would help the student-teachers to be self-reliant through developing adequate resource material in their area after graduation.

4. The federal and state governments should offer financial assistance to any Mathematics educator who wishes to start something on his/her own for self-reliance.

References

Ali, A.A (1988). Educational Standards in International Perspective: A Comparism of Characteristics of Prescribed Secondary School Mathematics Textbooks in Nigeria and America. Standards in Education in the 6-3-3-4 system in Nigeria. *Proceedings of National Conference May 27th – 28th*.

Acs, Z. & Audretsch, D. B. (2010). *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction.* New York: Springer.

Alio, B.C (2001). The Effect of Instructional Material in the Junior Secondary School Mathematics Achievement in Enugu North Local Government Area. *Nigeria Journal of Curriculum and Instruction, (10): 101 – 106.*

Deakins, D. & Freel, M. (2009), *Entrepreneurship and Small Firms* (5th Edition). McGraw Hill.

Briggs, W.G (1981). A Philosophy for Nigerian Education. *An Opening Address of the National Curriculum Conference 8th – 12th September*

Izundu, N. T (1990). Integrating N.D.E's Technical Trends into the Senior Secondary Curriculum. Implication for Better Vocational Development and Improved Employment Prospect for Nigerian Youths. *National Vocation Journal 3. 3(5) 25-34*

Okoye, F. N & Ozigbo, G. I (2000). Status of Teaching Mathematics in Nigerian Primary School. Journal of Education, Nzelum. 2(4):20-24

Ozigbo, I. G (1999). Effect of the Use of Templates and Rolliography as Instructional Materials in Students Achievement and Interest in Mathematics, *An Unpublised Ph.D Thesis Proposal.* ESUT