Governments, schools, and people around the globe must respond to both the challenges and the opportunities of the technology-driven global information economy. As time goes on, technology becomes more vital for participating on equal footing with the rest of the world.

Information and communications technology (ICT) lets schools foster a 1:1 e-learning environment while raising computer literacy among their students. Making computers part of education helps children reach higher as they learn to think critically and understand their world. The potential is great for technology-based solutions in education that include the following components:

- Computers in the classroom
- High-speed connections to the Internet
- New teaching methods and professional development for teachers
- Localized digital content

Read on to learn how Macedonia is using technology to prepare a new generation of leaders.

**Intel® Learning Series Vision:**

Transform today's classroom for tomorrow

**MISSION**

Advance students and their communities by catalyzing partners in the global education ecosystem, through Intel Learning Series adoption in the classroom.

**IMPACT**

- Economic development and education transformation
- Partner enablement and ecosystem readiness
- Innovation and market growth

**SUCCESS STORY**

Intel® Learning Series
Macedonia: Computer for Every Child
Компјутер за секое дете
Inspiring Change, One Child at a Time

The Macedonian government’s vision to put a computer into the hands of every primary student country-wide led to the “Computer for Every Child” Initiative. The Academy for Educational Development (AED) and United States Agency for International Development (USAID) are assisting the government of Macedonia in implementing the “Computer for Every Child” initiative. USAID sponsors the Primary Education Project (PEP) in Macedonia, which has the following primary goals:

- Renovate schools and improve energy efficiency
- Broaden access to ICT and deepen its value in education as a whole
- Advance the quality of math and science education within primary schools
- Improve student assessment to make it more comprehensive and accurate
- Develop twenty-first century workforce skills in students to help them be more successful

As the first nation in the Balkan region to invest on such scale into Intel® Learning Series based solutions, Macedonia is providing a blueprint for success that can be followed by other countries. The initial phase of the effort is nearing completion, with early success. Already, logistics have been mastered, computers have been distributed to schools, and training teachers and IT personnel has been successful.

The process is well underway to effect a transformation of the Macedonian education system.

“This is a project that was started by a government initiative with one goal in mind: to modernize the educational system in Macedonia by introducing information and communication technology at the earliest grades in the school system to create a knowledge-based society.”

– Ivo Ivanovski, Minister of Information Society, Republic of Macedonia

INTEL WORLD AHEAD PROGRAM: Connecting the Next One Billion

The Intel World Ahead Program expedites access to the technology that enriches the lives of people and fosters socio-economic opportunities.

The program connects millions of people with the right technologies, high-speed connectivity, educational programs, locally relevant content, and health-care solutions. Collaboration with local and global leaders results in achieving long-term, comprehensive approaches that promote sustainable development.

>> Learn more: www.intel.com/worldahead
Creating the Blueprint: A National Technology Program

A project this large in scope requires the coordination of many different elements, so from the start, the team planned carefully for success. They decided to adopt a complete learning solution, instead of just buying computers. Intel Learning Series provides a holistic solution that includes hardware, software, and services for the implementation of ICT in Macedonia, which supports the government and non-government agencies that collaborate to enact the program.

Solution Infrastructure

The 1:1 e-learning environment for junior grades at Macedonia’s elementary schools is based on the Intel Learning Series. This package of hardware, software, services, and support works reliably together and is delivered by local vendors. At the heart of the Intel Learning Series are Intel-powered classmate PCs. Based on Intel’s reference designs and manufactured by local OEMs, they enhance teaching and learning in primary grades.

- **Innovative interaction** is encouraged because the Intel Learning Series focuses on the collaboration between students and their peers as well as their teachers.

- **Intel-powered classmate PCs** are powered by the efficient, powerful Intel® Atom™ processor, with an 8.9-inch display, a Linux* operating system, wired or wireless connectivity, and various storage options. With a rugged design that stands up to everyday use by children, the Intel-powered classmate PCs are purchased by the Macedonian government and owned by the schools.

- **Networking** includes Internet connectivity, wireless local area networks at schools, and charging stations, all of which are being procured as part of the deployment process.

Services and Expertise

As more than just an adjunct to education, the Computer for Every Child program seeks to transform education in the Republic of Macedonia using technology. The Ministry of Information Society and the Ministry of Education and Science combined their own expertise with that provided by Intel, AED, and USAID to facilitate that effort, with excellent results:

- **Shared expertise** from an international collaboration of government and non-government agencies combines specialized experience in ICT deployment with local knowledge and authority.

- **Training for master teachers** provided by Intel pedagogical experts creates a “train the trainers” model, for the teachers and by the teachers. It benefits local teachers as well as Student Support Technician Clubs, which empower students to care for the hardware. This approach fosters teacher preparation, readiness, and professional development.

- **Ecosystem alliance partners** include Metasys, which provides access-control software and the V Class* collaboration suite, as well as Canonical, the partner behind Ubuntu* Linux, which is used in the solution.

Intel® Skoool™ Content

High-quality educational content is provided through the award-winning, interactive skoool™ Learning and Teaching Technology program. This standardized instructional curriculum was developed by Intel, as the result of a 10-year, USD 15 million research and development program.

The Macedonian government is so pleased with the program that it plans to adopt skoool content as the country’s official math and science curriculum. This innovative material helps standardize the curriculum by delivering it electronically. That allows agencies, such as the Macedonian Ministry of Education and Science, to easily keep official course content up to date.

“Under the USAID-funded Macedonia Primary Education Project (PEP), AED and Intel Corporation have created a successful public-private partnership to increase the quality and relevance of teaching throughout the country.”

– Jonathan Metzger, Vice President and Director, Information Technology Applications Center, Academy for Educational Development
Multi-Level Benefits: Near-Term and Longer-Term Advantages

Intel, the Macedonian government, and other project members developed the program to accomplish both short-term and long-term objectives. Accomplishing these objectives will benefit education, society, and government agencies.

For now, the computers, which some teachers have given the nickname “IntelKO,” are used only in the classrooms and are not taken home. Teachers meet with parents to discuss Internet safety, another important factor in the children’s computer literacy.

Benefits to Education
Effective 1:1 e-learning environments give students the opportunity to develop twenty-first century skills that will increase their chances for future success:

- **Enhanced collaboration** among students and teachers provides experiential learning giving schoolwork a new immediacy.
- **Increased access** to computers and Internet connectivity helps prepare students for a technologically driven world.
- **Improved quality** of education is provided by a standardized curriculum, helping give all students equal access to excellent learning materials.

Benefits to Society
Just as children represent the future, excellence in education helps build a future filled with opportunity. Macedonia’s Computer for Every Child initiative hopes to create long-term benefits that will extend broadly to the overall socio-economic growth of the Macedonian people:

- **Computer literacy** among a greater proportion of the population better prepares people to participate in the global economy.
- **Future business growth** may be encouraged by information and telecommunications infrastructure development that leads to technology leadership in the Balkan region.
- **Local economic development** can arise as IT and other support industries become more needed with the increase in computing.

Benefits to Government
While successful implementation of an ICT program, such as the one being undertaken in Macedonia, requires deep collaboration with non-government organizations, industry, and schools, government agencies play a pivotal role. Through these projects, government agencies can expand their roles as leaders in society that boldly advance the public good:

- **Increased visibility** of government ministries by the public as a whole helps assert the role of those organizations and individuals as eager promoters of socio-economic development.
- **Intra-government collaboration** fosters strong relationships between the agencies involved in the project as they work together toward success.
- **Effective outreach** to the public is provided for government agencies that gain a new means of providing effective educational and economic leadership.

“The [Intel® Learning Series solution] is being implemented by several agencies, ministries, and other government institutions, which fosters their cooperation and coordination.”

- Nikola Todorov, Minister of Education and Science, Republic of Macedonia

“This provides individual opportunities for every student, and my students are very motivated to do their work using [Intel-powered] classmate PCs.”

- Dobri Jovevski, Teacher, Primary School ILINDEN, Kriva Palanka
Checking in at the Schools: Progress So Far

A successful pilot begun in 2006 at a small number of Macedonian schools led to the larger implementation of the program. Intel-powered classmate PCs began to arrive at the schools in November 2009. A recent survey of teachers who have completed the training produced the results shown in the charts on the right.

Use of the Intel Learning Series in Macedonia has been extremely successful, with schools moving toward total adoption. Deployment continues on schedule for completion by the end of the 2009-2010 academic year, and the response by students, teachers, and parents has been overwhelmingly positive:

- **Technology in schools** throughout the Republic of Macedonia includes 53,000 Intel-powered classmate PCs for all students in grades 1–3 and 22,000 netbooks for teachers. More than 300 members of the Intel-sponsored Facebook* Macedonia teacher training community are discussing lesson plans and best practices.

- **Internet access and wireless networking** are being implemented throughout the educational system, and AED is purchasing routers to provide intranet access at each school. By contrast, the Statistical Office of the Republic of Macedonia reports that as of 2009 just 54.1 percent of Macedonian households were using computers.

- **Training is successful**, with master teachers working with regional teachers who in turn are reaching out to classroom teachers, students, and parents throughout the country. A total of 1,500 teachers have been trained, including at least two in every school, and plans are on schedule for all of the approximately 5,000 teachers for grades 1–3 to be trained by August 2010.

Survey of teachers participating in the Intel® Learning Series solution

I feel comfortable having the Intel-powered classmate PCs in my classroom.

- 11% Strongly Disagree
- 0% Slightly Disagree
- 0% Neutral
- 11% Slightly Agree
- 78% Strongly Agree

How often do you use the Intel-powered classmate PCs in class during your school day?

- 22% None of the time
- 45% 0.5-1 hours
- 22% 1.5-2.5 hours
- 11% All of the time

How do students use the Intel-powered classmate PCs?

- 31% Researching on Web
- 22% Writing Project Reports
- 16% Creating Digital Media
- 31% Other

The training I received adequately prepared me to use the Intel-powered classmate PCs in my classroom.

- 17% Strongly Disagree
- 0% Slightly Disagree
- 0% Neutral
- 17% Slightly Agree
- 66% Strongly Agree

Which subjects do you use the Intel-powered classmate PCs for?

- 12% Math
- 14% Reading and Writing
- 14% Test Taking/Making
- 18% Group Projects
- 20% Individual Work
- 22% Other
“[Intel-powered] classmate PCs induced changes and adaptation of the present curriculum in the elementary schools, as well as changes of the educational technologies according to the needs of the modern world.”

– Nikola Todorov, Minister of Education and Science, Republic of Macedonia

**Through the Eyes of a Child**

Q: What do you like most about Intel-powered classmate PCs?
A: It is small, easy to work with, and compact. It opens fast—simply super! I like to use all the tools, making presentations, ToolKid*, and drawing.

Q: What can you do now in class that you were unable to do before?
A: Many things. On the Internet, I can research other places, and depending on what we are learning, I use an Intel-powered classmate PC two to three hours per week.

• **Educational software and content have been installed** on Intel-powered classmate PCs, including ToolKid* content, and skool content has been localized into both the Macedonian and Albanian languages by the local company Zona Technologies.

• **Regional IT leadership** has advanced significantly, with local companies expanding to complete logistics and deployment, localization, and other tasks related to the project. The Macedonian government is hosting ministers from other Balkan countries to spread the success even further.

Although the Macedonian government has made exceptional progress in implementing 1:1 e-learning, issues still remain to be solved, as one would expect in such a complex project. The Macedonian educational system will continue to meet new challenges in the future, such as the need to advance technical professional development for teachers. It will also need to advance the ability to create new educational content.

The State Educational Inspectorate and the Bureau for Development of Education monitor the teachers’ work to ensure the use of computers in the classroom supports the curriculum. The law states that each teacher must have seven days per year of professional development activities, such as workshops and seminars, and an increasing number of teachers are pursuing ICT-related activities to fulfill those requirements.

The Republic of Macedonia is well on its way to pioneering a new era in the region, where education and technology advance together for the greater good. The socio-economic benefits have already begun, and a generation of primary school students is poised for a bright future.
“With the arrival of the [Intel-powered classmate] PCs, our classrooms have a new dimension. Our students are deeply interested and engaged with creativity and a new thirst for knowledge.”

– Marina Vasileva, Teacher, OU Sveti Kiril i Metodij-Centar, Skopje Macedonia

“Successful implementation of the [Intel® Learning Series solution] can contribute to further attracting foreign investors through public-private partnership.”

– Nikola Todorov, Minister of Education and Science, Republic of Macedonia

“One of the most valuable benefits from this program is supporting anti-discrimination between pupils in primary schools, regardless of their gender, ethnic background, physical capabilities, and social status.”

– Ivo Ivanovski, Minister of Information Society, Republic of Macedonia
Achieve Your Vision

Contact your local Intel representative to discuss how you can implement a sustainable, technology-based education program in your country.

Learn more about the Intel® Learning Series education solution:
www.intellearningseries.com

Visit us on the Web:
www.intel.com/worldahead