



**ABC in Scientific Education
Hands-on in Rio de Janeiro / Brazil**

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**Science education by investigative teaching processes:
implementing and expanding with quality**

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The Oswaldo Cruz/ Fiocruz Institute: tradition and pioneering

-Tradition: a centenarian research institute, temple of Brazilian science known worldwide.

- Pioneering: social commitment to improve the quality of life of the populations in several corners of the country

Institutional missions: scientific and technological development, especially in the field of life sciences geared towards promoting health

- Research, Medicine Production, Conservation of Collections and Graduation Programs

Current issues:

If techno science is progressing in the country, why hasn't there been any improvement in quality of life?

Why have diseases that had been defeated in the past emerged again (or reappeared)?

Why have the causes of mortality/morbidity not changed?

Why can't situations be prevented if science has already pointed out the determining factors of problems, considering that technology has already offered possibilities of solution, treatment and cure?



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ABC – the acronym:

It expresses the support given by the Brazilian Academy of Sciences to develop the project (in collaboration with the French Academy – Hands-on Project)

**Emphasis on improving science education in elementary school
Scientific education – against exclusion and in favor of citizenship**



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Main characteristics:

**Literacy (in the sense of an intermittent process)
with an inter/transdisciplinary approach**

**Investigative Process (research) – It is not a simple process
of stimulation to experimentation, but a process to stimulate
questioning, elaborating forecasts and hypothesis testing.**

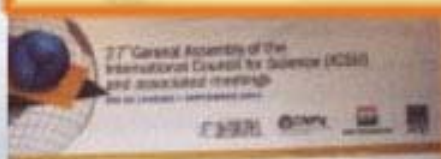
**To build an environment that fosters debating (exchange of ideas)
and develops the capacity of discussion and argumentation.**

**Against exclusion – valuing the culture of illiterate families,
with the purpose of reducing the gap (distance, separation)
between scientific, school and community culture.**



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Central partners: educators (elementary school teachers, coordinators, principals), scientists and science teachers





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Project implementation strategy:

- Political support**
- Funding**
- Participant's training**

**Important intersectorial partnerships in Rio de Janeiro:
Oswaldo Cruz Foundation, Education Government Agency,
Ministry of Education (Pedro II School),
Brazilian Academy of Sciences, French Consulate**



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Map of the 29 teaching government divisions and number of schools per region of the State of Rio de Janeiro



Schools / Coordination

1- Northwest 1	19	2- Northwest 2	75	3- Northwest 3	37	4- North 1	143	5- North 2	29
6- North 3	16	7- Coast Region 1	43	8- Coast Region 2	59	9- Mountain Region 1	105	10- Mountain Region 2	91
11- Mountain Region 3	44	12- Mountain Region 4	39	13- Center-South 1	34	14- Center-South 2	31	15- Paraiba river Region 1	51
16- Paraiba river Region 2	60	17- Paraiba river Region 3	22	18- Ilha Grande Bay	22	19- Metropolitan area 1	130	20- Metropolitan area 2	110
21- Metropolitan area 3	144	22- Metropolitan area 4	127	23- Metropolitan area 5	103	24- Metropolitan area 6	42	25- Metropolitan area 7	51
26- Metropolitan area 8	63	27- Metropolitan area 9	63	28- Metropolitan area 10	125	29- Metropolitan area 11	46		

Pedro II Federal School – an institution with 11,000 students, located in Rio de Janeiro and divided into 7 units disseminated throughout the city



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Quality of expansion:

**Assuring experts' training:
Graduation in Scientific Education**

Theme topics:

I - Concepts, teaching conceptions and practice

II - Scientific updating in specific areas



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III - Production of teaching material

IV - Methodology and analysis to disseminate knowledge

V - Creativity and science



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Objectives:

Shared elaboration of teaching materials and strategies that meet the philosophy and the methodology of the ABC in Scientific Education project (Challenges of observation, Elaboration of different hypothesis, Solutions that lead to other questions)



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**The follow-up evaluation
is the process really investigative?**



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Challenges of Interaction

Science	School
To stimulate scientific vocation	to support teachers, to stimulate investigative work in teaching – solving enigmas
To develop scientific creativity	to offer spaces of creation with the possibility of multiple answers for an endless chain of questions
To promote interaction between different areas of knowledge	To favor the perception that innovative solutions are interdisciplinary ones and that life phenomena cannot be explained by isolated disciplines.



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Science as a part of culture

Universal Science

**Accessible science
teaching**

Humanistic science

**science teaching linked
to ethical issues**

Committed science

**Contextualized
science teaching**



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