

COMPUTER TECHNOLOGY FOR LITERACY AND EMPOWERMENT OF MASSES IN DEVELOPING COUNTRIES

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Abstract

Presuming that the economic development of a country depends on i) the level of success in expanding educational opportunities for masses, and ii) to what extent common people feel empowered for making decisions in various spheres of their lives, the authors maintain that the computer technology has opened avenues in the field of education that were absent as late as the last decade. In developing countries that are characterized by resource shortages, education funding generally gets shortchanged compared to other more pressing needs. This presentation will focus on the creative use of computer technology for expanding educational opportunities for the masses at the fraction of cost compared to the traditional modes of schooling. We believe that there is a realistic case to be made for a shift in paradigm about the process of education that is more relevant for the 21st century. The presentation would include instances of successes of pioneering efforts in the field of education from several countries, including India, and engage the audience in generating ideas that are feasible and promising.

Introduction

Education and national development go hand in hand. The rise in education level of the masses both in quantity and quality is a fundamental step in ensuring a large scale economic development of a state, or a nation. For this reason, the United Nations, from its inception, considered basic literacy for all as a major world wide initiative and a priority. All nations of the world have committed themselves to this goal at one or other time. As a result, large scale efforts have been made in each country to achieve a universal level of literacy for all their citizens. But the results are far from being achieved. It is estimated that at least seventy countries would not achieve their goal of basic literacy for all by the target year 2015. Some of the countries that would fully achieve the goal of total literacy include Russia and former USSR countries, Singapore, South Korea, Cuba, China, Nicaragua, and Ethiopia. Most countries in Africa, Middle East, and South-East Asia continue to have the highest illiteracy rates despite large investments of funds. UNESCO estimates that there are nearly one billion people in the world who are yet to achieve basic literacy levels. Wide disparities exist especially in developing countries when it comes to the educational opportunities offered to males vs. females, with the latter receiving considerably less attention. (EFA, 2005)

Economic Reality

“Mind is a terrible thing to waste”, is a popular saying. But providing education for all is costly. Many developing countries that characteristically have few economic resources find themselves with pressing needs in all spheres. In such an environment, it is no surprise that financial commitments to education lag behind many other needs such as providing food, shelter, and security. Even in the United States of America, with the largest economy in the world, education dollars are not sufficient to meet all the needs that exist in schools, and colleges/universities.

Shortage of Schools, Shortage of Teachers

The existing model, practice for centuries, requires a (trained) teacher, a school building to protect participants from the elements, and supply of appropriate instructional materials. It also assumes that students would travel to a central school location at a given period during the day where they would

receive organized instruction. The assumption is made that in order to be educated, one has to be enrolled and physically attend a school on a regular basis¹. Each one of these requirements adds cost and restraints on the schooling system. Putting all the factors together makes the educational enterprise one of the costliest initiatives in many countries, second perhaps only to the security related expenditures. Conversely, when demands on resources increase due to shifting priorities in a country, education funding becomes an easy target for accessing additional funds. There really are never sufficient funds for education even in a country with booming economy e.g. India or one with less stellar economic picture as in Bangladesh, Pakistan, Jordan, and Egypt. (UNESCO 2005)

Needed: A Paradigm Shift for Expanding Educational Opportunities

Haddad and Draxler (2002) proposed that given the shortage of resources, nations should start thinking of education not as 'a location but an activity: a teaching/learning activity'. If we consider this as a postulate, education can be provided not just in a school building during limited hours but anywhere and anytime where people are. Many institutions subscribing to this paradigm have developed a huge market for their programs as evidenced by a huge market for on-line degree granting courses in the past five years. However, most such programs are at the higher education level for those who have already attained secondary education from traditional schools. Friedman (2005) in his latest book, *The World Is Flat: A Brief History of the Twenty First Century*, describes the technological advancement for doing work via cyberspace within a country or across the world, a fundamental shift in capacity that would revolutionize the economies of countries that were hitherto unable to do many things due to lack of resources. Nations that do not educate all its citizens and allow them to enter active workforce in the next ten or twenty years would be left behind further with each passing year in the next decade. In other words, nations that take advantage of the new capacities offered by computer technology would be the front runners claiming a major share of resources from the rest of the world. Friedman considers the changes taking place in the way world business is conducted today to as fundamental to the future as the industrial revolution was in the last hundred years.

With the advent of powerful desktop computers at affordable prices, and the rapid development of internet, the question needs to be answered for why not use this medium (e.g. computers) for large scale basic literacy programs in places where formal schooling has not penetrated beyond the surface. In a short time, computer based literacy programs can be more economical and highly successful for educating the masses in developing countries if the governments and private agencies would shift their paradigm of how education is delivered. Farrel and Wachholz (2003) have contributed greatly to our knowledge of the status with regard to Distance Education and various models being attempted by governments and private agencies. The authors propose that the need for basic literacy is acute and any delay in achieving this goal universally should be considered as a huge loss and a waste of enormous human talent and abilities by governments and private organizations. Use of computers is the future and how well and fast a society begins to use them for most of their business would determine how successful its people would be in the coming decades. We ask a simple question: Why not should we figure out how to use the tremendous capacity of computers for educating the masses especially in areas where progress has been extremely slow through traditional methods?

Viable Computer Technology Models

Many small scale experiments in India and elsewhere initiated by governments, NGOs, and businesses provide exciting and promising models that can be adapted over wide geographical areas. In this section a brief description of several projects is provided. The intent for providing these examples is to show that creative uses of computers have already been implemented that have

¹ Notable exceptions are highly successful Distance Education programs such as India's National Open Schooling program, UNED program in Spain for S. American and Central American countries, and programs in S. Africa.

overcome the most nagging problems of inadequate infra-structure in rural areas. Additional information can be obtained directly from the sources cited at the end.

E-Choupal¹

A leading private company (ITC) in India has implemented an innovative approach for empowering village farmers using computer technology and internet. Given that most farmers are in small villages that are not well connected through roads, ITC developed an ambitious plan to connect the villages (and farmers) by setting up a computer in a centrally located village (serving approximately 600 farmers in about a five kilometer radius). The company provides training to a person (called *sanchalak*) from the village in the basic use of computer and necessary software such as word processing, web browsing, email, and on-line ordering. The *sanchalak*, in turn, makes the computer available to local farmers each day for finding information using the internet on a variety of topics. Generally, these include looking at commodity rates in various markets, weather information, news, and best farming practices, and Question and Answer sessions. During harvest, ITC also provides opportunity for farmers to sell their crops at the company sanctioned locations, within a reasonable distance, at the previous days closing rates. A significant advantage of this strategy is that the farmers end with a much higher price for their crops by avoiding a middle person who used to take most of the profits by exploiting the limited resources of a common small farmer in India. In addition, farmers can order on-line their supplies e.g. seeds, and fertilizers, as well as many other products needed for farming. This way, they are assured a higher quality of products at reasonable prices – another drawback that farmer usually suffered from in the past. A small commission is provided by the company to *sanchalak* on each transaction from the computer. (Annamalai et.al. 2003)

The reason we mention this project is that here is a model that has overcome many of the infrastructure obstacles on large scale in Indian villages that have an endemic problem of electric shortages and poor telephone services. E-Choupals have been a viable method of connecting people from villages (most of them illiterate) to internet. ITC has also announced that the computer in off-peak hours can be used for education, and health related information services. Hardware and connectivity problems have been resolved by using Battery Packs, and Solar battery chargers, dial-up service or lately a VSAT connection for accessing the internet. The initial set up is expensive (appx. \$6000). On a recurring basis, the cost is appx. \$100 per month.

The Tata Group²

The Tata Group is a large industrial group in India. To address the problem of illiteracy in rural areas, this group has set up 415 centers educating nearly 9000 people. The lessons, based on the National Literacy Mission materials, are delivered on a stand- alone computer using animated graphics and voiceover. The focus of each lesson is on developing functional literacy that can be developed in 40 hours, according to the project developers. Functional literacy is described as being able to read road signs, and simple instructions used in various tasks on a daily basis. As a result of the project, women who were unable to go to schools previously are now able to read and see the benefits of education for themselves and their children.

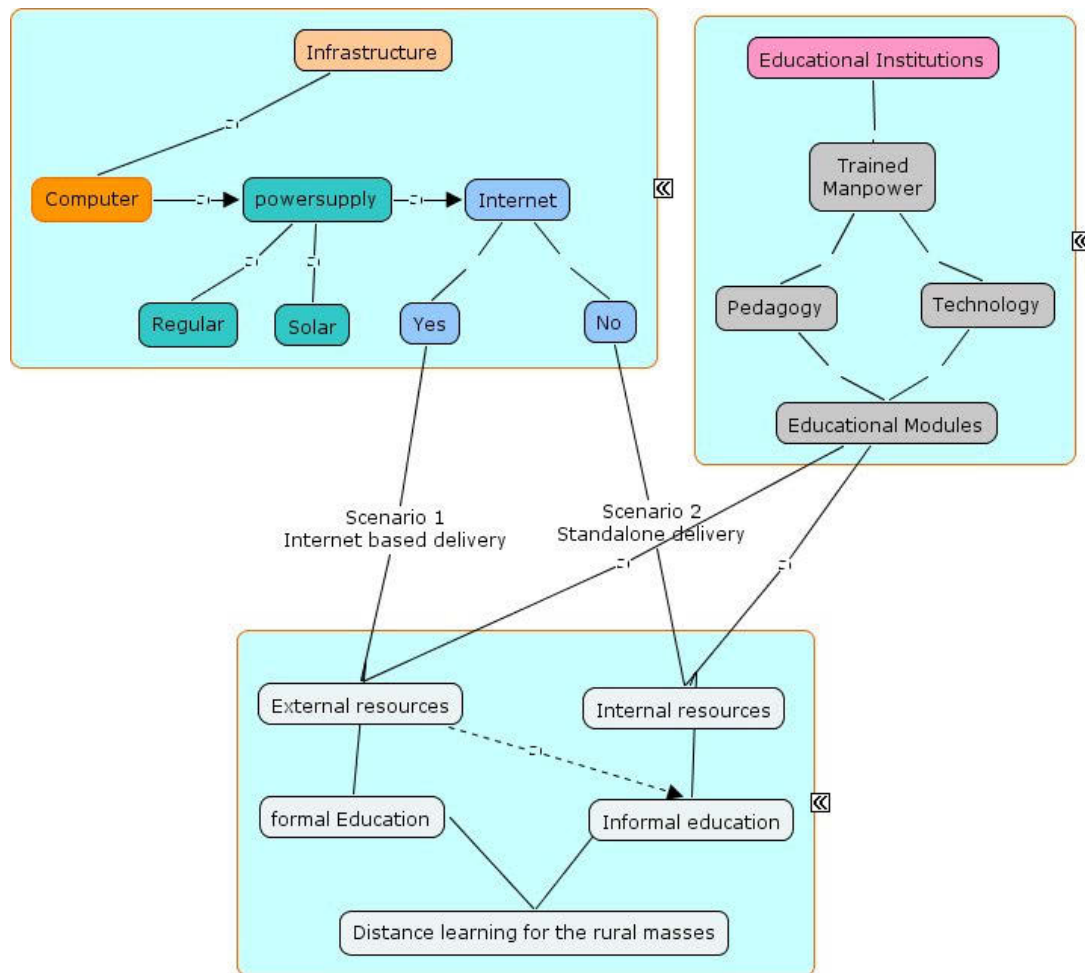
Our reason for highlighting this project is to demonstrate that literacy projects can be launched at specialized centers that are located within a few miles of villagers. Instructional materials can be loaded on the stand-alone computers that can be made available to villagers using flexible hours. The requirements for hardware are minimal beyond the initial setup.

Similar projects have also been set up in Malaysia using an “ICT hub” with up-to-date multimedia equipment. These hubs provide an integrated curriculum for students in the area going beyond what the schools can provide.³

Developing a Computer-Based Program for Literacy

As mentioned earlier, a cost-effective program can be started that provides flexibility for learners and cut the recurring costs to minimum by using computers in innovative ways. In order to develop such a program, considerations of infra-structure for delivery of instruction, and on-going operation are necessary. The development of high quality instructional materials is another major consideration, although there is a great deal of experience and expertise at national and local levels for producing high quality educational materials.

Implementing a technology based solution in the developing countries; especially in the rural areas, depends on paying close attention to infra-structure necessary for a viable instructional program. In this section, we are exploring two types of scenarios, one with the infrastructure that can support internet access (internet based), and the other without such capability (standalone). The flowchart 1 includes these conditions and a schematic of various factors requiring discussion for developing innovative solutions unique for each country.



Flow chart 1.0

Scenario One – Infra-structure Supporting Internet Connection

A computer with internet connection can help the rural youth to connect to the available distance learning courses from different schools and colleges in far away places. Students who are not likely to attend a school due to geographical location or other reasons would be able to acquire not only literacy skills in this manner but can also advance to higher levels of educational ladder.

Internet connection

Access to internet would enhance and expand the curriculum by using a wide array of teaching and learning materials and situations. Internet connection can be set up as a dial up connection or through satellite connection – the latter being more expensive – but extremely efficient.

Phone connection

Phone connection is needed only in places with dial up internet connection.

Reliable power supply

Uninterrupted power supply is essential for successful operation of this nature. Since developing countries generally have power shortages on a recurrent basis, this becomes an important limiting factor that must be overcome. Some options available include: Battery packs and battery chargers. The assumption is that while the power is on, battery chargers can charge the battery packs for later use. In the E-Choupal project, solar energy chargers have been used with limited success. A one full day of sunlight with one battery pack is sufficient to run computer for 60 – 90 minutes in the evenings.

Computers are becoming cheaper each year and it is likely that many middle class families in the developing countries, such as India, can afford to buy their own computers and access the instructional materials for their own use. The cost for implementing solar powered solutions is a concern that needs to be addressed in each country with engineers and other experts.

Scenario Two – Infra-structure Without Supporting Internet Connection (Standalone)

Rural areas without adequate infra-structure to access to internet would use a standalone computer strategy. The users (or a center in a village) can be supplied computers that are already loaded with necessary educational modules or supplied with necessary CDs (and updates) for the use by individual users.

This scenario needs a source of reliable power supply & the educational modules (with permission to save the resources locally). Saving resources locally will help the students to access it without any internet connection. Since there is no need for internet access, phone connectivity is not required. Power sources in such places are more likely to be dependent on battery packs and solar energy to a large extent each day.

A crucial element for this scenario will be the availability of high quality instructional materials (modules) that are context specific and suited for the populations to be served.

Educational reach in the rural areas can be expanded using these technologies. Untrained youth in the rural areas can be trained to use computers for different purposes. A computer with a trainer can act as a teaching station to educate more rural children. Moreover rural youth can access these technologies for their education and business purposes. Recently, Cyber Cafés have become a reality in almost all corners of the world. In the absence of other centers, the cyber cafes can be used as an educational hub.

Conclusion

The success of an initiative depends largely on the commitment exhibited by those responsible for its implementation. Technical constraints, although large in scope, are surmountable if there is a priority established for using computers on wide scale in a given country. While we fully believe that formal schooling is necessary when and where it can be established, there is an unprecedented opportunity

available now to implement strategies that can potentially cover a much larger geographical area in efficient manner. There are still nearly one billion illiterate people in the world (majority of them in few countries) whose participation in national development is highly limited. The challenge is great and innovative strategies need to be adopted to reach such large number of people in the shortest possible time. The existing successful Open School movements are primarily based on print, and audio and video materials. But the coverage of these programs is still limited compared to the size of the population in need of services. Computer technology, once adopted as a strategy for educating the masses, has the potential to be a less expensive solution than all others while the shortage of schools and trained teachers continue to plague the educational services in many countries of the world.

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End-notes

- ¹ For a detailed description of E-Choupal and its various aspects see <http://echoupal.com>
- ² See www.tataliteracy.com/how_it_works.htm# for a full description of the project.
- ³ See www2.coca-cola.com/citizenship/education_malaysia_elearning.html for additional details.