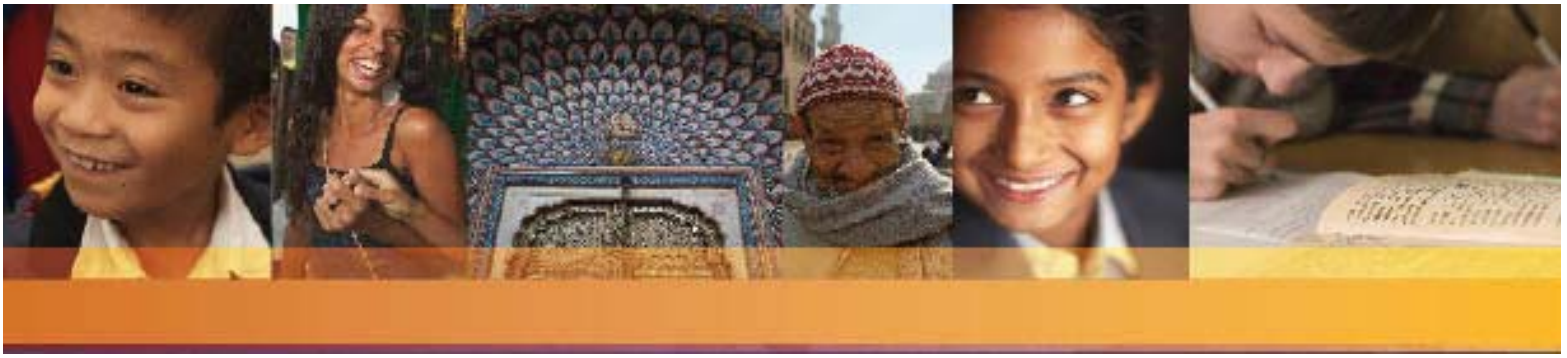




The Education Imperative: Extending the Reach of High-Quality Learning

A Microsoft White Paper from the
Unlimited Potential Group

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Introduction

In 1948, the United Nations declared education a basic human right. Since then, significant progress has been made in providing universal access to education, but more work remains, particularly when it comes to providing a high-quality education for *all*. Education is a cornerstone of sustainable social and economic development. It offers an intellectual foundation for people to become productive citizens and community leaders. It nurtures the kind of creativity and flexible thinking that leads to innovative new businesses. And it can provide skills for people to find work and enjoy more meaningful employment.

Yet despite concerted efforts by governments, development organizations and local communities to improve the availability, quality and effectiveness of education, transformative improvements often remain out of reach. Around the world, and particularly in underserved communities, significant challenges to education remain. Many schools are overcrowded and poorly maintained. Teachers work overtime and with low pay to accommodate growing student populations. Students rely on equipment and textbooks that are sometime obsolete or out of date. And learning is based on teaching methods that need to evolve to encourage the development of valuable skills that are increasingly essential for life and work, such as collaboration and teamwork, problem solving and creative thinking.

In addition, the low quality and lack of availability of education in many countries often lead children to miss out on anything beyond a basic primary education. In Guatemala, for instance, more than 93 percent of eligible children are enrolled in primary school, while only 34 percent attend secondary school. In India, those figures are 90 percent and 49 percent.¹ Alongside other socioeconomic factors, this can contribute to a self-reinforcing cycle of poverty and limited economic development.

The need to transform education and ensure that all children have the opportunity to participate has never been more urgent. Far too many children simply do not have access to basic education. According to a recent report from UNESCO and UNICEF, 115 million primary-age students are not enrolled in school,² and more than twice that number of secondary-age students — 264 million — are not enrolled.³

¹ UNESCO Human Development Report (2004).

http://hdrstats.undp.org/countries/data_sheets/cty_ds_GTM.html

² “Children Out of School: Measuring Exclusion From Primary Education,” UNESCO Institute for Statistics, 2005.

http://www.uis.unesco.org/template/pdf/educgeneral/OOSC_EN_WEB_FINAL.pdf

³ “Education and the World Bank.” <http://go.worldbank.org/TJAXO12A50>



Underserved communities in particular need much higher levels of student enrollment to help them rise above poverty, fuel economic and social growth and participate fully in the opportunities of the global economy.

Schools around the world also face urgent shortages of qualified teachers. UNESCO estimates that 18 million new teachers are needed worldwide to accommodate population growth, with the greatest need in South and West Asia and a number of Arab countries.⁴ In its work with education leaders around the world, Microsoft Corp. sees significant and ongoing challenges in recruiting, training, motivating and retaining new teachers as well as in meeting infrastructure needs, including construction of new schools and colleges. These issues are especially critical for people at the middle and bottom of the economic pyramid, where education has great potential to support economic growth.⁵

⁴ “World Teachers’ Day 2006: 40 years of Fighting for Teachers’ Rights.” UNESCO Web site: http://portal.unesco.org/education/en/ev.php-URL_ID=50927&URL_DO=DO_TOPIC&URL_SECTION=201.html.

⁵ As defined by C. K. Prahalad in “The Fortune at the Bottom of the Pyramid” as well as by other economists and social scientists, the middle of the pyramid includes the emerging middle class in developing countries (approximately 1 billion people), while the bottom of the pyramid consists of the 4 billion people who live on less than \$2 (U.S.) a day.



A Global Commitment to Education

At the second World Summit on the Information Society, sponsored by the United Nations and the International Telecommunications Union and held in Tunisia in 2003, 174 governments affirmed their commitment¹ to a people-centered, inclusive and development-oriented information society and emphasized technology's role in improving the quality and reach of education:

[Technology is] making it possible for a vastly larger population than at any time in the past to join in sharing and expanding the base of human knowledge, and contributing to its further growth in all spheres of human endeavour as well as its application to education, health and science. [It has] enormous potential to expand access to quality education, to boost literacy and universal primary education, and to facilitate the learning process itself, thus laying the groundwork for the establishment of a fully inclusive and development-oriented Information Society and knowledge economy which respects cultural and linguistic diversity.

(¹http://www.itu.int/wsis/doc_s2/tunis/off/7.html)

How Technology Can Help

Transforming education and extending its benefits to all underserved communities is a complex challenge that requires a combination of institutional, cultural, technological and infrastructure changes, as well as innovative and effective partnerships between governments, development organizations, communities and businesses.

Although technology is not the only tool required to address these challenges, it can play an important role in broadening access to learning, helping empower students and teachers, and enabling schools and education systems to be more relevant, effective and adaptive. By helping transcend the barriers of time, distance and limited resources that often impede access to education, software can be a powerful agent for change. Compelling software and tools can create a rich, interactive instructional environment that ignites students' imaginations, expands their horizons and sparks the curiosity and wonder that is the catalyst for learning.

Building on a decade of experience working with education leaders worldwide and developing innovative learning resources, Microsoft is committed to using its expertise, its passion for technology, and a rich network of alliances to accomplish these goals:

Broaden access to education by making hardware and software more affordable, increasing access to content and tools through hosted software and services, and building on innovations in accessibility technology to further extend the reach of education to people with disabilities.

Help education systems become more efficient and effective by making available technology road maps and software that enable schools to plan and maintain their infrastructure with less complexity and at lower cost. This effort includes the development of hosted education tools, content and services that can be broadly and inexpensively distributed and are easily adaptable to changing needs.

Enhance learning with rich software tools that help students and teachers more effectively conduct research, prepare reports and presentations, share information and ideas, and collaborate on projects.

Enable student-centered learning with a wide variety of software tools and content that accommodate diverse learning styles and help teachers guide students along their own unique path to knowledge. Putting students at the center and maximizing their learning based on their specific needs and interests are crucial to helping spark a fundamental change in the quality of education.



Technology can play an important role in broadening access to learning, helping empower students and teachers, and enabling schools and education systems to be more relevant, effective and adaptive.

Create connected learning communities where educators can collaborate and share best practices; teachers, students, parents and school leaders can share information and track student progress; and classrooms can learn from subject experts from around the world.

Helping to ensure a high-quality education for all is a key component of Microsoft Unlimited Potential, the company's commitment to bringing the benefits of technology to the 5 billion people who are underserved today. Unlimited Potential applies new business models, technology solutions, advanced research and a complement of relevant corporate citizenship initiatives to help communities around the world create and sustain social and economic development by transforming education, fostering local innovation, and enabling jobs and opportunities.

A Systemic Approach to Technology in Education

Like many other technologies and solutions, software innovations in education that are designed to meet the needs of the developed world might not always be appropriate elsewhere. Bringing the benefits of high-quality education to underserved populations often requires a different approach, one that takes into account the diverse economic, social and logistical issues faced by different countries.

For example, people living at or near the middle of the economic pyramid often share aspirations and goals with people at the top. Education is viewed as a path to greater economic opportunity and is valued as a means for intellectual and personal growth. Many aspire to technical or professional careers in their home country or abroad, or they aim to start new businesses. Families understand and appreciate the value of education, and they are willing to make significant financial investments to help improve their children's performance, such as purchasing a computer for use at home. Education systems also tend to resemble those at the top of the pyramid, with a reasonably well-developed physical infrastructure, relatively high qualification standards for teachers and a commitment to investing in technology to the degree possible. One important difference, however, is that these education systems sometimes lack the financial resources that those in the developed world enjoy, so they must ensure that all their assets are used as effectively as possible.

People at the bottom of the economic pyramid have different circumstances and needs. Learning is valued just as highly, but practical educational outcomes are often measured in terms of basic literacy and numeracy rather than college enrollment or employment rates. The basics of life, such as housing, nutrition and health, play a more fundamental role. Owning a computer is simply not an option or a priority for the vast majority, who might encounter PCs only at a local library, community center or Internet café — if at all.



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Education systems in communities at the bottom of the pyramid face a wide range of challenges not often seen in the developed world. These include finding and retaining qualified educators willing to work in challenging school environments that can have student-to-teacher ratios in excess of 50:1, high rates of teacher dropout and absenteeism, a shortage of basic supplies such as textbooks, and challenges to keeping school buildings in basic repair. At the most extreme, schools lack electricity, furniture and books. Some communities lack schools entirely.

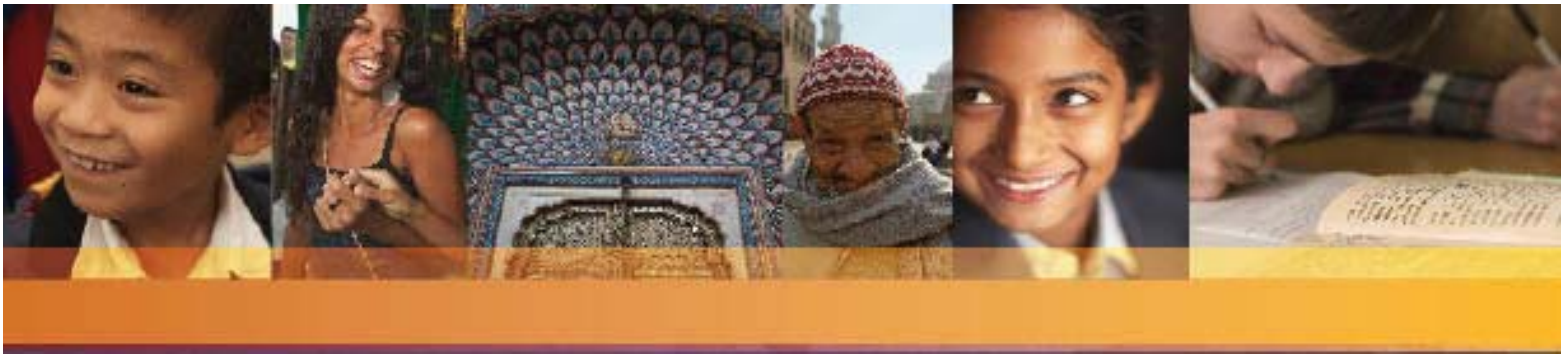
Considering this wide spectrum of needs, it is important to take a broad approach to transforming education that includes tools, strategies, support and reforms at every level, with efforts that can be combined and customized to meet the specific needs of any country and to help students, teachers, schools and systems become more capable, adaptive and innovative. This approach can extend the capabilities of systems at the middle and bottom of the pyramid by making proven developed-world solutions more affordable and accessible while helping schools make better use of scarce resources, increase enrollment and clear a path to further improvements.

Innovation at Every Level

By offering a range of technologies, services, curricula and training — supported by strong collaborations with governments, development organizations and software providers — Microsoft is working to extend the reach of high-quality learning so all communities can gain from the social and economic benefits of a well-educated population. These efforts are focused on empowering innovative students, innovative teachers and innovative schools and education systems.

Innovative Students

Computers and software are powerful tools that can help students solve complex problems, nurture their creativity, and explore a world of knowledge. However, typical home or school PCs remain out of reach in many underserved communities. To address this challenge, Microsoft is working with a wide range of industry and government partners to reduce the cost of hardware and educational software and to make it easier for students with limited resources to tap into the benefits of computing.



Creative Solutions for Underserved Communities

Professor Eduardo Chaves, a Brazilian education scholar, has noted that “some of the most radical attempts to employ technology to drastically change education and reinvent formal learning environments are likely to appear in the developing world” because their education systems are in the greatest need of reform and aren’t bogged down by the institutional inertia and sunk costs that make developed-world solutions more conservative.¹ This is especially true in Brazil, which was an early adopter of Microsoft-sponsored initiatives such as the Student Help Desk and Innovative Schools programs.

Building on this idea, underserved communities can find many ways to creatively adopt and use technology in education to optimize use of scarce resources, open their schools to the community and maximize economic opportunities within and outside the school. For example, the Partners in Learning Student Help Desk program, which gives students valuable IT skills by training them to maintain their schools’ computers and networks, helps reduce costs for education systems, provides additional support for teachers as they learn to use technology effectively and opens up new paths to employment for participating students. Similarly, some schools with computer labs open them up for public use at night and on weekends, operating as de facto community centers or even subsidizing their own costs by operating as Internet cafés (with student apprentices providing technical support). Throughout its efforts in education, Microsoft encourages and supports these creative solutions and works to identify best practices and share them in a scalable, sustainable way with other communities.

¹ Partners in Learning 2007 Progress Report.
<http://www.microsoft.com/education/PartnersinLearning/2007ProgressReport.msp>

A number of studies have shown that regular access to a computer can improve student performance in many subjects.^{6,7} Pilot implementations of Microsoft’s **Family Education PC** program are being carried out in several countries to determine the most effective way to provide an affordable home computer to support children’s education needs while also giving parents the opportunity to improve their own technology skills. This program combines a PC with a suite of education content and productivity software created by local and global developers and publishers. It is designed to address the near-term need to support education at home and as a supplement to classroom learning, while helping to spur the creation of local software “ecosystems” that are capable of developing relevant content and applications over time.

For example, to help schools in impoverished areas make the most of limited PC resources, Microsoft Research India has developed **Windows MultiPoint**, a software program that enables several students to share a single PC using multiple mice or other peripherals. Because these peripherals are far less expensive than additional PCs and students are more engaged and active when they have some control over their computing experience, this approach enables educators to extend the reach of limited computing resources.

Innovative Teachers

As computing becomes an increasingly powerful tool for helping students learn in their own style and at their own pace, it’s

⁶ “Regular Computer Users Perform Better in Key School Subjects, OECD Study Shows.” Australian Computer Society (ACS) Web site:
http://www.acs.org.au/icdl/content/upload/files/pdf/PISA_04.06.pdf.

⁷ “Impact of ICTs on Learning & Achievement.” infoDev Web site:
<http://www.infodev.org/en/Publication.154.html>.



important that teachers are able to guide and shape their students' learning while ensuring that outcomes meet local and national standards. However, many teachers still lack the basic computer skills and pedagogical foundation to effectively support their students' use of technology. To address this, comprehensive and sustainable teacher training must go hand-in-hand with broader access to ensure that technology investments pay off in the form of improved learning outcomes. Targeted to local needs, these training efforts should support technology integration at every level, including supporting teachers' existing work through access to content and communications tools, facilitating group instruction and assessment, and enabling individual, collaborative and self-guided learning among students.

Microsoft's global **Partners in Learning** education initiative includes the **Innovative Teachers Program**, which connects a worldwide community of educators that are committed to 21st century learning.⁸ As part of the program — which includes a global network of online communities as well as a series of forums and events — more than 950,000 teachers in 73 countries are sharing best practices and providing ongoing mutual support.

Partners in Learning also offers a **Peer Coaching** program that offers a scalable model for developing innovative technology practices among teachers. The program helps teachers and institutions make better use of technology and training resources by offering a model of sustainable teacher training and support that relies on mutual collaboration among teachers.

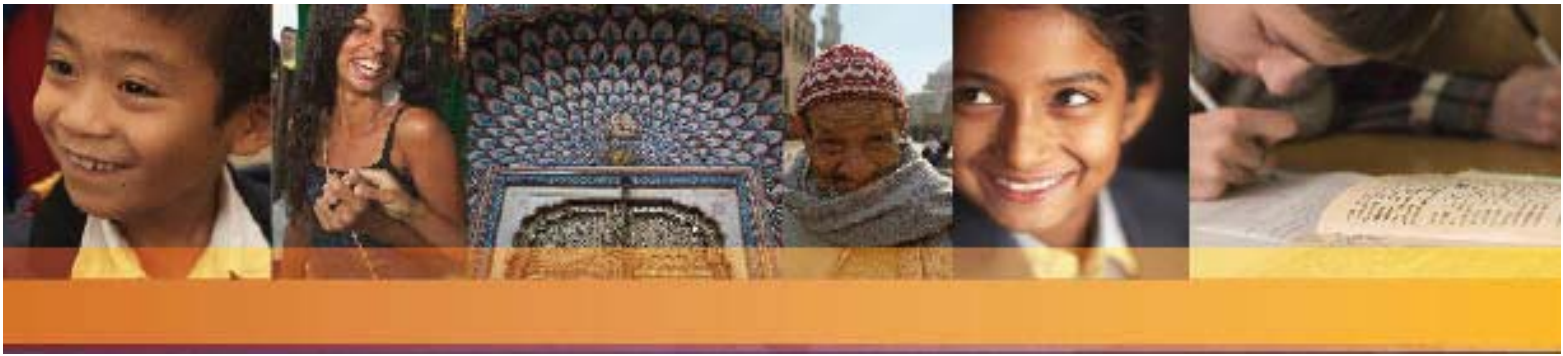
To help educators in the developing world access high-quality learning materials, the Microsoft Research **Digital Study Hall** project is distributing lessons on DVD from experienced teachers to rural and low-income areas, offering world-class instruction while helping local educators refine and improve their skills.

Innovative Schools and Education Systems

Teachers and students thrive when they are part of schools and education systems that recognize the value of technology and put their resources and expertise to work to improve the quality of learning. Ideally, government policies should support a pedagogically sound approach to learning and work toward clear educational goals. They must also be supported by the budget and personnel to deploy and maintain the technology, as well as to ensure that every educator is empowered to use it effectively.

This is especially important in underserved communities, where education systems often provide most of the technological infrastructure and students and teachers are unable to afford their own computers. Microsoft and its associates are working to support innovative schools and systems by making basic technology resources more accessible and affordable while provid-

⁸ More information about Partners in Learning is available at <http://www.microsoft.com/education/partnersinlearning.mspx>.



ing guidance and resources to aid in broader education improvements. For example, qualifying governments that purchase PCs for teachers and students to use at home can acquire the **Microsoft Student Innovation Suite**, a basic set of education software, for \$3 (\$U.S.). The suite includes Microsoft Windows XP Starter Edition, Microsoft Office Home and Student 2007, Microsoft Math 3.0, Learning Essentials 2.0 for Microsoft Office, and Windows Live Mail desktop.

To help education systems empower teachers, school leaders and students, the **Microsoft Learning Gateway** includes hosted software and services that enable teachers to collaborate and manage curricula and track student progress, help administrators meet reporting requirements and share data with parents, and offer students easy access to lessons and resources.

Low-Cost Hardware for Individual Learning

Educators have long recognized that many positive learning outcomes can be achieved when children have access to their own computer and are guided in their work by skilled educators. However, the promise of this approach has been limited by high upfront costs, ongoing maintenance requirements and complexity of hardware, as well as by the low availability of effective teacher training and relevant education software and curricula.

Making computer hardware more affordable and accessible is an important first step in moving toward the goal of individualized learning. The potential of "1:1 computing" is driving the development of a new generation of low-cost computers designed specifically for education, including Intel's Classmate PC, the Eee PC from Asus and One Laptop Per Child's XO. These inexpensive computers address many of the key "abilities" that education systems in underserved communities require: simplicity, reliability, portability, durability, maintainability and affordability.

However, these hardware innovations are effective only if they are complemented by affordable and relevant software; teacher training and pedagogical approaches that enable skilled teachers to guide students' learning; a comprehensive distribution, enablement and support system; and a sustainable economic model for covering maintenance costs over time.

Low-cost computers that work with the Windows operating system can take advantage of a vast content and application ecosystem that can benefit educators in underserved communities with little additional investment. This content pool includes thousands of software titles that enable individual, self-guided learning for students; complete K–12 curricula that include assessments and teachers' guides; and institutional software that helps school systems, districts, teachers and students work more effectively. They enable the use of extensive Web-based learning materials developed by a wide range of content providers, as well as teacher-created content from the Microsoft Innovative Teachers Program. They help prepare students for future employment by giving them experience with the productivity applications that they will encounter later in the work force. They enable broader networking and interoperability with a wide range of technologies, including new and refurbished PCs, mobile phones and services. And they are supported by the broadest community of trained computer engineers, software developers and service professionals in the world.



No single company, technology or initiative can address all of the challenges that schools and education leaders in underserved communities face. Tackling these issues requires a rich network of partnerships.

The **Fresh Start for Donated Computers** program helps schools ensure that computers donated by businesses, communities and development organizations have valid Windows licenses, while **Microsoft School Agreement** simplifies academic licensing through an affordable school subscription program. The **Community Microsoft Authorized Refurbisher** program enables organizations to install legal Microsoft operating systems and software on refurbished computers that are supplied to schools and community centers.

In addition to providing more affordable software and computing options, Microsoft is working with a range of government and development organizations in more than 100 countries to help improve education. Partners in Learning includes a number of programs that help schools and systems advance the quality of education and work to integrate technology into daily teaching, learning and research.

One such program is **Learning to Lead Change**, a series of workshops that help education leaders create a sustainable culture of leadership, collaboration and innovation in their schools. Partners in Learning also includes the **Innovative Schools** program, which is helping educators around the world move beyond the limits of traditional learning models to help make learning more engaging, inspiring and relevant. Focusing on 12 schools around the world, the program is aimed at creating sustainable and replicable models that any school or education system can use to prepare children for success in the 21st century.

Conclusion

No single company, technology or initiative can address all the challenges that schools and education leaders in underserved communities face. Tackling these issues requires a network of partnerships among teachers, communities, governments, development organizations and businesses working together to identify needs and develop effective, scalable solutions that complement local efforts. Building on a wide range of programs, partnerships and technologies, Microsoft is committed to creating learning environments that are relevant, effective and affordable and, most of all, empowering to teachers and students.

By extending the reach of high-quality education to the billions of people who are underserved by technology today, Microsoft envisions new possibilities that can lead to increased prosperity for individuals and to sustainable social and economic development for communities and nations around the world.