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Is Mathematics for All?

PETER GATES

School of Education, The University of Nottingham

CATHERINE P. VISTRO-YU

Mathematics Department, School of Science and Engineering, Ateneo de Manila University

ABSTRACT

Mathematics for All began as a programme in the early 1980s when concerns about pupils' access to mathematics education heightened due to the many issues surrounding the mathematics classroom and the mathematics student. The following chapter highlights these important issues by appropriately discussing the contexts within which these issues arise and may be resolved. The issues include curriculum content and assessment practices, equity among subgroups classified by gender, race, and socio-economic status, the use of mathematics as a selection device, democracy in the mathematics classroom, and the value of culture in the teaching of mathematics. The chapter, likewise, echoes the voices of marginalized groups in the mathematics classroom that are products of undemocratic pedagogical practices, societal perceptions, and cultural realities. Prerequisites for a successful Mathematics for All programme are put forward and directions for further research are offered.

1. INTRODUCTION

It can hardly be contested that many of us live in an uneven and unjust society where access to education and to justice depend on the capital one can appropriate and accumulate – particularly through the benefits the education system bestows on some individuals. There is ample evidence in the academic and research literature in education to support this contention such that it is hardly now arguable.

Many mathematicians and mathematics teachers would see their discipline as an important means through which individuals can make sense of the world; that mathematics is an empowering force in solving life's problems. The guidance to the UK National Curriculum put this argument in the following way:

Mathematics provides a way of viewing and making sense of the world. It

is used to analyse and communicate information and ideas and to tackle a range of real life tasks and real life problems.

(NCC, 1989, p. A2)

Yet, there are others who posit a more critical approach to understanding the importance of mathematics that is portrayed in that relatively value free contention. Ole Skovsmose argues that mathematics plays a more socially defining role:

Mathematics not only creates ways of describing and handling problems, it also becomes a main source for the reconstruction of that reality.

(Skovsmose, 1994, p. 52)

Mathematics thus acts as a 'gatekeeper' to social progress. A qualification in mathematics seems to be considered as vital for many careers as it is for entry to University (Harris, 1991; Stake & Easley, 1978), even when the subject to be studied bears little connection to mathematics. Furthermore, a qualification in mathematics tends to result in higher salaries in later life, so what we do in schools actually does affect not only the here-and-now existence of our pupils, it also affects their future prospects (Volmink, 1994).

In 1990, the World Conference on Education for All (WCEFA) was convened by the World Bank, UNESCO, UNICEF and UNDP. Participants in this important event included some 1500 individuals representing governments, intergovernmental bodies, non-government organisations, institutes and foundations. The conference was organized in response to the widespread concern over the deterioration of education systems during the 1980s (The Consultative Group on Early Childhood Care and Development, 1993). At its conclusion, the Conference unanimously adopted two texts that signified the world community's renewal of its commitment to ensure the rights of all people to education and knowledge: the 'World Declaration on Education for All' and a 'Framework for Action to Meet Basic Learning Needs'.

The initiative of the WCEFA was unique in two aspects: the breadth of its definitions on what is needed to make education available to all and its focus on action. Subsequent documents on each and every participant country in the conference testify to the second aspect. On what it means to make education available to all, the Conference affirmed what most educators believe:

In addition to calling for universal access to schooling for all children, the declaration reaffirms that "every person – child, youth and adult – [should] be able to benefit from educational opportunities designed to meet their basic learning needs." These include "both essential learning tools, such as literacy, oral expression, numeracy and problem solving and the basic learning content (knowledge, skills, values and attitudes) required by human beings to be able to survive, to develop their full capacities, to live and

work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions and to continue learning.”

(UNESCO, 1990, p. 1)

To strengthen its claims, the WCEFA noted in the preamble of the *World Declaration on Education for All: Meeting Basic Learning Needs* the following realities that persist to this day:

- More than 100 million children including at least 60 million girls, have no access to primary schooling;
- More than 960 million adults, two-thirds of whom are women, are illiterate and functional illiteracy is a significant problem in all countries, industrialised and developing;
- More than one-third of the world's adults have no access to printed knowledge, new skills and technologies that could improve the quality of their lives and help them shape and adapt to, social and cultural change; and
- More than 100 million children and countless adults fail to complete basic education programmes; millions more satisfy the attendance requirements but do not acquire essential knowledge and skills.

(UNESCO, 1990, p. 1)

It is in light of the above facts that we want to question the existing conditions of mathematics education in the world. In support of the WCEFA and the *World Declaration on Education for All: Meeting Basic Learning Needs*, we want to ask, yet again, “*Is Mathematics for all?*”

1.1. *A Historical Perspective*

In the late 70s and 80s, past presidents of the Commission Internationale pour l'Etude et l'Amelioration de l'Enseignement des Mathematique (CIEAEM) tried to “end the ‘noble isolation’ of mathematics and mathematics education and its orientation towards pure mathematics only and to connect mathematics education closer to other sciences, to the social reality and to the social mathematical practice” (CIEAEM, 2000, p. 2).

The demand for a ‘*Mathematics for All*’ programme was inevitable. First, there was the demand to give access to mathematics not just to some, but to all pupils, to make school mathematics beyond the primary phase compulsory and sufficiently comprehensible in order to gain mathematically literate citizens. At the same time, a broad international audience (ICME-6 1988, 5th Day Special Programme and ICME-5 1984, Theme Group I ‘*Mathematics for All*’) acknowledged the problems of cultural selectivity and unequal distribution of mathematics education as a legitimate challenge and as a matter of world-wide consciousness and recognition. One important focus was on analysing conditions