e-Discussion on UN Solution Exchange ICT for Development and Education Communities

Consolidated Reply of the 1st Query:

Query: *Framework for ICTs in School Education: Investment Issues - **Capacity Building***

Moderator's note: We are happy to host an e-discussion on a framework for the use of ICTs in School Education, which could feed into the policy formulation process of the Government of India. This is the first query in a series of three queries forming part of the e-discussion. We request you to contribute your suggestions and insights, as well as the insights and suggestions of your colleagues and associates. We encourage you to broaden the discussion to your contacts in NGOs, schools, government, local authorities, private sector, and other non-members who you feel would have something to contribute.

The Ministry of Human Resource Development (MHRD), Government of India, has initiated the process to formulate the 'National Policy on ICT in School Education' with a focus on addressing the needs and challenges of teaching and learning in schools using information and communication technology tools.

The Global e-Schools and Communities Initiative (GeSCI), a UN ICT Task Force founded organisation, will provide strategic assistance to MHRD in the preparation of this policy. GeSCI has partnered with the Centre for Science, Development, and Media Studies (CSDMS) to coordinate and facilitate the process of policy formulation. I am working as the lead facilitator of the Action Group to engage online communities to solicit expertise from members, and thus contribute to the consultation process.

There is yet no draft policy document that can be shared for consultations and comments. We have instead developed a consultation process document (available at: http://www.solutionexchange-un.net.in/ictd/cr/res28030801.doc) to help us gather inputs for feeding into the policy formulation process. This process document outlines seven thematic areas along which we are seeking suggestions.

As an input into this consultation, we propose to run an **e-discussion series** on Solution Exchange, to solicit suggestions and insights from the ICTD and Education Communities. For this purpose we have grouped these seven topics into three broad areas: The first discussion will cover investment issues, and address the topics of **Infrastructure** and **Capacity Building**. The second discussion will cover content and quality issues, and address the topics of **e-Content**, **Quality in School Education**, and **Innovation and Research**. The third discussion will cover programme delivery issues, and address the topics of **Public-Private Partnerships**, and **Monitoring and Evaluation**.

Each of these discussions will be open for **two weeks**, beginning with the investment e-discussion.

Issue	Question 1	Question 2	Question 3
Capacity Building	What are some of the key capacity gaps facing ICT in school education? Are there any good examples where these capacity gaps have been addressed?	Can you suggest creative ideas and innovations for building capacity for ICT in school education?	Do you have any insights about the capacity-building process that would be relevant?

Response List: 11 responses were received on the thematic focus area namely, Capacity Building. Responses were received from both ICTD and Education communities of UN Solution Exchange facilitating in making the policy formulation a consultative process leading to enriching the draft document with the suggestions and input received.

1. Rajen Varada, Technology for the People, Bangalor
2. Jitendra Shah, Indictrans, Mumbai
3. Anindya Kumar Banerjee, Panchayats and RD Dept., Government of West Bengal, Kolkata
4. Nisheeth Verma, Learning Links Foundation, New Delhi
5. John Mathew, Business Consultant, Kochi

6. Frederick Noronha, Bytes for All, Goa
7. M V Ananthakrishnan, Developmental INfomatics Lab,KReSIT, IIT Bombay, Mumbai
8. Srinivasan Ramani, International Institute for Information technology, Bangalore
9. Anjela Taneja, ActionAid, Bhopal
10. Anindya Kumar Banerjee, Panchayats and RD Dept., Govt. of West Bengal, Kolkata
11. Gurumurthy Kasinathan, IT for Change, Bangalore

Response 1

Rajen Varada, Technology for the People, Bangalore

What are some of the key capacity gaps facing ICT in school education? Are there any good examples where these capacity gaps have been addressed?
Capacity building is not a one time exercise and needs to be ongoing especially in government schools where teachers are overloaded, schools short staffed and transfers happen often. The gap is not so much in the capacity building as much as in the lack of developing innovative thinking in the trainers. ICT content needs to be defined in this context. What really are we saying when we try to define ICT in school? Is it Information & communication or Education? Is it only the digital form of the school curriculum and enhanced rote learning or is it going to bring in an environment of creative exploration of knowledge? Are the schools going to be true centres of learning and information or continue as (e) rote teaching?
Karnataka has developed excellent Radio learning material for schools in collaboration with EDC along with capacity building material. A compilation of such initiatives and collation of content in local language will be helpful.

Can you suggest creative ideas and innovations for building capacity for ICT in school education?
Capacity building is not a one-time exercise and needs to be ongoing especially in government schools where teachers are overloaded, schools short staffed and transfers happen often. The ongoing training needs to be built into the system. Capacity building is also linked to the kind of content to be decided for the schools.
The gap is not so much in the capacity building as much as in the lack of developing innovative thinking in the trainers. ICT content needs to be defined in this context. What really are we saying when we try to define ICT in school? Is it Information & communication or Education? Is it only the digital form of the school curriculum and enhanced rote learning or is it going to bring in an environment of creative exploration of knowledge. Are the schools going to be true centres of learning and information or be (e) rote teaching?
Karnataka has developed excellent Radio learning material for schools in collaboration with EDC. A compilation of such initiatives and collation of content in local language will be helpful.

Do you have any insights about the capacity-building process that would be relevant?
May I suggest Peer learning as an alternative/add-on to capacity building? Create student clubs and include creative tools (software such as Photoshop, adobe insight, illustrator, flash or GIMP and so many other open source software) as part of the schools software library.

Response 2

Jitendra Shah, Indictrans, Mumbai

To address the issue of Capacity Building, I would recommend the use scholarships for higher education students (Post Graduate and Ph D) to provide support in schools.

Response 3

Anindya Kumar Banerjee, Panchayats and RD Dept., Government of West Bengal, Kolkata

. What are some of the key capacity gaps facing ICT in school education? Are there any good examples where these capacity gaps have been addressed?
I think the following reasons may be some of the gaps facing ICT@SCHOOL

1. The School does not have adequate trained manpower to understand what is being taught hence mostly depend on the private partner.

2. The headmaster/headmistress are not interested to learn the advantages mostly due to ignorance they feel they are too old for the new technology but this very technology can make their retired life better if they can help in automating their own service books. There are other examples of using the same for preparing online tests for the students.
3. The trainers from Private partners should be screened with their educational and IT background in question. In West Bengal the government had given the criteria for trainer and the quality control mechanism was ensured in this way.

2. Can you suggest creative ideas and innovations for building capacity for ICT in school education?
Probably yes as I often meet the trainers in my state and interact with them and am aware of the issues they face while training as the training in this state is not mandatory but optional.

3. Do you have any insights about the capacity-building process that would be relevant?
Yes, I feel there are many methods/ways which will perhaps help the ICTD team to device a fruitful process for Capacity Building for ICT@SCHOOLS

I would also like to invite suggestions from the team members if we could ask the Private Partners and some Head masters where ICT is in real practice to attend a workshop on brainstorming the Process?

Response 4

Nisheeth Verma, Learning Links Foundation, New Delhi

The exercise needs to be done at three-tier level which can help in better implementation

At State level:

- Experiment and adopt the best practices for the integration of ICT in both formal and non-formal education programs in order to increase access to education, enhance educational quality, and improve learning performance, especially among populations traditionally most excluded from education.
- Strengthen the training and professional development of teacher trainers, teachers and non-formal education facilitators in the integration of ICT in education.
- Establish a state Clearing House in order to produce, collect, process, utilize and disseminate local contents and link it to other relevant institutions.

At District/school level

- Effective Use of ICT in Improving Teaching and Learning" project involving training teachers to create project portfolios using Project Based Learning.
- An online teacher resource base to be developed and implemented and
- A network of teacher-training institutions to be established so that teachers can share their education courseware and innovative practices.

At Educational institutions level

- The formulation of plans for the integration of ICT into the curriculum,
- The creation of a framework for enhancing learning opportunities using ICT across the curriculum,
- Designing a flexible curricular model to embrace inter-disciplinary and cross-disciplinary thinking,
- Development of attitudes that are value driven, rather than technology-driven.

If worked at these levels, we can ensure transparency, developing effective usage model, and overall implementation.

Response 5

John Mathew, Business Consultant, Kochi

Most of the ICT installations in schools that I've been to, have been maintained by one faculty member and interested students. All the administration, upgrades, installation and discarding were decided by this local group within each school. The infrastructure and capacity of this group was decided specific to the school and they are only responsible to the school board/ parent teacher committee.

Most other forms of capacity building, with respect to infrastructure, are hinged on funds. The other aspect capacity related issues is that of content. As content increases, maintenance and ownership will become difficult. There has to be clear guidelines as to how content will be kept current and interesting to students.

Response 6

Frederick Noronha, Bytes for All, Goa

Anindya has brought out a very interesting point. In this regard, I would like to share two links that might be of interest.

FLOSS for third standard students
http://divshare.com/download/4053521-61e
August 2007

Providers teaching material for 3rd Standard teachers in India.

Taking Sharing to the Class Room
Paper; by Frederick Noronha
Available at http://divshare.com/download/3321637-94c

Paper informs about Free and Open source software for use in Schools.

Response 7

M V Ananthakrishnan, Developmental INfomatics Lab,KReSIT, IIT Bombay, Mumbai

All my observations/suggestions are based on a two-year study carried out in six schools in rural Maharashtra. The author led the project, implemented by IIT Bombay (IITB) in collaboration with Vigyan Ashram, Pabal and with financial assistance provided by Media Lab Asia, Ministry of Information Technology, Government of India

What are some of the key capacity gaps facing ICT in school education? Are there any good examples where these capacity gaps have been addressed?

1. The key gaps are:
2. high student-teacher ratio
3. poor infrastructure
4. limited number of computers
5. refurbished computers
6. computer education
7. maintenance issues
8. Resistance to change

The IITB project did make an attempt to address these gaps by first identifying the causes and then coming up with appropriate and localised solutions. These included:

1. Ensuring that at least two computers were in position in each school
2. Focus was made on one of the classes, Class VII.
3. Inverters were provided to ensure supply
4. Schools started one hour before normal hours, exclusively for computer classes
5. Each student got 2.5 hours per week on computers
6. Each school had a teacher exclusively for computers and whose salary was funded by the project.
7. Teacher training workshops were conducted at regular intervals during the project, where teachers were:
    a. Given an overview of various teaching methods and their relevance to traditional teaching
    b. Exposed to use of computers
    c. Exposed to use of courseware
    d. Trained on integrating courseware with classroom teaching
    e. Guided on how to involve students using ICT

The positive results were seen during a recent visit in March 2008 to two of the schools in the Pabal area. One of the schools reported positive results in terms of

1. Better student performance in terms of grades
2. Better attendance in classes
3. Teachers more enthusiastic
4. Students more participative
5. Management happy

Issues still remaining:
What actually does the student do in the 2.5 hours/week quota, based on (5) above? This was a grey area that was detected in all the schools. There was no direction…with the students doodling with PAINT and groping with PowerPoint. They had no purpose in mind and neither the teachers were giving directions to the students to come up with something purposeful.

Can you suggest creative ideas and innovations for building capacity for ICT in school education?
The IITB experiment with the rural schools could be a god starting point.

Do you have any insights about the capacity-building process that would be relevant?
Yes. Primarily, it should be done in stages viz.,

1. A detailed study of the current classroom teaching practices and use of laboratory/demonstrations, field visits, localised contents etc.
2. An exposure to the various teaching techniques and their integration with classroom teaching
3. An exposure to computers and their role in adding value to classroom teaching e.g., simulation, time lapse, repetition, revision-on-demand etc.
4. Training of teachers to use computers in developing instructional resources.
5. Hardware and software acquisition, through donations from industry, purchase and grants from Software manufacturers
6. Expertise induction from industry as a part of corporate CSR., either on sabbatical or on short term assignments
7. Students invited to software houses to see how ICT is used and thereby know the career paths available
8. Vendors to include teachers/educationists in teams negotiating with schools
9. Students and teachers being an essential component of the school negotiation team
10. Vendors will be required to essentially demonstrate the use of their courseware in real classroom scenarios of the host school
11. Vendors should necessarily emphasise on the role of courseware as an aid to the teacher and not as independent of teacher
12. Systems should be in position to periodically evaluate the progress of the suggested approach…and having the correct check-points and correction-paths.

Response 8

Srinivasan Ramani, International Institute for Information technology, Bangalore

What are some of the key capacity gaps facing ICT in school education? Are there any good examples where these capacity gaps have been addressed?

A key issue is the scarcity of effective teachers who can handle ICT infrastructure and utilize it for educational purposes. Any training we give such teachers is lost within a couple of years as many of these teachers move out of educational institutions and go to business and industry. We could modify an idea of the SNDT Women's University in Mumbai and use it to solve this problem. SNDT offers a Master of Educational Technology (Computer Applications) (http://www.sndt.ac.in/det/METCA%20Prospectus%202007-08.pdf). IGNOU could offer a "Diploma/Degree for ICT Teachers in Schools" to start with, for the benefit of teachers working in schools. This would be a part time course spread over two or three years, giving significant credit for effective performance as a teacher using ICT. Practical work specified to the participants could be teaching assignments, which could be graded by local senior teachers or other administrators. In addition, the participants would be learning in the distance education mode and taking examinations. Those enrolled would serve the school during their education, and get the greatest reward – getting better

educated. If they leave the school system after qualifying for a Diploma/Degree, that would be fine. The economy needs such people too.

Can you suggest creative ideas and innovations for building capacity for ICT in school education?

We could announce an award of Rs One Lakh per author for a hundred authors a year for creating educational content in the form of e-books in Indian languages. This may be any one, not necessarily a teacher; for instance it could be a college teacher writing for school students. Those whose books are selected for the award should put the e-book in the public domain, so that any one can use it. This would be a method of providing inexpensive content for digital libraries at schools. If 50,000 schools use an e-book and it has a notional value of Rs 50 per copy, the value created by the proposed "Indian Language e-Book Award Scheme" would be Rs 25 Lakhs. Public libraries should also be able to use public domain content in Indian languages, thereby doubling the utilization of e-books created. The scheme should not exclude books in English.

MHRD's National Programme for Technology Enhanced Learning (NPTEL) has created thousands of hours of video lectures, covering a lot of the four-year curriculum in four disciplines of engineering at the university level. The valuable experience gained in this project can be used to create video content to cover school curricula in all Indian languages. School-teachers can be trained and invited to create video content in their areas of expertise, and in their own language. The best teachers can provide inspirational lectures and model lectures. This content can also be packaged as short video clips which a local teacher can use in the class, offering his/her own lecture livened and enriched by the video-clips.

Response 9

Anjela Taneja, ActionAid, Bhopal

What are some of the key capacity gaps facing ICT in school education? Are there any good examples where these capacity gaps have been addressed?

1) As previously mentioned, the shortage of teachers is a huge problem to begin with. My sense is that IT trained teachers would currently be a bit of a luxury for the system. Ensuring PTRs are met would be a starting point. Ensuring that hiring of parateachers (untrained teachers) stops or they are trained would be a prerequisite for up scaling of computer education.
2) A suggestion offered previously in the discussion was to introduce computer education in the curriculum. However, lets not forget that only a fraction of teachers hold professional BEd degrees. A lot of states have done away with the requirement to hold them in the first case. It would, therefore, be an incomplete step in that direction if we rely only on preservice training
3) The alternative is inservice training. Only 40% teachers in government schools had received training in the previous year (with the figure going down to 26% for government aided schools). Therefore, one would need to keep in mind the reality of teacher training when planning teacher training processes.
4) One solution that may come to mind is mobile teachers providing computer education to several schools. This SHOULD be feasible, provided a sufficient number is hired and they are given transportation. However, this would involve the risk of adding another layer to the already stratified teacher profession. Ensuring that the teachers already in place are used instead of adding further layers would be a better idea in my opinion.

In conclusion, I am not an ICT expert, but a manager of education programs from within the NGO sector who has some understanding of how the system operates in the most interior areas. If the government is to come up with a policy for its citizens, it should be a policy that reaches out to all of them- and that means also reaching out to the most excluded and marginalised. The real challenge in my opinion is how to find the resources to reach out to these areas and the solution for this may not come from the few isolated small scale NGO experiments backed with plentiful funds, but in the overall processes of strengthening the public school system. Consequently, the need for ICT infrastructure in government schools cannot be seen in isolation from the overall questions of quality and I hope the policy would recognize the actual reality of abyssmal infrastructure overall and doesn't result in computers at the expense of books, blackboards and charts, but rather in both being present in ALL schools (not just a few elite rural schools).

Response 10

Anindya Kumar Banerjee, Panchayats and RD Dept., Govt. of West Bengal, Kolkata

I understand that much has been written about the important issue of deciding on our children's future related to education and literacy in ICT, I request all to think more logically and humanely rather than impulsive thinking as it is our own people we are talking about.
I somehow have been close to ICT@School not only in the East but also at Madhya Pradesh, Chhattisgarh, Bihar and Jharkhand by some means or the other and have a lot to share in this forum of learned people who are trying to come to a conclusion for the FUTURE of INDIA.
I am sure the 7 Thematic Pillars made will stand good enough like the 7 Colors, 7 Wonders, 7 Sur, 7 seas, 7 Continents one day.
I strongly feel that this exercise was required for the best understanding of the ICT@School project being thought about by MHRD. I am sure that all members will agree to:

1) Capacity Building is an ongoing process and needs to be mentored by a national policy I strongly feel that one session/semester should be kept for the Trainer/School Management so that the trainers are aware of the changes in the industry vis-a-vis the changes in the outflow of the curricula to the students.

I am sure these 14 days have been a learning experience for all of us in the forum but it will bear the fruit only when the actual formulation of these policies are implemented with or without us or the stakeholders of the project of ICT@School.

Response 11
Gurumurthy Kasinathan, IT for Change, Bangalore

Capacity Building
As in the beginning, one would like to know what exactly is meant by capacity building - whose capacity, and what kind, and to what end. It would be useful to clarify that 'capacity building' should not merely mean ability to use ICTs or 'ICT Literacy'. Though this is an essential pre-requisite, it is rather trivial for a policy to be limited to this. The real meaning and power of ICTs for 'capacity building' would be the ability of the teacher and the student to use ICTs in their own processes of teaching-learning in a manner they deem fit arising from their engagement with ICTs, facilitated by teacher educators and teachers respectively. Moreover, this would logically be components respectively within 'Teacher education' or 'school education' itself. (Education itself is the process of capacity or capability building, hence having this as a subset theme seems inappropriate. Capacity building will need to situate itself within the teacher education arena as well as within pedagogy itself).

Secondly the term 'capacity building' itself does not reflect the significant understanding of the complex issues that surround both school education and teacher education in India (and elsewhere). Take the issue of Teacher education, the issues of teacher training programs, the learning theories that appear to be used – often preferring 'deficit models' (of skill building by 'Resource persons' imparting knowledge) over 'constructivist' pedagogies that are even more critical to adult learning; the methodologies followed consequently of 'mass dissemination' through across the board programs in cascade modes; issues relating to the SSA norms for teacher training that often make residential programs impossible and require large learner groups of 50+ to enable the program to be funded etc need to be addressed while discussing 'capacity building' for appropriating ICTs in education.

Similarly the issues of pre-service and in-service teacher training (which should certainly be the concern of 'capacity building' for ICT in education) cannot be discussed without relating it to the state of our current teacher education institutions – the DIETs (District Institute of Education and Training). The vision with which this academic support institution was setup, its current existentialist crises and their structural causes need to be considered in determining the possibilities for appropriating ICTs for teacher education.

The important point is that once we start analyzing from these perspectives deriving from domain understanding and domain priorities, then possibilities such as collaborative networks amongst teachers, 'decentralized curriculum preparation' itself as a teacher professional development process, distance-mode 'on demand academic support' for teachers, asynchronous relationships possibilities across institutions and people etc leveraging the capacities of ICTs become apparent. These are areas of exploration that non-specific term as 'capacity building' will not open us to.
