CASE STUDY
Intel Education
Portugal

Portugal Transforms Primary Education with 1:1 Technology Integration

Broadband delivered to schools and homes, netbooks to all first-cycle students.

Based on original data collection and analysis by researchers, Débora Goes and Mário João Braga in Portugal in collaboration with Rockman et al, SRI International, and Intel

Intel Education Transformation 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, Débora Goes and Mário João Braga in Portugal in collaboration with Rockman et al, SRI International, and Intel.

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Advancing Education Worldwide

Introduction

Portugal is home to one of the world's most successful, nationwide 1:1 technology integration programs targeting primary education. Begun in 2008, the program has transformed the country's primary education system, created a new generation of eLearners, and built an education technology industry that now exports its solutions worldwide.

Portugal's technology integration program, known as *e.Escolinha* program or the "Magellan project," is part of a broader, government-led initiative that combines age-appropriate technology and content with the training, support, and Internet connectivity students need to develop 21st century skills.

Already, *e.Escolinha* program has helped to deliver broadband Internet access to all schools in the country. In addition, every first cycle student (grades 1-4)—more than 750,000 students in all—now has access to the Magellan PC, a locally produced computer that uses the Intel-powered classmate PC reference design.

The success of the *e.Escolinha* program depends on the government's long-term investment in comprehensive eLearning programs, tight integration of economic development and educational goals, and phased home-to-school rollout. Through its rapid transformation of Portugal's education system, *e.Escolinha* program demonstrates how countries around the world can develop successful and sustainable eLearning programs.

The Vision: Modernizing Education Through ICT

The modernization of the Portuguese educational system has been a priority on the political agenda since Portugal joined the European Union in 1986. *e.Escolinha* program is one element of the country's comprehensive national ICT plan for education, *Plano Tecnológico de Educação* (PTE), published in 2007.

The main priority of the PTE is to prepare citizens to participate effectively in a knowledge-based society through digital inclusion (ICT for all) and the modernization of education. The PTE is also intended to help Portugal become one of the five most advanced European countries in terms of the technological modernization of schools.

e.Escolinha program is just one of five eLearning programs being implemented as part of the PTE. The other four programs are intended to increase ICT access for students and adults, increase mobile Internet connections, promote computer literacy, and improve digital skills. In the first phase alone, these programs will deliver more than 1 million netbook computers, with the goal of democratizing ICT access across the country.

The initial financing for *e.Escolinha* program and all of the PTE's technology integration programs came from the government's sale of 3G mobile licenses through a spectrum auction, which raised EUR 460 million. In 2009, the newly re-elected prime minister gave the Ministry of Education (MoE) full responsibility for all aspects of the Magellan project, including the financing. The program is now supported through government funding rather than offset agreements with telecommunications companies.

Planning: Preparing Infrastructure, Teacher Training, and Localized Content

e.Escolinha is an ambitious initiative that touches every student in grades 1–4, including each new incoming class. In the initial stages, the Ministry of Public Works, Transportation, and Communication (MOPTC) designed the program and oversaw all aspects of technology configuration, device, and connectivity distribution and school and family readiness. By 2009, the MOPTC had completed a program handover to the Ministry of Education.

To facilitate netbook distribution to the students, the MoE created regional teams to work with schools in each district, with teachers working directly with the students' parents. Because the rollout prioritized homes and families, families also signed up for home 3G Internet connections with participating telecommunication companies as part of the *e.Escolinha* program.

Schools were equipped with broadband connectivity early in the program and teachers were trained on how to use the Magellan PC and available digital instructional content. The MoE, in partnership with Intel, trained 800 master teachers, who provided pedagogic and technical training and support to more than 7,500 teachers. By 2010, 98 percent of polled elementary teachers reported using the Magellan PC in the classroom at least one day a week, with nearly half of all teachers using it more than two days a week.[1]

Implementation: Integrating ICT at School and Home

The Magellan PC implementation was extremely rapid, with as many as 3,000 Magellan PCs distributed each day. In the first phase, between 2008 and 2009, the government purchased and distributed 412,697 Intel-powered clamshell classmate PCs to all first cycle students. A second round of distribution in 2010 and 2011 delivered an additional 250,000 Magellan PCs to incoming classes of students. In total, 750,000 Magellan PCs will be distributed over four years.

CHALLENGES

- Improve computer-to-student ratios and school Internet access, which once lagged other EU countries
- Spur local economic development by integrating ICT in education
- Increase country competitiveness through digital inclusion programs that focus on education at home and in the classroom

SOLUTIONS

- Government prioritized the modernization of the educational system, with ICT as a central element, and secured stable funding from sale of 3G mobile licenses
- Partnerships formed with local businesses, Intel, telecommunications companies, and others
- Local manufacturing effort is expected to result in a gain of 1,500 jobs and EUR 2.26 billion
- Worldwide export of the program and technological expertise with more than 1.5 million Magellan PCs sold to date

Throughout the program, the MoE focused on helping whole families integrate computers and the Internet into home life, as well as preparing schools and teachers for Magellan PC use in the classroom. To facilitate educational usage both at home and in schools, the MoE created school portals, implemented learning management systems, and made digital resources available to teachers, students, and families. By 2010, about 33 percent of teachers used the educational resources available at Portal das Escolas in the classroom or for the preparation of lessons.

At home, the Magellan PC was available when the students needed it. Researchers found that whenever students had a question or were curious about something, they used their computers to search for answers; whenever they found something interesting, they shared it with family and friends. As a portable learning device, the Magellan PC significantly changed the manner in which students interacted with and manipulated information.

The *e.Escolinha* program has received a tremendous amount of media attention. Magellan has also become one of the most recognized brands in the country and is now used colloquially to refer to the whole suite of eLearning programs.

Research and Evaluation: Identifying Areas for Improvement

The MoE established the Coordination, Monitoring, and Evaluation team to track the progress and budget of the eLearning initiatives outlined in the PTE. Another group called the directory (a loose affiliation of researchers and evaluators) has also been engaged in summative assessments of the program.

In September 2010, an MoE survey of all primary-school teachers found that:

- 98 percent were using the Magellan PC inside the classroom[1]
- 50 percent were using the Magellan PCs at least twice a week and 12 percent were using it four or more times per week
- More than 30 percent of teachers used educational resources available at *Portal das Escolas* in the classroom or for the preparation of lessons, and, among these, 57 percent did so weekly

Qualitative research about the Magellan project is also positive—based primarily on the value children and families give to computer ownership and the importance of the ready-at-hand means of accessing information and online resources that connectivity provides.

Conclusion

Portugal is rapidly moving toward its goal of preparing all citizens to participate in a knowledge-based society through digital inclusion and the modernization of education. Already, primary-school students are known as the "Magellan Generation"—an entire generation of students who now have access to a modern, technology-rich eLearning experience. The program has also touched the lives of students worldwide, from Argentina to Uruguay to northern Africa, as they adopt the technology and lessons learned from the *e.Escolinha* program.

Other countries can follow a similar process to improve their education systems and develop successful eLearning programs similar to those now being deployed across Portugal. 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.

FIVE KEY ELEMENTS OF EDUCATION TRANSFORMATION

The following five elements have proven essential to support Portugal's education transformation, as well as similar efforts in more than 70 other countries that Intel works with around the world.

1. POLICY[2]:

- Two-decade commitment to modernizing Portugal's education system
- Comprehensive technological plan for education, PTE, that dovetails with the EU's Lisbon Strategy and Portugal's Strategic National Plan
- Combined reform efforts that target an increase in all students' and teachers' ICT proficiency

2. CURRICULUM AND ASSESSMENT:

- MoE implementation of school portals, learning management systems, and online eLearning resources for teachers, students, and families
- By 2010, more than 30 percent of teachers used the educational resources available at Portal das Escolas in the classroom or for the preparation of lessons; among these, 57 percent did so on a weekly basis

3. PROFESSIONAL DEVELOPMENT:

- 800 master teachers trained and 7,500 primary school teachers reached
- The percent of teachers with ICT certification rose from 8 percent to 55 percent

4. INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT):

- More than 750,000 locally produced Magellan PCs distributed to every first-cycle (grades 1-4) student
- Household broadband connectivity rose from 13 percent to 54 percent, and PC penetration from 43 percent to 62 percent. Primary school connectivity is at 100 percent
- 98 percent of surveyed elementary teachers report using a Magellan PC in the classroom for at least one day a week and 50 percent report more than two days per week

5. RESEARCH AND EVALUATION:

- Formed the Coordination, Monitoring, and Evaluation team to track the progress and budget of the Magellan projects' eLearning initiatives
- Formed a loose directory of academics and evaluators engaged in summative evaluation of the program
- The MoE in participation with the Observatory for the Technological Plan and two Portuguese universities will complete a study on the education impact of *e.Escolinha* for publication in 2012

THREE BEST PRACTICES

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

BEST PRACTICE 1: Integrated economic and education vision

Under the umbrella of the EU's Lisbon Strategy and Portugal's Strategic National Plan, the Portuguese government tapped into wide-ranging private and public sector partnerships, including local telcos, software developers, and computer manufacturers, as well as global companies such as Intel, Cisco, and Microsoft. The result was the delivery of 750,000 locally manufactured Magellan PCs preloaded with software approved by the Ministry of Education to students nationwide. In addition, the government and the resulting public-private partnership has exported its ICT4E expertise and more than 1.5 million Magellan PC eLearning solutions worldwide.

BEST PRACTICE 2: Phased effort that progressively builds expertise and results

The PTE's overarching framework and phased series of ICT in education programs allowed program decision makers and implementing agents to build on earlier program experience. The result was broadening expertise that supports the *e.Escolinha* program. In addition, the *e.Escolinha* program builds off prior home-based digital inclusion programs to target both home and classroom based educational usage. This drives both formal and informal eLearning adoption. It also sets easy-to-track, progressive success indicators.

BEST PRACTICE 3: Inventive financing

In 2001 and 2002, several companies purchased 3G mobile licenses from Portugal's government through a spectrum auction that raised EUR 460 million. With the long-term goals of the PTE in mind, Portugal's government set aside the auction proceeds to fund the nation's ICT programs, including the educational technology programs. The funds have been used to support many aspects of the programs, including subsidizing technology purchase programs for students and teachers. As the program matured, the MoE assumed full responsibility for all aspects of *e.Escolinha*, including the financing. The program is now supported through government funding rather than offset agreements with telecommunication companies.

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] See, "Inquérito aos professores sobre a utilização do Magalhães 2009/2010" by Gabinete de Estatica e Planeamento da Educação. Highlights can be found here: http://www.pte.gov.pt/pte/EN/Espa%C3%A7oMedia/Not%C3%ADcias/022004257?idNoticia=022004257

[2] For more information, see the Policy for Education Transformation: An Educational Policy Brief.

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