Literacy Issues in Developing Countries:
Why Access Matters So Very, Very Much

Susan Crichton

Faculty of Education - University of Calgary

Associate Professor

602L Education Tower

2500 University Drive NW

Calgary, Alberta, Canada T2N 1N4

(403) 220-7522

(403) 282-3005

Brown Onguko

PhD Student

Faculty of Education - University of Calgary

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Curtis Bonk (2008) writes "In the twenty-first, education trumps economy as the key card to participation in the world" (p. 8). However, like many academics / educators in the developed world, Bonk and others promote the advantages of the Internet which favours those with broadband, 24/7 ubiquitous access to the web and other important digital resources and materials to support education.

Our work in rural, and not so rural, settings in Asia and Africa suggests a very different context – one where classroom walls are bare, windows are often open to the air, electricity is intermittent, and books and resources are limited or stored safely away or do not exist. Correspondingly, literacy levels in these settings are low and school completion rates do not even begin to reach the Education for All (EFA) targets entrenched in the United Nations Millennium goals (United Nations Development Programme, n.d.). Typically, teachers in these settings lecture or read from a text, using the blackboard as the only visual support for lessons.

<<insert picture – classroom.jpeg>>

The case we present in this paper is that access to resources and support materials matters very much in areas where low literacy is a concern. Access helps to stimulate learners, bridge gaps in literacy levels, and support teacher / trainer professional development, recognizing the importance of skilled individuals to provide quality teaching, training and learning in basic education, healthcare, and general awareness impacting the quality of one's life.

Sachs (2005, p. 19), the well-respected economist, notes while half the world has a foothold on the development ladder, one sixth of humanity is not even remotely close. And, not because they don't want to be, truly

> They are ready to act, both individually and collectively. They are already hard working, prepared to struggle to stay afloat and to get ahead. They have a very realistic idea about their conditions and how to improve them, not a mystical acceptance of their fate. They are also ready to govern themselves responsibly, ensuring that any help that

they receive is used for the benefits of the group rather than pocketed by powerful individuals. But they are too poor to solve their problems on their own " (p. 242).

Most of us working in the development community already know the 21st century is being defined by those with human and knowledge capital, recognizing both contribute to health, nutrition, skill acquisition, and economic mobility; and it is up to us with access and resources to provide opportunities "grounded in human rationality, to fuel the continued prospects for improving the human condition" (p. 352).

Background

"Nearly a billion people entered the 21st century unable to read a book or sign their names" (Shah, 2010), and at a time when the rest of us recognize we are shifting rapidly to a knowledge economy. Further, 1.6 billion people — a quarter of humanity — live without electricity, and by the end of 2007, fewer than 1 in 5 people living in the developing world were online. In countries such as Myanmar, Bangladesh, Cambodia, and Nepal the number is closer to 1 in 10, compared to over 6 in 10 in the developed world. Consequently, more than 5.2 billion people cannot use the Internet – the tool touted as the panacea for contemporary learning / training and the way to access many current resources.

When the General Assembly of the United Nations drafted the Universal Declaration of Human Rights, access to free, basic education was determined to be a fundamental right, at least in the elementary and fundamental stages. The declaration further stated education, whether for children or adults or healthcare or training or ongoing professional development, was central to achieving the Millennial Development Goals and underpinning of civil society and democracy.

So, imagine our surprise to find almost no books or resources, limited or non-existent libraries, few maps or pictures on the walls in our work in schools in Western China (from 2002 – 2006), Bhutan (2009), and East Africa (2008 – present), and little or no additional funding to support the important EFA initiatives and goals that are ever present in the media and politicians' speeches. These schools are on the front lines of the Education for All / Basic

Education movement, yet teachers in these settings are inadequately equipped to do the jobs they are called upon to complete. These teachers have little training and virtually no instructional supports, and one can only imagine how they struggle to meet the needs of a diverse range of learners in their overcrowded classrooms. It is little wonder that the chalkboard is used to dispense drill and practice lessons, supported by teacher lectures to children as young as 3 - 5 years of age. Further, schools in these regions often double as community centres for health education, agricultural training, and general meeting places, so they offer what they can, but it is often sparse, out of date, or not available. So, we might ask, how can literacy flourish when the environment required to nurture it languishes? While the digital divide is a term commonly used, the resource divide is barely acknowledged. And yes, there are initiatives such as Room to Read (2009), which are building one library at a time, but the gap between those with resources and those without continues to widen. As the Room to Read website states "World change starts with educated children." Sachs (2007) notes

> The trick I believe, is to train very large numbers of people at the village level in creative and targeted ways, specifically for the main tasks at hand. For example, every village should aim to have a group of village experts, who, like the barefoot doctors of China, have enough formal training to address basic technical needs at the village level (p. 257)

One way to support that "trick" is what Schumacher (1973) called "technology with a human face" (p. 21), and what we call Colorboard, which we will describe in the next section of this paper.

One Approach - Colorboard

It was the summer of 2004 and Susan[1] was working on a basic education project for western China, funded by the Canadian International Development Agency. Content for teacher professional development was delivered using a satellite download system and stored on a computer. Teachers were expected to share the one computer and study from the materials. In the evenings, many of the schools opened their doors and allowed villagers to use

[1] Susan Crichton – please see the author's website for background on her international experiences – www.ucalgary.ca/~crichtos

the satellite system to download content on agriculture, health or general interest. Community workers could also download materials to support adult literacy programs.

An interpreter and Susan arrived in one school to see how the system was working and what folks thought of the content. Even without translation, it was obvious local government people and school administrators were frustrated and had something to say. Basically, they could not understand why they had to download content to the computer, wrestle with file management, incur significant electricity costs, and risk file corruption when data transfer was affected by lightening strikes and power interruptions. Why, they asked, couldn't the project just supply content on a DVD player that they could power with rechargeable batteries?

<<insert picture – satellite system.jpeg>>

Why indeed – and hence the seeds of thinking behind the Colorboard system. Since 2004 Susan has wrestled with an offline, HTML reader that would support multiple literacy levels through the use of contextually specific, locally developed, multimedia content. Colorboard is an innovative yet cost effective concept to bridge the digital divide, address the UN Millennium development goals, and develop processes for creating access and opportunity to learning and training. Colorboard is a sustainable approach to content development, distribution and use. Working with regional partners, experts collaboratively develop context specific materials using open source web authoring and multimedia software. Colorboard provides access to accurate content and creates a system to build and distribute more.

Colorboard provides both a product (a hardware solution) and a process (an effective, educationally sound, collaborative content development approach). The Colorboard approach is grounded in the principles of sustainability, renewable resources (both human and physical), and simplicity (elegance of design).

There are four components in the Colorboard approach: content development, appropriate hardware solutions, access to a content repository, and training to support both the Colorboard system and the development of local, accurate content. Colorboard, the hardware component, is a small, rugged tablet with a color touch screen interface, bi-directional infrared

line of sight communications, and sound peripherals to support multimedia content. It is powered by an internal battery designed to accept a wide range of voltages so it can be charged by conventional or alternative power sources such as solar options.

XO, the $100 laptop, opened the door for inexpensive, small devices, but Colorboard is quite different from the XO unit (http://laptop.org/en/). It is a simple, yet elegant way to support a collection of educational resources and to support the development of local expertise, and functions as a reader for digital content and resources that allows for PDF markup and text creation. It runs on Open Source software and uses Open Source applications.

Colorboard provides access to web resources without using the Internet. This is significant because approximately 5.2 billion people in the world today do not have Internet or electricity. Web authored resources allow users to move through linked content by clicking on highlighted text which is hyperlinked to related content within a resource. It also allows users to listen with audio content, view videos and animations, read text, and study pictures – all without complicated software.

Content can be collected from a range of sources (e.g. learning objects, existing curriculum, training modules, Internet sites, government materials, etc.) and activities (e.g. worksheets, model construction, hands-on training, workshops, etc.) can be delivered to help the user understand the material. Users of this content might be learners engaged in training (e.g. construction of small hydro systems, health care issues), formal course work (e.g. high school completion, college preparation), or general interest lifelong learning pursuits (e.g. literacy support, nutrition, agriculture, woodworking, crochet, etc.).

The learning environment afforded by Colorboard is flexible and open ended. Learners and facilitators working with Colorboard function as co-constructors of the learning experience. Learners, in consultation with the facilitator, can choose from a range of course offerings or multimedia resources that meet their goals and similarly explore content for self-study or personal knowledge building and awareness. The facilitator matches the learner's goals with the specific needs by providing relevant and timely activities. In actual practice, this interaction might involve a potential learner in a community or refugee camp coming to a center, such as a

community hall, library, public meeting place, in which there are Colorboard units, looking at a list of available courses, talking with the facilitator about the potential offerings and programs.

Initial Findings

In May 2010 Brown[2] conducted the first field trials of the Colorboard system with educators in Kenya. Brown asked participants to try the various software applications installed on the device and to explore the content provided (a course on School-based Teacher Training – Assessment Strategies; a PDF journal and book from the Commonwealth of Learning, and a short movie). He also led participants through a usability test of the device.

<<insert picture – usability testing.jpeg>>

The final initial findings are positive. The content was inviting and welcomed. Participants recognized that this device was the Internet for those without the connectivity – their World Wide Web was just small – the content contained on the SD card or USB drive. The Open Source applications were powerful and deemed useful by the participants. In particular, they felt the audio and video players would support multiple learners and provide a short of visual / auditory access to content for those with limited or low literacy levels. Participants struggled a bit with the stylus required to manipulate the device's interface, but once they became comfortable and started using it like a pencil / pointing device, they were fine.

We are heartening by the findings of our first field trial and see promise for the Colorboard system and its accompanying solar power option. Our field trial participants recognized the power of this approach for rural, remote learners, trainers, and teachers. They saw immediately the potential of multimedia to support low literacy learners, and they understood how this approach could put an entire library of resources, professional development, and support materials at peoples' fingertips. The price point for an approach like this allows individuals to own their own Colorboard device as it also provides a source for domestic solar lighting.

<<insert picture – CB solar charging.jpeg>>

[2] Brown Onguko, author, is a PhD student, whose research explores mLearning. He is an instructor at Aga Khan University – Institute of Educational Development, East Africa, Dar es Salaam, Tanzania.

<<insert picture – solar option.jpeg>>

Final Thoughts

As *Kofi Annan, the former United Nations Secretary-General, said* "Literacy unlocks the door to learning throughout life, is essential to the development and health, and opens the way for democratic participation and active citizenship." Systems such as Colorboard help to unlock the door as well as providing access to resources and materials and professional development and learning. Tablet devices are rapidly becoming popular options – a shift from the desktop / laptop / netbook units. Examples of tablets include the iPAD, iTOUCH, eReaders, and some multi-function smart phones. However, many of these are either quite expensive, limited to user content development, and/or tied to high speed Internet access.

We see Colorboard as an example of Schumacher's technology with a human face (1973), and as a system with significant potential for local relevance, sustainability in content design and development, and access to learning opportunities. Further, we cannot see how the issue of literacy in rural remote settings can ever be addressed without bridging the resource divide and providing individuals with access to books, media, resources, and quality teaching and learning experiences.

Interestingly, we have really only touched on the issue of traditional literacy. What of the demands of literacy for the 21st century? Schrum and Levin (2009) remind us that literacy is no longer just reading, writing, and arithmetic. "The new literacies, which are necessary for everyone to learn in order to survive and thrive in the 21st century, include information literacy, media literacy, and information, communications, and technology literacy" (p. 4) as well as visual literacy, multimedia literacy, and cultural literacy. Many scholars note global economic competition requires the sharing of information and being able to participate fully in the exchange of constant communication with others around the world. Simple solutions like the Colorboard system attempt to address the new literacies by providing access and opportunity in a small, handheld device and the option to work with Open Source applications.

We take strength in the words of Pilloton (2009) who states "When you are designing for social good ... you've changed the bargain between producer and consumer; you've added

elements of social currency" (p. 7). We believe that by enhancing social currency we improve both the social and human capital required to participate fully in the 21st century, and inherent in that is enhanced literacy and access to the world of learning and training.

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