

THE CREATION OF AN EFFECTIVE EDUCATIONAL AND SOCIAL INFRASTRUCTURE PROGRAMME FOR INDIA: SCHOOL NET INDIA AND TECHNOLOGY

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Introduction

Ladies and Gentlemen, we consider it an honour to be able to address you on the occasion of your conference here in Brunei. We bring to you a simple, yet powerful idea that has been around for the better part of this century but will only be realized in the next century.

The dream of a world where citizens would not be shackled by not having access to information and knowledge skills but rather be judged by the ability, ambition and skill that each possesses is at the root of our scheme. We know that this is an age-old dream but we know the dream has failed to be manifest in the past not because of lack of vision but due to lack of resources and tools. In modern times the dream was articulated by the great American civil rights leader, Martin Luther King Jr. It also formed part of the basis for the creation of human rights documents now endorsed by most nations on earth. It is also the central mission of the Commonwealth of Learning, our host organization.

The efforts to bring this dream into reality have been great, but the results have been less than spectacular. We assert that the time has come to make the dream a reality for most of the world's people. The time is now.

Introduction

Why is the time right for a massive education program? What things have changed that makes it feasible now?

*'Distance education is becoming increasingly popular as economic forces encourage, and new technologies facilitate, its spread.'**

The convergence of communications technologies and computing technologies is rewriting the possibilities for distance education both in terms of capabilities and cost spawning opportunities for consortia between governments, agencies, schools, businesses and people. Technology is the major contributor to the re-thinking of educational possibilities. The use of technologies in distance education is not new. For almost fifty years distance education has used technologies such as radio, television, video tape and audio tape to supplement what was fundamentally an institution-based, text oriented course. This type of course was considered to be inferior to taking the course in person at an institution.

Multimedia computers, appropriate software tools, satellites and Internet servers are transforming the world into a borderless, educational arena capable of serving the under served without the necessity of uprooting them from their community. The shift in possibilities is dramatic. Digital courses can be created once and served up to tens of thousands of people. Digital books can be made and distributed at a fraction of the cost of creating paper-based text. Highly interactive education can match or beat traditional methods of delivery and can be delivered asynchronously providing maximum flexibility for the education consumer.

* Potashnik, M. ; Head of the World Bank Education and Technology Team. Capper, Joanne, Senior Consultant, World Bank Education & Technology Team. Article: 'Distance Education: Growth and Diversity. Journal: Finance & Development / March 1998

Before getting too carried away with the advantages of digitally based education, there are a number of limitations that we must be aware of. Developing countries do not have access to the technologies, information and communications systems necessary to deliver the promises of a new digital based education system. It is clear that we need to understand the terms of reference for the need that exists.

Understanding the Need

There are four critical categories of factors that must be well understood before we can look toward solutions.

1. Allocation of Resources at the macro level

In developing countries, people live in extreme poverty. Is it really reasonable to invest in technology for an education system instead of allocating the same money to those in dire need?

- Competitiveness in international markets is increasingly based on educational levels of people rather than raw resources.
- Task automation in the work force has created demand for an educated workforce.
- Present education systems are not keeping up with demand for skilled people.
- Policies intended to alleviate dire economic conditions have failed to work in the past. Without a social infrastructure policy in place, the systems that are at work will perpetuate the status quo.

In many cases, resource needed to be re-allocated. This does not mean an abdication of responsibility to the pressing social needs but it does mean the alignment of government regulations, communications infrastructure, training and the re-ordering of material acquisitions. Simply put, it means making the investments in computer based education delivery systems rather than traditional delivery systems. If India were capable of building a university the size of the University of British Columbia every month for the next two decades, there would not yet be enough institutions to meet the demand. If a much smaller investment could be made on providing basic Internet access to every community access to a world of education resources could be achieved.

2. Allocation of resources at a micro level

Even if modest incursions are to be made, it will be necessary that the systems be useable by a large sector of the population for economic purposes as well as educational ones. The closer the economic tie is to the infrastructure, the more likely it is that communities, groups and individuals will choose to make an investment in infrastructure support. Micro loans are dependent on the capacity to pay them back, and therefore must have some economic imperative.

3. Education Implementation Issues

In most developing countries, overpopulated classrooms, (as many as 50 per class) is the norm, not the exception. The schools tend not to be well equipped with either technology-based resources or other types of learning resources. The lack of basic infrastructure (electricity, telephones and even adequate sanitation facilities) in the schools seriously impedes the introduction of dependent technologies such as computers and Internet.

Because many schools do not have a baseline for technology, teachers are ill-prepared to launch into new technologies and fearful that the expenditure on technology based educational resource access may be dubious. Teachers tend to be very poorly paid, producing an exodus of intellectuals for higher paying professional jobs. The lack of trained professionals willing to work in schools has resulted in schools placing poorly qualified staff without appropriate credentials. Many schools presently lack pedagogical and administrative capacities for new technologies and do not see a way to manage new systems without substantial additional support.

The education implementation issues center around the availability of infrastructure, teacher training and preparation, ** means of integrating technologies into existing methods and sustained support for the technologies being introduced. Without a plan that comprehensively addresses all of these issues, a plan will not be successful.

Social Infrastructure Model

The model of developing physical infrastructure is well understood in developing countries. Roads are necessary to stimulate trade. Ports are necessary to stimulate export. Dams are necessary to manage water for farmlands. The metaphor of developing a system education that provide access to the world wide information highway is a convenient way to understand what is required to be done.

The Physical Infrastructure

Macro- level infrastructure

In developing nations, traditional telecommunications infrastructure is not well developed. The phones per person, in many instances is less than one phone per hundred people. Traditional telephone-modem based computer-to-computer communications is likely only to play a small role in an overall solution. The greatest likelihood is that any viable solution will be based primarily on wireless communications and only marginally on land -lines. In India, there is a well-developed satellite communications system used for government and industry purposes. Satellite is ideal for satisfying episodic Internet requests from a broad geographic base.

Many rural schools in developing nations do not have the requisite electrical power to the schools to operate electronic based equipment. Many other schools have circumstances of irregular power or times of brown-outs when power is not suited for use with electronic tools. In these circumstances, it is necessary to recognize the problem and deal with it. No electrical service is an infrastructure problem that can be identified and targeted for additional funds. Schoolnet, for example has given these schools special designation and has sought to fund these schools through corporate donations, which to date has been a successful strategy.***

In some cases, computer communications services may be placed in buildings other than schools but readily available to schools. In many schools where electronic equipment is now present, the schools have put together an ingenious backup system using automobile batteries that provides uninterrupted power through brown-outs and black-outs.

The servers serving SchoolNet India are centrally located and administered from the Teacher Training Centre in Mumbai. This server is a Linex (Unix) based server group capable of managing all of the dynamic web materials, email, data based serving and site administration. It is dynamically linked to a site in Canada. The servers are configured to be split into operating groups of data services, web delivery management, and education club management. The site is built entirely around a 'web engine' automating many of the advanced communications functions.

Micro-level

Under the SchoolNet plan, every participating school gets a bank of SchoolNet computers loaded with all of the appropriate education software and hardware configurations, a proxy server, additional network based software, video players, television sets and a library of media. Many courses (National Open School) are being converted for Internet delivery. SchoolNet has developed a robust under \$US500 multimedia computer that will provide access to SchoolNet Internet services and allow for access to courseware. Cost of this service, even in the not-to-distant past, would have relegated this level of service into the land of wishful thinking. Recent breakthrough in hardware pricing, software development and regulatory issues have made this a reality.

** for a comprehensive overview of this problem see "Computers in Education in Developing Countries: Why and How" a World Bank publication by Luis Osin, consultant, Education and Technology Team

*** see SchoolNet hand-out

Issues such as teacher training and upgrading, community college course taking, literacy programs, access to a vast variety of on-line resources are all now possible. Bring technology bases into communities also provides some very real possibilities for local people with special skills to create electronic versions of their area of expertise and share that with other communities. Electronic commerce of knowledge transfer that will benefit people where they live, provides a basis for a massive re-thinking of what is possible to come out of villages. Create locally, think and act globally.

Tools for the job

Many of the traditional ways of thinking about infrastructure constraints on development no longer apply in a technology-enabled community. A bicycle repair man in a community can continue to be a bicycle repair man but can now create courses on his expertise, providing money to him and also can take courses that would provide skills essential for him to grow and develop. The same applies to every member of the community. While this is a pleasant enough dream of a new, emerging economic sector arising from the expertise that people already possess, it cannot happen unless there are powerful, easy to use tools that are readily available for use.

The tools required are tools that allow people to construct meaning out of experience. Tools that provide training and communications base that supports 'life-long learning' inside a supportive community of learners. The tools must also provide a tangible economic benefit to the community so that there is a directly link in peoples' mind between participating in education and their economic well-being for themselves, their families and their community.

In preparation for this mission, we undertook to create tools that would foster thoughtfulness, resourcefulness and insight. The tools that we built are specific for the user that was intended:

PlanIt Teacher -a tool for teacher preparation, lesson planning, communications, resource acquisition and sharing via an Internet club

PlanIt Student -a tools for students to plan for learning, resource acquisition, communicating, web publishing and sharing via an Internet Club

PlanIt Parent – a tool for parents to assist their children in their quest

for a quality education, to enhance communication between the home and school and to assist parent in learning about what education options they have for their children after formal schooling

Course Concert- a full scale course development system that allows for the creation of multi-media course to be developed and delivered by persons not having the technical expertise necessary to achieve success.

Costing

The economics of implementing a system nation wide such as we have described is extremely important. Recent shifts in technologies have for the first time in human history have made it possible to deliver sophisticated, complex education systems to people at a very low cost. In the past, the cost of physical resources such as a book was prohibitively high and the net result was that libraries and education resources were poorly stocked denying access to information. An electronic book, course or other materials can be created at extremely low cost and delivered to millions at very low cost provided the base technologies are in place.

The social infrastructure necessary to provide access to schools, universities and ordinary people is a very high priority in most developing countries for if access can be achieved, users have not only the keys to the library but they have the keys to all forms of training institutions. That is just the first step. Providing access to the easy development of sophisticated education resources will provide a powerful economic engine for local communities will make possible the global market for the sharing of ideas and expertise.

When we can implement tools that impact on human development on a broad basis, we can assist people, in a very dramatic way to assist themselves and their families to a future positive.

Accessing Corporate Assistance

SchoolNet India has developed a program to provide for corporate assistance in the deployment of this infrastructure program. Within the country, there are schools certainly capable of bearing the costs of implementation. A much larger group of schools could not, without substantial assistance, be able to participate. For those schools, Indian companies are being approached to sponsor schools. In addition the Indo-Canadian business community is being approached for sponsorship through the Morgan Media Inc. Foundation. The expected yield from these initiatives is expected to be very substantial over the next several years. We have found that resourceful approaches applied to funding issues is very productive.

Regulatory Issues

In every nation, telecommunications regulations are a vital part of the necessary infrastructure. In many cases, the regulatory bodies are not current with many of the implications that rules have on education infrastructure. It is essential that early in the planning stages of any program that the regulators be addressed. Space on satellite, telecommunications bandwidth allocations, tariff charges on phone line, the cost of installation of normal land lines, the importation of technologies for education, taxation on goods and services and a host of other issues need to be addressed effectively before a credible implementation strategy can be mounted. The regulatory issues can be one of the biggest blockades to an effectively run program. It is essential the education programs have special dispensation from other types of telecommunications activities.

Implementation Strategies

SchoolNet formulated the mandate for what was required and began to work toward the realization of a goal. SchoolNet staff unearthed appropriate technologies for a variety of sources and for the most part, licensed them for use in India. SchoolNet formed a partnership relationship with Morgan Media Inc. to provide some of the core services and software. This alliance, while new, seems to be a very good approach.

The first servers are now in place. The first round of software acquisition is now complete. The first group of teachers have now been trained at teacher centre. The first schools will be online very shortly. The plans are very ambitious and the hopes are very high.

India is the second site to be developed. The first was in Canada. We believe that the service will be expanded to begin to meet the needs of people on virtually every continent. We know that the effort to make these new possibilities is large and that we will face many obstacles. These obstacles pale in comparison to doing nothing or maintaining the status quo.

*To know and not to act, is not to know.
'Carpe Diem'*