

Transforming Education in Rural Philippines

A technology solution designed for rural infrastructure has significantly improved educational outcomes for Philippines students, with a complete educational transformation program supported by teacher professional development and strong support from principal and parents in the community.



“Technology has become a tool to facilitate teacher professional development – enhancing content knowledge and teaching strategies to ensure effective learning, both for the teachers, and the most important person in the school – the pupil.”

– Zenaida Ayop,
School Head,
MCES

Challenges

- **Overcome** rural infrastructure barriers to deliver a rich, technology and teacher-led educational experience.
- **Help teachers** to better engage students from diverse cultural and learning backgrounds.
- **Improve** educational outcomes to equip students for an ICT enabled 21st century workplace.

Solutions

- **Technology** puts interactive learning tools into students' hands.
- **Intel® Teach Program** provides professional development for teachers.
- **Microserver appliance** provides access to educational content.
- **Solar powered** ICT classroom runs energy-efficient Intel® Education devices.

Results

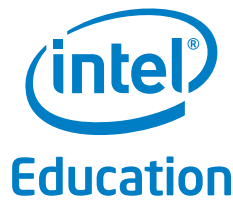
- **Education transformation** through a holistic approach combining teacher development, educational content, and appropriate technology with the strong leadership of a progressive principal.
- **Student engagement and achievement has increased.** The school's dropout rate is down, graduation and promotion rates are up, and average National Achievement Test scores have increased by 24 percent since the technology program was introduced.
- **Parents and teachers are excited about the new opportunities.** Parents believe access to technology ensures their children a better future, while teachers are finding new satisfaction and opportunity in their teaching.

Bringing a world of education to Marilog

While the small agricultural town of Marilog is only 50km from the country's third-largest city, Davao, it was only partially electrified and its major primary school, Marilog Central Elementary School (MCES), had no electricity, so the students had no access to modern learning technology.

Student attendance, promotion and retention were challenging. Some 5 percent of students dropped out annually and nearly 15 percent of students did not graduate.

The teachers of MCES did the best they could with available resources but often found that the traditional lecture style of teaching and the lack of access to technology left them struggling. “There was little interaction between the pupils and the teachers,” commented one teacher.



Student engagement drives strong results

Teachers identified the obstacles they faced in teaching their students and the MCES principal, Zenaida Ayop, worked tirelessly to help them. However, school administrators could do little to fix the problem until an Intel initiative was introduced to the school with a holistic approach to transform the education environment. This initiative would support teacher professional development with the introduction of powerful mobile computing devices, designed specifically for education, that were energy-efficient enough to be powered by solar panels.

The Intel® Teach Program provided professional development, which was delivered by accredited trainers from the nearby Ateneo de Davao University. Through this training the teachers learned how to use Project-Based Approaches to engage students and help them develop critical thinking and collaboration skills. MCES teachers proved to be enthusiastic students themselves as they learned new student assessment skills, how to create lesson plans for this new

pedagogy, and how to make the most of the new technology in their classrooms.

Teachers quickly learned how to use the new technologies, then progressed to finding new ways of integrating technology with the curriculum through ongoing engagement with Intel Teach instructors.

The new technology and new methods of teaching helped engage students in learning, ensuring that they stayed in school. The dropout rate declined dramatically, from 5.18 percent when the technology was introduced to 2.22 percent two years later.

"I became a mentor to my classmate," Grade 6 student Reyvie L. Maranga said. "Because of this, we got to know each other better. We learned to respect each other, and the bullying stopped."

Graduation rates also increased dramatically after the education transformation initiative was introduced. Whereas just 87 percent of students stayed through graduation in the year the computers were introduced, that figure jumped to 95 percent the next year and 100 percent in the 2012-2013 year.

Stronger engagement and student effort also helped improve students' educational achievement: average scores on the Philippines' National Achievement Test (NAT), administered to all Grade 6 students, increased by 24 percent in the two school years after the technology was introduced.

Students have become invested in the devices' role in improving education - for themselves and their peers.

"I used to be careless about things - always dropping or breaking them," said Grade 6 student Shella Mae G. Siy. "But I want to take care of our new devices because there is so much information in them."



"I want students in the lower grades to be able to use them and receive that information, as well, so I need to make sure I take care of the devices for them."

These results confirm that the education transformation initiative has positively impacted the educational outcomes by combining teacher professional development, content, and appropriate technology with the strong support of the school's principal and board.

Community support was also essential to ensuring that the program had its desired effect.

MCES and Intel staff worked closely with family and community member to encourage their active participation in the educational transformation.

Parents supported children in their homework. The school community ran fund-raising campaigns to further improve the school and its environment. And community groups built on newly available information resources to launch community education initiatives in areas such as maternal and child health care.

This significantly increased the benefits of the solution and raised MCES' status in the community. "Now MCES is a school that you prefer to send your children to," said grandparent Rufina Rabi. "I made sure to transfer my grandchildren to MCES."

A global classroom without Internet

The introduction of learning technologies dramatically improved teaching and learning at MCES. However, that transformation was just the beginning: in 2013, Intel began Phase II of the project as it rolled out 25 Intel® Education Tablets, a content distribution appliance capable of working while offline, and wireless connectivity that has given MCES a rich e-learning environment.



The 10-inch Intel® Education Tablet has been designed specifically for education, and built to meet students' needs. It features a ruggedised, dust- and water-resistant design and incorporates front and rear-facing cameras to facilitate content creation. Long battery life ensures the devices can last through an entire school day.



Designed as companions to classroom learning, the tablet supports experimental tools including a snap-on magnification lens and plug-in temperature sensor. It also includes the Intel® Education Software suite, – empowering student learning and helping teachers manage e-learning classrooms. Introducing new learning technologies to MCES presented challenges because conventional urban education technology relies heavily on live Internet access. However, at MCES the lack of reliable Internet connectivity prevented students from getting access to Internet content during lessons.

Limited Internet connectivity restricted the opportunity for live online learning, but it did not preclude the delivery of robust educational content. To work around the school's limited connectivity,

Intel engaged with Critical Links, whose cloud-managed C3* micro server appliance stores a range of educational content for delivery to teachers and students via a built-in wireless access point.

Designed for low power consumption, the C3 microserver appliance is loaded with a range of learning content including Intel® Education Resources; a complete version of the Wikipedia* encyclopedia; a range of open-source educational content; and content from the Department of Education. Content is available offline and is updated from Critical Links' cloud using a 3G mobile broadband service. This ensures that teachers and students have fast access to up-to-date content regardless of the bandwidth of their internet connection.

Because the micro-server and the tablets have no moving parts, they are very power efficient and offer high reliability. They are powered by a cost-effective solar power system that keeps the entire ICT environment running and available throughout the school day.

"Students now perform better, and now they are excited to be in class because of the pictures I can show them," said one MCES teacher. "They work more effectively together in spite of being from different groups and ability levels."



Parents have also welcomed the new technology, which has turned a rural and poorly-connected school into a model for education across the Marilog District and in other rural areas of the Philippines. With the support of MCES' technology-embracing teachers and administrators, they know that the future is no longer out of reach for MCES students.

"Now I know that it is possible to really prepare our students for life beyond Marilog," said teacher Jorge R. Alfante. "It's preparing them for the larger, global community."

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