

# Brief history of the development of cognitive neuroscience applied to education in the Dominican Republic 2009-2022

## Breve historia del desarrollo de la neurociencia cognitiva aplicada a la educación en la República Dominicana 2009-2022

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### Abstract

Cognitive Neuroscience Applied to Education has experienced constant development in the Dominican Republic since 2009. The knowledge provided by neuroscience to understand the role of cognitive functions and emotions in learning has revolutionized teachers throughout the country in an increasing way. However, a creative and innovative vision of education that prioritizes inclusion, respect for diversity, collaboration, social responsibility, critical thinking, and scientific evidence; needs an innovative proposal for teacher training at all levels of the educational system. From 2009 to 2022, not only were crucial topics of Cognitive Neuroscience Applied to Education in the Dominican Republic deepened, but also the levels of dissemination and understanding of the profound need for transformation of the Dominican educational system so that it can respond to the Neuroeducation proposals.

**Keywords:** Cognitive Neuroscience; Education; Neuroeducation; NeuroPedagogy; Neuroethics; Emotion; Learning.

### Resumen

La Neurociencia Cognitiva Aplicada a la Educación ha experimentado un desarrollo constante en la República Dominicana desde el año 2009. Los conocimientos aportados por la neurociencia para comprender el papel de las funciones cognitivas y las emociones en el aprendizaje han revolucionado a los docentes de todo el país de manera creciente. Sin embargo, una visión creativa e innovadora de la educación que priorice la inclusión, el respeto a la diversidad, la colaboración, la responsabilidad social, el pensamiento crítico y la evidencia científica; necesita de una propuesta innovadora de formación docente en todos los niveles del sistema educativo. Del 2009 al 2022, no sólo se profundizaron temas cruciales de la Neurociencia Cognitiva Aplicada a la Educación en República Dominicana, sino también los niveles de difusión y comprensión de la profunda necesidad de transformación del sistema educativo dominicano para que pueda responder a las propuestas de la Neuroeducación.

**Palabras clave:** Neurociencia Cognitiva; Educación; Neuroeducación; Neuropedagogía; Neuroética; Emoción; Aprendizaje.

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*There is a country in the world placed on the same path as the sun. (...) /  
Simply fruit-bearing / Fluvial. / And material (Pedro Mir).*

Seen from the eyes of this Dominican author, mentioned by Rosario (2021), it was only a matter of time before this beautiful and productive country could understand, value, and demonstrate that Cognitive Neuroscience should be a priority on the national agenda as an effective response to a battered educational reality, both in successful solutions and in the revitalization of learning ecosystems, which are only possible from a deep knowledge of how the brain works.

Worldwide, it is recognized as vital that students, learning managers, and behavior professionals know and master the brain bases that govern human behavior. Cognitive neuroscience is the convergence of two disciplines: neuroscience and cognitive psychology, which have provided information on the material bases of human behavior's cognitive and emotional processes (Lozoya et al, 2018). Learning is a process that is already genetically programmed in the brain of all organisms (Mora 2013).

In 2005, the Doctoral Program in Psychology with an orientation in Cognitive Neuroscience Applied to different branches of scientific work begins in Buenos Aires, Argentina, allowing a binding bridge to the Dominican Republic. This program of the Maimonides University (UMAI) receives the first Dominican candidates in 2006.

Neuroeducation in the Dominican Republic begins to take root with the development of clinical neuropsychology. In 2009, Neurotraining, a specialized and multidisciplinary service in neuropsychology and neuroeducation, was born. Its purpose is, through training and support initiatives, to attend in a multidisciplinary way to the needs of public and private educational centers at all levels of the metropolitan area of the capital Santo Domingo, and, in addition, to respond to the clinical demands of educational institutions and the families.

In August 2010, the Dominican Institute for the Study of Integral Health, and Applied Psychology (IDESIP), Neurotraining, and the Neurobehavioral Institute of Miami organize the 2nd Inter-American Congress of Applied Cognitive Neuroscience, which, without a doubt, marks a milestone in the development of cognitive neuroscience in the country. The scientific agenda of the event covered different aspects of cognitive neuroscience, addressing the “neuro” phenomenon from psychological, psychiatric, neurological, pedagogical, and epistemological perspectives, among others.

In the process of applying Cognitive Neuroscience and in the search for formulas to merge it and the educational sector (Educational Neuroscience), in 2009 a series of diplomas in Neuropedagogy Applied to Children began in private schools and in 2014 in the public sector. reading, writing, and math processes. This effort involved the Ministry of Education (MINERD) and the National Institute for Teacher Training and Training (INAFOCAM), which hired NEUROTRAINING, companies specializing in neurological diagnosis and treatment, and CACATÚ, dedicated to the development and innovation of educational projects, to train more than 4 500 teachers throughout the country. This strategy continues today with an offer of diploma programs, certifications, and seminars.

As of 2014, at the request of the Presidency of the Republic, the Ministry of Higher Education, Science, and Technology (MESCyT) promotes the integration of the “Neuroscience and Learning Seminar”, as part of the initial teacher training program., primary and secondary, in coordination with the Ministry of Education (MINERD). To make this possible, the MESCyT sponsors training sessions, reiterating the interest that the university professors responsible for the contents update their knowledge about the biological and psychological processes involved in the act of learning.

In this same period, efforts are focused on bringing this knowledge to the professional public and disseminating the basic concepts that govern neurodevelopment processes in early and late childhood. She begins with a diploma in Cognitive Neuroscience Applied to Neurodevelopment at the Universidad Central del Este (UCE), in the city of San Pedro de Macoris. Simultaneously, in Santo Domingo through NRD (NeuropsicologiaRD.com), which worked on the subject until 2018, bringing this knowledge through an agreement with the National Institute for Early Childhood Care (INAIPI) and all the personnel who work with the issue at the national level.

In October 2015, the 1st. Dominican Congress of Cognitive Neuroscience Applied to Education, with the endorsement of INAFOCAM, the Ministries of Education and Higher Education, Science and Technology, the Organization of Ibero-American States for Education, Science and Culture and the INTEC and Pontifical Catholic universities Mother and Teacher (PUCMM). Designed by CACATÚ and Neurotraining, with the participation of Dr. Néstor Román, Director of the Applied Cognitive Neuroscience Doctorate at Maimónides University, giving the keynote address “The Neuro Cognitive Model of the Person”. His keynote speech served as an introduction for the signing of an agreement with the Doctorate and with the Ibero-American Network of Cognitive Neurosciences, chaired and led since 2014 by Dr. Fabián Román, whose work in Ibero-America promotes, disseminates, and investigates in the field of Cognitive Neuroscience Applied to Education and has been a pillar of support and reference for our country in different training programs (INAFOCAM, 2017).

The Diploma in Neuropedagogy applied to the teaching-learning processes of reading, writing and mathematics opened the doors to knowledge of cognitive neuroscience applied to pre-university education. The evaluations of this program reveal positive indicators of the assimilation of content and its application to teaching practices to stimulate and increase students’ cognitive abilities. In the Dominican educational system, almost 80,000 teachers are willing to participate in improvement and training processes, “and, in the end, we do all of this because we want better teachers for the Dominican Republic” (Organization of Ibero-American States-OEI, 2015).

Neuroeducation is an active science that involves a continuous task, and, above all, dissemination accompanied by Neurodidactics and the passion of the professionals who take care every day to make it happen in the Dominican Republic, sowing new knowledge in each student, each teacher, every manager, and decision maker (The National, 2015).

### *State and current situation*

The association between Cognitive Neuroscience and learning-teaching paradigms constitutes the basis for a new vision in the educational field that promotes the development of skills and abilities that come from an adequate neurodevelopmental process (Pherez et al, 2018).

In June 2022, the Dominican Society of Cognitive Neuroscience (SDNC) was established, to accompany and manage actions for the development of Cognitive Neuroscience in the Dominican Republic (Alvarado, 2022).

The progressive incorporation of Cognitive Neuroscience applied to Education is integrating biology, cognitive science (cognitive psychology, cognitive neuroscience), developmental science (and neurodevelopment), and education, to investigate from new perspectives the biological bases of cognitive processes. of teaching and learning and cause them to be optimized in all their dimensions. To the extent that educators have a better understanding of how the human brain works in the learning process, that knowledge will become more effective and meaningful for students and the educator himself.

The Dominican Republic makes great efforts to improve its educational system. With the execution of 4% of the Gross Domestic Product (GDP), the Ministry of Education, through INAFOCAM – the body in charge of teacher training policies – has initiated a strategy aimed at optimizing the quality of teacher training, impacting their human and professional development, with new proposals for continuous training (INAFOCAM 2017).

Within these strategies, CACATÚ and Neurotraining have developed a vast proposal for continuous training from Neuroeducation, which includes a series of programs designed based on the training needs of Dominican teachers, among which the diploma in Neuropedagogy applied to teaching-learning processes of reading, writing, and mathematics, Diploma in Neuroeducation and cognitive disorders, Diploma in Neurodidactics: Forming schools of the future. Diploma in Neuroscience applied to the comprehensive development of early childhood, Certification in Inclusive Education, and attention to diversity. With the endorsement of INAFOCAM and the support of private banking entities and in short with programs at the national level based on Neuroethics How It Values Being directed to the development of social cognition capacities, constant work is done for effective training, inside and outside the classroom., with a view from Cognitive Neuroscience Applied to Education.

Efforts are not only directed at teachers, but they also include counselors and school psychologists in the public system through the Diploma in Cognitive Neuroscience and Pedagogy, in joint action with the Ministry of Education, INAFOCAM, and IDESIP, where 120 professionals from this area from Regional 01, 390 from Regional 02 and 800 from Regional 10 (INAFOCAM, 2022), were impacted through knowledge about behavior and the cognitive and emotional processes of human behavior.

Many of these programs are part of a regional strategy for the development of Cognitive Neuroscience carried out through the Ibero-American Network of Cognitive Neuroscience, generating ecosystems, integration, and articulation of programs and projects, with institutions, universities, and professionals related to the development and promotion of Cognitive Neuroscience, in countries such as the Dominican Republic, Argentina, Colombia, Puerto Rico, Ecuador, Peru, Portugal, and Spain, which hold regional scientific events every year. (Román & Poenitz, 2018).

*The brief history of Neuroeducation in the Dominican Republic in numbers:*

- 2 international congresses with the participation of 12 countries.
- 7 education programs continue to be maintained in the last 10 years.
- 2700 new teachers graduated with programs that include Neuroeducation.
- 10 thousand certified teachers trained in different Neuroeducation programs.
- 1 310 educational psychologists and counselors in neuropedagogy programs.
- More than 26 000 hours of training.

#### CONTRIBUTOR ROLES

Rosalba E: Gauteaux-Betancourt. Conceptualización, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing-original draft, Writing review / editing.

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#### REFERENCE

Alvarado, L. F. (2022, June 12). A new Medical Society on Cognitive Neuroscience emerges. *Santo Domingo Dominican Republic*.

<https://www.resumendesalud.net/33-sociedades-medicas/33510-se-constitución-una-nueva-sociedad-medica/>

INAFOCAM. (2022, November 11). *Inafocam and IDESIP open diploma course in Cognitive Neuroscience and Pedagogy*.

<https://www.inafocam.edu.do/index.php/noticias/item/1323-inafocam-e-idesip-aperturan-diplomado-en-neurociencia-cognitiva-y-pedagogia>

INAFOCAM. (2017, Feb 6). *Citizen commitment letter*.

<http://www.inafocam.edu.do/index.php/sobre-nosotros/quienes-somos>

- Lozoya, E., Amaya, S. & Lozoya, R. (2018). Cognitive neuroscience in the initial training of Educational Research teachers. *Science and Education*, 2(3), 11–25. <https://doi.org/10.22206/cyed.2018.v2i3.pp11-25>
- Mora, F. (2013). *Neuroeducation*. Publisher Alliance.
- OEI. (2015). *Congress of Neurosciences Applied to Education*. <https://oei.int/pt/escritorios/republica-dominicana/noticia/realizan-congreso-de-neurociencias-aplicadas-a-la-educacion>
- Pherez, G.; Vargas, S. & Jerez, J. (2018). Neuro learning, an educational proposal: tools to improve the praxis of the teacher. *Civilizing Social and Human Sciences*, 18(34), 149–166. <https://doi.org/10.22518/usergioa/jour/ccsh/2018.1/a10>
- Román, F. & Poenitz, V. (2018). Neuroscience Applied to Education: contributions, challenges, and opportunities in Latin America. *RELADEI. Latin American Journal of Early Childhood Education*, 7(1), 88–93. <https://revistas.usc.ga/index.php/reladei/article/view/5272>
- Rosario, B. (2022). *There is a country in the world. Evocation of Pedro Mir*. Universidad Católica Madre y Maestra (UCMM).
- The National. (2015, October 21). *INAFOCAM says it has trained 1,900 teachers in neuroscience*. <https://elnacional.com.do/inafocam-dice-ha-formado-1900-maestros-en-neurociencias/>