



There are two different conceptions of Mathematics. In one the emphasis is on quality; in the other a much greater emphasis is on quantity. One believes that Mathematics is to train the mind; the other is based on the assumption that Mathematics is all about quantity. They are not only different, but are in fact divergent, even to the extent of being contradictory. They reflect different perspectives on the universe and life. The irony is that the two different conceptions are made to appear as similar or even identical. The divergences or the contradiction are sought to be camouflaged through clever use of words.

The first conception was presented in ancient times by Plato, when he said, "above all, arithmetic stirs him up who is by nature sleepy and dull, and makes him quick to learn; retentive, shrewd, and aided by art divine, he makes progress quite beyond his natural powers.". Without listing the names of all those thinkers who believed in and propagated this kind of Mathematics, let me immediately jump to the National Policy on Education, 1986 as amended in 1992, which says, "Mathematics should be visualised as the vehicle to train a child to think, reason, analyse and to articulate logically. Apart from being a specific subject, it should be treated as a concomitant to any subject involving analysis and reasoning". There's not a word about measurement, quantification and numbers. If Mathematics was conceptualized and propagated in this manner, the history of epistemology would have been different.

The second concept has been the dominant one in actual practice ever since but more particularly in the last five centuries, when it was considered to be the axis and foundation on which advancement in science and technology was built. It is credited with being responsible for a major upward shift in human history, the graph of human progress rising almost vertically. Ever since acquiring this honour, this conception seems to have completely overshadowed the first conception emphasising quality. This conception is reflected in the following excerpts from the National Curriculum Framework 2005: "the narrow aims of Mathematics consist of developing useful abilities in numeracy -- numbers, number operations, measurements, decimals and percentages". Even when this framework goes on to the higher aims, it

substantially and materially differs from the policy document. It says that the higher aims are "to develop the child's resources to think and reason **mathematically**". (Emphasis added). Unfortunately the narrow aims have become the only aims in practice globally as well as historically. While the NPE refers to thinking, reasoning, analyzing etc generally without any qualifications, the framework brings the qualification of making them narrower -just mathematical. The narrower concept within the higher aims continues in a little muted form, when it goes on to refer to 'mathematical communication, 'being precise' and emphasizes 'rigour in formulation' 'the use of jargon', and states that 'good notation is held in high esteem and believed to aid thought'. These are all statements, which taken together, project an image of Mathematics which is different from the conceptualization in the policy document. One cannot blame the curriculum framework for this notion of Mathematics. This notion is widely spread, practiced and believed. The framework only captures it and presents it, to give due credit, in a more subdued form than the general belief among the students, parents and public at large about Mathematics.

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The National Curriculum Framework 2005 has been credited for capturing and presenting the general belief about Mathematics in a more subdued form because in its

elaboration it also keeps on referring to the larger or higher aims side by side. It further goes on include, ' to pursue assumptions to their logical conclusion and to handle obstructions, a way of doing things, and the ability, attitude to formulate and solve problems '; it builds abilities of problem-solving and analytical skills and is helpful in preparing children to meet a wide variety of problems in life. It also says, ' proof is important ' and makes children understand ' proof as a systematic way of argumentation '. This duality in the NCF and mixing of broader and narrower aims clearly arises out of a different perspective than the national policy which only talks about broader and higher aims. Interestingly, to camouflage the difference and the divergence, many phrases and statements that are part of the first conception are interspersed as if, both are the same thing.

Unfortunately, in teaching, learning and use of Mathematics only the second conception dominates to the complete neglect of the first one. The curriculum, the detailed syllabus, the textbooks, actual classroom teaching and learning processes and the examination only focus on the quantitative aspect of Mathematics. Use of quantitative techniques has become a major criterion for judging the quality of research as also the respectability of the different branches of knowledge. Indeed, globally and almost

universally, in the educated mind, the second conception abbreviated to a science of quantity or a branch of knowledge relating to quantity, is the enduring image.

This has had disastrous consequences and resulted in serious distortions in the direction, progress, emphasis and management of knowledge. It has also resulted in a kind of caste system among the branches of knowledge. More regrettably, it has developed blind spots in human perspective resulting in a kind of duality between quantity and quality in which the former is desirable and therefore to be pursued while the latter is only a consequence of the first and will automatically follow, if the first is achieved. The quality of human life is therefore being solely determined by 'quantities', GDP, Human Development Index and the like. Even richness and poverty are sought to be divided by 'a line'.

There is an urgent need to appreciate that the first conception of Mathematics should be accorded its due place. The educational perspective must change and be permeated by this conception which visualises Mathematics as a critical and important tool for training the mind to think, analyse, and articulate logically. It is amazing how this loftier aim, which the national curriculum framework admits is a higher aim is completely missing from the teaching - learning as it operates today.

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