CASE STUDY
1:1 eLearning
Intel World Ahead Program
2nd generation Intel® Core™ i5 processors

Embracing 1:1 eLearning in the United Arab Emirates

Institute of Applied Technology supports 21st century learning with advanced technology, training, and professional development for students and teachers

The United Arab Emirates (UAE)-based Institute of Applied Technology's (IAT) objective is to contribute to the development of the UAE by providing distinctive secondary school programs that integrate career and technical education with a rigorous academic core. Towards this end, IAT engaged with the Intel World Ahead program, a global initiative designed to bring the benefits of the digital world to the next generation. Nearly 6,000 Apple MacBook Pro* computers were deployed across five campuses, to 400 teachers and over 5,000 students. Other 1:1 eLearning elements were also introduced such as rich-media local content, new teaching methods and a professional development curriculum, all designed to drive technology-based collaborative learning.

معهد التكنولوجيا التطبيقية
INSTITUTE OF APPLIED TECHNOLOGY

"Today, laptops have a central role on the classroom and in some instances there are no hard copies of anything."

Dr. Abdullatif Al Shamsi, Managing Director, Institute of Applied Technology

Challenges

- **The road ahead.** Prepare students for the global workforce in which technology skills and knowledge are fundamental to workplace success
- **Essential skills.** Help students develop the computer skills they need to thrive in the 21st century
- **Tools and knowledge.** Enable teachers to effectively use technology within the classroom to ensure improved learning for students

Solutions

- **Comprehensive training.** Intel introduced 1:1 eLearning training designed to support widespread computer literacy and collaborate learning
- **Reaching out.** Encouraged the use of information communication technologies (ICT) in the classroom to prepare students for 21st century learning
- **Equipping teachers.** Provided technology-based training for about 400 teachers so they can pass on knowledge to their students
- **Apple MacBook Pro distribution.** Approximately 5,700 Apple MacBook Pro computers, each powered by 2nd generation Intel® Core™ i5 processors, delivered to students and teachers

Impact

- **Flexible learning.** Increased scope of learning for students means students can access almost everything in terms of material, online lectures, labs and videos as well as 24/7 support from the teacher
- **Motivation and improvement in thinking.** Critical thinking and problem solving skills enhanced among students while students are more motivated and engaged in the classroom
- **Interactivity and collaboration.** Students share their knowledge, skills and participation through technology such as blogs, videos, e-mail, chat, and application sharing to complete projects. This 'sharing' extends to time outside of the classroom

Teachers become role models for students in collaborative technology-based learning

The IAT in the UAE is a leading school for career technical education. Spread over five campus locations, it provides a core curriculum and clustered technology courses in engineering, applied engineering, information communication technology, and health science and technologies.

The curriculum is offered to grades nine to 12 (ages 14 to 17) and is strongly based on internationally recognized standards and assessments. Between July 2009 and July 2010, IAT bought approximately 5,700 Apple MacBook Pro computers powered by 2nd generation Intel Core i5 processors to engage in a 1:1 eLearning program.

1:1 eLearning provides each teacher and student with a dedicated laptop for use at school. Laptops serve as personal teaching and learning tools that are used throughout the day for many educational tasks and subjects. As a result, technology is integrated into the classroom, rather than confined to a PC lab.

1:1 eLearning prepares students for a world where technology is central to all that we do. Computer literacy is essential for most skilled jobs, while the Internet opens up a world of educational opportunity. Computers can and do motivate students to learn, make lessons more relevant to their lives, and enable them to participate in the global community. This philosophy is central to the Intel World Ahead Program, which brings the benefits of the digital age to people all over the world.

Intel/Apple MacBook Pro environment

Intel ran pre-project workshops with approximately 400 teachers from the IAT. This consisted of Intel Teach essentials and 1:1 test bed training. The goal was to familiarize the teachers with the aims of 1:1 eLearning and the planning of eLearning deployment.

In short, this training focused on the use of ICT and how this can drive forward computer-based learning in the IAT. Within this context the eLearning approach had several specific focuses[1]:

> "Technology is now supporting the teacher-student relationships enabling a collaborative approach to study."
>
> *Mr. Shadi O. Ayoub, Curriculum Developer, ICT, Institute of Applied Technology*

- **Policy.** Encourage the use of ICT in individual learning and informed by the understanding that ICT competence is a fundamental component of global citizenship
- **Professional development.** Introduce the basic use of ICT within the classroom to improve teacher efficiency and promote its use to create communities of educational practice that create and share experience and content
- **Pedagogy.** Through the competent use of ICT the teacher becomes a role model for students, a learner, coach, mentor and facilitator
- **Curriculum.** Use ICT to supplement curriculum content and as a tool for content creation and collaboration
- **Assessment.** Use ICT to conduct standardized assessments of and collect the results of students' endeavors as well as using it for cause-and-effect feedback loops to ensure continuous improvement
- **ICT.** Starting with the MacBook Pro computers, encourage teachers and students to engage in pervasive use of technology such as using social networks like wikis and blogs, supporting collaboration between each other, and sharing of knowledge

Apple MacBook Pro computers were chosen as the best technology platform to support 1:1 eLearning. They have an advanced operating system which acts as a unified platform for lots of different applications; they are pre-loaded with relevant collaboration applications such as iLife*, Chat Server* and email as well as media-rich applications and multimedia software. Finally, they are fast and responsive, thanks to 2nd generation Intel Core i5 processors, and are light, durable and robust with a long battery life.

Old versus new

To establish the success of the 1:1 project, Intel devised a measurement model based on different classroom types ranging from a traditional 'old' style of teaching to new 'lighthouse' teaching values [2].

- **The old classroom.** Technology is not used and teacher-student relationships are hierarchic and top down. The main teaching style is transfer of knowledge

Connecting people to a world of opportunity

The Intel World Ahead Program makes 21st century technology more affordable and accessible for millions of people worldwide.

Through hands-on collaboration with governments, telecommunications providers, technology companies, and other organizations, Intel World Ahead increases access to digital devices, the Internet, and local content. Working together with our partners, we develop long-term approaches that strengthen communities and encourage sustainable social and economic development.

Already, through more than 200 programs in over 70 countries, Intel World Ahead has helped to transform education, improve healthcare, and increase economic opportunities around the globe.

"To date, there have been positive results with astounding progress made; from project-based learning to more digital content and parents, students and teachers all embracing 1:1 eLearning."

Dr. Abdullatif Al Shamsi, Managing Director, Institute of Applied Technology

- **The collaborative classroom.** Technology is not used but the teacher-student relationship is mentor-apprentice based. The dominant teaching style is the construction of knowledge by the student.
- **The technology classroom.** Technology is used but the teacher/student relationship is hierarchic and top down, with the main teaching style transfer of knowledge from teacher to student.
- **The lighthouse classroom.** Technology supports and underpins the learning and the teacher-student relationship, which is mentor-apprentice based. The dominant teaching style is construction of knowledge by the students themselves,

In this latter lighthouse classroom, technology enables exploration and experimentation ensuring a more individual approach to student needs and learning styles. Multimedia and collaboration tools are also used to support learning and teaching.

An extensive report, 'IAT 1:1 Mac Enhancement' created by Apple Computers produced an extensive conclusion about the success of the project, the barriers that were encountered and potential benefits for both teachers and students. In summary it reached the following conclusions:

Vision and professional development

Initially, the vision of the 1:1 program was not clear to teachers, which resulted in discussions about the definition of the program and issues related to the 1:1 projects and working with the MacBook Pro computers.

Teachers appreciated the MacBook Pro computers but initially lacked the knowledge to use them effectively. This led to requests for MacBook Pro training, which resulted in peer review and help centering on technological issues.

Also, at first, some teachers complained that the computers were a distraction. But they then realized that engaging the students before the introduction of MacBook Pro computers was sometimes difficult and that the computers actually helped gain the attention of the students.

Some of the teachers also thought that the Macbook Pro computers were viewed by the students as toys. This reflected the view that there was a fundamental misunderstanding of the use of computers in the classroom.

However, as collaboration and teamwork improved, the value of the computers became evident. Ultimately, the teachers became familiar with the concept of student-centered learning and a project-based approach to some subjects.

Digital content and digital learning

Existing digital content in the classroom such as text, programs, simulations and video, was built upon, with a marked bias towards classical text-based content. However, innovative projects, such as collaborative assignments for students and student reports in the form of an iMovie* were noted.

Teachers also reported on their own initiatives to record instructional material, though sometimes these attempts did not fully develop because of technical issues. One example was, the lack of access to an internal wiki and blogging server, though these services were eventually accessed via external servers. Other issues included lack of bandwidth to transport large files, no sharing space on central servers and unwillingness by central IT to let students install software needed for the classroom.

Challenges and solutions

The project revealed challenges in the current implementation of 1:1 eLearning at the IAT. For example, MacBook Pro repair processes need to be optimized to ensure that all students have a fully functioning computer in the classroom or a swap unit so a student can continue to work if their computer is broken.

Another area for improvement was the use of Microsoft Windows*. Windows use became common because teachers and students were not familiar with the Mac OS X*. However, use of Windows means that the full potential of the MacBook Pro is not unlocked. Overcoming the widespread usage of Windows could be achieved by changing the curriculum to ensure Windows usage is not overly emphasized, so the curriculum does not create learning materials that require Windows. It would be useful to create a safe environment for teachers to familiarize themselves with the use of OS X.

Not all of the 400 teachers had enough skills and competence to teach in a 1:1 environment. This can be addressed by clearly communicating vision, removing technical issues that hinder adoption and providing a continual program of professional development. Making use of student helpers could also be beneficial.

Value and benefits

Despite the sometimes difficult hurdles of implementing a 1:1 eLearning program for 400 teachers and over 5,000 students across five campuses, there have been significant short-term and long-term gains and some key milestones have been achieved:

- Students have 24/7 access to computers and are confident in MacBook Pro usage
- Teachers are positive and supportive of the 1:1 learning initiative
- Increasing amounts of digital content are available
- Project-based assignments are carried out and successfully completed
- Wikis and blogs are used; the Macbook Pro's multimedia features are made use of
- Parents' acceptance of 1:1 creates a community around the school and has also increased enrollment

The study also utilized a number of key performance indicators (KPIs) to define organizational success and progress towards a specific goal. For every KPI there were three measures: the current level, the IAT ambition level and the NL Benchmark level (defined by a written questionnaire completed by three important Apple 1:1 schools in the Netherlands).

For example, for standardized test results, the current ambition level was 10 percent; the IAT ambition level achieved was 20 percent and the NL Benchmark 50 percent. The KPIs were wide-ranging, from the number of project-based assignments to technology supporting pedagogy.

Teacher benefits

Traditional teaching methods were limited. Teachers had to concentrate, on average, on 20 to 30 students for about 45 minutes in each lecture. The teacher delivers five to six lectures each day while the students attend six lectures a day. It was noted that students generally only concentrated, on average, for the first 20 minutes of each lecture, and subsequently were not engaged for the reminder of the class.

It's a known psychological fact that a person's attention can only be engaged for a limited amount of time, yet the 1:1 eLearning helped facilitate longer attention spans. To start with, the teacher delivery method is more compelling due to the use of digital media, which made the task of engaging the students a lot easier.

Students' attendance, interest and involvement in the lectures was increased, collaboration between students and teachers was enhanced, and peer learning among teachers was improved through the sharing of digital media content.

Dr. Raa Said, director, academic services, IAT, said: "1:1 eLearning has enhanced the self-learning skills among the students and teachers have become facilitators in promoting student-centric teaching. These are important steps as we move towards our lighthouse classroom."

Spotlight on Institute of Applied Technology

In 2005, realizing that education and training contribute to an individual's personal development, increase productivity and incomes at work, and facilitate participation in economic and social life, the Government of Abu Dhabi established the IAT to lead the development of career-based technical education. Its driving objective is to create a world-class career technical education system that will produce the scientists, engineers and technicians needed for the UAE to build a knowledge-based economy.

Find a solution that is right for your organization. Contact your Intel representative or visit Intel's Business Success Stories for IT Managers at **www.intel.com/itcasestudies**

[1] IAT 1:1 Mac Enhancement, March 15, 2011, J.LevelT for IAT, page 7

[2] IAT 1:1 Mac Enhancement, March 15 2011, J.LevelT for IAT, page 9

What is your vision of the world ahead? See how the Intel World Ahead Program can help you design programs that use technology to improve education and achieve other policy objectives. Talk to your Intel representative, or visit us at: **www.intel.com/go/ITforEd**

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