



Piraí, Brazil, Transforms Education with Help of Technology Integration

1:1 technology integration program reaches teachers and students at all grade levels.

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Intel Education Integration Research is conducted in regions around the world to understand the successes, challenges, and policy implications of a variety of eLearning programs, and compare them to other programs worldwide. The information in this report is based on original data collection and analysis by researchers at the Universidade Federal do Rio de Janeiro and Universidade Federal Fluminense in Brazil, in collaboration with SRI International and Intel.



Introduction

Piraí, Brazil, is a small city in the state of Rio de Janeiro, with a population of about 24,000. The city is pioneering a 1:1 technology integration program in education as part of a larger Digital City effort to provide digital access to every citizen. By also integrating technology into its schools, Piraí aims to transform into a Learning City, in which eLearning plays an integral role in every student's education.

Already, 5,500 Intel-powered classmate PCs have been distributed through the Intel® Learning Series to every student at the city's 20 municipal- and state-run schools, which serve students at all grade levels. An additional 560 laptops have been distributed to teachers and administrators, and project learning pedagogies were introduced for grades 1–9. This is in addition to the 800 Intel-powered classmate PCs distributed to a Piraí school as part of a pilot project in 2008.

By encouraging student independence and helping to shift teachers from a didactic, lecture-based approach to one of facilitation, Piraí's program shows the power of technology integration to transform teaching and learning. Piraí's program also demonstrates the power of a strong local vision to shepherd complex and lasting educational change.

The Vision: ICT to Improve Education, Job Skills, and Digital Literacy

Piraí's 1:1 technology integration program is part of two larger policy initiatives, one municipal and one national. Underpinning all of the initiatives is a desire to use information and communication technologies (ICT) to address Brazil's high unemployment and underemployment by improving education, job skills, and digital literacy.

The current program is modeled after an experimental rollout of 800 Intel-powered classmate PCs at one Piraí school in 2008, which was part of the federal 1:1 computing

initiative, Um Computador por Aluno (UCA, or One Computer per Student). The current program is also part of a larger municipal program called Piraí Digital, which built a strong ICT infrastructure, including providing wireless Internet access across the city.

The total cost of Piraí's 1:1 technology integration program is BRL 5.4 million, of which the municipality invested about BRL 1.5 million. The state of Rio de Janeiro agreed to pay for about 75 percent of the program, including investment in devices, while the municipality agreed to pay for infrastructure and maintenance.

Planning: Extensive Stakeholder Engagement

The Piraí rollout is citywide, serving all students at all levels. State funding of the devices ensured that all students living in Piraí, including those in municipal and state schools, have access to a device during the school day, and that adult-education students have access in the evenings.

Local program coordinators facilitated the planning process and communication between municipal offices and schools. School administrators and teachers were involved in planning, identifying community goals, and developing a pedagogical plan. School committees also focused on pedagogical changes, knowledge-sharing strategies, and planning related to curriculum integration and change.

The planning process was aided by results from the earlier, experimental rollout at a single school in Piraí. The success of the pilot program contributed to the decision to move ahead with the citywide program. The experiences of students, teachers, and administrators in the pilot school also guided decision-making about the subsequent citywide rollout.

CHALLENGES

- Limited city budget
- Lack of IT infrastructure in schools
- Poor education scores (pilot school scored 2.4 on a scale of 1-10)

SOLUTIONS

- Citywide commitment to integrating technology into schools
- Financial and technical support from the state and federal government, as well as business partners
- Carefully executed educational paradigm shift (including eLearning curriculum planning and teacher training) to transform teachers from central figures of authority to facilitators of students' learning



Implementation: The Transition to Project-Based 1:1 eLearning Classrooms

Pirai's 1:1 technology integration program is now in the implementation phase. With the help of the Intel Learning Series Alliance, 5,500 Intel-powered classmate PCs have been distributed to every student at the city's 20 municipal- and state-run schools.

In addition, 560 laptops for teachers and administrators were distributed and paired with professional development before student programming began. The two-tiered professional development program included elements to improve both teacher buy-in and training.

Several elements of the implementation process have helped to mitigate challenges that have appeared in other eLearning deployments. One key has been the continuing engagement of school and city stakeholders throughout the deployment. The process has also been aided by the continuing autonomy of school leaders to manage their school site implementations.

Another key element in the implementation has been an emphasis on active knowledge sharing among teachers and students. For example, although not all teachers have integrated technology into the classroom, teachers who were early trainees and early adopters have passed

on lessons learned through their participation to other teachers. In addition, early adopter students have taken active roles to facilitate eLearning adoption in the classroom.

Careful curriculum planning and changed classroom layouts have also made it easier to transition to project-based 1:1 eLearning classrooms.

Research and Evaluation: Identifying Areas for Improvement

During the municipal rollout, stakeholders at many levels were interviewed to report on laptop use, transformation in the schools, and overall attitudes and concerns about the rollout. Parents were among those interviewed, and they provided information not only on the value of the laptops for education, but also on additional benefits not included among initial goals.

Interviews with participants from the experimental school were especially helpful. They noted, for instance, that use of the laptops has changed over time. Students have transitioned from using laptops as simple word processors to using presentation software and Web 2.0 tools, and many students reported feeling more engaged and interested in the self-directed approaches now available to them.

At the experimental school, teachers and others also noted that they were anxious about adopting technology and changing their approaches in the classroom. For the citywide rollout, professional development is therefore focused on achieving strong teacher buy-in from the start, which may help to reduce teacher anxiety and increase adoption rates.

Conclusion

The success of a 1:1 technology integration program such as the one in Pirai requires all of the steps shown here, including establishment of a strong vision, extensive planning, a systematic implementation process, and ongoing evaluation and monitoring.

Other cities, states, and countries can follow a similar process to improve their education systems and develop successful eLearning programs similar to those now being deployed in Pirai, Brazil. By working with Intel and other public and private partners, countries can create sustainable, cost-effective technology integration programs that will provide social and economic opportunities for years to come.

EDUCATION TRANSFORMATION PROGRESS

Pirai's 1:1 technology integration program shows substantial progress in five key areas that have proven to be essential to education transformation efforts in more than 70 other countries.

1. POLICY¹:

- The program was integrated into the city's long-term Digital City vision, and extended the federal Um Computador por Aluno (UCA) pilot project to address all of the city's municipal and state-run schools
- Co-funding between governments in the state of Rio (equipment purchase) and the city of Pirai (funds program oversight and maintenance) supported the program's long-term financial feasibility

2. CURRICULUM AND ASSESSMENT:

- Program coordinators actively involved school administrators and teachers in 1:1 eLearning program planning and pedagogical plan development
- Schools oversaw adoption of project learning pedagogies, knowledge sharing strategies, and ongoing curriculum integration

3. PROFESSIONAL DEVELOPMENT:

- Teacher and administrator laptop distribution was paired with two-tiered professional development (targeting buy-in and technology-specific training)
- The program was framed as an educational paradigm shift in which teachers shift from didactic lecturers to apprentices, learners, and facilitators, and students are coached to use computers as tools to develop individual agency and independent learning
- Early adopter teachers served as "multipliers" to share what they learned through their participation with other teachers

4. INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT):

- 5,500 Intel-powered classmate PCs were distributed to students at all grade levels and shared across multiple school shifts

- 560 laptops were distributed to teachers and administrators

- School connectivity was provided by Pirai's earlier Digital City initiative

5. RESEARCH AND EVALUATION:

- The biennial federal IDEB indicator noted significant improvement in pilot school fifth-grade completion rates (from 2.4 in 2005 to 4.2 in 2007 to 4.5 in 2009). Next cycle indicators are to be completed in 2011
- Program coordinators qualitatively monitor program progress to fine-tune program implementation and operations

THREE BEST PRACTICES

The ongoing success of Brazil's education transformation depends on several best practices that other countries can follow to achieve similar success.

BEST PRACTICE 1: Long-term municipal vision

Piraí's education transformation depended in part on the city's earlier commitment to become a Digital City that would provide digital access and proficiency to all residents. The Digital City initiative created an IT infrastructure that was then leveraged to support the city's transformation into a Learning City, in which all students can take advantage of the benefits of eLearning.

BEST PRACTICE 2: Phased rollout

Piraí's 1:1 technology integration program built on the experiences gained from two larger initiatives, demonstrating the value of phased rollouts. The national UCA program included a pilot project in one school in Piraí, and the experiences at that school later informed the planning and design of the technology integration program. Likewise, Piraí Digital played a key role in supporting the technology integration program by creating a dependable IT infrastructure.

BEST PRACTICE 3: Experienced, independent oversight

Throughout the planning and implementation of Piraí's 1:1 technology integration program, the program has benefited from experienced, authoritative, and independent oversight. Program monitors continue to monitor the program's progress, and feedback is sought out from a variety of stakeholders, including teachers, parents, and city leaders.

Achieve Your Vision

What's your vision of the world ahead? Intel's model of education transformation can help governments improve the quality of the education system, leading to greater economic and social opportunities. Contact your local Intel representative to discuss how you can implement a sustainable, technology-based education program in your country.

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.

Working with governments, policy makers and local vendors, Intel helps to implement eLearning solutions that provide professional development to teachers; support student achievement and development of 21st-century skills; and enable access to relevant, localized digital content.

Intel Learning Series, based on years of ethnographic research, is designed specifically to support 21st century student learning. It is a package of hardware, software, services, and support—delivered by local vendors to meet local needs—designed to work reliably together. At the heart of the Learning Series is the Intel-powered classmate PC—a purpose-built netbook with full PC functionality. Built to advance education, the Learning Series enables more personalized and comprehensive eLearning solutions for students K-8.

Learn more about:

- Intel Education programs, including the Intel Guide to Monitoring eLearning Programs and Education Transformation Research Reports at: www.intel.com/education
- The Intel Learning Series at: www.intellearningseries.com

Or contact: educationresearch@intel.com

¹ For more information, see the Policy for Education Transformation: An Educational Policy Brief.

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