Beyond Access:

Effective Digital Learning for a Globalized World

by Jane Best and Allison Dunlap

The landscape of teaching and learning reflects a rapid increase in digital learning programs within the U.S. and around the world. Supporters of digital learning suggest that technology can help prepare students for the workforce, improve student learning and educator effectiveness, and bring high-quality education to those who cannot otherwise access it. Despite the potential benefits of digital learning, many students still lack access to the technologies that could benefit them, creating a digital divide that is evident both within and among countries.

Furthermore, those students who have access to digital learning technologies do not always benefit from that access. Some studies demonstrate improvements in student achievement associated with digital learning technologies, while others have found no correlation between access to technology and student achievement (Pedró, 2012). The reasons for these mixed results are complex, yet one way to improve the likelihood of creating a successful digital learning program is to focus on access to technology and the successful implementation of digital learning programs.

Policymakers considering whether to support digital learning in their regions should be thoughtful about which digital learning initiatives best suit the needs of their regions and which show greatest promise toward improving student achievement. To provide guidance to policymakers as they consider digital learning policy, this brief addresses digital learning options, rationales for employing digital learning, and strategies for administering successful digital learning programs.

The examples in section I represent a range of possible investments that support access to technologies in education. Section II presents rationales in support of digital learning, and section III discusses investments that support the successful use of technologies in education. Lastly, you will find recommendations at the end of the document.

I. Digital Learning Options

Digital learning spans a range of activities, from enrolling in online courses full-time to completing one educational activity on a school computer. Selecting the most appropriate option for a specific region requires an understanding of that region's needs and level of development. While one school district in a highly developed urban area may benefit from investment in personalized learning software, a remote, rural, or underdeveloped area may be working to gain access to an adequate Internet connection. Any effective digital learning policy must take such diverse needs into account.

High-speed Internet:

High-speed Internet allows students and teachers to download, manipulate, and create multimedia projects; communicate with others around the world; participate in online courses and assessments; and access abundant open education resources. Global access to the Internet, however, varies drastically. In sub-Saharan Africa, for instance, four percent of people have access to the Internet at home, compared to 97 percent of South Koreans

(Dutta, Bilbao-Osorio, & Geiger, 2012). In the United States, some regions have high-capacity broadband while others are using dial-up or have no Internet access. One-hundred percent of residents in the District of Columbia, for instance, can access broadband that offers a download speed greater than three Mbps, while only 74.4 percent of West Virginians have similar access (National Telecommunications and Information Administration [NTIA], 2011). Moreover, only 45.7 percent of Guam residents and 21.4 percent of residents in American Samoa have access to this form of broadband (NTIA, 2011). Rural and remote areas are especially likely to lack access to the Internet when compared with urban areas (NTIA, 2011; U.S. Department of Commerce [Commerce], 2011). Indeed, in 2010 only 57 percent of rural U.S. households had broadband Internet access while 72 percent of urban U.S. households had such access (Commerce, 2011).

In regions where Internet access is limited or slow, investment in broadband may prove to be a valuable first step toward supporting digital learning. The State Educational Technology Directors Association (SETDA) recommends that schools aim to have at least 1 Gbps per 1,000 students and staff members by the 2017–18 school year (Fox, Waters, Fletcher, & Levin, 2012). Policymakers seeking to achieve this goal, or simply to improve Internet access, may need to prioritize specific regions and populations for investment. In the United States, for example, the Federal Communications Commission has specific Internet initiatives to provide or improve access for rural areas and Native populations, thereby working to narrow the digital divide.

Regardless of the approach that a region takes, improving Internet access allows students and educators to access innumerable education resources that are otherwise unavailable.

Devices:

Certainly, students and teachers must have access to a computer to benefit from high-speed Internet, online classes, or learning software, but it is not always clear how much to invest in devices, and which ones to employ. Increasingly, schools, districts, and states are adopting laptops and tablets in a one-to-one computing environment that offers every student and educator in a school access to his or her own device for use in creating multimedia projects and presentations or participating in game-based learning, for example.

Not all regions have the resources to invest in one-to-one computing, however. Interactive white boards and student response systems may allow regions with more limited resources to bring technology into the classroom. These devices can promote collaboration and student engagement as educators and students share access to one computer projected onto a much larger screen.

Regional needs and resources will undoubtedly inform decisions about which devices merit investment.

Online classes:

Once a region has access to digital devices and an adequate Internet connection, students in that region may benefit from online classes, which allow them to take specialized courses that individual schools or districts are unable to offer. Online classes can supplement traditional classroom learning, creating a blended learning environment, or they can take the place of traditional instruction, creating an entirely virtual educational experience. Such classes may be especially useful for rural and remote areas where funding limitations may prevent schools from offering advanced, remedial, or other specialized courses (Hannum, Irvin, Banks, & Farmer, 2009).

The quality of online classes, however, remains variable. While some studies have shown that students in online classes outperform students in traditional classes, others have drawn the opposite conclusion, making any definitive determination about their efficacy premature (Means, Toyama, Murphy, Bakia, & Jones, 2009). Such variability suggests that the selection of online classes should be accompanied by research into the effects of specific approaches and programs.

Software for personalized learning:

Many educational software programs now incorporate gaming, adaptive programming, and other Web 2.0 features, such as collecting real-time data and adjusting delivery and content to an individual learner's needs. Although software programs for K–12 education are plentiful, not all of them have been shown to be effective.

One study of the effects of educational software programs concluded that only one of six reading software programs had a positive impact on student achievement while zero out of four mathematics programs positively impacted student achievement (Campuzano, Dynarski, Agodini, & Rall, 2009). Another study, however, found that a mathematics software program had demonstrably better effects on student achievement than did traditional classroom instruction (Barrow, Markman, & Rouse, 2009). Given such variable success, investment in educational software should include an investment in research to support the acquisition of the most effective and appropriate programs.

Learning management systems:

Learning management systems (LMSs) are becoming increasingly popular in regions seeking to streamline instruction and administration through a single system that brings together students, teachers, school leaders, and regional officials. These systems are far more robust than a subject-specific software program. An LMS can gather and track data, provide a platform for online instruction, personalize the content and delivery of instruction by drawing on a learning content management system, and maintain administrative records, which might include personnel evaluations (Watson & Watson, 2007).

In the United States, districts and states have begun adopting their own LMSs tailored to the goals of local and state education agencies. Hawaii has adopted the Data for School Improvement System, which offers a curriculum aligned with state standards, assessment tools, and a range of reporting capabilities (Hawaii Department of Education, 2011). Kentucky is in the process of rolling out its Continuous Instructional Improvement Technology System, which offers standards-aligned instructional resources, assessment tools, and better access to data (Kentucky Department of Education, 2012). Eventually, this system will include an educator effectiveness module, professional development resources, and guidance for Common Core implementation (Kentucky Department of Education, 2012).

LMSs are substantial investments. However, many educational leaders support their use, especially as these systems become increasingly capable and comprehensive.

Table 1: Considering Digital Learning Options

Policy Goals	Questions for Policymakers to Consider
Support digital learning that is the most effective and efficient for my region	1. Are high-speed Internet connections available to all schools in my region? How are these connections distributed? Do certain schools or regions lack adequate access to the Internet? What policies support the availability of Internet to schools? 2. Do students and educators in my region have access to devices such as laptops or tablets? Is access evenly distributed across my region or do certain areas have fewer devices per pupil than others? What policies govern the acquisition and maintenance of technological resources? 3. Do students in my region lack access to specialized courses that could be offered online? Are online classes available to students in my region? What policies govern the availability, financing, and quality assurance of such classes? 4. Are schools in my region using educational software programs or learning management systems? If so, are these programs demonstrably effective? What policies govern the acquisition and maintenance of educational software programs? How do policies approach the issue of quality assurance as it relates to educational software?

II. Toward a Rationale for Digital Learning

The various reasons a policymaker may choose to support digital or blended learning include the region's need for greater access to courses and resources, for improved use of real-time data, or simply to introduce remote populations to new technologies. Regardless, policymakers should examine and articulate their reasons for supporting digital learning by asking, "Why invest in digital learning?"

In a report from the Asian Development Bank (2009), *Good Practice in Information and Communication Technology for Education*, the authors provide three major rationales that support digital learning: the knowledge economy rationale, which emphasizes education's role in preparing students for the workforce; the pedagogical rationale, which prioritizes the optimization of student achievement and educator effectiveness; and the equitable access rationale, which focuses on providing all children with a high-quality education. Each of these can contribute to a broader rationale for supporting digital learning, which in turn can improve stakeholder buy-in.

Preparing students for the workforce:

Many prioritize the role that education plays in preparing students for the workforce, arguing that educators must account for the realities of current and future economic trends if they are to successfully prepare students for careers. Because the global economy has become increasing reliant upon digital technologies, students preparing to participate in this economy must learn to use these technologies. In short, many proponents of digital learning argue that students must attain a high level of digital literacy to succeed in the workplace.

Promoting student achievement and educator effectiveness:

Supporters of digital learning who prioritize the optimization of classroom instruction maintain that digital technologies can improve educator effectiveness and student achievement. As the authors of *Using Technology with Classroom Instruction That Works* point out, technology has the capacity to produce a more dynamic, collaborative, and engaging classroom environment that allows students to practice higher order thinking skills and allows teachers to better differentiate instruction (Pitler, Hubbell, Kuhn, & Malenoski, 2007).

Additionally, many proponents of the pedagogical advantages of digital learning emphasize technology's capacity to personalize learning and improve student achievement (Horn & Staker, 2011; Wolf, 2012). Programs that work to tailor lessons to student needs using digital technologies have proliferated in recent years. The Khan Academy, for instance, tracks students' progress as they complete activities and review lessons online. The program presents students and teachers with knowledge maps that help them understand their strengths and weaknesses and that provide recommendations regarding which lessons and activities might best support their needs. This sort of technology-enabled personalized learning, many argue, is likely to improve student achievement (Horn & Staker, 2011; Wolf, 2012).

Advocates of the pedagogical benefits of digital learning also suggest that digital technologies will increase educator effectiveness. For teachers, digital technologies can offer improved access to real-time student data, teaching materials, professional development, mentorship opportunities, and communities of practice (Howley, Kim, & Kane, 2012). This increased access to teaching resources, in turn, may improve teacher effectiveness (Howley et al., 2012; Wolf, 2012).

Supporting equitable access to education:

Access to a high-quality education is uneven both within the United States and around the world, and many advocates for equitable access to education argue that digital technologies can help narrow the gap between those who have access to a high-quality education and those who do not. Remote and rural areas within the United States often lack the capacity to offer specialized and advanced courses, to recruit and retain effective teachers, and to provide the professional development and support that promotes high-quality instruction (Johnson & Strange, 2007; Hammer, Hughes, McClure, Reeves, & Salgado, 2005; Hannum, Irvin, Banks, & Farmer, 2009).

Globally, uneven access to high-quality education is even more evident. Although the United Nations Millennium Development Goals include a goal to achieve universal primary education by 2015, reports on progress toward this goal suggest that it will not be reached (UNESCO, 2011). Indeed, in 2008, over 67 million children were not attending school, and progress toward enrolling these children in school had slowed (UNESCO, 2011).

However, there are some initiatives currently underway that are improving educational equity by allowing remote and underserved children to digitally access high-quality instruction. In the Maldives, for example, a broadband initiative has maximized resources by bringing 1,200 islands together. Teachers in the Maldives now receive virtual training, and many students have access to modern technologies for the first time in their lives (UNICEF, 2007). Similarly, many rural districts in the United States rely on distance learning enabled by information technologies to offer courses that those districts would otherwise be unable to provide (Hannum, Irvin, Banks, & Farmer, 2009).

Table 2: Developing a Rationale for Digital Learning

Policy Goals	Questions for Policymakers to Consider
Use digital technologies to support students with the skills they need to participate in a knowledge economy	1. Does the workforce in my region rely on digital technologies or is it likely to rely on these technologies in the future? 2. What workforce development resources are already available in my region? Do these resources include adequate training in digital technologies? What policies govern the use of digital technologies in career and technical education in my region? 3. What careers do students in my region ultimately pursue? To what degree will digital literacy enhance their employment prospects?
Harness digital technologies to advance educator effectiveness and promote student achievement	1. Do students in my region have what the region considers adequate access to advanced, remedial, and other specialized courses? What policies promote access to these courses? Are there policies that inhibit access to these courses? 2. Is learning personalized and contextualized in my region? Do students receive credit for seat time, the mastery of skills, or some combination of the two? Can teachers and students access data on student performance? Are there policies in place to promote personalized learning? Is there any urgency for real-time data? 3. Do educators in my region have access to sufficient teaching materials, professional development opportunities, and communities of practice? What policies are in place to ensure this access? 4. How do teachers in my region use technology? Are there policies in place to ensure that teachers receive training that will maximize the potential pedagogical benefits of technology?
Take advantage of digital technologies to support educational equity	1. Are there significant geographic, social, or other divides that contribute to uneven access to a high-quality education in my region? Do students in rural and remote areas within my region receive the same level of instruction as students in more populous areas? How does my region compare nationally? How does my region compare globally? 2. How are teachers and schools distributed in my region? What policies guide the distribution of high-quality instruction in my region? 3. How is technology distributed in my region? Do remote areas have the same access to technology that more populous areas do?

III. Moving Beyond Access to Create Successful Digital Learning Programs

Research shows that technology alone is no guarantee of student success (Pedró, 2012; Goodwin, 2011). Rather, to make a difference in the quality of education a student receives, access to technology must be accompanied by a successful implementation plan. To support access to technologies in schools and effective use of that technology, policymakers may wish to consider the context in which a digital learning initiative is embedded, training and support for users of digital technologies, and the evaluation of the effectiveness of digital learning interventions.

Accounting for context:

For maximum efficacy, a region's digital learning initiatives must account for the economic, social, technological, and political context that characterizes the region (UNESCO, 2004). Digital learning initiatives that fail to account for contextual factors are likely to face challenges. For example, a recent one-to-one laptop initiative in Peru produced mixed results, even though the initiative successfully increased access to technologies. An independent evaluation concluded that the program had no impact on mathematics or language scores probably because it did not address issues related to attendance or completion of homework and because it did not significantly change instructional practice (Cristia, Cueto, Ibarraran, Santiago, & Severin, 2012). Local issues related to student and teacher practices affected the degree to which the one-to-one initiative was successful.

Needs sensing and outreach activities can help policymakers understand the context that will undoubtedly affect any digital learning initiative. According to a UNESCO report on the successful integration of information and communication technologies (ICTs) into education, successful digital learning initiatives account for the following contextual factors:

- the vision and goals of an education system;
- digital technology infrastructure in a given region;
- the role that other government and non-governmental organizations play in digital technology infrastructure;
- national and local education policy priorities;
- the role that donors and the private sector play in digital learning; and
- the socio-cultural context that characterizes a school or region, including parent and community participation in digital learning (UNESCO, 2004).

In short, successful digital learning policies understand and incorporate the local context that surrounds digital learning, thus harnessing available resources and increasing stakeholder buy-in.

Providing for training and support:

Successful digital learning initiatives must also account for educator familiarity with technology. While some educators have received extensive training in digital learning, others may lack familiarity with digital technologies altogether. Providing the training and support that both school leaders and teachers need to successfully integrate technologies into their work is likely to increase the success of any digital learning initiative (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2010).

- *School Leaders:* Research has demonstrated that the integration of technology into education is more successful when a champion for that technology exists at all levels in the education system (UNESCO, 2004). Giving adequate training and support to school principals will help them be champions for digital learning initiatives at the school level. Schools that effectively integrate technology into teaching train principals in best practices, teacher buy-in, and change management (Greaves et al., 2010). Additionally, school leaders with successful digital learning programs adopt strategies that make digital

technologies part of the daily routine of all teachers and make time at least monthly for teacher learning and collaboration on teaching with technology (UNESCO, 2004; Greaves et al., 2010).

- *Teachers:* Successful digital learning initiatives include teachers in the development of an implementation strategy, demonstrate to teachers how technologies help them meet their curricular goals, and provide continuous training on both technical and pedagogical best practices related to any digital learning initiative (UNESCO, 2004). Digital learning professional development for teachers is more effective when it is continuous, extending from pre-service education and continuing throughout a teacher's career; defined by regular workshops, peer-based collaborations, and mentorship; and tailored to teachers' needs (UNESCO, 2004).

Conducting evaluations:

Digital and blending learning initiatives are relatively new, so research and evaluation on any such initiative will help improve that program and inform future efforts. Research that integrates a variety of methods, including not only the analysis of standardized test scores but also interviews, focus groups, case studies, and questionnaires is likely to produce a richer understanding of any given digital learning program. This research, in turn, can help inform policymaker and policy implementer decisions as digital learning programs progress.

Table 3: Supporting Successful Digital Learning Initiatives

Policy Goals	Questions for Policymakers to Consider
Support successful digital learning initiatives by accounting for local context	1. How familiar are educators and students in my region with digital technologies? Do different demographic and geographic populations have more or less familiarity with certain technologies? What policies are in place to respond to the needs of different groups? 2. Are digital technologies already embedded in the daily culture in my region or are such technologies new? Are other industries in my region using digital technologies? Are government or non-governmental organizations using digital technologies or working to support technology use? 3. Are there policies to guide the implementation of new initiatives in schools in my region? Are there policies that guide the implementation of digital learning initiatives in schools in my region? Do these policies provide for needs-sensing and outreach activities? Do these policies take local context into account? 4. What are the goals of current local and national education policy in my region? How can digital technologies support these goals?
Maximize the efficacy of digital learning by providing training and support to teachers	1. How are school leaders and teachers trained when new initiatives are introduced in my region? How are they trained when new digital learning initiatives are introduced in my region? 2. What policies govern professional development in my region? Do these policies allow for ongoing support, which might include periodic needs sensing, follow-up trainings, in-class observations, mentoring, and peer-based collaboration?
Ensure the continued success of digital learning programs through ongoing evaluation and improvement	1. How are new initiatives in my region evaluated? How are new digital learning initiatives in my region evaluated? Are there policies that support the continued evaluation and improvement of new initiatives?

Recommendations

The following recommendations might assist policymakers as they begin to formulate digital learning policy:

Policymakers should consider digital learning options in their region.

- Gather information on the availability of digital technologies, including any disparities related to that availability.
- Examine policies related to the acquisition and maintenance of digital technologies.
- Examine the availability of specialized courses.
- Consider policies governing the availability, financing, and quality assurance of online courses and educational software programs.

Policymakers should develop a digital learning rationale for their region.

- Investigate the use of digital technologies in regional industries.
- Examine the inclusion of digital technologies in career and technical education programs.
- Examine policies related to the promotion of personalized learning, including policies related to receiving credit for seat time versus the mastery of skills.
- Consider the availability of teaching materials, professional development, and communities of practice to teachers.
- Examine policies requiring minimum levels of professional development and supporting maximum levels of professional development for educators.
- Investigate student access to high-quality instruction within the region and examine policies related to the distribution of high-quality instructors.

Policymakers should support successful digital learning implementation strategies in their region.

- Examine policies governing the implementation of new initiatives, including digital learning initiatives.
- Consider policies related to needs-sensing and responding to the needs of different groups.
- Consider the ways in which economic, technological, social, educational, and political context affects the use of digital technologies.
- Investigate the promotion of stakeholder buy-in related to new regional education initiatives.
- Examine policies governing the training and professional development of educators, including the degree to which those policies promote continuous and ongoing training.
- Ensure that new initiatives, including digital learning initiatives, are evaluated periodically to inform improvements to those initiatives and future policy.

References

Asian Development Bank (2009). *Good practice in information and communication technology for education.* Mandaluyong City, Philippines: Author. Retrieved from http://www.adb.org/publications/good-practice-information-and-communication-technology-education

Barrow, L., Markman, L., & Rouse, C. E. (2009). Technology's edge: The educational benefits of computer-aided instruction. *American Economic Journal: Economic Policy, 1*(1), 52–74.

Campuzano, L., Dynarski, M., Agodini, R., & Rall, K. (2009). *Effectiveness of reading and mathematics software products: Findings from two student cohorts* (NCEE 2009-4041). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Cristia, J., Cueto, S., Ibarraran, P., Santiago, A., & Severin, E. (2012). *Technology and child development: Evidence from the one laptop per child program.* Washington, DC: Inter-American Development Bank. Retrieved from http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=36706954

Dutta, S., Balbao-Osorio, B., & Geiger, T. (2012). The networked readiness index 2012: Benchmarking ICT progress and impacts for the next decade. In S. Dutta & B. Bilbao-Osorio (Eds.), *The global information technology report 2012: Living in a hyperconnected world* (pp. 3–29). Geneva: World Economic Forum. Retrieved from http://www3.weforum.org/docs/Global_IT_Report_2012.pdf

Fox, C., Waters, J., Fletcher, G., & Levin, D. (2012). *The broadband imperative: Recommendations to address K–12 education infrastructure needs.* Washington, DC: State Educational Technology Directors Association (SETDA).

Goodwin, B. (2011, February). One-to-one laptop programs are no silver bullet. *Educational Leadership, 68*(5), 78–79.

Greaves, T., Hayes, J., Wilson, L., Gielniak, M., & Peterson, R., (2010). *The technology factor: Nine keys to student achievement and cost-effectiveness.* Shelton, CT: MDR. Retrieved from http://pearsonfoundation.org/downloads/ProjectRED_TheTechnolgyFactor.pdf

Hammer, P. C., Hughes, G., McClure, C., Reeves, C., & Salgado, D. (2005). *Rural teacher recruitment and retention practices: A review of the research literature, national survey of rural superintendents, and case studies of programs in Virginia.* Charleston, WV: Edvantia.

Hannum, W. H., Irvin, M. J., Banks, J. B., & Farmer, T. W. (2009). Distance education use in rural schools. *Journal of Research in Rural Education, 24*(3), 1–15. Retrieved from http://www.jrre.psu.edu/articles/24-3.pdf

Hawaii Department of Education. (2011). *Data for school improvement.* Retrieved from https://hawaiidoedsi.pbworks.com/w/page/25448388/DSI%20Home

Horn, M. B., & Staker, H. (2011). *The rise of K–12 blended learning.* Mountain View, CA: Innosight Institute. Retrieved from http://www.innosightinstitute.org/innosight/wp-content/uploads/2011/01/The-Rise-of-K-12-Blended-Learning.pdf

Howley, C., Kim, K., & Kane, S. (2012, June). *Broadband and rural education: An examination of the challenges, opportunities, and support structures that impact broadband and rural education.* Fairfax, VA: ICF International. Retrieved from https://www.icfi.com/~/media/Files/ICFi/Articles%20and%20Books/Broadband_Rural_Education.ashx

Johnson, J., & Strange, M. (2007). *Why rural matters 2007: The realities of rural education growth.* Arlington, VA: The Rural School and Community Trust. Retrieved from http://files.ruraledu.org/wrm07/WRM07.pdf

Kentucky Department of Education. (2012). *Continuous instructional improvement technology system.* Retrieved from http://www.education.ky.gov/kde/instructional+resources/curriculum+documents+and+resources/continuous+instructional+improvement+technology+system+ (ciits)+public.htm

Means, B., Toyama, Y., Murphy. R., Bakia, M., & Jones, K. (2009). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online-learning studies.* Washington, DC: U.S. Department of Education. Retrieved from http://ctl.sri.com/publications/displayPublication.jsp?ID=770

National Telecommunications and Information Administration. (2011). [Searchable map of broadband availability across the U.S.]. *National Broadband Map.* Retrieved from http://www.broadbandmap.gov/technology

Pitler, H., Hubbell, E. R., Kuhn, M., & Malenoski, K. (2007). *Using technology with Classroom Instruction That Works.* Alexandria, VA: Association for Supervision and Curriculum Development.

Pedró, F. (2012). Trusting the unknown: The effects of technology use in education. In S. Dutta & B. Bilbao-Osorio (Eds.), *The global information technology report 2012: Living in a hyperconnected world* (pp. 135–146). Geneva: World Economic Forum. Retrieved from http://www3.weforum.org/docs/Global_IT_Report_2012.pdf

UNESCO. (2004). *Integrating ICTs into education: Lessons learned.* Bangkok, Thailand: Author. Retrieved from http://www.unescobkk.org/fileadmin/user_upload/ict/e-books/ICTLessonsLearned/ICT_integrating_education.pdf

UNESCO. (2011). *The hidden crisis: Armed conflict and education.* Paris: Author. Retrieved from http://unesdoc.unesco.org/images/0019/001907/190743e.pdf

UNICEF. (2007, November). *Broadband revolutionizes education on remote Maldives atolls.* Retrieved from http://www.unicef.org/infobycountry/maldives_41944.html

U.S. Department of Commerce. (2011, November). *Exploring the digital nation: Computer and Internet use at home.* Washington, DC: Author. Retrieved from http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_computer_and_internet_use_at_home_11092011.pdf

Watson, W. R., & Watson, S. L. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends, 51*(2), 28–34. Retrieved from http://search.proquest.com/docview/223124171?accountid=144346

Wolf, M. (2012). *Culture shift: Teaching in a learner-centered environment powered by digital learning.* Washington, DC: Alliance for Excellent Education. Retrieved from http://www.all4ed.org/files/CultureShift.pdf

For more information, contact Allison Dunlap at adunlap@mcrel.org or 303.632.5510.

Mid-continent Research for Education and Learning
4601 DTC Blvd., Suite 500 • Denver, CO 80237
303.337.0990 • mcrel.org • info@mcrel.org

20120813