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State maths phobia is NCERT's worry

With five lakh failures, education department considers making subject optional
Pia Chandavarkar

Pune, November 28: While the State education department is toying with the idea of making mathematics an optional subject at the secondary school level, efforts are on in other states to boost mathematics learning. At least 15 state boards in the country are taking up the initiative to switch to a practical, activity-based approach to mathematics by setting up laboratories to dispel the fear and generate interest in children. Concerned, officials of the National Council for Education Research and Training (NCERT) have called upon the State to follow other states to promote the subject. With the National Curriculum Framework 2006 highlighting maths and science as a crucial component of futuristic learning, there is a growing emphasis across the country on the need to move away from the chalk and talk method of teaching to a more constructive-activity based approach.

"NCERT has recommended the setting up of mathematics laboratories in schools, which will help children understand fundamental concepts in an interesting way. This would include understanding abstract concepts through concrete examples, with application to daily life, leading to improved performance even at later stages," said NCERT's maths and science department head Hukum Singh.

While work on the maths lab concept began in 1993, the Central Board of Secondary Education (CBSE) issued a circular recently to all affiliated schools to introduce such laboratories compulsorily for students from classes I-X.

Moreover, the CBSE also recently changed the mathematics evaluation pattern at the secondary level, making it 80 marks theory and 20 marks practical. This was introduced in a phased out manner, in 2004, 2005 and 2006, in standards VIII, IX and X respectively. "Students appearing for the CBSE board exam in 2007 will be evaluated as per this pattern," said Singh. While CBSE-affiliated schools in India will implement this, Singh said other schools in several states were interested in the maths lab concept, and NCERT had carried out many demonstrations, orientation and training programmes for teachers in nearly 15 states including Uttar Pradesh, Jharkhand, Andhra Pradesh, Kerala, Karnataka, Bihar, and others. Maharashtra's response has been lukewarm.

With 5 lakh failures in maths among the 15 lakh students appearing for the Standard X board examination in the state, the education department has been holding brainstorming sessions with academicians and parents to deliberate whether maths should be an optional subject.

Of the two brainstorming sessions held in Pune and Nagpur so far, 75 per cent of opinion has been in favour of making maths optional, while the rest have asked for alternatives like deleting complex mathematical concepts to retain the functional ones, or having different question paper sets for different IQ levels.

"The National Policy on Education (NPE) 1986 states that mathematics should be a part of general education up to the secondary school level. This implies that there should be no such bifurcation in difficulty levels which is also NCERT's stand", NCERT officials said, adding that the real problem was defective teaching methods.

Comments from Steven Rasmussen <srasmussen@keypress.com> .

Dear Math Education Colleagues,

I wanted to share with you a few thoughts prompted by an interesting article sent to me recently by a business partner in India (where I am currently working). Several comments in the article reminded me that I wanted to write this note to colleagues in the math community here reflecting on my experiences in Asia and the contrast that I find there to our experiences in the U.S. While the article in its entirety is only tangential to my own thoughts, you'll see why it prompted me to write my note.

To understand the article, you should know:

1. "The National Council of Educational Research and Training (NCERT) is an apex resource organization set up by the Government of India, with headquarters at New Delhi, to assist and advise the Central and State Governments on academic matters related to school education," (from the NCERT web site)
2. CBSE is the Central Board of Secondary Education (<<http://www.cbse.nic.in>><http://www.cbse.nic.in/>).
3. One lakh is equal to a hundred thousand.
4. Pune [Puna or Poona] is a city about 150 km southeast of Mumbai [Bombay]. And the article is from a nationally syndicated online news service.

I spend a fair amount of time traveling and working in Asia - mainly Southeast Asia (Singapore, Thailand, Malaysia, Vietnam), but also India, China, Taiwan, South Korea. In Southeast Asia I work with various parts of the Ministries of Education and also speak with many teachers. It is my work in math technology that brings me to Asia most often, but I also engage with colleagues here on broader educational issues. Most of the countries I listed are undergoing big shifts in thinking about math and science education. While it is

not possible to characterize them by any simple formula, I feel comfortable in saying that education for creativity, project-based education, inquiry- and activity-based education, utilization of technology are themes identified by educational leadership in these countries as important national goals. This is certainly the case in India where I have met and discussed educational issues with policy makers at all levels, including the Secretary of Education.

I find it ironic that in our own country, where we have pioneered many of these themes, and that been the center of research on their efficacy, the mainstream math community is on the defensive for the pioneering work that is now catching hold in Asia--even as a minority of our community points to traditional practices in Asia as the example we should emulate in math and science. In India, even successful students (those who do well on their 10th and 12th grade Board Examinations) are generally so turned off by the boring nature of school mathematics that they don't pursue their studies at Indian universities. It has become a national problem. I wonder whether those that pound away against "fuzzy math" in the U.S. realize the revolution that is happening in Asia with regard to educational policy and pedagogy--moving from from drill and direct instruction to activity- and inquiry-based practices. My fear is that heightened attention to math education on the narrow terms advocated by a few here, under the premise of positioning our country to compete in the global STEM market, will result in adoption of "_____ math" (you fill in the _____ with the country of your choice) of a bygone era, just as the countries of Asia move closer to the national vision that our own mainstream community has advocated for the past decade. Of course practice in a country like India lags very far behind policy--for many reasons. But the scent of change is in the air here, and in many countries--Singapore, S. Korea, Taiwan, Malaysia--change is in full bloom.

Several weeks ago I attended a national Impact Conference of the Partnership for 21st Century Skills in Berkeley, sponsored by U.S. business and educational organizations across industries and disciplines. STEM businesses made their needs clear, and those needs are the same in the U.S. as in Asia The Partnership advocates student creativity, collaboration, communication, problem solving, critical thinking as key elements to strengthen in our educational system. While our friends and colleagues in Asia have embraced these themes to move their economies and citizens forward, for some reason our country waivers.

Like may of my colleagues, I worry where we are headed in the U.S.--forwards or backwards Maybe we'll be first in TIMMS the same year that Asian countries, deciding that being first on a narrowly defined instrument to measure mathematical knowledge doesn't make any sense with respect to promoting creative application of knowledge, abandon the TIMSS race.

Respectfully,
Steve Rasmussen