Report : Rashtriya Avishkar Abhiyan

The first meeting of Rashtriya Avishkar Abhiyann (RAA) in the Kanpur and Kalyanpur district was held under the recommendation and on the premises of IIT Kanpur on 14th November 2015.

After a short snack break at 10 30, the event started at around 11 with the introduction of RAA to the entire audience of nearly 70 teachers from State run schools in the areas around IIT Kanpur and volunteer members of the faculty.

RAA has been set up by Ministry of Human Resource Development (MHRD) in order to better the education system in country by promoting “Learning Outside the Classroom”. In order to bring this to effects the MHRD has mandated higher education institutes such as the IITs, IISc and IISERs to assist high school and junior high school teachers to bring this to life in an effort to make understanding sciences and mathematics easier for the major population of the country who have little or no academic background.

RAA was an initiative to make sure that a student, who, while studying the sciences and maths, also learns how to apply it in real life and most of the day to day observations are explained to him using simple logics which are being taught as part of the curriculm. RAA believes that only when a student can relate to a given topic or field of understanding, can he actually concentrate on learning it effectively and efficiently.

RAA has been installed alongside other programs such as the Sarva Shiksha Abhiyan, Madhyamik Shiksha Abhigyan etc with a 5 year target plan to make the education of students in the age group 6 - 18 easier. One of the important ideals on which RAA has been founded on is the famous quote “Country’s future is shaped in classrooms and laboratories of school, college and universities.” Reiterating this led to an effort to think of ways of teaching which promoted understanding of core concepts rather the mechanical part of knowing how to solve problems, while simultaneously increasing the exposure of a given student to everyday observations and also to new technologies and how he can use them to make his life easier.

The core idea from the MHRD, which they posed as recommendations that could be implemented to achieve our within goal in the given time period was as follows :

1. Student level mentoring which allows the more intelligent students to teach other weaker classmates, hence taking both him and the other guy forward.
2. Establishment of Teacher circles which allow teachers who teach the same type of age groups to discuss the problems and the new methods they have come up with for effectively imbibe ideals onto the minds of young kids.
3. Clubs for children must be encouraged in order to help them learn together and detailed discussions may help them to not only innovate but also to learn how to think of new perspectives to the same problem by discusion among themselves.
4. Olympiads must be held from a very small age which would be able to make sure that a student who has a scientific aptitude to know it and work towards honing that skill and hence contribute effectively later in his life.
5. Efforts to sensitive the parents in the region in order to make them realize the importance of not only education but also of making sure you effective use your scientific aptitude by giving it a direction.

“The basic idea is to Kindle the Flame, not fill the vessel to the brim”
-Socrates

Right now RAA is working with State run schools in the area but the effort would seen be expanded to Kendriya vidalayas and other partially Govt. funded schools and lastly be reiterated for public schools.

Following this, all the teachers were divided on the basis of the subjects and classes they were teaching at the present time and then had one to one interactions with various members of the IIT Kanpur faculty.

Discussion with Junior High Science and Mathematics Teachers

The discussion, after it's initial stages went into deeply into the everyday problems faced by the school teachers in the area. Irrespective of their determination and will to teach, these hindered them from imparting quality education to their pupils to the best of their abilities.

Problems faced by the teachers :

I. There is a major lack of resources in most State run schools. There are areas where the schools do not even have black boards and kids have rub leaves on a wall to make sure the chlorophyll deposits create a dark enough colour, such that you can teach by writing on that surface with chalk.
II. Teachers feel they are harassed by officials during inspections where they are unduly pressurised into showing unrealistic results which are not practically possible to achieve. The inspections try to test everyone on given parameters, rather than seeing the advancements in learning abilities. This also pushes the teachers over the edge, making them believe that less importance is being given to teaching and more to the little responsibilities that are being handed down to you, which severely hits their passion for teaching.
III. The teacher to student ratio is such that the teacher is hardly able to concentrate on any given set of students. Also due to the lack of teachers, multiple subjects are being taught by the same teacher, who being overloaded is again not able to communicate with most students effectively.
IV. The books that are prescribed are hardly used and there is even less possibility they will/ can be effectively used due the very fact that a major chunk of the students coming to class 6 can hardly read or write any language.
V. Students are also seen to be not being up to the mark due to fact they do not belong to well off parts of the societies where understanding is inculcated from a very early stage. Some students have to miss school on a regular basis because they need to work as daily wage labourers in order to financially support the family dependents.
VI. Computers and Projectors and various technologies which may help teachers may make effective demonstrations are not available.

Suggestions made by the teachers :

I. Recycling everyday waste items or waste from larger school/university labs to create makeshift projects and demonstrations which can be used by the teachers to put forward their points.
II. To create small science corners where DoItYourself charts and project material which can be used by students as they like.
III. Students, along with experimental demonstrations, be taught how to think of other methods to get it the same experiment done, hence inculcating a sense of experimental design.

This was followed by a major overview of problems by all the groups who were involved in one to one interaction with teachers, who concluded on the major issues that must be addressed as follows :

I. One of the major problems is that most students are not interested in studying in early classes, and later are not interested in school teaching because of the fact they are attending coaching elsewhere which was teaching them the exact same things. And because of the people around them, bright minds who do wanna study too are not able to study to the best of their ability
II. Laboratories in Physics and Biology especially are not equipped properly and hence the students can not be given the necessary exposure to demonstrations.
III. Syllabus is monotonous, with one topic after another and no sense of direction to the student. Hence students lose both hope and interest very easily.
IV. Syllabus in subjects like Physics is too vast to be covered in the given time periods and especially via a theoretical approach rather than an intuitive one.
V. Students who are coming to classes 9-12 are not well equipped with the required background, hence must be taught even those topics side by side, while students who are coming to class 6-8 do not even know a single language, hence making instruction via books especially difficult.
VI. Due to pressure from administration and random work assigned to the State school teachers, they get so caught up in the system, they do not have a free hand in teaching the students as they want to and in a way students will grasp it. Hence, this philosophical logger head is very counter productive.
VII. There is also a major difference between what is taught by word of mouth and what he understands. But more than that, there is an even larger difference between what the pupil may understand as an idea and what he can represent on paper, and the entire RAA's main aim is to reduce the gap between these two understanding levels.

Suggestions :

1. Student mentoring can be made effective in every school, where students who are proficient in the language can be paired up with any given weak student to allow them to interact and over a large time allow the weak student to reach the other's level. We can even ask the intelligent kids to hold open dialogue with other students who are facing problems and try and solve them, and if not possible contact teachers and share with the basic issues they think everyone else is facing.
2. To create small science corners where Do.It.Yourself charts and project material which can be used by students as they like.
3. To combine some students of class 6-8 and some of class 9-12 who can match a wavelength, when they must be taught common topics, mostly where the senior students do not have the required background for advanced sciences and mathematics.
4. Keep revisiting old stuff to imbibe the topics into the student's blood and hence make sure that they understand all the topics and if they do that, there would not be any problem passing examination with best grades.
5. Videos that involve biology slides or physics experiments can be prepared and sent to most people, in order to make sure that making demonstrations is made easier for the teacher.
6. We can also try to think of simples chemistry or physics experiments which can easily portray what we want them to, with minimum and easily available materials and therefore encourage students to do it themselves and even at home.

The basic idea is to encourage that a student channelizes his energy into something constructive, if not studies, in order to make them learn.

NSS Contributions

NSS can contribute in this program under various heads :

1. Creating and editing videos for various demonstrations, even shooting them can be done very easily by the NSS teams. We can start our own YouTube channel and upload videos there book wise.
2. We can undertake the task of a NSS team going to various remote schools along with laptops and Projection screens and small projectors to schools who do not have the facilities that allow showing of videos.
3. We can organise small workshops in State schools and talk to students who are interested in science and take them forward.
4. We can design small experiments or demonstrations which the students can do themselves using very basic material and provide the methods to create these to the teachers and students.
5. We can hold small workshops for the teachers, familiarising them with basic computer softwares and therefore enabling them to create their own presentations and virtual demonstrations on Google Drive as that requires only internet access and no paid softwares.