Exploring Techno-Pedagogy

Information and Communication Technology (ICT) programmes in development (including education) have had a similar trajectory as they have had in the business sector where they first made an impact. First generation programmes have been driven by technology enthusiasts while people working in education have largely regarded ICTs as a peripheral phenomenon or as something with a purely negative potential for teaching-learning. Hence, 'first generation' ICT programmes in education have been stand-alone programmes with little connection to the mainstream teaching-learning processes in the school. The curriculum has been limited to basic computer literacy (focusing on operating system and office suite which have little pedagogical relevance), transacted by 'computer teachers', thus bypassing the regular teaching staff in the school. Fortunately, educationists have been involved in designing second generation ICT programmes. Here, ICTs serve to achieve larger educational goals, rather than being an end in themselves, curriculum pertains to regular mainstream subjects, transacted by regular school teachers and teacher educators. We formally studied one such programme, the University State Resource Network (USRN), during this year. Based on our learnings, we launched the 'Teachers Communities of Learning' (TCoL) programme this year to serve as a demonstration project. We also continued our capacity building work for teachers and teacher educators on 'techno-pedagogical' applications of ICTs in education. Our focus, thus, has been to help policy makers migrate programme design from first generation to second generation models and our work has continued at four levels:

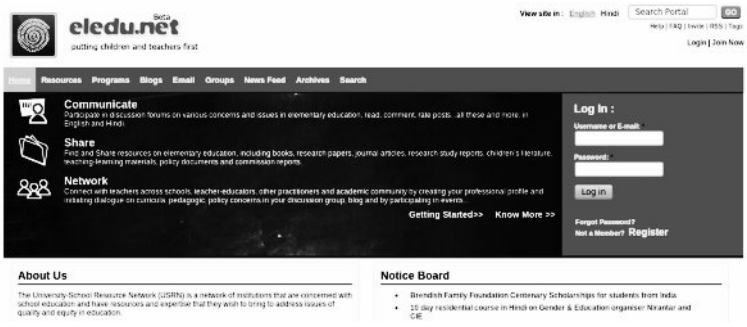
1. *Conducting research for gathering evidence regarding the design and implementation of different models of ICTs in education*
2. *Using the learnings from research for the capacity building of educators and policy makers in alternative, progressive, ICTs in education models that focus on empowering teachers and strengthening the public education system*
3. *Taking up demonstration projects, which display the suitability of such alternative models at a systemic level. The demonstration projects act as action research to test hypotheses relating to the potential of ICTs to support educational aims and to build a body of knowledge based on such practice.*
4. *Using learnings from our research, capacity building and programme work for our policy advocacy with education policy makers*

Research

One important research study this year was on the USRN, a significantly digitally-enabled Teacher Professional Development (TPD) programme of the Regional Resource Centre for Education (RRCE), Delhi University (DU). This programme is collaboratively designed and implemented by leading academic institutions in India (Jawaharlal Nehru University and DU), along with one District Institute of Education and Training (DIET) in Delhi, and select government and private schools.

The USRN project aims to strengthen teachers' identities as professionals, support the use of ICTs for the self-directed professional growth of teachers, and build a (real and virtual) network amongst teachers and teacher educators in different institutions working in education. It

Web portal www.ElEdu.net



also aims to contribute to academic resources, especially in Hindi, and bring multi-disciplinary expertise in universities to engage with school education. The project portal (www.ElEdu.net) has facilities for teachers to access resources, participate in discussions and upload their own work. We have borrowed elements of this programme for our own demonstration project, discussed later. (Our report is available at www.ITforChange.net/RRCE).

Teachers at the 'Photography as a teaching-learning medium' workshop (Bengaluru, India)

The trainer did not undermine the chalk-talk method used in classrooms, but rather encouraged the use of ICTs as an additional tool for teaching-learning.

Ria, an observer from the Sir Ratan Tata Trust, India, at our workshop on mathematics educational tools

Our report from another study of ICTs in education programmes in the district of Yadgir, one of the most backward districts of Karnataka (India), which we concluded this year is available at www.ITforChange.net/Yadgir_ICT. This study discusses the issues and implications of first generation computer programmes in schools.

Based on our research studies, we wrote a policy brief (available at www.ITforChange.net/Note_teacher_prof_dvp) on how ICTs are best used for supporting teacher professional development. The biggest challenge in implementing the Right to Education (RTE), arguably, is to develop the professional abilities of a very large number of teachers across India. Conventional teacher training models, which are designed in a top-down/centralised manner and which rely on point in time workshops (compared to long-term and continuous facilitation) have largely not had the desired impact. Using digital methods, including educational software tools as well as virtual networks to allow teachers be in regular contact with one another and with teacher educators, is perhaps the best application of ICTs in education. The digital medium also has the capacity to enable local knowledge construction in text, audio and video formats. However, in order to be effective, such programmes need to be firmly anchored by educationists and grounded in educational aims, philosophies and contexts.

Capacity Building

Along with the Policy Planning Unit (PPU) of the Education Department (Government of Karnataka), ITfC organised workshops to develop the capacities of 120 teacher educators from DIETs and Block Resource Centres (BRCs) of Karnataka as 'Master trainers on public educational software tools' in mathematics, science and social science. The initiative was supported by *Sarva Shiksha Abhiyan* (SSA) and the Azim Premji Foundation, with infrastructure support from the R.V. College of Engineering and faculty support from the R.V. Educational Consortium. The workshop aimed to integrate ICT educational tools for teaching regular subjects and encourage teachers to see computers as pedagogical devices rather than sophisticated typewriters.

We also conducted workshops for the SSA state office staff on using OpenOffice and Ubuntu at the SSA Bengaluru laboratory. In addition, we introduced them to educational tools in mathematics, science and social sciences.

Bindu Thirumalai from ITfC also gave a talk for principals of Diploma of Education (D.Ed.) institutions which train teachers about the potential of ICTs to enhance teachers' training and professional experience in the classroom and amongst colleagues through networks. The presentation aimed at diffusing a higher level understanding of the ways in which ICTs can be used at different levels of the education system.

We also conducted a series of awareness cum capacity building workshops for NGOs working in the area of education to introduce them to the possibilities of digital technologies in the teaching-learning process.

In Gujarat, we are part of a committee to evaluate proposals for creating digital learning

resources for schools. We are also a member of the technical committee for supporting an evaluation of ICT@Schools – phase 1 and phase 2 projects (ICT programmes for high schools in Karnataka) and a member of a resource group for DSERT.

Higher Education

We participated in the process of revising the curriculum for polytechnic courses of the Department of Technical Education (DTE) for the fifth and sixth semesters. We have provided inputs to include public software educational tools as an alternative to popular proprietary software applications used in engineering. A list of such tools is available on http://public-software.in/PS-tools-HigherEducation.

Demonstration Project and Action Research

Our TCoL project focused on two critical components: firstly, building a network of government school teachers in one block in Bengaluru, focusing on their professional developmental and affiliation needs; and secondly, the collaborative design and development of digital learning resources, using public software educational tools. Creating an online community of teachers enables them to network, share resources, seek assistance and voice their opinions on education policies and day-to-day school transactions. Ultimately, the goal is to enable teachers to grasp the advantages of peer networking, break away from working in isolation and become active participants in the public education system. The project also aimed to introduce teachers to possible ways of effectively integrating ICTs in their everyday classroom transactions to enhance the quality of the teaching-learning process by making the lessons more engaging, active and connected to real life.

Through this project, we have been working directly with thirty teachers in twenty schools. The teachers have prepared lesson plans using digital tools, such as Geogebra in mathematics, Kalzium in science and KGeography in geography. They were also trained on web tools, to be able to access useful resources from relevant sites on education, and to blog about their lesson plans and discuss subject-oriented issues on the web-portal http://bangalore.karnatakaeducation.org.in. We have also created subject-wise resource groups in mathematics, science and English, where teachers can interact, share ideas and learn from each other. Teachers from the community have also successfully showcased their work at the block level Teaching-Learning Material (TLM) event. A *Bala Mela* (children's fair) was also organised to introduce children to different digital tools. A recognition function for teachers was held at the end of the academic year to recognise the efforts and the work done by the teachers through the programme, where they spoke about their learnings and future needs. The videos of teachers are available on the web-portal mentioned above.

In July 2010, student teachers from the Netherlands came to visit the TCoL project through the Edukans Education Experience Programme. The TCoL team presented the project, the role of ICTs in education and its possibilities for the future.

> After learning more advanced functions in Geogebra, I understood the power of the tool. It made me realise how I must focus on the conceptual understanding and not only on the process or methods in my mathematics classes
>
> Radha, mathematics teacher, as part of the TCoL project, Bengaluru, India

Advocacy and Networking

Based on our advocacy work relating to the National Policy on ICTs in school education, which we have described in detail in our previous annual report, the issue of 'vendor driven ICT programmes' was discussed at the Central Advisory Board of Education (CABE), an advisory body to the Ministry of Human Resource Development (MHRD), and a sub-committee was setup to study the issue. IT for Change (ITfC) was asked to make a presentation at a meeting of this committee. The presentation discussed the need

Mary Anita Angel, a teacher from Akkitimanahalli higher primary school, demonstrating KHangMan to another teacher at the Teaching-Learning Material Mela

Children exploring Childsplay, a public software educational tool targeting children aged 5-7

to move from a technological perspective/vendor driven first generation programmes to second generation programmes and provided specific inputs on policy and programmatic aspects. For a copy of the presentation, visit www.ITforChange.net/CABE_Meeting_March2011.

We conducted several capacity building workshops for government departments and NGOs on using public educational software applications for creating digital resources and for networking. The underlying philosophical reasons for adopting public software to create an environment of collaboration and unrestricted access and use of digital resources was always the starting point of these workshops, which served as a useful process of advocacy for the 'digital public' and for networking amongst these organisations. The table in Annexure 1 provides a list of the workshops, as an information resource for organisations who may be interested in the workshops conducted.

We created two 'learning networks' during the year, one for our TCoL teachers (tcolbangalore@karnatakaeducation.org.in) and a second for a group of teacher educators working in DIETs and BRCs in Karnataka (kalika-balaga@googlegroups.com).

I am very excited to see where we are at the end of one year of the TCoL project. When we started, we were all individual teachers. We were here for a technology training that we could use for our children. Today, I see ourselves transformed into a community of teachers who have taken responsibility for their own professional development. The design of technology use in TCoL has opened many possibilities for teaching and learning.

Getzi Joel, Programme Officer, Development Focus, Bengaluru, India

Looking Ahead

Our learnings from the Bengaluru demonstration project and the USRN research study will help us provide inputs to policy makers on how ICTs can support teachers professional development efforts, a priority area in school education. From our research, it is evident that the potential of ICT tools to support information sharing, as well as collaborative work among teachers, is immense, but programmes need to be driven by clear educational perspectives and a strong focus on local contexts and priorities. Keeping these principles in mind, we will be working with the *Rashtriya Madhyamika Shikshana Abhiyaan* (RMSA) to create 'Subject Teacher Forums' among government high school teachers in mathematics, science and social sciences. These forums would link teachers and teacher educators for each of these subjects across schools in twelve districts of the state. The forum would also support teachers to create digital learning resources in these subjects and make these available on a portal (http://RMSA.KarnatakaEducation.org.in).

We will be working with DTE and select polytechnics to build their capacities to use public educational software tools in their teaching-learning processes as well as to to create digital resources for engineering drawing, numerical computing, mathematics, science, computer programming. We will also work for the National Mission on ICTs in Education (NMEICT) programme of MHRD along with the Indian Institute of Technology (IIT) Mumbai, to create videos (called 'spoken tutorials') on these tools, to both learn how to use them, as well as to engage them to promote learning in the relevant subjects.

We will continue to participate and strengthen the ICT-Education-India[3], FOSS Community Network (FOSSCOMM)[4], public software[5] mailing lists and the teachers communities we have helped establish this year.

1 ict-education-india@googlegroups.com.
2 Network@lists.fosscom.in.
3 public-software@lists.public-software.in.