

Empowering Women Mathematically for the Attainment of Millennium Development Goals

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Abstract- Goals can easily be set, but attainment has been a great problem. The Millennium Development Goals (MDGs) are eight goals set to be achieved by 2015. That corresponds to the world's main development challenges which are meant to improve people's lives. The attainment of MDGs has been a serious concern all over the world. This study looks into how empowerment of women mathematically could serve as a required tool to the attainment of the goals. The paper considers: the concept of women empowerment, mathematics and women empowerment, how women can be empowered mathematically, mathematics, women empowerment and the attainment of the Millennium Development Goals (MDGs). Conclusion was reached.

Index Terms- Mathematics, Women Empowerment, Millennium ,Development, Goals.

I. INTRODUCTION

Every development is expected to lead to good change of the society which may be in terms of material assets, intellectual resources, physical necessities of life, employment, and participation in government, political and economic independence.

Mathematics involves much of solving life's problems, riddles and puzzle; there is no technology without science and of course no science without mathematics. It is the key to opportunities, contributes to direct and fundamental ways to business, finance, health and defence. For students, it opens doors to careers, as it enables informed decisions, for citizens, it provides knowledge to compete in a technological economy.

The role mathematics plays in any society is enormous. It is the bedrock of any national development. This can be seen in the National objectives of primary and secondary education which were spelt out at the Benin conference of 1997. These include:

- i. To lay a solid foundation for the concept of numeracy and scientific thinking.
- ii. To give the child opportunities for developing manipulative skills that will enable him function effectively in the society within the limits of his capacity.
- iii. To provide the basic tools for further advancement as well as prepare him for trades and crafts of his locality.
- iv. To build on the foundation of primary level so that the child can make a useful living professionally, economically, politically and socially.

- v. To generate interest in mathematics and to provide a solid foundation for everyday life.
- vi. To develop computations skills and to develop ability to recognize problems and to solve them with related mathematics knowledge.

There is then the need for every one to have mathematical attitude. These are those attributes, behaviors, responses or actions which are peculiar to mathematicians. Such behaviors include that people who are good at mathematics do things quickly and do a lot of work mentally, anxious to know, very eager to learn and do not rest until they have learnt. They are also persistent, self-confident and patient, skeptical, inquisitive, thorough, competent and resourceful. It is believed that if a teacher (woman) has all these attributes, her students (children) will imbibe some or all of these attributes.

In spite of the fact that the purpose of every development is to improve people's lives especially by their choices, freedom and dignity yet gender imbalance exists at all levels of education system (Emunefe and Oyetunde, 2009).

Gilmer and Milwauree (2001) in their work " An African American Perspective, on Developing women in mathematics, state that mathematically oriented minds, especially women prefer brief, orderly, concise presentations of materials or directions. According to Uka(2006), anxiety and self-confidence are related to achievement. It takes an experienced and self-confident teacher (woman) to help her students (children develop self-confidence in mathematics. A teacher (woman) that is self-confident will also pass it on to her students (children) and thereby positively affecting their achievement . A child who has confidence in himself, is likely to achieve higher in mathematics, and by extension in all aspect of life.

Women in order words should be mathematically strong which makes them empowered in order to be scientifically developed as to be able to achieve the MDGs.

The attainment of Millennium Development Goals (MDGs) has been the problem which occupied the attention of scholars, politicians, activists, development workers and international organizations. The MDGs are eight goals to be achieved by 2015 that respond to the world's main development challenges. MDGs was adopted by 189 nations and signed by 147 Heads of State and Governments during the Millennium Summit in September 2000.

The MDGs are:

- 1 Eradicate extreme poverty and hunger.
- 2 Achieve universal primary education.
- 3 Promote gender equality and empower women.
- 4 Reduce child mortality.
- 5 Improve maternal health.

- 6 Combat HIV/AIDS, Malaria and other diseases.
- 7 Ensure environmental sustainability.
- 8 Develop a global partnership for development.

II. THE CONCEPT OF WOMEN EMPOWERMENT

Empowerment means moving from position of enforced powerlessness to one of power. It can range from personal empowerment that can exist within the existing social order. Thus this kind of empowerment would correspond to the right to make one's own choices to increase.

Women empowerment is the process by which women gain greater share of control over resources – maternal, human and intellectual knowledge, information, ideas and financial resources – and access to money and control over decision – making in the home, community, society and nation, and to gain “power”.

True women empowerment takes place when women challenge the existing norms and culture, to effectively improve their well being. In the feminist paradigm, empowerment goes beyond economic betterment and well-being, to strategic gender interest.

The empowerment of women is one of the central issues in the process of development of countries all over the world. Infact it is a global issue, that is why in September 2000 the millennium development goals (MDGs) was signed up at the United Nations in which the third goal was “promote gender equity and empower women.” The issue of gender equality and women empowerment are discussed in world conferences, national and international conferences, etc.

In order to give a fillip to empowerment of women, appropriate institutional mechanisms and interventions have been consciously built into the development design; separate institutions for women and child development, departments at the central and state levels, creations of the National Commission for women and also state commission for women in several states are some of the important developments for the betterment and prosperity of women.

Infact the government of India declared 2001 as the year of “Women's Empowerment”.

The year 1975 was proclaimed the international women's year by the United Nations General Assembly. The year was a turning point in that it put women's issues on the agenda.

The United Nations decade for women (1979-85) was a world – wide effort to examine the state and rights of women and to bring women into decision making at all level. In 1979, the General Assembly adopted the convention on the Elimination of all forms of discrimination against women, which entered into force in 1981 and set an international standard for what was meant by equality between women and men.

Nations like Egypt, the United State of America and the United Kingdom signed the convention on 16 July 1980, 17 July 1980 and 22 July 1981 respectively.

The fourth world congress on women, Platform for Action, held in Beijing in 1995 aimed at accelerating the implementation of Nairobi forward – looking strategies for the advancement of women, aimed at removing all the obstacles to women's active participation in all areas of public and private life through full

and equal share in economic, social, cultural, and political decision-making.

Nigeria is not left out in the effort to bring women into lime light. Several efforts have been made in Nigeria in the area of empowerment of women. In January 1995, the Ministry of Women Affairs and Social Welfare was created by the federal government. The aim had been to ensure effective implementation and mobilization of women and children to be supported for primary health care and other related issues that are peculiar to women and also to ensure their greater participation in national development as well as empower them politically, socially, and otherwise.

In fact the spouses of successive Heads of State and Government in Nigeria in order to improve the lot of women had several projects\ programmes which include:

Family Support Programme (FSP) by Maryriam Babangida, The Family Economic Advancement Programme (FEAP) of Maryram Abacha, Child Care Project of Stella Obasanjo, Anti-Prostitution and Human Trafficking by Titi Atiku Abubakar and the Women for Change Initiative of Patience Jonathan.

Even the Affirmative Action Bill which says that 35% of political post/seats should be reserved for women, Nigeria is only 8% compliant is also an avenue of empowering women.

III. MATHEMATICS AND WOMEN EMPOWERMENT

There is no goal especially developmental goal (including MDGs) that cannot be achieved scientifically.

Researches have established that women play enormous roles in the area of mathematics which invariably leads to a good scientific inclination. Below are some of such researches.

Mwamwenda and Mwamwenda(1989) in their studies found that students of female teachers had significantly higher achievement score in mathematics and other subjects than male teachers. Similarly Ryan (1972) in Uka (2006) found that female teachers rather than male teachers were more effective in urban schools.

According to Stake and Katz (1982) cited in Krieg (2004), female teachers provide a more positive overall classroom atmosphere. The study conducted by Meier (2004) found that female mathematics teachers were positively associated with girls mathematics score in grade 7 and 8 on the exit examination. This study also found that there was little difference in mathematics examination scores in districts with female administrators, but mathematics in districts with female superintendents surpassed all other categories. The study concluded that for those seeking to increase girls' education benefits and mathematics scores, attention must be paid not only to the number of female teachers in the districts, but also to increase female representation among upper levels of the organization.

IV. HOW WOMEN CAN BE EMPOWERED MATHEMATICALLY

Many factors are known to hinder the empowerment of women generally, particularly in mathematics. Among them include culture, ignorance, poverty, gender discrimination, high incidence of crime etc. This notwithstanding, there are measures

that can be employed in order to empower women mathematically. These include:

V. EDUCATION

Education of women is the most powerful instrument of changing their positions in the society. Education also brings about reduction in inequalities and also acts as a means to improve their status within the family. In order to encourage education of women at all levels, Indian government established schools and colleges and universities exclusively for women in the state, supplied books, boarding and lodging clothing for hostels, mid day meals, scholarships, etc. In other words, women should be educated to see the need to be mathematically oriented.

1. **Free Coaching Exclusively For Women Students.** Centers should be designated where women students should receive free coaching especially in mathematics and the sciences.
2. **Entrepreneurship Awareness, Development Training program:** This type of program will help bring out the talents of women and make them stand on their own. It will enable them see the roles mathematics plays in all facets of life especially in business.
3. **Capacity Building and skill information.** Government has to impart various types of mathematical training which is designed to not only promote self, but also wage employment.

Mathematics, Women Empowerment and Attainment of Millennium Development Goals (MDGs)

The National policy on Education (F R N, 2004) has spelt out that every Nigerian child shall have a right to equal educational opportunities. The efforts of Nigerian government in education have not yielded significant positive results on girls and women education (Akomolafe, 2010). Female enrolment dwindles as they move up the educational hierarchy (Onuebunwa, 2003), likewise, according to UNESCO (1996), empirical studies show that the number of women in Universities and research institutions drop at each stage of higher qualification. In the final analysis, only few women make science system both in research positions and in the science policy area. A recently concluded research by Iji and Uka (2010) shows that there are more male mathematics teachers than female mathematics teachers.

The statistics of Science and Technology enrolment of the Universities during 2004/2005 session shows that the males had 73% while that of female is 27% (Jamb, 2006).

According to UNESCO report (2006) cited in Akomolafe (2010), girls make up 60% of all out of school children and women represent two thirds of illiterate adults. Girls usually perform worse than boys in schools and that in some countries one in every four girls drops out before fifth grade. Roughly, 85% of boys' complete primary school compared to 76% of girls. Mathematics is the key to any development. Training (empowering) a woman is training a nation, so if the women are empowered mathematically the achievement of the MDGs is likely to be much easier

A sound mathematical knowledge will enable members of the society to have insight into the socio-cultural changes and control of the environment in which they live in (Eze, 2009). It is not a hidden information that the population of women /girls is more in number than that of men/boys.

This section discusses how empowering women mathematically can assist achieve the millennium development goals

Eradicate Extreme Poverty and Hunger.

When one talks about poverty in any nation like Nigeria, women are worst hit. Here, women and children trek a long distance in search of social amenities like water, firewood, coal etc, thereby wasting a lot of time they would have devoted to education. Fuel for cooking such as kerosene and cooking gas are reserved for the very few rich women while some of the domestics' facilities like pipe – borne water, electricity, kerosene, and cooking gas are not within the reach of an average Nigerian. Women and children are being subjected to hardship. Many women still live on menial jobs, and most jobs performed by women do not have economic values. All the work and activities that do not require financial reward are the responsibilities of women (Egunjobi, 2005).

Having seen the plight of the women, one can see with the researcher that women need not only to be empowered but to be empowered mathematically because of the drastic roles mathematics can play in this area.

When one has a gainful career job, poverty and hunger can be drastically reduced, if not eradicated. In any career and job opportunities in a technological society, a strong mathematical background is needed.

If women who are more in number and those low economically are empowered mathematically, the extreme poverty and hunger can be reduced if not eradicated.

To eradicate poverty and hunger we need to improve in our agriculture. An agriculturist cannot do without mathematics; he needs direct application of mathematics such as measurement of land or areas, average investment and expenditure, average return or income, cost of labor, time and work, seed rate, manure rate etc. Since women are involved more, if they imbibe the mathematical attitudes: persistence, patience, resourcefulness, thoroughness, etc, this goal can be achieved

Achieve Universal Primary Education

Examining the seven goals of primary education in the National policy of education in which one of them is to lay a sound basis of scientific and reflective thinking (FRN, 2004, P. 14), it is obvious that mathematics education is at the center; its actualization can be done through women. A sound basis of scientific and reflective thinking cannot be laid without a sound mathematical ability; this is why mathematics is made one of the core subjects in the school.

Generally if women are empowered it will go a long way in reducing child abuse. If women are empowered their children will receive more care and education. Naturally most children have more attachment to their mothers than their fathers. And if we must ensure that all boys and girls complete a full course of primary schooling, their mothers must be empowered educationally. The empowerment of such a mother is to be

mathematically for the scientific and reflective thinking to be achieved.

Moreover, in most primary schools in Nigeria especially public schools, there are more female teachers than male teachers. Unfortunately, most of them are not mathematically inclined, yet the class teacher teaches all the subjects including mathematics. So if these teachers, in particular female teachers and mothers, are mathematically empowered, universal primary education can be achieved.

Promote Gender Equality and Empower Women.

The issue on women empowerment is of a very paramount importance and that is why it became one of the MDGs. It is also an obvious statement that there is no MDGs that does not need mathematics and women. As earlier discussed in this section, statistics has it that few women are in sciences especially in mathematics. Moreover, Akuboiroh (1990) cited in Ogundele (2009) found that the fear for mathematics normally affect females more than male students. Females normally experience higher emotional instability than their male counterparts. The females are then discouraged from mathematics education, yet these are the people who constitute a significant size of the population. It is known that every development relies on science and technological careers, which cannot be successful without mathematics yet greater population (women) fear this queen of science. It then means that something must be done to really encourage girls and women to be empowered mathematically if promotion of gender equality and women empowerment should be achieved.

Reduce child mortality, Improve maternal health, Combat HIV(AIDS), Malaria, and other Diseases

Three of the MDGs relate to health and of course the health of any nation, especially a developing nation like Nigeria will definitely affect her development.

When one talks about child mortality, maternal health, HIV/ AIDS, Malaria, and other diseases women are more affected and involved. Mathematical knowledge will assist in reducing these health matters especially if the women who are affected and involved more are mathematically inclined. Infact a scientific nation has a lot to achieve, that is why Mangena (2006) states, "we need to be a nation of scientist not only because we are competing with other nations, but more importantly, because we need to be a nation of scientists so that we can fight enemies such as poverty, infectious diseases like HIV and AIDS, Malaria, or Tuberculosis, and lifestyle related illness such as malnutrition, obesity and diabetes. We need science to calculate and mitigate the effects of global warming, severe storms, over fishing pollution and a host of other problems.

Ensuring Environmental Sustainability.

There is no environmental issue that does not need mathematics, be it land scaping, erosion control, planting of trees and flowers, digging of wells or laying of pipe born water etc that does not need concept of mathematics such as distance, measurement etc.

The role of mathematics in any environment is enormous. Our environment has more women than men, if these women are

empowered mathematically; the achievement of ensuring environmental sustainability becomes more feasible.

Develop a Global Partnership for Development.

Two of the targets are; to provide cooperation with pharmaceutical companies, access to affordable essential drugs in developing countries; to make available in cooperation with the private sector, the benefits of new technologies especially information and communication technology(ICT). It may no longer be news to the generality of the people that health issues and ICT cannot be possible without mathematics. It has earlier been established that women are more involved in health issues and consequently they need to be more informed technologically. Therefore, if the women are mathematically empowered, it will be easier to achieve this MDG.

VI. CONCLUSION

The problem of achieving any developmental goal has been a global challenge and that of millennium development goals have occupied the attention of the world leaders. The aim of any developmental goal is to improve the lives of its populace, so there is need to actualize the MDGs.

Considering the roles of mathematics and women in any developing nation like Nigeria, this paper strongly opined that empowering women mathematically is very vital for the attainment of MDGs.

To be able to achieve this, the following areas need to be seriously looked into

- Women to be integrated in all aspects of the development process
- Establishment of international network of women scientists and mathematicians
- Promote the education of girls and women of all ages in science ,technology and mathematics(STM).This can be done through awards and scholarship
- Promote knowledge and sponsor research on the role of women(especially mathematics based)
- Increase women's share of seats in national parliament and local government bodies to ensure that they can participate in decision- making on equal footing with men
- Invest in infrastructure to reduce girls and women's time burdens
- More awareness to be created.

When the aforementioned issues and their likes are dealt with, it will help in empowering women mathematically which invariably will facilitate the attainment of the millennium development goals.

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