Site visit to Kodagu Mobile Science Van

By Melli Annamalai, Asha Boston, on August 28, 2023

Murnadu is a village about 17kms from Madikeri in Kodagu district. Like this entire region the road to reach Murnadu offers beautiful scenes, like the ones you see in Indian movies in romantic songs. Lush greenery and pretty plantations. But it is not all song and dance for everyone in the local society. Instead of the usual striations of multiple levels of caste and class, people here are divided into two major groups – the landowners and the workers. The disparity between them is large, with the workers being very poor, and these are the students at the government schools.

The Mobile Science Van was in Murnadu today, so we were visiting there. We had driven from Mysore that morning, and during the ride I had had a good opportunity to discuss with Praveen and Avith from SVYM. Praveen is the head of all education activites at SVYM, and Avith is a coordinator for the Science education projects. In addition to the Mobile Science Van project we discussed activities that help build on this, such as the Viveka Scholar Program.

Like at scores of other government schools I have visited we were received warmly by the headmaster and other teaching staff when we arrived in Murnadu. Probably because of the proximity to Madikeri, Murnadu school had a good number of teachers 9 for about 100 students. But it also faced the challenges every government school faces – the Science teacher had requested for and had been granted a transfer to a school near Mangalore, her hometown. After 9 years of teaching at Murnadu she would be leaving on October 1. The HM did not have a firm date for a replacement.

The school also has decent facilities and has a room designated as the Science lab. After climbing a set of stairs with great views (the school grounds are on a hillside) we reached the upper level building that had the Science lab. Inside, a class was in progress for class X students. Mr. Mahesh from SVYM who had arrived with the Mobile Science Van earlier was teaching a class on Chemistry.

Mahesh did a good job of teaching the basics of various types of chemical reactions. First was the topic of physical change (change in the appearance, but not the composition, typically reversible, for example water freezing into ice) vs. chemical change (change in the composition of the substance, the substance

itself changes, for example the formation of water from Hydrogen and Oxygen). I asked what type of change cooking created, which led to a short interesting discussion on what type of change cooking is (we arrived at the feeling that it was both).

The key aspect of the class was that the children could actually do the experiments themselves. Mahesh first demonstrated in front of the class, and then the students (who were distributed into groups) did not the experiments themselves. This of course generates a lot of excitement among the kids – many of the chemical reactions results in visible changes along with light and fumes and this made the concepts more tangible to the students. Chemical combination, chemical decomposition, chemical displacement and chemical double displacement where discussed and presented, and then the children did the experiments themselves. Mahesh did a good job keeping the class interactive which helped in keeping the children engaged.

The school Science teacher stood at the back of the class, and occasionally helped when a student ran into some difficulty with an experiment. Also, there were students in the class who seemed to have a basic grasp of Chemistry, for example some students were able to balance equations. I was really quite pleasantly surprised by this level of competence among the students, and at the teacher's expertise, who said that she also demonstrated some experiments to her classes. During a break, when the HM visited the classroom, I brought up this point for discussion. "Why does a school like yours need a Mobile Science Lab?" The HM said the Mobile Science Van provided many valuable additions, one example being that the school did not have the funds for chemicals for the students to do the lab by themselves, and the Mobile Science Lab brings the chemicals and the equipment needed such as test tubes and Bunsen burners so that the students can touch and feel all of these themselves. While that did not feel like a significant value-add, there are other types of help the Van provides, such as some teaching when there is a missing teacher (as there will be soon at Murnadu).



Towards the end of the class, I asked the students how many of them would take Science after class X. Only one hand went up, a girl who was wearing a different school uniform so perhaps she was new here from a different school. I then went around the room to quickly ask whether the kids planned to go to PUC, and if so what would they study there. Most kids said they planned to study beyond high school. The girls mostly said Arts, and some said Commerce. The boys almost all said ITI.

We left the class after about two hours, and had a further chat with the Science teacher and HM. Later, after lunch, we had a discussion at the SVYM office in Kodagu. I knew that in Kodagu district the Mobile Science Van project worked with *all* government schools and government-aided schools and did not differentiate between them based on how good or bad they already were. So I brought up this question on the value of sending the Van to a school like the Mardur school. Particularly in the light of the fact that the van visited each school only 4 times in a year (to be able to cover all schools). Shouldn't the Van be visiting less resourced schools more frequently? This led to a spirited discussion, at the end of which I had a much better idea of the current goals of the project.

When the Mobile Science Van project had been started around 2010 in HD Kote taluk, the goal had been to improve the understanding of Science. Since then, based on the experiences of the project in HD Kote taluk the goals have evolved to be the following:

(1) Identification of students interested in Science. Due to various reasons the number of rural students studying Science after class X is very small. When the project started in 2010 barely 1% of students joined PUC Science. These reasons include

a. teaching of Science without hands-on experiments
b. lack of PU Science colleges locally, students had to go to Mysore to choose Science in PUC (a particular challenge for girls, which is why almost all of the girls in Mardur School planned to study Arts or Commerce), and
c. a general fear and apprehension about studying Science in college, because of the poor understanding of Science and importantly because studying Science in PUC required the switch to English medium. Students who managed to surmount other obstacles and join a PU Science course in Mysore typically dropped out after the first semester.

When rural students don't study Science after class X, they are shut out of careers in Science. These are often more lucrative than other career options. So in HD Kote taluk SVYM integrated the Mobile Science Van project with other SVYM projects to focus on careers in Science.

The Mobile Science Van visits create an excitement in the schools about Science, and helps students to start thinking more positively about Science. They understand concepts better, and overcome a fear of Science. Over the course the project, some of them start considering studying Science in PUC. This is an important outcome of the project - it ***helps SVYM identify students who are potentially interested in Science***. These students are then encouraged to join Science courses in PUC, mentored through VSP (the Viveka Scholar Program run by SVYM for PUC students) and other programs, and guided in careers in Science (selection of college, selection of courses, etc). There are also other recently started supportive initiatives such as enabling interest-free loans for initial expenses at engineering colleges. ***The goal is to help prepare students for careers in Science that are often more lucrative than other career options. Without these initiatives rural students are stop studying Science after class X, and are shut out of Science careers.*** Here is a recent example of one such student, who might not be studying to be an engineer if not for the Mobile Science Van project and VSP.

(**Note:** Not having enough students studying Science has all kinds of repercussions. For example, they found it very difficult to hire people to work on the Mobile Science Van project, there were just not enough qualified people. So folks working for SVYM in Sargur have now taken on this work. They stay in Madikeri during the week and go back to Sargur on the weekends. Some folks come from Mysore, and they generally commute.)

(2) Capacity building among Science teachers. In HD Kote taluk an unexpected outcome was the sparking of interest among some Science teachers who went on to
   a. form discussion groups (was called Vignyana Vedike) and became avid learners themselves,
   b. show great initiative in improving their teaching skills and their school environment (teachers created their own labs, demanded funding for creating labs, etc.), and
   c. become tremendously self-motivated and go on to win prestigious awards (Harsha S is one such teacher who recently won the Karnataka State award for 'Best Teacher.' ***This is a potential outcome in Kodagu district.***

(3) What students do after getting a college degree in Science. SVYM has observed (this was not yet been formally studied) that about a third of the students come back to the family farm and work in agriculture. The students who come back appear to be better equipped and

become more successful farmers than others who do not study Science. Is this because of studying Science in college, and that influenced their thinking process, or is it because exposure to various things outside their villages and hometowns? This has to be studied further. (Among the rest of the students a third take up jobs in Mysore and Bangalore and a third come back to work on non-agricultural jobs).

(4) Community ownership of encouraging Science education. SVYM has observed that when about a third of the students start studying Science in PUC, the advantages of a Science education (in particularly as a way to more lucrative careers) become apparent to the community, and the community itself starts taking ownership of initiatives related to encouraging students and making it possible for students from rural areas to study Science. This can take 3-5 years, and is a potential time for SVYM to withdraw the Mobile Science Van project from the area. The project would then take on a different form (support VSP and other initiatives in a different way).

(5) Identification of schools that are doing really poorly. SVYM identified a village in Madikeri taluk close to the Kerala border where there was no teacher at all for classes 8, 9, and 10. Teachers had been transferred but guest teachers had not been appointed yet, with no date in sight for new appointments. What is particularly heartening is that teachers from the Vijnana Vedike (see (2) above)) responded to SVYM's request and spent part of their Dasara holiday to go and teach at the school. That is the level of the motivation of those government school teachers. The unexpected creation of a forum like Vijnana Vedike has resulted in many such amazing outcomes.

Summary

This project has the goal of improving Science education with the final tangible goal of encouraging more students to study Science after class X. In HD Kote taluk we estimate about 10% are now studying Science in PUC, up from 1% (this needs to be verified). The Mobile Science Van alone cannot achieve this, but it works in tandem with other SVYM projects such as the Viveka Scholar Program. More photos from my visit are here.