**Universalizing Good Quality Science Education (UGQSE)**

**An invitation to participate in the national campaign**

About 60 practitioners from the field of science education met on January 3rd and 4th 2015 at Pune for an intensive workshop on the question of “Universalizing Good Quality Science Education. They included professional science educators, teachers, scientists, communicators, government officers, science movement activists, open source software practitioners, etc. The meeting was organized on a voluntary basis without external funding. Participants travelled at their own expense. Venue and accommodation were generously provided free of charge by the National Centre for Radio Astrophysics. The list of participants and their organizations is attached. (This list includes a few team members who could not attend.)

The workshop began with a short welcome by veteran scientist and pioneer of radio astronomy in India, Prof. Govind Swarup. The keynote address was delivered by Arvind Gupta, who gave numerous examples of world class science resources created by innovative educators in India. He highlighted the importance of creating a repository of freely downloadable digital resources in all languages for universalization and of working tenaciously towards this objective.

Homage was paid to Savitribai Phule, pioneer of universalization of education in India, on her birth anniversary.

The presentations and discussion on the first day focused on issues of content for UGQSE. The second day focused primarily on organization, formation of working subgroups, communication and drawing up an actionable road map. The report of the consultation/workshop, along with presentations and notes will shortly be available on the web.

What is UGQSE ? After the enactment of the Right to Education Act (RTE 2009) and the notification of NCF 2005 as the curriculum framework for the whole country, ‘good quality’ education has explicitly become a legal and justiciable right of more than 170 million young Indian citizens. NCF 2005 provides a strong definition of ‘good quality education’, stating that ‘equality of opportunity’ is not enough. Good quality education is that which delivers ‘equality of outcomes’, and enables every child to overcome the inequality of opportunity into which he/she was born .

UGQSE is a thus a stronger requirement than mere promotion of GQSE. It requires every child to be able to obtain science education of good quality. This then demands a much greater commitment and organized effort than at present, by all stakeholders, including the government.

Nation-wide science campaigns like IYA 2009 and Eyes on ISON, science promotion networks like All India People’s Science Network and Vigyan Prasar , science teacher’s associations, active teachers forums , outreach departments of science institutions, government education bodies at the central and state levels, NGOs working in science education, progressive schools etc. have created and constitute, a distributed collective of human resources which can work together for UGQSE.

Though more than four years have elapsed since the coming into effect of the RTE Act, the question of UGQE has not been taken up with sufficient seriousness at the governmental level. Hence the need for a plan B, where this issue is taken up systematically, irrespective of governmental support, but welcoming that support when and where available. One of the main conclusions of the consultation was that such an initiative is feasible, given an active network of resources in every state, beginning with the voluntary participation of thousands of active teachers.

Good quality science education can be made possible at a mass level by enabling children in every class in every school to make interesting toys, perform interesting experiments with self constructed equipments , interacting with and exploring the real world, the Universe - understood broadly as the cosmos , our planet, our environment and human society. There exist repositories of hundreds of such WOW! activities. UGQSE can be initiated by systematically including dozens of the best WOW activities in the curricular practice. For science learning the WOW! must be taken further to WHY? and HOW?

The consultation decided to share knowledge about, and to initiate **a time bound process to further survey this wealth of resources and to make a preliminary selection of best practices and best experiments** keeping the following criteria in mind :

* Is it age appropriate?
* Will the children enjoy it?
* Does it have WOW?
* Does it take students to WHY and HOW?
* Does it build self confidence and self-reliance amongst the students ?
* Does it use low cost self constructed materials?
* Does it cover the syllabus content for the grade ?
* Is it suitable for self study ?
* Does it facilitate critical thinking and the understanding of the scientific method ?
* Does it encourage students to engage with contemporary problems like environmental protection, equity and sustainability?
* Is it easy for the teacher to use ?
* Does it have sufficient background material and follow up ?
* Does it take us to a modern understanding of the subject and show us how this understanding has evolved ?

This preliminary selection of ‘best activities’ would be tried out by hundreds of active teachers and students in an initial phase of about one year. The validation of the UGQSE package of activities as above would be conducted not by a small committee of experts, but by the organized feedback of these hundreds of teachers and students, through a rating process, where the practitioners rate each activity after actually trying it out, on each of the selection criteria. Through this process a set of activities with the highest ratings will stand out, and emerge as a ‘tried and tested’ UGQSE package for wider use. In addition, feedback on possible modifications and extensions of these activities would also be documented. All of this feedback will be collated and made available to everyone.

Thus all the participants in the distributed collective for validation would be envisaged as members of a ‘scientific community’. They can contribute improvements and innovations to the UGQSE package of activities which will also be evaluated by the community on a continuous basis.

The consultation decided to create a dedicated web platform for conducting the above ‘wiki’ process and also for communication between the different work teams.

Working groups (WG) were set up as follows :

WG 1.1 Primary School Science Classes 1- 5.

WG 1.2 Classes 6,7,8.

WG 1.3 Classes 9,10.

The above three ‘content’ WGs will make the initial selection of activity modules for trial and practical validation, link it to appropriate parts of the curricula, and make further continuous improvements at the given grade levels based on feedback.

WG 2 – Web Platform for UGQSE and also non digital communication between stakeholders.

This WG will set up and administrate the interactive digital platform envisaged for continuous documentation/discussion/feedback between the participants and also design and provide non-digital forms of communication as appropriate.

WG 3- Organization and outreach for wider participation and implementation.

This WG will make systematic efforts to initiate the implementation of the activity modules in all states/districts and maintain links with a wide spectrum of participating organizations/schools/teachers etc.

As an active practitioner for quality science education, your contribution to this process is important. We invite you to join this effort and contribute to the best of your ability. Please get in touch either through internet, or by letter or phone. We welcome your participation in any number of the working groups described above.

The contact details are as follows :

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An approximate time frame and road map for the next two years was arrived at in the consultation and is attached.