Dialogue: An Interesting TLM

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When we work in the realm of education we often realise that there cannot be any single/uniform pedagogy that can be claimed to work for every single child. It is important that we are not afraid of incorporating the various approaches to education in our own teaching style. I have always believed that each child is capable of learning, even if it may take a little extra time. In 2014 through my fellowship I travelled to Dehradun and it was in an office there that a poster captured my attention. The poster carried a slogan which said that dialogue was the best mechanism to come closer to children and explain things to them. When one notices something of this kind written somewhere, the faith in its strength becomes deeper. It is this spirit of dialogue that I have been using as part of my pedagogic practice for long. In the elementary classes this enables students to understand concepts from tangible/concrete to intangible/abstract.

In class five I told the students a story – the milk-man comes to my house every day. One day my niece asked him, "how much milk do you get each day?". To this, the milk-man replied, "now we have 7 cows so we get around 56 litres of milk every day. So my niece said, "this means that each of your cows gives 8 litres of milk." The milk-man said, "No, some cows give less than 5 litres while others give more than 5 litres, but in total we have 56 litres of milk every day."

My niece said, "How is this possible? I did not understand." The milk-man said, "both the red cows give 6 and 7 litres, the black-brow cow gives 8 litres, the brown cow gives 12 litres, another brown cow gives 14 litres, the white cow gives 5 litres and the spotted cow gives 4 litres, so in total did it not amount to 56 litres?" My niece did not fully understand the explanation given by the milk-man and looked towards me and she said, "Uncle, if in total there is 56 litre of milk then each of the cows is supposed to give 7 litres, but the milkman explained…?" Concluding the story, I asked the students how I could explain things to my niece.

Out of the 30 students in the class, two raised their hands. Then I said that we would now be doing some activities and then we would discuss them and then eventually discover how I could explain the matter to my little niece. All the children nodded in agreement.

I handed over some marbles each to 6 of my students and then asked them to close their palms. Then I told them that when I say start they should all come in collectively and decide how they would allocate the marbles if they were to be equally divided amongst them all and only the student's name I would call out would reveal the plan. After some time the students declared that they were ready. So I called out to Kanha to explain, he said that the first thing that they did was to see how many marbles each of them had in their hands and then when they discovered that Kanha had the maximum number of marbles he began by giving one of them to the person who had just a single marble in his hand. Then the person who had four marbles gave to the person with two marbles one marble and now three has 3-3 marbles each so then I decided to give one marble to the boy who just had one marble originally, so now everybody had three marbles each.

Then I asked if anybody in the group would like to say anything. They said they did not have anything to say. I asked that 5, 4, 5 members also repeat the same activity and most of these explanations were similar to those of Kanha. Then I gave all the students plastic cups and told them that each must have marbles equal to the number of cups that they had. All of them placed their plastic cups on the table. When I turned around I saw that some of the children were doing the same thing that they had done in the first activity and some were trying to do something new (the two students who had raised their hands earlier were asked to separately solve it on the board). After a while Manisha and Arzu exclaimed that we could solve it in another way. I asked them to present this in front of the others in the claasroom. Arzu asked if she could

be permitted to speak to Manisha for a bit and I agreed. They discussed for a while and then placing six cups on the table, Arzu said "Teacher" (then I told her to address the entire class instead). She smiled and agreed and continued by saying that in the six cups that I have the marbles are placed in this order (I urged her to write on the board and so she wrote and spoke) 1,3,4,2,5,9. Then I placed all marbles in one cup (in between both had asked for a cup each) and counted these and in total there were 24 marbles. How many cups do I have to put them in, 6? So then I divided 24 by 6 and 4 was the answer and then I put 4 marbles each in the 6 cups? Manisha said "In my 8 cups 2,0,7,6,5,3,8,1 marbles were there so I put them all together in one cup and counted them to be 32. I was supposed to divide these in 8 cups so in this way I put 4 marbles each in each of the cups." After listening to this, both of them (the ones who wrote on the running board) started laughing. I asked – "What was the least number of marbles?" Arzu-"1" and – 'the largest' Arzu-'9' after this the rest of the students started shouting that they too had solved the problem. I called the two former students. They too agreed that first they combined all and then divided the marbles equally. I said -"Arzu and Manisha are saying that it is 4 marbles and that the mean was between 1 and 9" and then both the girls agreed. I told them that it was this that was called the average. But can we formulate a rule about how the average can be discovered?

Kanha who was so far busy playing with the marbles spoke with a startle – "I will explain teacher" and I urged him to explain. Then including the four children many others too raised their hands. So according to the rule that the children themselves had made, I asked the child who first raised his hands to speak. Kanha said- "First I will combine all the marbles and add them". I urged him to speak for any object and not just marbles. He stopped for a while and then spoke - "I will combine all the given things and then divide them by the number of sources that they came from". When I looked at the children, their expressions revealed that they were still not clear about the concept, so I said – "Good, then let's do one thing – we will listen to everyone and I will write them on the board, then collectively we would come to a decision." The children agreed in unison and by then I had asked the four kids to sit down. The children placed their arguments and

I wrote them on the board. The children came to an agreement that if everybody is to get the same amount, then-

Average= the sum of all numbers / total given

I proceeded the discussion -"We are getting some information through the story and the activity of cup - marbles, these quantities are called numbers. So what would you call the quantity of milk in the story and the number of marbles in your cup?" Everyone (almost) exclaimed – 'numbers'

Then we can write this rule in another fashion- "what" the children said - "yes"

Average = the sum of all given numbers/the total number of units given

I asked how then we to solve the problem in the story were and asked everybody to solve it one the running board. Some students also solved the marbles question.

The solutions were like this-

The milk man has milk – 6, 7,8,12,14,5 and 4 litres

The total quantity of milk = 6+7+8+12+5+4=56 litres

Total number of cows = 7

Every cow will give= 56/7 =8 litres

After this we did many written and oral question-answers.

Make a guess-

1. A cricket player in a total of 5 matches has made 20,15,10,5,0 runs then what is his average run per match?

The children were able to make the guess that the average would come between 0-20

Homework

1. I divided the children into groups of six and asked them to find the average height of the group
2. I asked them to find the average weight
3. I asked them to imagine some questions related to average
4. I also gave some kid questions from the textbook

My Understanding-

1. The process of open discussion with the children was of great use and this time was utilised at different occasions during the assembly, break-time, play-time and during other activities of the school routine.

2. The children were independently able to find answers and also discover the logic

3. It is important to remember the numbers that are given during discussions as these are often forgotten by the children.

4. The fact that each child can learn provided he/she practices is a belief that was reaffirmed.

References:

1 Classroom experiences and Lesson plans

2 Pull-outs from Azim Premji University, Bengaluru

3 Teaching-Learning at Digantar, Rajasthan

4 SCERT textbook, Chhattisgarh and NCERT book, *'Ganit ka Jadu/ Magic of Maths'*

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