Pencil or Computer: Appropriate Technology in International Development

A Perspective Article By Harold Bergsma

"Somehow the idea of computer literacy programs for overseas aid programs takes on a very different perspective amidst poverty and extremely high illiteracy rates."

The car stopped at the side of the road, in a spot that had a view of the entire misty valley of Ibb, Yemen, below. A group of children came up to us with smiling faces and hands outstretched saying in Arabic 'Alam roo-sahs' (Pencils! Pencils!). To my surprise my colleague, Everett Edington, pulled out a dozen No. 2 pencils from his inner coat pocket and handed these to the delighted children.

The pencil, a tool in the hands of an informed user, becomes an instrument which has profound power for computation, recording, inscribing creative thoughts, even for noting ideas for speeches on the backs of envelopes and scribbling the words of a constitution. The simplicity of the pencil requires simple instructions for the user: sharpen, hold, move the point across the paper. The pencil transforms human thought, creates a record of such intellectual activity by the 'pencil-literate user'. The grafitti of all the ages of pencil users leaps out from walls of cisterns in Baluchistan, on stone slabs of the Cheops pyramid in Egypt, and petroglyphs in the Gila National Monument of New Mexico. With pencil in hand, entire bedroom walls have become inspired murals recording a child's intellectual fantasy of the moment.

Every time I work with word processors I remember from childhood the slates carried by Indian children going to school in Taxila. Their 'pencil' was a piece of white clay which left its mark on the dark grey slate surface - which at the writer's wish dissolved with a spit dampened palm stroke or a wet rag rather than the press of the menu key.

American scholars[1], examining ways in which computers could be used in the U.S. educational system, have found limits to their application. The point made is that in a wealthy country such as the U.S., to have the schools of the future computerized will be exceedingly costly in terms of capital, care, skills training, time, programming, revision and updating.

These limits in a developed country all speak to caution when trainers attempt to bring computer assisted instruction (CAI) technology to developing countries. Technology transfer with respect to CAI should be considered cautiously by development consultants. But the opposite may, in fact, be happening. Consultants like to impress and be impressive in their personal approach to providing assistance. To provide access to 'state of the art' technology is a

the appropriate state of the art might be an approach that is human resource, not technology, intensive.

What about the lonely pencil lying next my computer and in the pockets of meni children in Ibb? Somehow the a of computer eracy programs as rt of overseas aid programs takes on a very different perspective amidst poverty and extremely high illiteracy rates.

In Pakistan the functional literacy for females is less than fifteen percent. s and other information about world illiteracy provides a stark referent for those who consult overseas. Certainly the personal computers most consultants bring to overseas offices to help them with their own work become visual and cultural referents to people of other nations. In fact, the consultant who sits for hours and days typing on the personal computer keyboard, performs an almost 'mystical ritual' to those observing, and certainly the ritual allows for little interference. The computer revolution of the western world contrasts sharply with international literacy campaigns, and the concerns for the declining literacy levels among adults in this country.

The beneficial use of computers in international development has been well documented in almost every area ranging from establishing simulated models in water management to development of statistical tables for Women in Development projects. But the use of computers in educational development and in human resources development training programs remains an area of real concern. The training requirements involved in introducing computers for teaching purposes at the secondary and university levels would be massive. U.S. studies show that the real cost to set up even one PC ranges from $12,000-15,000. Costs and logistics for implementation would, in most cases, preclude consideration of beginning a 'computer revolution' in international development education.

An approach to integrate specialized training utilized in Pakistan and a number of other developing countries is to establish centers for excellence which are showcase, state of the art programs. This approach has merit as it centralizes specific programs, such as training for computer use in one facility, provides for a few to become specialists and future change agents, and allows for functional utilization of hardware and software in the most cost-effective manner. Such centers for excellence speak to a need for a minimal yet functional integration of technologies. It is understood, however, that any sort of technological revolution is not implied—such as the oft-discussed computer revolution in schools in this country.

business world computerizes, expanding populations in third world countries put additional pressure on educational institutions to provide even the most basic literacy to the young. While the young of some developed nations are bombarded with special computer literacy programs in schools, the young of the rest of the world remain in need of basic literacy, in need of a teacher and a pencil.

Recently I sat in a secondary school classroom in Nigeria watching and listening to the teacher lecture. Half of the class did not have a pencil, most had no books. They only had the teacher's voice and chalk marks on a black cement wall. These were the available means of intellectual assistance, the means of learning. Textbooks and printed materials are a luxury in much of the developing world!

In overseas development programs related to training and education, care must be taken to focus on the basic needs of developing societies. Various approaches are possible to provide this basic stuff—including improved teaching methods for teachers. In some cases, computers may be an appropriate means to enhance the provision of basics—a major goal of the U.S. in this decade. But as Harry Gray warns, "a cruel trick has been played on American education. What were once basic skills sufficient to thrive in a buoyant national economy are woefully inadequate to meet the needs of an international marketplace."[2]

The use of computers in the private sector of many developing countries is growing rapidly, particularly in business and industry, which must compete globally and utilize advanced communication systems. International and multi-national business corporations are at this time leaping forward to create a communication's revolutions. This competition is a real challenge, and has led to the creation of consortiums such as the Microelectronics and Computer Technology Corporation (MCTC) to enhance the American competitive edge internationally. At the same time the modern

The 'cruel trick' spoken of by Gray may have a different meaning in developing nations abroad. The cruelest trick of all may, in fact, be to forget basic educational needs abroad in non-thriving economies in favor of introducing highly sophisticated CAI including interactive computer video teaching. As American educators abroad we cannot afford to play tricks with fads. The international educational gap may best be bridged through improved teacher training, improved textbooks, improved schools, and an improved curriculum related to literacy—and basic education for many as had been successfully done in India and South America through Radio Distance Education. The gap may also be bridged with careful application of sophisticated high technology at specialized centers for excellence and at the university research level through materials and by instructors who have been trained in their use.

The pencil and the computer are means, relative means, to be applied to basic development program ends abroad. Both have power to create programs for change. But basic literacy may need to precede computer literacy in the hierarchy of development priorities.

[1]Harry J. Gray, "Science, Society, and the International Education Gap, "*National Forum:* Summer 1986, 20.

[2]See Carnegie Foundation, The Fourth Revolution: Instructional Technology in Higher Education, New York: McGraw-Hill, 1972; Carnegie Quarterly, Vol. XXX, Nos. 3 and 4, Summer/Fall, 1985, pp. 4-6; Linda H. Fleit, "Overselling Technology: Suppose You Gave a Computer Revolution and Nobody Came?," The Chronicle of Higher Education, Vol XXXIII, No. 2, April 22, 1987.

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