

# INTERNATIONAL ICASE REPORT: SCIENCE EDUCATION IN LATIN AMERICA (2024-2026)

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## Executive Summary

This report provides a comprehensive overview of science and STEM education initiatives, research, and institutional monitoring in Latin America from 2024 to 2026. Key findings highlight an increasing regional focus on integrating Artificial Intelligence (AI) into classrooms, promoting climate change resilience, and advancing energy transitions. Academic networks like LASERA and AAPT-MX have served as vital engines for teacher professional development and pedagogical innovation. However, deep-seated structural challenges persist. Data from PISA and regional monitoring indicate that nearly 50% of 15-year-olds still lack basic scientific competencies, exacerbated by critical resource and connectivity gaps between urban and rural areas.

Este informe ofrece una visión integral de las iniciativas, investigaciones y monitoreo institucional de la educación en ciencias y STEM en Latinoamérica entre 2024 y 2026. Los hallazgos clave destacan un creciente enfoque regional en la integración de la Inteligencia Artificial (IA) en el aula, la promoción de la resiliencia climática y el impulso a la transición energética. Redes académicas como LASERA y AAPT-MX han fungido como motores vitales para el desarrollo profesional docente y la innovación pedagógica. Sin embargo, persisten desafíos estructurales profundos. Los datos de PISA y el monitoreo regional indican que cerca del 50% de los jóvenes de 15 años aún carece de competencias científicas básicas, brecha que se agrava por la disparidad crítica de recursos y conectividad entre las zonas urbanas y rurales.

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## 1. Regional Initiatives and Scientific Cooperation

During the 2024-2026 period, the region's educational agenda focused heavily on ecological transition, open science, and institutional networking.

- **CSIELO Project (Climate Education):** Formally launched in Lima and promoted at COP30 in Belém, this macro-project led by the IRD and the *Office for Climate Education* operates between 2025 and 2026 in **Peru, Ecuador,**

**Colombia, and Mexico.** Its goal is to train **3,000 teachers** and mobilize **100,000 youth** using science education as a driver for climate resilience.

- **ENERGYTRAN Project (2024-2025):** Coordinated by the [Organization of Ibero-American States \(OEI\)](#) with European Union funding (*Horizon*), this initiative links higher and scientific education with the energy transition across Latin America.
  - **UNESCO Residency 2025:** An innovation space within the *Open Educational Movement for Latin America* aimed at co-designing Open Educational Resources (OER) and evaluating the impact of **Artificial Intelligence** on science teaching.
  - **Consolidation of LASERA Networks:** The [Latin American Science Education Research Association \(LASERA\)](#) strengthened its international academic network. This ecosystem connects scientists, administrators, and teachers across all educational levels to standardize science teaching and participatory research methodologies.
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## 2. Monitoring, Research, and Scientific Dissemination

Regional academic and banking platforms worked in parallel to map classroom quality and implement active methodologies.

- **LASERA International Seminars:** These global seminars focused their agenda on **Inquiry-Based Science Education (IBSE) and the STEAM pedagogical approach**. They were carried out via virtual platforms and hybrid scientific collaboration networks.
- **Scientific Production in LAJSE:** The [Latin American Journal of Science Education \(LAJSE\)](#) served as the official peer-reviewed outlet for LASERA's research. Throughout this biennium, the journal prioritized publishing indexed articles, curricular reviews, and classroom experiences aimed at closing the gender gap in STEM careers.
- **ERCE 2025 Study (UNESCO LLECE):** Ministries of education coordinated preparations for the regional **ERCE 2025** study, which measures primary school learning achievements in science and mathematics across Latin America.
- **Geospatial Planning:** In early 2026, the [Inter-American Development Bank \(IDB\)](#) boosted the use of georeferenced data to solve school infrastructure, digital connectivity, and vulnerability challenges against climate change.

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### 3. Diagnosis and Gaps in Science Learning

Despite the rise of regional programs, international reports published between 2024 and 2026 warn of persistent structural issues:

| Critical Indicator | Regional Situation                                                                                                                                                   |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| School Lag (PISA)  | Approximately <b>50% of 15-year-old students</b> in the region fail to reach the minimum proficiency level in science.                                               |
| Regional Leaders   | <b>Chile and Uruguay</b> lead the indices for optimal schooling results (students completing school on time with basic competency levels).                           |
| Territorial Gap    | Reports from <a href="#">UNESCO (GEM 2026)</a> and the IDB show an alarming disparity in access to labs and science resources between <b>urban and rural areas</b> . |

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### 4. Congresses, Exchange Networks, and Professional Development

The circuit of specialized congresses and national chapters structured the regional scientific agenda, placing particular emphasis on physics education and regional ecosystems:

- **CIEDUC 2025:** The Congress of the *UNESCO Chair in Science Education for Latin America and the Caribbean* (co-organized with the University of Alcalá) stood out as a major forum for discussing Ibero-American research in science didactics.
- **IV LatinSoTL Congress 2026:** Held in Santo Domingo (Dominican Republic), this event prioritized **curricular innovation** and participatory research to transform higher education science classrooms.
- **AAPT-MX Annual Meetings (Mexico Chapter):** The Mexico Section of the [American Association of Physics Teachers \(AAPT-MX\)](#) drove physics education research, pedagogical innovation, and teacher networking across North and Central America:
  - **XVII Annual Meeting AAPT-MX (November 2024):** Hosted at the [Universidad Autónoma de Nuevo León \(UANL\)](#), the summit centered on

active learning, information technology integration, and closing gender gaps in STEM.

- **XVIII Annual Meeting AAPT-MX (November 2025):** Held in hybrid format at CICATA Legaria (IPN) and CECyT 2 in Mexico City, this meeting addressed the "**Challenges and Opportunities of Physics Teaching in the Era of Artificial Intelligence**".
  - **XIX Annual Meeting AAPT-MX (November 2026):** Convened at [CUCEI - Universidad de Guadalajara](#), focusing on digital transformations, active methodologies, and educational physics advancements.
  - **LASERA Manaus Symposia (Brazil):** Organized by the AIECAM research group at the [Universidade do Estado do Amazonas \(UEA\)](#), these meetings contextualized science education for biodiverse environments:
    - **XI Symposium (November 2024):** Focused on designing mathematics and natural science learning sequences adapted to the Amazon context.
    - **XII National Symposium (November 2025):** Debated the integration of undergraduate and postgraduate students with teachers from the interior of the Amazonas state to mitigate local connectivity and infrastructure gaps.
    - **XIII Symposium (November 2026):** Structured under the theme "**STEAM in Education: Educational Transformation in the Era of Artificial Intelligence**", focusing on active methodologies for physics, chemistry, and biology teacher training.
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## 5. Strategic Policy Recommendations

Based on the events, research trends, and metrics monitored from 2024 to 2026, the following policy guidelines are recommended for Latin American ministries of education:

- **Bridge the Digital & Rural Infrastructure Divide:** Scale up georeferenced investment plans (following IDB frameworks) to supply remote schools with stable internet connectivity and functional, robust laboratory kits for natural sciences.
- **Institutionalize Context-Specific STEM Frameworks:** Adopt localized teaching strategies—similar to the LASERA Manaus model for biodiverse regions—ensuring science curriculums directly reflect local environmental, social, and economic realities.

- **Regulate and Integrate AI in Science Didactics:** Establish regional frameworks for the ethical and practical integration of Artificial Intelligence in physics, chemistry, and biology classrooms, leveraging the findings from the AAPT-MX 2025/2026 summits.
- **Strengthen Continuous Professional Development (CPD):** Create permanent, fully funded pipelines linking universities and active research networks (such as LASERA and AAPT-MX) with K-12 public school teachers to institutionalize Inquiry-Based Science Education (IBSE).
- **Target Gender Parity in STEM:** Expand regional and national initiatives specifically designed to remove structural barriers and encourage girls to enroll in advanced scientific and mathematical paths from early primary education.

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Sincerely yours,

César Mora,