Nigeria Improves Learning Outcomes in 3,000 Classrooms with Innovative Intel® Education Solutions

The success of the Intel® Education Solution has created a platform for the integration of 1:1 eLearning within the Nigerian education system that can be replicated across other African countries.

The Intel® Education Solution is a complete education solution designed for 1:1 eLearning in classrooms around the world. It includes infrastructure, hardware, software, content, training, and support delivered by local vendors to meet local needs.

Key Outcomes

- Improved class performance: In just three years, the percentage of students in physics and English who passed their certification exams rose to nearly 100 percent.
- Higher class attendance: Almost all teachers report that the program has significantly improved student attendance.
- Increased student collaboration: Most students, as well as teachers, report that students now spend more time working together.
- Greater access to information: Teachers and students indicate improved access to information that improves the overall quality of education.
- Improved teaching: Teachers (88 percent) and administrators report increased teaching effectiveness, with the largest gains in urban schools.

Intel Program Strengthens Education in Nigeria

Intel® World Ahead’s innovative School Access Program (SAP) is supporting Nigeria in its transition to the digital world. SAP uses the Intel Education Solution to deliver Internet connectivity, teacher training, improved learning methods, and a digital curriculum to nearly 3,000 schools across Nigeria.

In just six years, the program has already achieved its ambitious goal of "creating an effective and sustainable ICT usage model in education," as shown by improved student test scores, higher class attendance, increased teacher effectiveness, and more.
ICT Is Key to Education Transformation

Intel's education solution is part of an ongoing effort by Nigerian educators and policymakers to use information and communication technologies (ICT) to transform teaching and learning, improve basic literacy, and create a new generation of leaders with 21st century digital skills.

Nigeria offers free education for grades K-12, but the country's education system faces many challenges, including poor school infrastructure and a lack of basic literacy. Only 44 percent of children in grades 7-12 attended school in the years 2007-2011, and according to the Internet world statistics (2012) just 28 percent of Nigerians have access to the Internet. (http://www.internetworldstats.com/stats1.htm)

To address these challenges, Intel created the comprehensive SAP education solution, which facilitates learning through modern digital technology. The solution features:

- PCs purpose-built for education
- Broadband Internet access, provided through a partnership with a key technology telecom service provider, Universal Service Provision Fund
- Teacher professional development
- Software, including eLearning classroom management tools and curriculum-based educational content

Key Elements of School Access Program

Intel first piloted the School Access Program (SAP) in a single Nigerian government school in 2007. The lessons learned from the pilot were used to guide the national rollout, which has reached about 3,000 schools in six years.

SAP's objective is to "entrench the use of ICT as a tool for teaching and learning," and to serve as a model for future programs that will also use technology to advance education within the country. The five main components of the program are:

1. The technology platform: The platform included PCs and related hardware, as well as Internet connectivity. The deployment included 296, 305 Intel® Classmate PCs to learners, 6000 teacher laptops, one server and a Local Area Network (LAN) for each school, and a wireless toolkit.

2. ICT readiness: Intel ensured that a working environment with functioning equipment was established in each school. This included refurbishing classrooms and deploying technology infrastructure such as alternative energy and electricity sources and improving the transportation and security infrastructure.

3. Integrated software: PCs were preloaded with local education content and software applications using eLearning solutions such as Skool Nigeria, local content from Nigeria's Ministry of Education, as well as sample lesson plans from Intel.

4. Professional development: Intel provided professional development for 6,000 teachers through a five day training period to help them successfully integrate technology in their classrooms.

5. Maintenance support: The program includes training and support for suppliers and engineers to ensure proper delivery, installation, and ongoing maintenance. This component focused on sustaining the programme by providing spare parts, offering technical support, performing repairs, and monitoring network centers.
ICT Program Delivers Impressive Results

A research study conducted in late 2012 assessed the results of SAP. As shown in Figure 1, one of the most significant improvements seen in the schools was a significant rise in Senior Certificate Examination scores in English and Physical Science—improvements that were likely aided by the SAP program.

Figure 1:

Figure 2 shows additional results from a survey of students, teachers, and administrators, which found the program has positively impacted students as well as teachers.

<table>
<thead>
<tr>
<th>Impact on Students</th>
<th>Impact on Teachers</th>
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<td><strong>Attendance:</strong> 94% of teachers report significantly improved student attendance.</td>
<td><strong>Enrollment:</strong> More than half of administrators report a positive impact on teacher enrollment.</td>
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<td><strong>Collaboration:</strong> Students and teachers indicate greater student collaboration.</td>
<td><strong>Staff effectiveness:</strong> 88% of teachers indicate a high impact on their personal teaching effectiveness.</td>
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<td><strong>Interest and morale:</strong> Teachers and administrators note increased student interest and morale.</td>
<td><strong>Administrative tasks:</strong> Most teachers indicate greater efficiency in completing administrative tasks.</td>
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<td><strong>Access to information:</strong> Students and teachers report having greater access to information that improves the school experience.</td>
<td><strong>Access to information:</strong> 82% of teachers and most administrators indicate that staff has better access to information.</td>
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The study also found that the Intel Education Solution, which was used to support the SAP program, had a strong impact on schools:

- Half the schools made additional investments in the Intel Education Solution
- Outside of class, 74 percent of teachers use the Intel Education Solution for research
- Teachers expressed confidence in their ability to use the Intel Education Solution

"It has benefitted us the students very much as it has taught us how to go to websites, internet, learn from each other and taught the teachers how to do their lesson plan through the computer." Learner
Intel’s commitment to sustainable Total Cost of ownership in Nigeria

Initial deployment costs for the project were very dependent on the Universal Service Fund. This included internet connectivity, transportation, and civil works at schools. An illustration of the relationship between the cost of acquiring the devices and the cost of deploying the infrastructure is shown in the pie chart.

It has been accepted for some time that the cost of deploying the technology platform or ICT infrastructure is but one element that needs to be considered in TCO studies and that often it is not even the dominant element. The costs of deployment of the infrastructure in Nigeria were thus very significant. The costs ranged widely as some schools had internet and some chose not to due to high costs for access. Schools had secure Labs where three or more students accessed each computer during the day. Per student cost for schools with Internet was approximately $56 and for non-internet schools $31. However this per student figure needs to be treated with caution as the deployment was very asymmetrical with over 60% of devices being deployed in Year 5 of the 6 Year TCO.

In order to make the program sustainable in an environment where the local ecosystem is not well developed, Intel made a significant investment in teacher professional development, deployment best practices, and a purpose built solution. This has led to successful teaching and learning using ICT's in Nigerian schools.

Lessons Learned

- Appropriate collaborators and investors (preferably local) need to be part of ICT programs to provide relevant ICT hardware, software, training, monitoring, and maintenance.
- To ensure sustainability, infrastructure deficiencies need to be addressed prior to adoption of an ICT program.
- In deploying ICT solutions in emerging economies, it is important to look beyond the device cost to determine whether there is a sufficiently affordable mechanism for deploying and sustaining the infrastructure in the long term.
- Appropriate ICT capabilities are required at schools to manage the ICT infrastructure and software.
- Teacher training is imperative to seamlessly integrate technology into classroom teaching.
- Education content should be linked to the established curriculum to enable seamless integration into the classroom.

Nigerian Program Serves as Model for Africa

With the help of Intel World Ahead and numerous partners across the country, Nigeria has transformed the educational experience for students across 3,000 schools. The 1:1 eLearning solution deployed in the country has improved student academic performance, enrollment, and morale, and is successfully preparing those students for life and work in the digital world.

The SAP program and its use of the Intel Education Solution serve as a model for additional schools across Nigeria—and for the rest of Africa. By successfully integrating ICT in the classroom, Nigeria joins a long list of countries that have improved the quality and relevance of the education they provide to the next generation.

Learn More

To learn more about Nigeria’s education solution and related programs around the world, visit www.intel.com/education

Source of Data:
Intel EMPG Summary Report: Nigerian Academic Impact Assessment Report, Dr. Armstrong Takang, December 2012,
Total Cost of Ownership Nigeria: A Report for Intel by Education Impact, 29 January 2013