

Chapter 11

Using Alternative Technologies for Teacher Training in Developing Countries

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ABSTRACT

In this chapter the author discusses how developing countries are using technology in education when Internet connectivity or electricity is not dependable. Developing countries are embracing educational technologies because they are the fastest, cheapest, and most consistent way to train large numbers of teachers and support education reform. Emerging nations are also enjoying funding opportunities that include public/private partnerships, which contribute to the needed infrastructure, providing significant amounts of computers and networking hardware and software from the likes of Microsoft, Cisco, Dell, and Oracle. Many outstanding ICT case studies and examples abound, but most rely on the Internet in whole or in part (Trucano, 2010). One of the great challenges in the developing world is finding sustainable methods for improving teacher training where Internet and electricity are not a given. Some of the ways these obstacles have been overcome in developing countries are discussed in this chapter.

INTRODUCTION

Worldwide access to the Internet has been growing and continues to grow dramatically. The number of Internet users doubled between 2005 and 2010. A number of countries, including Estonia, Finland, and Spain, have declared access to the Internet a legal right for citizens (ITU, 2010). Yet, developing nations still lag behind developed countries by a wide margin. While 71 percent of developed

countries' populations are online, only 21 percent of developing countries' citizens are online (ITU, 2010). In terms of broadband, subscriptions in both developed and developing countries are growing, but penetration levels in developing countries remain low: 4.4 subscriptions per 100 people compared to 24.6 in developed countries (ITU, 2010). As the developed world embraces the Internet at broadband speeds, the digital divide appears to be widening for developing countries.

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In part this is due to lack of funds, but also to telecom monopolies that prohibit competition, keeping costs high and Internet speed low.

The only way the digital divide will become less is by developing the necessary infrastructure to support Internet connectivity and by creating a stable electrical grid for developing countries. However, there are temporary solutions that will enable learners in developing nations to enjoy the media-rich, electronic delivery of education and training similar to connected parts of the world. This point in history is very similar to the early days of e-learning development and delivery when the Internet was not a viable option for most learners. Despite a lack of Internet access or access severely limited to dial-up speeds, the creation and delivery of rich multimedia educational content flourished. This chapter will discuss a number of factors that have come together at this point in time to make the delivery of media-rich educational content possible for developing countries.

The Early Days of E-Learning

Seward Incorporated has been designing and developing electronic education and training software since 1990. Computer-based training was the term most often used to describe this work and stood for self-paced education or training that could be viewed on a computer screen, typically navigated in a linear fashion. Content was copied to computers via storage media and was generally textual in nature to fit within the small storage capacity of floppy disks and later diskettes. As e-learning designers and programmers became more adept at producing non-linear interactive media-rich instruction, file sizes grew. Larger files containing more forms of media (photos, illustrations, animations, audio, and video) and more programming code required data transfer via relatively expensive external disk drives like SyQuest's 44-megabyte, 88-megabyte, and 200-megabyte disk technology. Disk cartridge costs ranged from \$35 to over \$100 per cartridge.

Media-rich, interactive e-learning became much more viable with the introduction of low-cost, higher capacity storage media such as CD-ROM (650-megabyte) and DVD-ROM (4.7-gigabyte or higher). Until this time, networked storage and delivery of content was an option most often seen in large corporations with restricted local area networks that served internal audiences only. In these pre-Internet days, the rapidly declining cost and increasing capacity of hard drives, the ability to copy files easily onto desktops and laptops, and the ability of designers and developers to create interesting and effective multimedia training fueled the growth of media-rich e-learning.

Today's situation in developing countries is similar in many ways to the pre-Internet e-learning days. While delivery of content to large, geographically dispersed audiences via the Internet or other networks is not viable, there is a need, desire, and ability to deliver training and educational content that takes advantage of multiple forms of media, can support large file sizes, can be easily replicated, provides a consistent learner experience, and can be disseminated easily and affordably.

Four trends are driving the ability for developing countries to use technology for educational purposes that delivers a media-rich experience without being connected to the Internet.

Reduced Hardware Costs

Hard drives used to be measured in price per megabyte (one million bytes). Today, the measurement is expressed in gigabytes (one billion bytes), and 1-terabyte (one trillion bytes) drives are now available for under \$100. A comparison of hard drive cost per gigabyte 1980-2009 shows the cost declining from over \$1,000,000 to just under \$.10 per gigabyte (Komorowski, n.d.). This trend supports the ability to build devices that can hold a considerable amount of media-rich content and to do it at a very low cost.

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