



Brazil Revolutionizes Education across the Nation



Introduction

In 2004, just 6 percent of Brazil's citizens had access to the Internet. Included in that figure were millions of students, who lacked access to the advanced technology and resources necessary to compete and succeed in the 21st century global economy.

Recognizing the value of integrating technology into education, in 2005 the government created the "Um Computador por Aluno" program ("One Computer per Child"). The program was designed to create a paradigm shift in education, improve digital inclusion rates in schools and homes, and support the growth of local information and communications technology (ICT) manufacturing companies.

Six years later, Brazil was distributing 150,000 Intel-powered classmate PCs to more than 300 schools in 27 states across the country, with plans to distribute an additional 750,000 this year, possibly totaling 900,000 by the end of 2011. Already, six cities are "Total Cities," meaning every student has access to a computer. The program also involves extensive teacher training and localized education software, and in keeping with the initial goals, all of the computers are manufactured by a Brazilian company.

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CHALLENGES

- Poor information and communication technology infrastructure (6 percent of population with Internet access in 2004)
- Immense scope of the project
- States and municipalities, not the federal government, have responsibility for school policies and curricula

SOLUTION

- National commitment to education transformation
- Systematic research, partnerships, pilot projects, funding, and project expansion
- "Bottom-up" approach that gives necessary support and autonomy to states and municipalities

RESULTS

- The government plans to enable states and municipalities that are purchasing to distribute 750,000 Intel-powered classmate PCs to schools in their local area.
- Six "Total Cities" have achieved 1:1 eLearning access for all students.
- Thousands of teachers have learned to integrate technology and 21st century skills training into their classrooms.

Establishing a New Education Model

The solutions adopted in Brazil fall into five categories which enabled the country to move systematically toward its goal of 1:1 eLearning for every student.

Step #1: Conduct preliminary research

After committing to the Um Computador por Aluno (UCA) program in 2005, the government moved quickly to conduct preliminary research on the state of the country's current ICT infrastructure and the key components of a nationwide education transformation.

Five research institutes, funded by the Inter-American Development Bank, studied a variety of issues in order to:

- Assess capacities and limitations (human factors) in the existing ICT infrastructure
- Outline basic guidelines and pedagogies for UCA
- Plan the later massive deployment projects
- Plan UCA's pedagogical development and assessments
- Determine how best to coordinate and supervise the program

The Ministry of Education formed a UCA force consisting of leading university thought leaders and researchers who began meeting monthly to monitor and follow up on the progress of the research.

Step #2: Form partnerships

Partnerships played a critical role throughout the UCA program. Initially, the federal government brought together agencies such as the Presidencies office, Ministry of Education, Office of Digital Inclusion, and local academia and research institutes that could lend expertise in education and technology. State and municipal authorities were also brought in to help shape policies and provide insight into local needs and desires.

The government also formed a broad network of public-private partnerships with global businesses such as Intel, as well as local businesses, nonprofit organizations, teachers, education coordinators, and more. By bringing these decision makers together, the government was able to generate support for programs and develop sustainable ICT solutions that benefited students and the local economy.

Step #3: Implement pilot projects

The government and its partners selected five schools in five cities across Brazil to test a variety of ICT integrations. Intel and other companies donated the technology for the experiments.

The results of the pilot projects were carefully reviewed and analyzed. The Brazilian Council for Research and Evaluation of Technology eventually published a book that evaluated the pilot program and established best practices that were applied in the years that followed.

In evaluating the pilot projects, the government found that the two schools that integrated Intel-powered classmate PCs performed best. At the pilot school in the city of Piraí, teaching quality scores rose on a 1–10 scale from 2.8 points to 4.8 points—well above the national average at the time of 4.2. Two years later, scores rose even further, to 4.9.¹

Through the pilot projects and other local ICT initiatives, the government discovered the advantages of “bottom-up” approaches in which states and municipalities harness local energy and insight to drive their own education transformations. The central government found it most effective to give states and municipalities the freedom to set their own budgets and customize education initiatives based on local needs and concerns.

Step #4: Build and distribute the solution

Once the government had identified the preferred technologies through the pilot projects, the next step was to find a local manufacturer that could develop and implement a bundled solution that included Intel-powered classmate PCs and the necessary localized software.

The government eventually set out a tender. A local company, CCE, won the bid, and could rapidly manufacture the 3,000 units per day necessary to meet a tight delivery schedule. CCE collaborated with Intel and Metasys, a local company that provided the software for the solution.

CCE has now manufactured and distributed 150,000 Intel-powered classmate PCs across Brazil. The computers will reach 300 schools in 27 states, as selected by the Secretary of Education in partnership with the state and municipal education secretaries union. Already, five “Total Cities”—ranging in population from 4,700 to over 40,000—provide 1:1 eLearning to all students.

In addition to the hardware, software, and broadband Internet access, the solution being deployed across Brazil includes training teachers on how to integrate ICT into their classrooms. The federal government agreed to provide 180 hours of initial training, and states and municipalities agreed to make teachers available for training and assessment, and provide follow-up and continuing support.

Step #5: Expand the program

The second phase of Brazil's UCA program will eventually involve distribution of 750,000 Intel-powered classmate PCs across Brazil, as well as training thousands of additional teachers.

A critical element of the program's expansion is a unique financial model, in which each state and municipality can buy a computer at a fixed price, tax-free, through a local manufacturer. The budget for these purchases comes from each state or municipality, but the states and municipalities can borrow the money from a USD 350 million credit line that is funded by the federal government at low, long-term interest rates. The government provides guidance to the states on how much each is allowed to borrow from the total allotment.



In 2007, the Ministry of Education selected the city of Pirai as one of five cities to take part in the Um Computador por Aluno (UCA) pilot projects. The limited deployment at one school in Pirai led to impressive results, leading the city of Pirai to fund the project's expansion, with state and national support, to the city's 20 other schools.

The city's successful effort to expand 1:1 eLearning helped to inspire the "bottom-up" approach that the federal government eventually adopted for the UCA program as a whole.

After seeing the success of Pirai's locally led information and communications technology (ICT) expansion, the UCA program took advantage of the country's decentralized education system—in which the Ministry of Education establishes policies and principles but does not institute curricula—to give municipalities autonomy to control their own education transformations.

Today, to help ensure ICT integration into classrooms across Brazil, the federal government creates policies and provides access to funding and teacher training. States and municipalities can then develop their own education initiatives, taking into consideration local variables.

As shown by the education transformation in Pirai, giving responsibility and autonomy to communities can enable them to harness local energy, insight, and experience that lead to greater success for the local region and for the country as a whole.



Conclusion

The successful integration of ICT in schools across Brazil demonstrates how a systematic process can be used to transform education. Building from initial research, partnerships, and pilot projects, through distribution and expansion of the project, Brazil's government was able to revolutionize the country's education system one step at a time.

Intel continues to work with Brazil's federal, state, and municipal governments to accelerate technology access and integration into schools across the country. By following the steps described here, Brazil is connecting its citizens with the computers, broadband Internet access, and locally relevant content necessary to succeed in the global economy.

Best of all, the systemic model followed in Brazil is equally available to other countries worldwide.

Intel has helped to implement more than 200 education programs in over 70 countries, and has invested more than USD 1 billion in the last decade to improve teaching and learning environments.

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¹Based on national indicators of teaching quality (*Índice de Desenvolvimento da Educação Básica* [IDEB]).

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