EQUITY ISSUES IN MATHEMATICS EDUCATION

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ABSTRACT

The paper discussed equity in mathematics education in relation to access by all students to opportunities to engage in rich mathematics. For any nation to develop technologically there must be massive education of the populace in mathematics irrespective of race, social status, health status, sex or any other discriminative or classification variables. The world over, development is not limited to a few individual. It is a collective responsibility. Education is regarded as an instrument for any form of development. The paper discussed Family, Gender, Social Status, Achievements, Earnings, Health status and Political participation among other factors that can affect equity issues in mathematics education. Inequity in education affects social mobility of citizenry negatively. Among the recommendation to achieve equity in mathematics education is fairness and inclusion. The educational design system, practices and how resources are allocated should ensure equity as much as possible.

KEYWORDS: Mathematics Education

INTRODUCTION

Science, technology and mathematics education (STME) has accelerated the pace of change in the world. It has provided the foundation for wealth and development and brought immense improvement to the quality of life. The models of science in interpreting the natural world and developments of theories all rely on mathematics. The subsequent conversion of these interpretation and theories using technology to invent things for the comfort and benefit of man to extend his abilities and capacities to manipulate and control his environment also apply mathematics. Mathematics is an essential tool for the development of science and technology. The importance and non-substitute place of mathematics education therefore, cannot be over emphasized.

For any nation to develop technologically there must be massive education of the populace in mathematics irrespective of race, social status, health status, sex or any other discriminative or classification variables (Nsofor, 2008).

Educational inequality is the difference in the learning results, or achievement, experienced by students who are classified as different, based on certain variables. Educational achievement is most of the time measured using numerical scores or grades. The grades could be Grade Point Average (GPA). The scores could test scores in class tests or other forms of examinations.

Educational inequality achievements are attributed to several variables. These variables include family of origin, gender, and social class. The variables are not the same everywhere. It could include achievement, earnings, health status, and political participation in some places (Ferreria and Gignoux, 2014).

A lot of educational inequality is attributed to economic disparities. In some multiracial countries economic and social disparities fall along racial lines. Location of residence and language are also factors that cause inequality in educational achievements (Lee and Gary, 2005).

Throughout the world, there have been continuous attempts to reform education at all levels. The attempts for these reforms are dependent on many forces. The forces could be historical, expectation of the society from graduates of a particular level of education, changing culture, and economic or technological development. The inequalities still persist. Education moves the society forward. It promotes the production of good citizens, identity, equality of opportunity and social inclusion, social cohesion as well as economic growth and employment" and for these reasons, equality should be promoted (Shrivastava and Shrivastava, 2014).

Equity in mathematics education is related to access by all students to opportunities to engage in rich mathematics. A fragile knowledge of mathematics will affect the students' learning and enjoyment of mathematics.

Family, Gender, Social status, Achievements, Earnings, Health status and Political participation are among other factors that can affect equity issues in mathematics education.

FAMILY

Family background has been identified as the most influential factor in student achievement. Lee and Gary (2005), found that the correlation between academic achievement of parents with academic achievement of their children.

The study reveals that while 11% of students from the bottom fifth of the educational ranking of parents academic achievement obtained college degree, 80% of students from the top fifty of the educational ranking of parents academic achievement obtained college degree (Haskins and James, 2009). The students from the top fifth parents may have a home that is more supportive of educational success. More books, libraries, help from home and intellectual intensive conversation will be readily more available to children from this type of home. Students from the bottom fifth may not have access to such facilities, environment and situations. They may lack behind in verbal memory, vocabulary, mathematics, reading achievement and even have more behavioural problems (Farkas, 2006).

Families in the middle class and above may have connections that will help their children gain admission to right schools. The stress children from lower class families possibly go through may not let them have high academic aspirations which may affect their academic growth (Gamoran, 2001). While students from lower class may have total break from their studies during holidays it may not be so for the students from middle class and above. The resultant effect will be loss in skills during this period. Students from single parent home may suffer some required attention than their counterparts from two parents. Fewer resources, less parental attention, and more stress all have effect on the academic achievement of students (Farkars, 2006).

Another influence the family background has on educational achievement is in the area of cultural knowledge and perceptions. Culture, includes knowledge, beliefs, art, morals, laws, customs and any other capabilities and habit acquired by a member of the society. It is, therefore, an effort to prepare them, to survive and live well. What is of great relevance here and which emerges, is that culture is the "way of life" of people which is transmitted to the next generation. Nigeria is made up of a larger number of cultural entities; it had its collection of norms, role assignments and order which made the existence of the society possible (Ajewole, 2006).

The language used in the family can also cause educational inequality among the students. Where the parents do not understand the language of instruction in school, it implies the student will not be able to get assistance at home to simplify his/her learning process. When the language at home is the same with that used as medium of instruction in school makes comprehension easier for the student. Gender

In the traditional Nigerian culture, the practices are that the woman's place was considered as primarily in the home. The ultimate aim is for women to stay at home and be good mothers and wives. Families with low in economic rating prefer to invest their limited resources in the education of boys rather than the girls who might eventually marry into another family or abandon their profession. There still exists cultural and social stereotypes concerning "professions for women" which greatly influence their choice of fields of study. There are some traditional roles assigned to males and females, for example, for females; nursing, teaching and cookery, and for males; science, engineering, hunting (Ajewole, 2006). A critical analysis of these roles and duties shows that there are no special qualities to warrant some of them being exclusively assigned to men or women. Socialize gender roles have impact on females' access to education. In Nigeria, parents socialize their children into specific roles based on gender. The male are preferred and encouraged to engage in computer and scientific learning. The females are encouraged to learn domestic skills.

A study by Banks (2013), reports that gender had no significant effect on mathematics and achievement in the early school years. The study however found that boys score higher on advanced mathematics, and participated more in class discussion than the girls.

Bolarin (2004) lamented the low participation of women in Science, Technology and Mathematics Education can be traced back to the last two years of secondary education. A number of studies supported this, among such studies is that of Bajah & Bozimo (2005) on enrolment distribution of boys and girls in science and mathematics subjects at the secondary school level.

SOCIAL STATUS

Social status of parents contributes to students' inequality access to education. Students from parents in the upper or middle class has better chance of being labeled as a gifted child than a student form low class even with the same level of potentials. The reason can be explained based on the mode of selection. In identifying and selecting students the use of standardize tests are usually employed. Some of the standardize tests may have cultural and mastery of language in built. The students form low class parents may not have access to such required information and high proficiency demanded by the standardized tests. Where nomination system is used, the nominators may not have the training in identifying gifted students. The knowledge of the parents, political skills and power to require schools to classify their child as gifted or talented is a factor that can lead to inequality in education (Banks, 2013).

Education plays a key role in determining how you spend your adult life - a higher level of education means higher earnings, better health, and a longer life. By the same token, the long-term social and financial costs of educational failure are high. Those without the skills to participate socially and economically generate higher costs for health, income support, child welfare and social security systems.

So a fair and inclusive system that makes the advantages of education available to all is one of the most powerful steps and strategy to make society more equitable. The hope that expansion in education would automatically bring about a fairer society have been only partly realized. Women have made dramatic advances, but overall social mobility has not risen and in some places inequalities of income and wealth have increased. Fair and inclusive education for majorities and minorities is a possible way to address these challenges. Equity in education enhances social cohesion and trust.

ACHIEVEMENT

The basic structure of education systems affects equity. Traditionally, education systems do separate or classify students according to educational attainment. Evidence from studies of secondary and primary schools suggests that such classification or segregation can increase inequalities and inequities, particularly if it takes place early in the education process. Early sorting can also weaken results overall.

Selecting pupils on the basis of academic achievement tends to create great social differences between schools. It also increases the link between socio-economic status and performance – it tends

to accelerate the progress of those who have already gained the best start in life from their parents – and is also associated with stronger performance at the top end of the scale in mathematics and science. So academic selection needs to be used with caution because of the risks it poses to equity.

EARNINGS

The socio-economic structure of education systems is also important. Secondary school systems where there are large socio-economic differences between schools tend on average to have worse results in mathematics and reading and a greater spread of reading outcomes. Indeed, social background is more of an obstacle to educational success than in systems without such socio-economic differences between schools.

Governments often allow parents a choice of schools, partly in the interests of equity. But this may in fact increase the risk of inequity because better-educated parents make better-informed choices. In much organization for Economic Co-operation and Development (OECD) countries, greater choice in school systems is associated with larger differences in the social composition of schools.

The conclusion is that school choice requires careful management form an equity perspective, particularly to ensure that it does not result in increased differences in the social composition of schools. Popular schools are likely to be oversubscribed, and need ways to ensure an even social mix. This could include selection methods such as lottery arrangements. Financial premiums to schools attracting disadvantaged pupils may also help.

What happens in the classroom obviously affects equity, but the relationships between schools, parents and communities also matter. Student learning benefits from an effective school-home relationship, but weak support at home can hold back children form deprived backgrounds.

Second chances for those who lack basic education and skills can be provided in a number of ways, including programmes that provide literacy training, work-based programmes, and arrangements to recognize informal learning. In the United States, almost 60% of dropouts eventually earn a high school credential (GED certificate) through second chance education programmes.

Making students repeat a year if they are not keeping up is a popular option; in some school systems, and there is little evidence that children benefit from it. High rates of year repetition in some countries need to be reduced by encouraging alternative approaches in the classroom.

It is possible to improve classroom attainment with methods such as formative assessment – a process of feeding back information about performance to student and teacher and adapting and improving teaching and learning in response, particularly with students at risk. "Reading recovery" strategies – short-term, intensive interventions of one-on-one lessons – can help many poor readers to catch up.

For classroom interventions to work, however, teachers need support to develop their techniques to help those pupils who are falling behind.

HEALTH ISSUE

The physical handicaps of individual children as well as those with mental retardation are discriminated upon within educational systems and institutional walls. Their individual needs make them to be automatically isolated from their peers and benefits of general education.

POLITICAL PARTICIPATION

Political linage/barriers also cause inequality in access to education. Schools are supposed to receive equal resources but undoubtedly there is inequality. The case of Federal government colleges or unity schools and some special schools in Nigeria readily comes to mind.

EFFECTS OF INEQUALITY TO EDUCATION

This inequality affects social mobility (ability to move upward irrespective of background). Stratified educational system forces low-income families to place their children into less-than-ideal schools that do not have same opportunities and educational motivations as to where high-income families send their children (Leonhardt, and Scott, 2005).

RECOMMENDATION

Equity in education has fairness and inclusion as two major dimensions. Three key policy areas can affect equity in education: the design of education systems, practices in and out of school, and how resources are allocated.

Global Partnership of Education (GPE) functions to create a global effort to reduce educational inequity with a focus on the poorest countries. GPE is the only international effort with their particular focus on supporting countries' efforts to educate their youth from primary through secondary education. Main goals of the partnership include providing educational access to each child, insuring each child masters basic numeracy and literacy skills, increasing the ability for governments to provide quality education for all, and providing a safe space for all children to learn in. they are a partnership of donor and developing countries but the developing countries shape their own educational strategy based upon their personal priorities. According to Banks, multicultural education is a reform movement that allows all students equal opportunities to learn regardless of their gender, social class, sexual orientation, ethnicity, or culture (Banks and Cherry, 2009). Since competition and biases are inevitable in a school setting, educational equality is an ideal that cannot ever fully be attained.

The followings can help in the provision of equity in mathematics education to students.

One way of improving performance and preventing dropout is to identify at-risk students early and take action quickly. This means monitoring information on attendance, performance and involvement in school activities, and having a concrete response to improve outcomes and prevent dropout.

Upper secondary education needs to be attractive not just to the academically-inclined elite, but also to offer good quality pathways without dead ends and effective links to the world of work. Offering at-risk students good career guidance and counseling, as well as making the curriculum more flexible and diverse is helpful. Additional learning support at the end of secondary school may also help to encourage students to stay in school.

Many countries could usefully follow the Finnish approach to learning difficulties, which offers a sequence of intensifying interventions to draw back into the mainstream those who fall behind. It certainly appears successful: only 1% of Finnish 15-year-olds are unable to demonstrate basic functional reading skills, while the OECD average is 7%.

There should be more emphasis on the use of communication technological for instructional purposes to complement the traditional instructional method. This will enable learners have access to instructions from experts through content sharing, videos and online forums. There is the need to help teachers develop their techniques to help students who are falling behind.

Classroom attainment can be improve using formative assessment methods.
If stratification of learners are to be carried out there should be justification based on proven benefits. It could be done to help improve performances and students at risk to prevent dropout.

Selection of pupils for a school should not be solely as a function of achievement. This is because socio-economic status and achievement are related, in that children from high socio-economic families gain better start from their parents.

Teachers and parents should work together to complement each other, and creating space for parents involvement in curriculum may not be out of place. Parents should improve their conversation with their children in regards to their schooling. A clear government policy on level of involvement expected of the parent should be put in place. Where there is free education parents should be made to know that are other financial responsibilities.

Parents should be educated on the need to change their attitudes and to invest in the education of their girls in areas of science, technology and mathematics.

Cultural and religious teachings which are anti-female in education in general and anti- female in science education in particular need to be discouraged.

Health matters are science-based. Research findings have shown that many health problems of developing countries such as high rate of infant and material mortality, high infertility rate, malnutrition and stressful condition etc. correlate positively with low level of women in science.

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