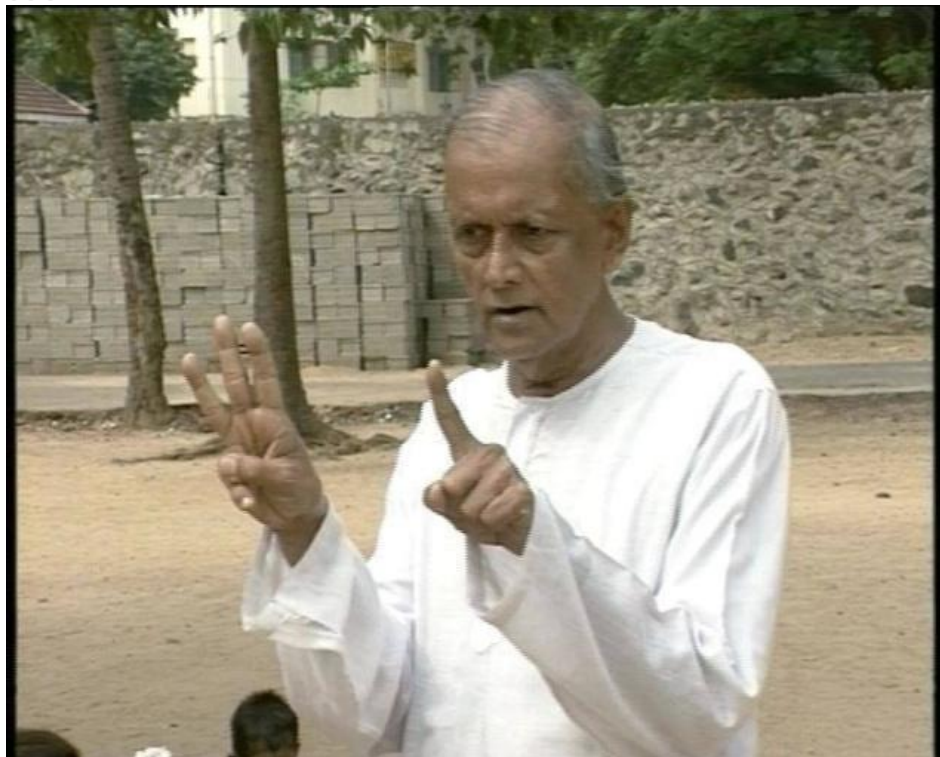


Education

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Passion for numbers

SOUDHAMINI



NUMBERS WERE THE SAME: P.K.S in action

P.K. Srinivasan (November 4, 1924-June 20, 2005) was an extraordinary person in the world of math education. I met him in 1998, while making a set of videotapes on innovative teaching methods in mathematics for the DPEP, the distance education cell of the Education Department, Government of India. PKS became the chief protagonist of those tapes.

He had retired from the Muthialpet High School, Chennai but continued to work as consultant for schools as diverse as Rishi Valley, the TVS school in Mysore, and Corporation schools all over Chennai. I attended a conference with him at Rishi Valley and heard his exquisite clarity on concepts ranging from fractals to the Fibonacci sequence. But my favourite memory of him is teaching the Narikuravar (gypsy) children at the Corporation School in Saidapet, Chennai.

Unique way

He had a unique way of introducing numbers to Kindergarten children. He felt that because they learnt numbers mainly in sequence — as 1,2,3,4 etc. they never really grasped the concept of discrete quantities. So after first letting them rattle off the sequence, he would intercept by asking, “Now show me 3 in as many ways as you can”. Initially there would be consternation among the kids and he would smile, his eyes gleaming with a fiery excitement. Putting up one gnarled hand he would first show 3 fingers, and they would all chime “3”. Then he’d bend his fingers, put out 2 first, then one more and say “2 + 1” and they would repeat, “3”. Next he’d put up four fingers and bend one - “4-1 = 3”. Then “2+2”, “5-2”, and so it would go on.

I have seen the excitement that erupted among those toddlers for whom numbers would never be the same again; nothing like the anonymous sequence that they began with. Soon all kinds of finger play broke out and PKS just stood smiling toothlessly, infinitely careful not to disturb that first moment of epiphany. Quite unobtrusively he’d introduced the concept of quantity, and also laid the foundation for the primary functions of addition and subtraction.

He had a vast collection of books in his house at Nanganallur, and once he showed me a World Encyclopedia on Mathematics to prove that it was not just the zero that India invented, but also the fraction. The world was afraid to break up numbers, he said, for fear the whole edifice would collapse, but Indian mathematicians proved that the concept of the 'Whole' was in itself quite relative.

Later, in the same school I was to see a wonderfully concrete demonstration of this abstract concept. Taking a long strip of paper he first folded it into eight equal parts. Then opening it out with the creases clearly visible, he pointed to the first part and asked the children, this time of 3rd standard, to name it. "1 by 8". Yes, that was fairly simple. And so it would proceed till he reached the last part, to which in predictable sequence, the children would intone "8 by 8" and then like a magician he would close the paper and re-open it, pointing to the same whole again to which they would now exclaim, but with some thoughtfulness, "1". And slowly the concept would sink in, that every number is merely a complete fraction of itself. From here, it was a small step to simultaneous fractions. Concept always came first for him, and only then the function.

However complex the concept he never prodded the students. Just waited patiently till they discovered it for themselves, and it seemed to me that they all did. I could barely shoot from excitement myself. Infinity lay right there within the interstices of the feeble chalk points on that faded blackboard and PKS helped us all to see it.

In the interview I recorded then he spoke passionately about his faith in education. "If a child falls sick, the doctor cannot blame him. It is his duty to heal the sickness. Similarly, the teacher has to find a way to clarify misunderstandings and release mental blocks about maths. He cannot blame the student."

Committed

He had visited the U.S. on a Fulbright scholarship and Africa on a teaching deputation. He also travelled frequently to Delhi and other parts of India to attend conferences and workshops. But his real commitment lay with the under privileged. His son, Kannan Srinivas, explained recently that, to PKS, this was his personal form of patriotism, this abiding faith in children to "develop themselves under proper exposure".

Another great area of fascination for PKS was the life of Srinivas Ramanujan. PKS was his first biographer, travelling every weekend after school closed for many years to Kumbakonam, in search of details of Ramanujan's life. He discovered the house where he was born, the temple he frequented and the letters he wrote to his father from Cambridge. All later biographers from the West were to use these primary sources and acknowledge PKS in their works.

Here again the interesting insight from his son was that this interest in Ramanujan fed into his passion for math education. Rather than simply celebrating a genius, PKS strove to create a climate where more Ramanujans could flower. PKS will remain one of the most inspiring individuals of his generation.

Soudhamini is a documentary filmmaker based in Chennai

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