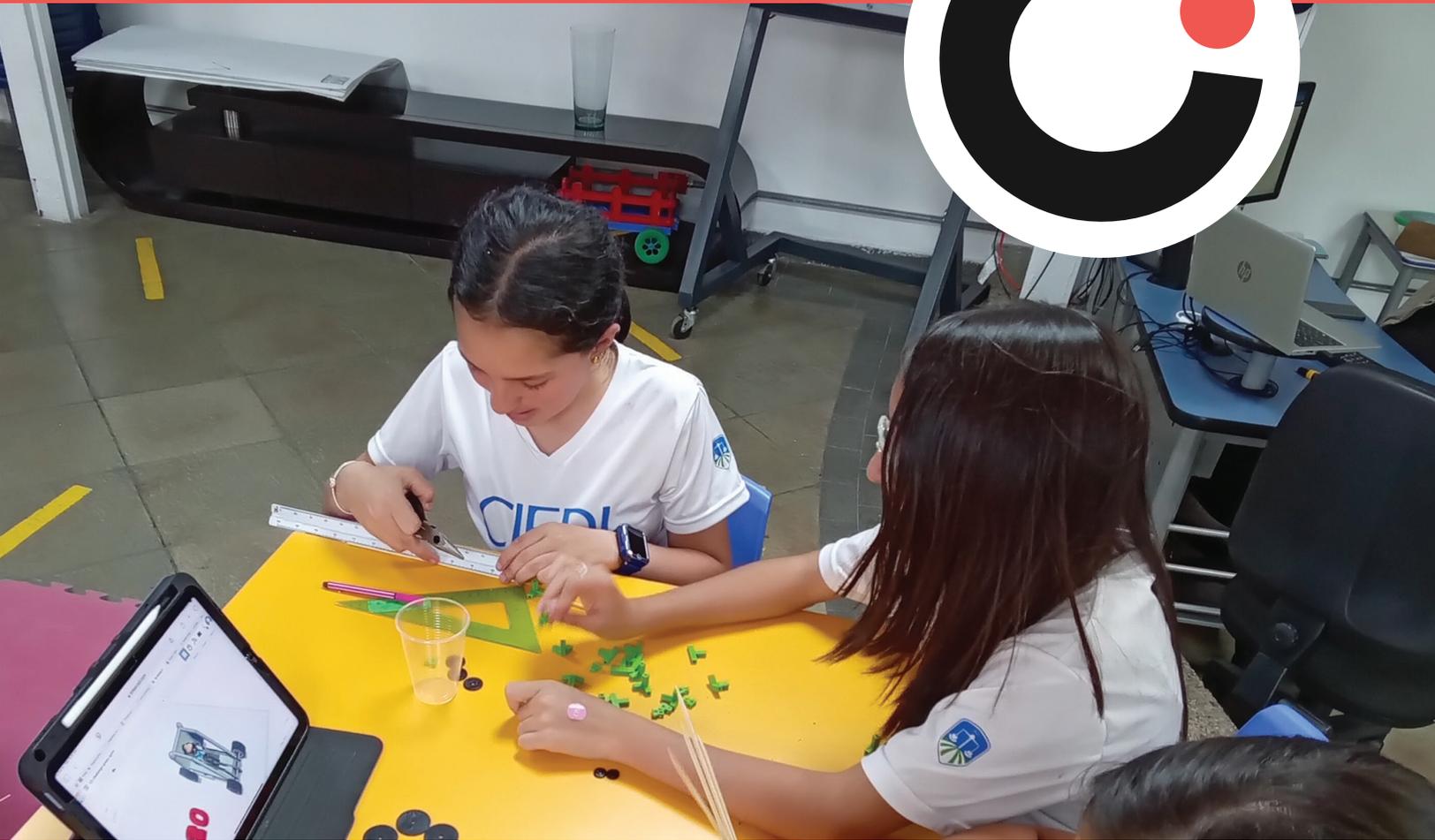


COMMUNITY STORY



Building a Roadmap for Continued Excellence

COGNIA AND COLEGIO CIEDI PARTNER TO STRENGTHEN STEM EDUCATION

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All photos courtesy of Colegio CIEDI

Colombia is now home to two of Latin America's top technology hubs, driving skyrocketing demand for STEM (science, technology, engineering, and mathematics) skills. Schools across the country have responded by developing STEM education programs to prepare students for this new world of work. However, since STEM instruction is still relatively new, educators are trying to determine where their programs stand in terms of quality.

One school taking a proactive approach is Colegio CIEDI, an International Baccalaureate (IB) Continuum school in Bogotá, Colombia. It has implemented an integrated STEM (i-STEM) model to help its approximately 450 students integrate and apply knowledge across STEM subjects and develop problem-solving skills.

The school's head, Felipe Palacios, discovered the i-STEM model while pursuing a doctorate in education at Australia's University of Melbourne. His doctoral research focused on innovative ways to make i-STEM part of primary and secondary school education.

CIEDI Seeks Support for i-STEM Model

In 2023, David Jácome joined CIEDI as the school's deputy head. He and Palacios began discussing the possibility of earning STEM certification from Cognia®, a nonprofit, nongovernmental organization that provides accreditation and certification services worldwide.

CIEDI was already accredited by Cognia, and Jácome had previously served as middle school principal at another Cognia-accredited school, the Colegio Bilingüe Richmond in Bogotá. In addition, he had volunteered as a Cognia review team member since 2019, served as a lead evaluator, and presented at Cognia Latin American IMPACT Conferences. Both Jácome and Palacios believed that tapping the nonprofit's global experience in STEM education and continuous improvement would make CIEDI's already excellent STEM program even more robust.

Jácome became further convinced that the nonprofit's STEM certification was a good match for CIEDI after attending the 2023 Cognia LATAM IMPACT conference in Bogotá. A breakout session provided an in-depth explanation about the process, and he was especially intrigued by the observation protocols and surveys in the Cognia Student Thinking and Experience Metric (STEM) suite of tools. "I felt that the Cognia tools were a very nice complement to what we already had in place and would help us measure a lot of the things we were doing," he said.

Rigor and Recommendations Increase Efficacy

The Cognia STEM Certification review team visited CIEDI in March 2024. "The process was amazing," said Jácome. "I've worked on Cognia Accreditation teams, so I already knew the drill. But for my staff, it was a very rigorous audit. They said they really appreciated that the certification was not just an easy-to-get stamp. We were properly assessed through classroom observations, interviews, and a documentation review. They felt the whole process was of a very high standard."

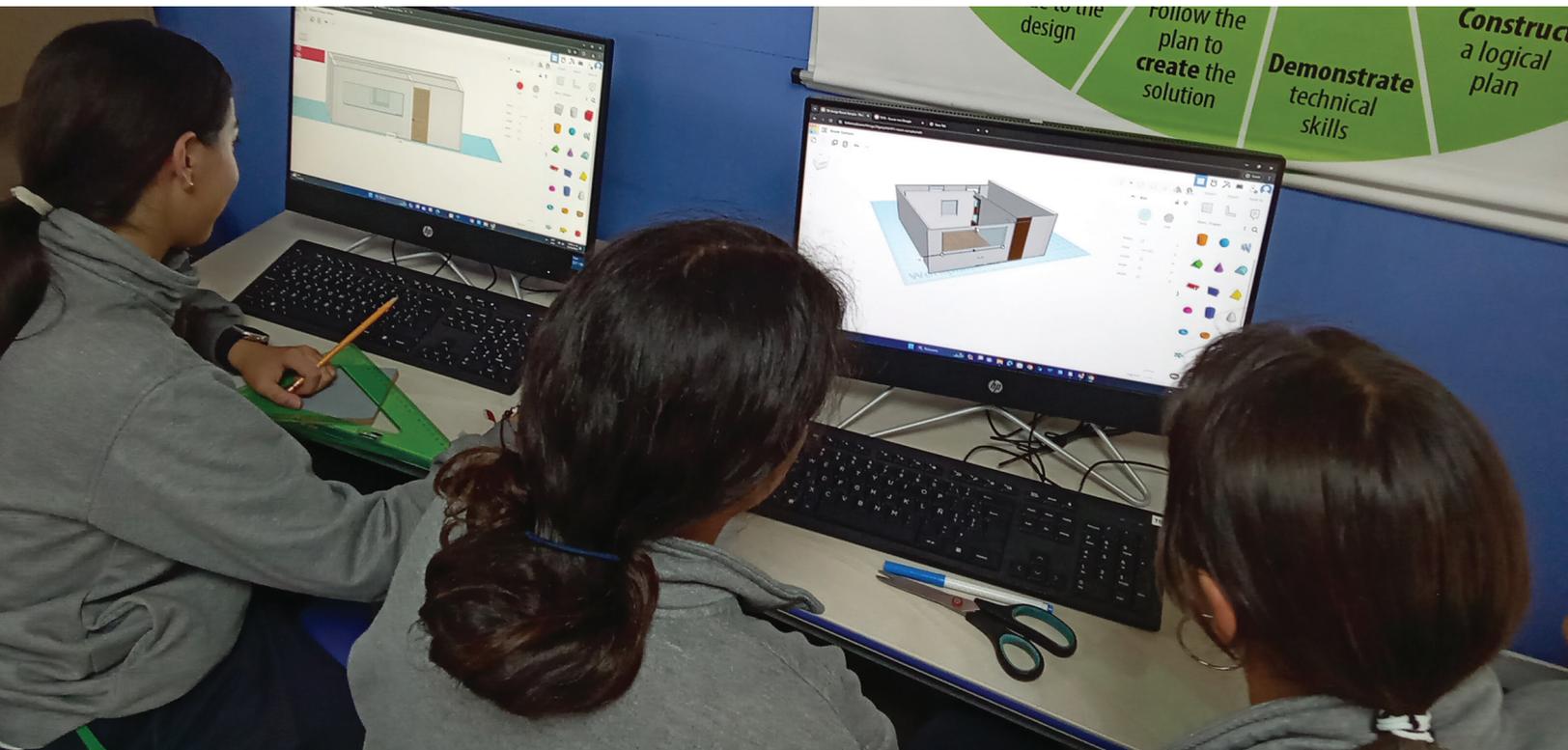
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Jácome reported that one of the Cognia team's most beneficial recommendations focused on developing protocols for documenting and analyzing students' mastery of STEM strategies and skills. "They also pointed to what we needed to improve in terms of measurement and analytics regarding STEM-specific standards," he said.

The review team noted that although CIEDI's STEM program was very robust, staffers were not measuring STEM literacy and outcomes. In response, the school created a strategic plan around measurement. "We're using the tools provided by Cognia with a little more intensity," said Jácome. "We have mapped them into specific timelines and use the Cognia Effective Learning Environments Observation Tool® (eleot®) to measure student engagement in our STEM units. That way, we can assess if we're going in the right direction."

In 2024, CIEDI became the first school in Bogotá and the second in Colombia to earn Cognia STEM certification.



Perfect Score for a Cognia Standard Achieved in the First Review

During the certification review, the Cognia team awarded CIEDI full marks for practices aligning with the fourth Cognia STEM Performance Standard: Leaders engage a diverse network of community partners and stakeholders in order to support and sustain STEM programs and initiatives.

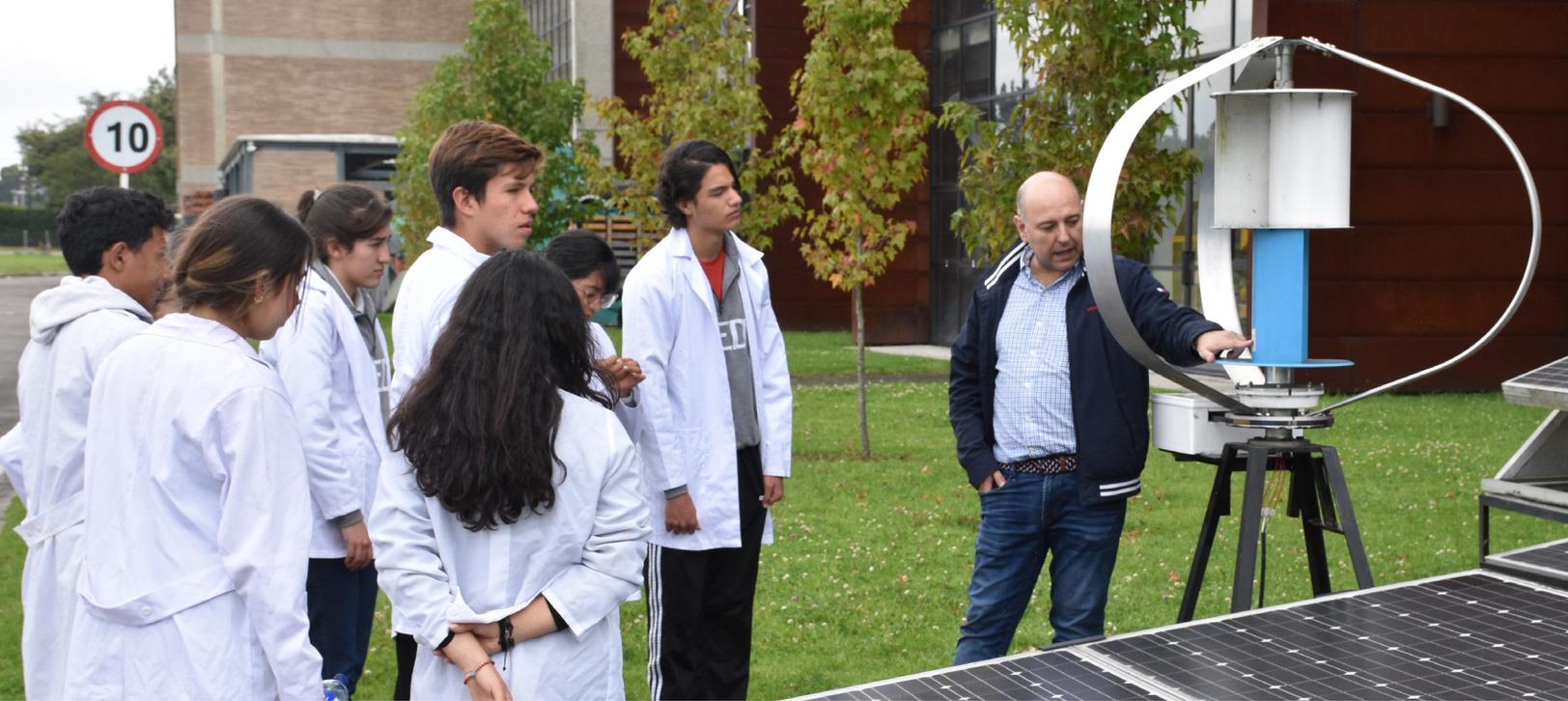
The school formed strategic partnerships with two universities, Universidad del Rosario and Escuela Colombiana de Ingeniería Julio Garavito, in 2022. Jácome stated that the partnerships enhanced the quality of CIEDI's hands-on, inquiry-based instruction. "The university educators bring a lot of rich, content-specific knowledge to the table," he said.

Jácome also noted that the relationship is mutually beneficial. Working with CIEDI has expanded the university professors' repertoire of methods for boosting student engagement. "That's the selling point for the universities," he said. "They win on more dynamic teachers, and we win on their specific knowledge." Jácome reported that CIEDI's primary and preschool teachers have been particularly good at providing the professors with new ideas for keeping student interest high. "It's amazing to see a university professor teaching first graders through hands-on activities, and he's dressed up for his audience", he said.

CIEDI manages the university partnerships by using the methodology that Palacios created in his doctoral studies. Each partnership starts with both sides signing a Memorandum of Understanding. Then, a school delegation is shown the university's state-of-the-art laboratories that could potentially be used for STEM units.

Afterward CIEDI and the university partners create an interdisciplinary community of practice. They identify which units offer the best opportunities for collaboration, and faculty members from both institutions are selected for inter-institutional teams. Each team meets to clarify the learning outcomes and expectations of their STEM unit. They also establish a timeline of follow-up meetings, checkpoints, and work sessions on both campuses.

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Most (80%) of the STEM unit is delivered on CIEDI's campus, with university professors visiting the school and giving lectures as required. The remaining 20% involves student groups visiting the university to test their projects in contemporary science practice learning spaces.

Each unit includes three visits to the university campus. After an initial test, the students return to appraise any project upgrades they've made. During both visits, they received feedback and guidance from university professors involved in the unit.

In the third and last visit, students' projects undergo a final performance test of their prototypes, which are assessed by university deans and other professors. This serves as the summative evaluation for the student group.

Among the I-STEM units developed through the school-university partnership, are the creation of small-scale animal shelters by first-grade students, 3D-printed turbines tested in a wind tunnel by tenth graders, and a small-scale 3D model of a soundproofed music classroom by ninth-grade students. Palacios strongly believes that "the interdisciplinary community of practice enabled cross-curricular work and ultimately allowed for these innovative learning experiences."

The university partnerships have increased awareness of CIEDI as a school option for university employees' children. "The ones that want their kids to go to a STEM-related school have us on their radar," said Jácome. "Those are the families we want because they're already interested in STEM-related areas."



Moving forward by expanding on strengths

To further enhance their STEM program and the application of Cognia Certification Standard No. 4, CIEDI leaders are exploring partnerships with schools in other countries. “We have been talking to schools in India, Japan, and Costa Rica,” Jácome said. “We’re trying to leverage interest from international universities.”

Additionally, CIEDI and its university partners are investigating potential partnerships with companies in STEM industries.

CIEDI is also using its current university partnerships as a model for enhancing internal workflows. The Cognia review team had suggested that the school implement one-on-one coaching sessions for teachers. So, the school plans to base those new sessions on the one-on-one collaborative sessions already happening with local university professors.

According to Jácome, the Cognia STEM certification has enhanced CIEDI’s reputation as a quality STEM program. “We are getting better known within the community,” he said. He added that the Cognia review team’s recommendations and its measurement tools will help CIEDI strengthen its STEM program for years to come.

“I knew, from past experience, that Cognia would provide us with proper feedback on how we could improve,” he said. “Now we have a clear roadmap of what to aim for and where to go.”

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