
The Digital StudyHall: An E-Learning System for Improving Basic Education in Third World Countries by Randy Wang, Microsoft Research India

Date: April 27, 2006 (Thursday)
Time: 6:15 pm (refreshment starts at 6:00pm)
Place: 202 ECEC, NJIT

About the Speaker

Randy Wang is joining Microsoft Research India, where he plans to devote full time to continue work on the Digital StudyHall project. Randy started this project when he was an assistant professor in computer science at Princeton University; before he and Princeton mutually decided they had had enough of each other.

About the Talk

Good primary education is one of the most crucial factors in combating extreme poverty. In this project, computer scientists and education experts collaborate to build a distance learning system that seeks to offer resource-starved schools in villages and urban slums of India human and content resources comparable to that received by middle-class students in cities. To avoid retracing the missteps of earlier "wire-the-schools" projects, we follow two important principles: (1) cost realism, essential if we are to scale the system up to a significant number of schools and students; and (2) building systems that solve end-to-end education problems, beyond just providing connectivity, so the twin pillars of technology and pedagogy must develop side by side.

Our Digital StudyHall system is based on a unique approach leveraging the postal system, DVDs, robotically operated DVD publishers, long-distance ham radio transceivers, and short-range TV transmitters with radio controllers. We combine these components into a general-purpose and transparent communication system, providing pervasive, high-bandwidth, and low-cost connectivity. On top of this, we layer a web repository, called the "learning eBay" to enable a wide variety of digital education "workflows," such as lecture capture and replay, remote monitoring, student project collection and feedback, connecting learners and teaching staff across time and space, including volunteers from overseas. The system consists of a network of hubs and spokes, where the "hubs" are typically distributed in urban centers of excellence, which "radiate" contextually meaningful and coherent content and methodology into village and slum schools in their vicinity, which form the "spokes." An important goal of the system is to enable customized any-to-any communication and effective group learning, which may provide an ultimate solution to the scalability problem of the education system.

The pedagogy practiced in the system is based on the theory of "Tutored Video Instruction," where remote expertise is projected into a classroom, mediated by a local less well trained teacher. This approach goes way beyond passive TV watching; it requires the local teachers to perform a variety of activities to proactively engage their students while alternately playing and pausing the pre-recorded videos. In a sense, the video and the local teacher form a "team:" the video provides a framework, an agenda, and a content and methodology model; while the local teacher supplies the crucial interactive components. In addition to helping the students, the process provides excellent training to the less skilled local teachers. Unlike conventional training workshops that last only for a short period of time and can be too abstract, the kind of training a local teacher receives from the supplied videos is ongoing, continuous, and highly specific.

A live deployment of a prototype has been in use by students starting in July of 2005. In the space of about five months, a database in the Lucknow headquarters has accumulated about 60GB of content. This includes more than 150 high-quality MPEG4 recordings of lessons staged by the best teachers at the headquarters school in front of an audience of girls from neighboring slums and based on the U.P. state board textbooks. The remainder includes Hindi science courseware, digital stories, and recordings of drama performances, all of which are produced by students and staff at the headquarters school. As the high-quality content is quickly and cheaply generated, it is being continuously pushed out to two test village schools and an "in-house" slum school. At the time of this writing, we are beginning to set up a second hub in Calcutta and a third in Pune. Preliminary results appear promising, and the system seems to be playing an effective but subtle role of blurring class differences in a highly stratified society. We hope to eventually scale up the system to cover a far greater number of villages and children, contributing toward the Millennium Development Goal of universal primary education.

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For more information contact Nirwan Ansari (973) 596-3670 or check <http://web.njit.edu/~ieeenj/comm.html> for latest updates. Directions to NJIT can be found at: <http://www.njit.edu/University/Directions.html>.