

ICTs in School Education - Outsourced versus Integrated Approach

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A study of two large scale 'ICTs in School Education' programs of two neighboring states of India brings out some interesting insights. The integrated model followed in Kerala state's *IT@Schools* program, where the accent is on developing systemic in-house capabilities anchored around the role of school teachers, has shown considerable success. This has been in terms of much higher level of teacher engagement, integration of computer learning with regular learning processes, greater per-learner availability of computers, significant cost efficiencies and development of teacher networks and collaborative content creation processes, which support teacher professional development. All of these together have led to the overall strengthening of the education system and better learning outcomes.

The alternative model of 'outsourcing' or 'BOOT'¹ employed by the *Mabiti Sindhu*² program in the state of Karnataka, where private vendors were paid to run the program, does not show such positive outcomes. Funds were spent on vendor payments instead of building in-house capacities and hence the system itself did not benefit from the program outlays, and is largely unable to meaningfully sustain the program beyond the BOOT period. Such outsourcing also seems to build more-or-less permanent dependencies of the public education system on private players, which can significantly distort its pedagogical structures in inimical ways.

The implications of this study for policy are critical. The *IT@School* model has demonstrated the advantages of developing comprehensive and end-to-end in-house capabilities in ICT education. However, if due to some contextual reasons, it is at all found necessary to consider some degree of outsourcing, such decisions need to clearly distinguish between non-core processes such as procurement, installation and maintenance of hardware, and core activities with direct pedagogical implications like content and software, teacher training and learning processes, and limit outsourcing to the former.

ICTs in School Education – To Outsource or Not

This policy brief is based on our study of two large scale 'ICTs in School Education' programs for high school students (classes VIII-X) of two neighboring states of India, Karnataka and Kerala. The study specifically addresses the key question of whether to outsource major activities or to invest in developing necessary processes and competencies within the school system.

The Outsourcing Model

The state of Karnataka, like a few other states in India, has tried the outsourcing model for its ICTs in schools program, called *Mabiti Sindhu*. This model relied on private vendors who are primarily in the business of selling computer hardware/software or into computer training to run the entire program. Typically, students learnt directly on

the computers, facilitated by support staff provided by the vendors, with teachers playing a minimal role. One consequence of this was that the teachers themselves had limited opportunities to learn and hence were not able to guide the learning processes of the students in any meaningful manner.

Some methods typically followed in such models, and their outcomes, are

discussed below.

Computer learning seen as a stand-alone activity

Computer learning is not integrated into the regular learning processes of the school student. The teachers of the school are not sufficiently involved with the computer learning processes and largely treat the entire program as something external to the school system. Teachers themselves mostly do not acquire basic computer literacy, though there are computers in their own schools. They are therefore neither motivated nor able to integrate possibilities of computer aided education in their teaching.

ICT Curriculum not linked to regular curriculum

With private vendors (who are mostly attuned to business contexts and uses of computers) driving the content and the processes, students learn applications that are often of limited use to them in their own contexts (office applications are themselves undoubtedly useful, but they require little time to learn, whereby it may not be justified to make these the major component of the ICT curriculum).

Limited competencies of staff provided by the vendor

The outsourced staff is also typically poorly paid³, which affects the profile of people who apply for these positions. They are treated as outsiders by the school, which can demotivate them greatly. As a result, in most schools, the real possibilities of learning and experimenting with ICTs are quite limited, both for the students and the teachers.

Dependencies on external vendors for core educational processes

A long term dependency gets built on private vendors for software, educational processes, content etc

which, as ICTs become more and more central to the educational system, can cripple the latter's independence as well as its broad public and community orientations. It should be remembered that in India, there are a number of high-level public institutions that meticulously work on every aspect of content/curriculum, processes etc of the public education system. Their role may largely get superseded by large-scale private sector dependencies that will get built through the outsourcing model. Many eminent educationists in India have been highly critical of this process of privatising core educational processes of curriculum/content design and teacher professional development⁴.

An Integrated Model of ICTs in School Education

The Kerala state's *IT@Schools* model which integrates the ICT component from the start into the mainstream teaching-learning processes, appears to have been successful in building a good platform for leveraging the best opportunities that ICTs may have to offer in furthering various educational objectives. Some key elements of the *IT@Schools* model that are seen as responsible for its relative success are briefly described below.

Complete integration with existing structures and processes

The *IT@Schools* program is fully integrated into the existing educational processes. It relies on the elaborate teacher training structures within the public education system in India to train the school teachers on using ICTs, both in terms of computer learning and computer aided learning. There are a set of master trainers who first acquire sufficient expertise in using

computers. Since these trainers are themselves teacher educators, who have also taught in schools, they are much more likely to bring up the best possibilities of using computers for learning different subjects. Some examples include using specific educational software that is available for different topics, say electrical circuits (physics), or circles (geometry), or simply through access to the Internet for information on different areas etc.

The procurement of hardware, and its installation and maintenance, is also managed within the system. This allows significant cost advantages arising due to great quantities of hardware purchased. The program has created 'mobile hardware clinic' teams, which regularly visit schools for inspection, checking hardware and doing most of the required maintenance and repair work. A policy of cannibalising computers that cannot be repaired has two benefits; it substantially lowers costs of maintenance while ensuring higher uptime. Teachers are trained to install software and also do routine software upgrades. The program disproves a commonly held belief that school teachers in India's public education system are not capable of, and/or are unlikely to be interested in, engaging with ICTs beyond being simple users.

High investment in teacher capacity building

The trainers provide intensive training to teachers as a part of the regular teacher training, planned every year. The training is comprehensive in its coverage; every teacher receives an initial ten day training in the first year, and 2-5 days every following year, which refreshes and builds on the learnings of the previous years. While the initial

foundational training covers basic operating system and applications relating to the Internet, email, image editing etc, as well as ‘office automation’ applications, later programs focus on specific areas such as hardware troubleshooting, software installation and upgrading, content management systems for publishing and sharing content created by schools, as well as specific educational software/ applications for different subjects.

Such high investment in teacher training is reflected in the high levels of confidence and self-esteem that teachers display. This confidence is reflected in their interactions with students and it has considerable positive impact on student learning.

Focus on computer aided learning and not just computer literacy

The *IT@Schools* program team is quite clear that computer literacy though foundational is really a relatively trivial issue and the real benefit of ICTs in education come from learning to apply ICTs in the regular learning processes⁵. The program focuses on access to the Internet for supporting regular learning activities, and also special projects that students work on. The program has ensured availability of broadband Internet to all schools, which allows the schools to connect to the web⁶. Many teachers also spend time on the Internet to identify learning materials that they can use in their own lessons. Several educational software and applications are provided by the program. The idea is to have a large set of such applications, from which teachers can choose what they find relevant and useful to their teaching.

Computer aided learning also focuses on the teachers, many of



Kerala IT@Schools Program

who are now learning how to setup and manage ‘content management systems’ that can provide spaces for teacher collaboration in curriculum and content development, as well as for teachers’ own writings and reflections⁷. These spaces are intended to provide meaningful opportunities of engagement and exploration for teachers’ professional development.

Constructivist educational approaches through use of free and open source software

The *IT@Schools* program initially began with proprietary software platforms but soon realized that for ICTs programs to be really effective in school education, moving to free and open source software (FOSS) platforms was necessary. The following advantages were found in using FOSS:

- FOSS applications can be freely modified and customized to suit local needs. The program created a custom package of the Debian GNU/Linux distribution, containing several educational software applications, as well as

local language (Malayalam) features that made it valuable to the schools.

- FOSS being freely shareable, there were huge savings in implementing the program in the thousands of schools that are part of the state’s public education system. Kerala has more than 15,000 schools, each having anywhere between 5 to 50 computers, and using FOSS software enabled scarce public funds to be used for hardware and peripherals rather than on software. This has enabled 100% coverage of schools by the program⁸. Instead of restricting software to a few proprietary applications, the program has very large number of FOSS applications for a range of application areas including image, audio, video editing, photo editing, creating and editing documents in a variety of document formats including PDF etc. More importantly, several educational software applications, written specifically for different subjects are made

available for teachers and schools to learn and use. The teacher training programs also cover such applications.

- Installation of software became a simple one-step process. In case of proprietary software, each application has to be installed separately, while in the case of FOSS, all applications can be bundled into a single CD for easy single-step installation in each school. Installing the operating system can also include installation of all other applications. Teachers and students take the same distribution to install on their home computers as well.

The success of this program with such a large numbers of computers and users can address the misgiving among some policy makers that using FOSS may present difficulties like poor stability, difficulty in training or lack of support. Our interviews with teachers and students using FOSS

showed that they found FOSS very user-friendly and training on it was like training on any other platform. The issue of support got sorted out due to creation of a sufficiently large ecology of FOSS use, as happens with a system-wide implementation in public schools. This enabled sufficient in-house capacities, as it also encouraged local enterprises for FOSS support activities.

Directions for Policy on ICTs in School Education

ICTs have enormous potential for providing new *educational experiences* and in the *organizing of these experiences*⁹. Our research on ICT programs in schools in two states of India confirms what should be obvious; that the actual attainment of educational objectives largely depend on the guiding principles and design used in employing ICTs for creating these new experiences (curriculum or content) and for organizing the processes around

these experiences (pedagogy). Our research on the *Mabiti Sindhu* and *IT@Schools* programs respectively of the states of Karnataka and Kerala in India provides crucial insights regarding the important policy issue of what kind of models should be used for incorporating ICTs into public education systems.

The combination of the features of the integrated model, (1) integrating ICTs with regular school processes, (2) investing in teacher capacity building, (3) moving beyond computer literacy to computer aided learning and (4) use of FOSS platforms, has resulted in educational outcomes that appear superior to those of outsourced models. In the latter model, on the other hand, the large resource outlays do not appear to cause similar systemic benefits and in fact weaken the system by making it dependent for its core pedagogical processes on actors, whose core competencies are not in school education.

Endnotes

1. **Build Own Operate Transfer** – this is a popular public private partnership model, in which the private party builds the infrastructure, operates it for a contracted period and then transfers it to the public authorities.
2. The program ended in 2006.
3. Government school teachers typically get between INR 8,000 to INR 15,000 per month while the vendor staff are typically paid between INR 2000 to INR 4500 per month. One US\$ = INR 45 approximately.
4. See a recent news item at <http://timesofindia.indiatimes.com/news/india/Educationists-oppose-HRDS-school-computer-education-plan/articleshow/4937946.cms>.
5. It is clear that integrating computers into the regular teaching-learning processes can be done only by teachers and not by staff from technology companies, who are not likely to have the required competencies.
6. In the private, vendor driven *Mabiti Sindhu* program of Karnataka, though providing Internet connectivity was a part of the deal with the vendors, in most schools it was not available on a regular basis.
7. Another good example of teachers coming together to use a content management system (CMS) for collaborative content creation and sharing is the University School Resource Network of Delhi.
8. For the one million plus schools in the Indian Government school system, the cost differentials between proprietary and FOSS applications can run into billions of Rupees.
9. Two of Ralph Tyler's famous four questions on basic purpose of education.

IT for Change (ITfC) is a non-profit organization located in India. ITfC envisions a society capable of, and comfortable with, innovative and effective use of information and communication technologies (ICT) as a tool, to further goals of progressive social change. This policy brief is a part of ITfC's Information Society for the South (ISS) project, supported by Hivos and IDRC. The ISS project interprets information society changes in the light of development needs of the South. It seeks to build research and advocacy capabilities in the South with regard to a progressive information society discourse.

