Competency 2: Promote and Model Digital Citizenship and Responsibility

A 'Hole in the Wall' Approach to Minimally Invasive Education for Mass Computer Literacy

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Introduction

This reflection-essay is the culmination of a thought process, the seeds of which were planted in 2007, when I was fresh from India starting my M.Ed. program. It started with conversations in a technology implementation class and evolved through the years as my understanding of the use of technology in the educational environment grew. Using the 'Hole-in-the-Wall' experiment carried out in India as the backdrop, the essay brings out how crucial it is to understand social issues of equity, access and inclusiveness and tailor the implementing of any instructional technology program to meet these needs, even if that means breaking some conventions.

The Hole-in-the-Wall Experiments:

The Hole-in-the-Wall studies that went on to suggest an alternative model for technology implementation and mass computer literacy were conducted in the context of growing structural exclusion of large masses of the Indian population from education and opportunities for betterment of their human condition.

Theoretical Basis:

Hole-in-the-Wall is a set of experiments on Minimally Invasive Education (MIE) conducted in various parts of India between 1999-2004 by a team led by Dr. Sugata Mitra of the National Institute of Information Technology (NIIT), focusing on IT education and training. The 'minimally invasive' approach to learning (a term borrowed from surgery) is based on previous work by Dr. Mitra on unsupervised learning as a methodology for teaching computer languages and for computer literacy programs. The experiment draws its theoretical basis from the Piagetian view of children as builders of their own knowledge, principles of Constructivism, Collaborative Learning and theory of Play and Experimentation (Mitra & Rana, 2001).

Objectives and Configuration

The experiments on the Hole-in-the-Wall involved placing a computer connected to the internet in a kiosk with the screen facing out and a touch pad / mouse mounted next to it. These kiosks were placed in under-privileged areas (like urban slums) and remote rural villages and towns where computer and internet access is between minimal to non-existent. The purpose of the experiments was to see if children living in poverty, lacking a supportive learning environment at home or at school, with no previous knowledge of computers or of the English language, could self-instruct themselves without adult intervention on how to use the computer and gain basic computer literacy skills. The experiment was repeated in various parts of the country, sampling different cross-sections of rural and regional society. An average of 200 children were observed to be using the kiosks regularly in different places. The activity from the kiosks was recorded on a camera and also monitored through computer logs and recording of screen activity.

Analysis of the data showed that through exploration, trial and error, vicarious and experiential learning in groups, trial and error, exploration and problem-solving, the kiosk-learning children were performing all the functions that are expected of a computer literate person within a

month and subsequently progressed to more complex authentic tasks like using Excel to create a database for the school, creating a personal website. The language did not seem to pose a barrier and they developed their own computer vocabulary and in many cases taught themselves English from a website or CD. They also actively sought out resources on the computer as well as from the local environment to help them (Mitra, 2000; Mitra & Rana, 2001). Standardized computer tests administered to the kiosk children revealed that they were performing at par with or better than the formally schooled children, meeting the same objectives at a considerably lower cost (Inamdar, 2004; Mitra et al., 2005)

Responses

The Hole-in-the-Wall experiment and proposed pedagogy has been criticized as being a pedagogy for the poorer and underprivileged sections of society and that the knowledge these children gain is of low-level use and not higher order thinking that is desired when learning with technology. The entire approach of the hole-in-the-wall has been accused of being hegemonic in nature, perpetuating upper class (corporate) values and structures and imposing them on the poor, convincing them to play by their rules without questioning the motives or the domination. The educational goals have been criticized for being driven by an economic agenda rather than being emancipatory and lastly, the suggestion that the teacher serves no significant role in the MIE learning process is objected to (Amina Charania, unpublished paper, Iowa State University)

The above critique raises some very valid points but I couldn't help feeling a sense of disconnect that the debate was constructed more from a western theoretical standpoint rather than being generated from within the context and premises that shaped the experiment. Taking the main points of criticism one by one, let us re-examine them from the ground realities that shaped the experiment. Is Minimally Invasive Education a pedagogy for the poor? Of course it is and it never purported to be otherwise. But in so doing, the experiments have demonstrated what we already know – that there is no need to spend millions in resources to teach young people how to use computers or computer programs. In India today, computer education centers make a lot of money teaching how to use different computer applications from simple word processing to 3D modeling and graphics at a high cost (I myself enrolled in one such program wasting 12,000 rupees on it). On the other end of the spectrum are free courses run by the Government such as a computer hardware and servicing course that our gardener's son was enrolled, in which he had not seen the inside of a computer even once – because there wasn't any! The course had been entirely theoretical based on circuit diagrams in a text book, a classic example of nominal and notional education. Clearly, the government is unable to meet the challenges of providing adequate infrastructure and training to make IT accessible to the billions. Meanwhile millions of young kids fall out of school in what is a tragic loss of human potential. The hole-in-the-wall model of implementing technology education is designed for just this target population where an average of 200 children can attain a good level of computer knowledge at as little as a rupee a day. It is a quick solution for an urgent need.

Are the educational goals of MIE driven by an economic agenda? Should it not be emancipatory instead, and teach to use technology in liberating ways for empowerment? Maybe, but these are lofty ideals and as Vivekananda said "Religion is not for empty bellies". Effective change can come if led from within the system and not from the margins, where the unprivileged

are today. They first need to be equipped with the wherewithal to break out of the cycle of poverty and deprivation. The technical skills they gain from the hole-in-the-wall centers gives them an opportunity to participate in India's outsourced job market and the world it opens up for them shows them the possibilities beyond their village and slums. That in itself is liberating.

India's struggle with equity in education

India is a developing nation that finds itself in a situation where economic progress via the information technology revolution has bypassed the vast majority of the "backward", rural and non-elite, reaping benefits for a small number of the educated middle class. India has historically been a very stratified society where hierarchical order has determined the distribution of resources including education. Since independence in 1947, the federal as well as state governments have undertaken several initiatives to overcome this divide, but each measure seemed to create another new gap without resolving the original one. For example, the introduction of a common system of progressive public education created a parallel system of private schools which became synonymous with urban, expensive, high quality education with English as the medium of instruction while the public schools became relegated to serving the rural, underprivileged and urban poor becoming synonymous with nominal and notional education with a vernacular medium of instruction and high drop-out rates as children join the agricultural and menial workforce to supplement family income (Chakravarty, 2001; Gulati, 2008).

Renewed efforts to bring the marginalized into the mainstream using information technology as the tool promised internet connectivity for all by 2009, spurred government investments in broadband infrastructure, technical institutes and development of online degree courses and modules. Although this did lead to some upward mobility, the resource allocation challenge posed by bringing infrastructure to the remotest parts again kept it beyond the reach of those who needed it most, leaving the net status quo unchanged (Gulati, 2008) . Today, the promise of internet connectivity for all in India is still unrealized with only 15.1 out of every 100 persons having access to the worldwide network. Digital divide and computer illiteracy is thus another one in the mix of inequities present in the Indian education system.
(http://data.worldbank.org/indicator/IT.NET.USER.P2/countries?display=default).

Introducing technology in any educational environment is basically a change project and should be formulated within the context of application with sensitivity to socio-economic factors, infrastructural challenges, resource availability, prevailing practices, perceived needs and barriers to use. Without this, even the most well-meaning technological innovations will be rejected, underused or produce unintended consequences to the contrary (Rogers, 2003). Lewins has rightly said that in developing countries, the losers in a technology implementation are often those who need it the most (rural children and less qualified teachers in isolated, underfunded schools) because they are least prepared for the change (as cited in Gulati, 2008, p.3). Thus, the educational goals of technology use in a developing country would be different from those of developed ones, aiming more towards providing rudimentary education to large numbers. Any design of technology programs should be developed for a responsible use of precious resources to address these needs.

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