Innovative Use of ICT for Educational and Community Development: A Case Study of two Educational Initiatives in SSA[1] Collaboration Schools in Tamil Nadu, India

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Introduction

Educational and other social systems are responsible today for preparing a society for the future and moderating the adverse impact of social and economic change. For being a part of this challenging economy students need to leave school with a deeper understanding of school subjects, particularly science, mathematics, and technology. But this knowledge is by itself not enough. They also need to be able to use technology, manage information, communicate effectively, think critically, work well in teams, and produce new intellectual and creative works that have value to others.

ICT's (Information and Communication Technologies) are a means for meeting these challenges. ICT can improve access to and promote equity in education by providing educational opportunities to a greater number of people of all ages, including the traditionally unserved or underserved (e.g. those in rural and remote areas, women and girls, and people with disabilities) and can enhance the quality of teaching and learning by providing access to a great variety of educational resources and by
enabling participatory pedagogies[i].

Background

While it is accepted, that Education as an instrument of social change and national development[ii] (As early as 1966, this was the main articulated agenda highlighted by the Education Commission of India.) the new thought is through innovative strategies, to make ICT integrated education more power-

[1] Sarva Shiksha Abhiyan (SSA) is Government of India's flagship programme for achievement of Universalization of Elementary Education (UEE) in a time bound manner, as mandated by 86th amendment to the Constitution of India making free and compulsory Education to the Children of 6-14 years age group, a Fundamental Right.

packed and effective for changing the quality of life of the individual and the social economic development of the country. The adoption of the ICT innovation in schools can also be described as the integration of digital media in the everyday school life of teachers and pupils. This new agenda is not India specific but covers every geographic region of the world[iii].

This study focuses on the need to build capacity in ICT integration among policymakers and teachers especially in developing countries. With respect to ICT in education, while policymakers set the framework, teachers are the one who implement education policy. In ICT in education programs, teachers are 'the key to whether technology is used appropriately and effectively' (Carlson and Gadio 2002, p. 119). Ertmer (2005), among others, considers the pedagogic approach of the teachers as the ultimate challenge ('final frontier')

The objective of this paper is to study the impact of the innovative use of ICT on Education and Community Development. The research will study

teachers and schools involved in the Intel Teach Program . The Intel® Teach Program is a professional development program that helps teachers to be more effective educators and integrate technology[iv] into their lessons, promoting problem solving, critical thinking and collaboration skills among their students. Under this program more than 6 million teachers have been trained in over 50 countries.(2010) The paper presents an intensive study undertaken in two SSA(Sarva Shiksha Abhiyan, a government of India initiative) and Intel Initiatives supported schools in Tamil Nadu-in Karaikottai in the Needamangalam block of Thiruvarur District and in the Toda tribal of Nilgiris in the Udhagamandalam Block. Both schools have children from the underserved communities and serve students with similar socio economic background.

The aim was to see if innovative ICT integrated Education could bring enhanced learning for students and deal with social evils like Child Marriage(Toda), illiteracy (Toda and Karaikottai) and stem child labor (Karaikottai)

After the study it was seen that both the cases evinced positive growth trends in knowledge deepening and creation. There were also major positive signs of change seen in the community.

Methodology Adopted:The study is based on Capacity-Building in ICT Integration For Teachers, which is part of a three stage ICT-CST (ICT Competency Standards for Teachers (ICT-CST)) model by UNESCO Bangkok of ICT integration in education. It is based on the idea that education reform supports national economic and social development in one of three ways, namely[v]: (Figure 1)

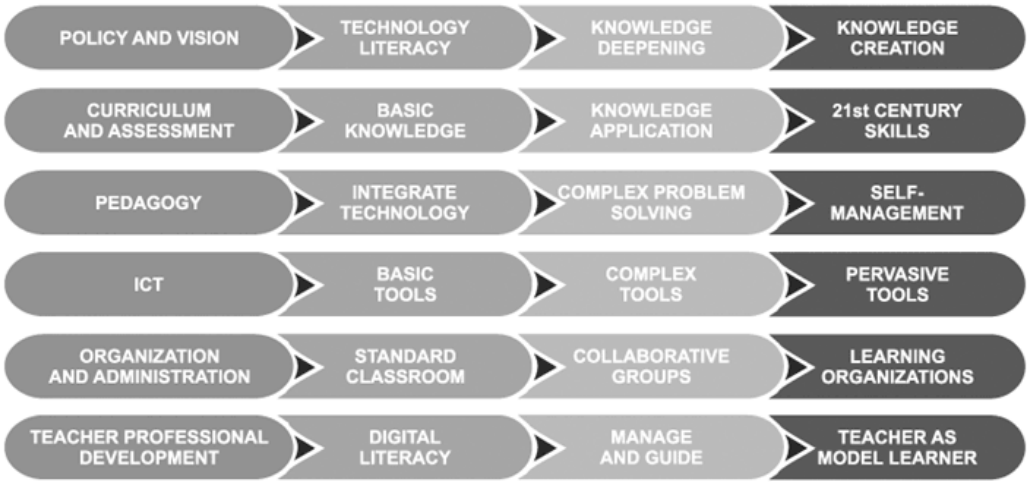
1. By developing technology literate citizens and workers through the incorporation

of technology skills in the curriculum (the technology literacy approach);

2. By developing citizens and workers who can apply knowledge to solving complex, real-world problems and thus add value to society and the economy (the knowledge deepening approach); and
3. By developing citizens and workers who can innovate and produce new knowledge (the knowledge creation approach).

Figure 1

UNESCO ICT competency standards framework for teachers



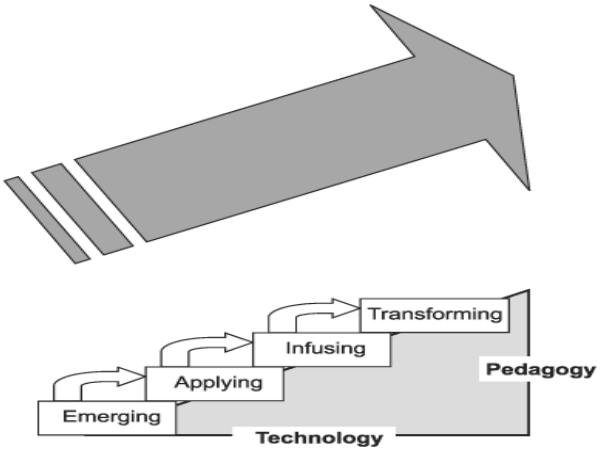
(Source: UNESCO 2008)

Under the methodology adopted there are four broad stages of ICT adoption and use that educational systems and individual schools typically go through (see Figure 2).

At the first stage, teachers and learners are discovering ICT tools and their general functions and uses, and the emphasis is usually on ICT literacy and basic skills. Discovering ICT tools is linked with the *emerging stage* in ICT development. The second stage involves learning how to use ICT tools, and beginning to make use of them in different disciplines. This involves the use of general as well as particular applications of ICT, and it is linked with the *applying stage* in the ICT development model.

Figure 2

Stages of ICT integration



(Source: UNESCO Bangkok 2005)

At the third stage, there is understanding of how and when to use ICT tools to achieve a particular purpose, such as in completing a given project. This infusing stage implies the ability to recognize situations where ICT will be most helpful and using these tools in combination to solve real problems. The fourth stage is when the learning situation is transformed through the use of ICT. This is a new way of approaching teaching and learning situations with specialized ICT tools, and it is linked with the *transforming stage* in the ICT development model.

There is proposed shift through this method to extend the cognitive (individualistic) and social (participatory) approaches on learning towards the inclusion of a knowledge-creation approach (Hakkarainen, & Paavola 2005). The knowledge-creation approach addresses the question how people develop new artefacts and products or ways of working collaboratively over longer periods. Importantly, it concentrates on the interaction through these common objects of activity, not just between people, or within individual minds.

The didactic of knowledge creation in the teacher training curriculum is based on Constructivism Piaget (1968) (cognitive constructivism) and Papert (1980) (social constructivism).This philosophical as well as psychological approach (Duffy and Jonassen, 1992) presupposes that people, behaviour and environment interact in a reciprocal manner and assumes that learning takes place in a context and people create knowledge, individually and collectively.

Data collection

The research utilizes a mixed-methods design, in two phases. Phase 1 is a descriptive cross-sectional survey questionnaire. Phase 2 is a case study in a school in Karaikottai and in Toda, Nilgiris over one year. To examine regulation of collaborative inquiry essential for building 21st century skills three levels of processes were employed: (1) monitoring and regulating individual process, (2) monitoring and regulating collective process, and (3) monitoring and regulating efforts in knowledge building and advancement of shared objects.

Process Adopted

Recognizing the outreach of education the Government of Tamil Nadu had prioritised education as the way to development among the scheduled tribes **(**Adi Dravidar Tribal Welfare Department). In 2007, Intel Educational Initiatives collaborated with the government of Tamil Nadu to train teachers in digital literacy. The objective being that to prepare students to succeed in the global era, it was critical that the educators be trained to be able to reinvent teaching methodologies. The program was implemented with the support of the Sarva Shiksha Abhiyan[vi].

On the initiation of the partnership with Intel, all teachers in schools run by the government of Tamil Nadu and covered under the SSA would have their teachers trained under the Intel Teach program. This training, done in the Tamil dialect, would be facilitated by the Block Resource Teacher who was also trained as a Master trainer under the Intel Initiatives, Teach Program. The Panchayat Union Middle Schools were also covered under this program.

At the beginning of the study, all teachers under the SSA in Tamil Nadu were trained on the Intel Teach Curriculum where they were taught to integrate technology, mainly through learning skills on the computer, into the educational curriculum and use a project based approach[vii] in dealing with community issues based on topics they were studying in their curriculum. This method of learning would not only enhance their learning but also lead to knowledge deepening and knowledge acquisition.

Table 1

Demographic and other details

	Karaikottai	Toda,Nilgiris
Area population	2500	1100
Parental Occupation- landless labor, casual workers	90%	95%
Drop outs/no schooling	50%	70%
Illiteracy among areas	85%	95%
Number of children in school	248	157

Based on: Household Survey 2005 & DISE Report 2007

Karaikottai

Panchayat Union Middle School, a Government school in village Karakottai is in Tamil Nadu in South India. The Needamangalam block of Thiruvarur District where it is situated, is also one of the most backward districts of Tamil Nadu.

The parents did not like their children to go to school as they could be used to fetch extra income for the family by working in the farming fields. Young children were sent to work instead of beingsent to school.

The problem of Child Labour was rampant in the society.

Toda Tribal, Nilgiris

The Panchayat Union Middle school covered under Elementary Education by the SSA comes under the Udhagamandalam, Udhagamandalam Block, Nilgiris District, Tamil Nadu and was the site of this study**.** Along with other rural populous of the neighbourhood the school also catered to the Marli Mandu (village/hamlet) of the Toda tribal.

Education was not encouraged and parents preferred to keep the children home to help with the crops and the only time the children walked into school was in the rainy season to use it as shelter. (Household Survey, 2005). Women were considered inferior and education was not encouraged nor were they allowed to leave the hamlet to study or work outside. (Mohanty 2002:310)

Social evils like child marriage and no education for girls were one of the key issues restraining overall development (Tamil Nadu Social Development Report 2000:2)

Impact of Initiative

The impact of the initiative has been very positive. A change was noticed over the preceding months.

On Students and Community

In Karaikottai

- The students under the guidance of their teachers created a powerful multimedia presentation which they shared with the villagers against child labour.
- As a result of this presentation and other brochures and posters which the students made on the computer -The drop out rate in classes was completely arrested. The entire village took an oath to attain 0% child labour and to attempt a 100% literacy in the village
- The Village Education Committee now plays an active role in the education of the village children and the Programme has enabled 7 ‘drop outs’ to enrol back in the school.

In Toda

- The students worked collaboratively to fight against child marriage they created brochures and posters against it which they displayed in the community.
- Finally they got the attention of the older women of the community who started supporting them the community head and other elders also extended support.

> "Tribal community can improve and achieve higher levels only with the help of higher education and this project had helped us in our 'mandu' (in our locality) to change the mind set of our community people. Students can convince the elders as their words would be heard effectively". Village Pradhan.

- Protests and public outrage outside the Toda temple stopped a child marriage from taking place.
- Parents have allowed their daughters to study more and learn a few skills Child marriages have been stopped
- Girl children who were earlier not allowed to cross the borders of their 'mandus' were now given permission to go out for receiving higher education 6 girls who were a part of the project are now completing their higher education in institutions outside of the village.

Teachers in both Karaikottai and Toda, Nilgiris have gained the respect and trust of the Toda community and learnt 21st century skills which are an impetus to them professionally.

Conclusion

To build knowledge societies teachers must be able to retrieve, organize, analyze, evaluate information and then use it for specific decision-making and problem-solving ends using the resources of ICT. This study presents a successful pilot of how teachers can transform schools into learning communities to serve as models for the rest of the information society.

The following key conclusions were reached: -

1. Innovative use of ICT in teaching/learning can stimulate dynamic learning environments.

2. The effectiveness of ICT based innovations, scientific knowledge and/or new educational/ pedagogic models rely on their successful integration into existing educational activities.

Teachers are the central figures for the cognitive, emotional and social development of their pupils in ICT-related teaching/learning.

[i] International Development research centre, Capacity building for ICT integration in Education.

[ii]Microeconomic data from 42 countries found that an average rate of return for an additional year of schooling was a 9.7% increase in personal income9. A cross-country macroeconomic study found that there was an additional .44% growth in a country's per capita GDP for each additional average year of attained schooling, a return on investment of 7%10. Other studies have found returns that go as high as 12%11.

[iii] The most radical transformations are produced when these technologies integrated in education, reach the world's remote and poor places where students can become instrumental to change around them by being the change themselves. (Arnett: 2002:279)

[iv] The term 'technology integration' refers to 'the use of computers and the Internet to support teaching and learning across the curriculum' (Gaible and Burns 2005, p. 18). In this study, the term is used interchangeably with 'ICT integration'.

[v] International Development research center, capacity building for ICT integration in Education,

[vi] *GenEduStats*, Tamil Nadu (2005). Pg 36.
http://www.ssa.tn.nic.in/Docu/GenEduStat.pdf

vi The Project Based Approach is a dynamic approach to teaching in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups.

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