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INNOVATIVE ENVIRONMENTS FOR LEARNING SCIENCE & MATHEMATICS

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SCI&MATH CREATIVE LAB

The CreativeLab_Sci&Math® is **a new didactic approach** of the teachers of the Department of Mathematic and Natural Sciences of Polytechnic Institute of Santarém/School of Education. Being aware of importance of educating future educators in teaching practices associated with new learning environments, we developed an initiative to transform traditional labs into innovative educational environments and named it CreativeLab_Sci&Math®. This initiative also focuses in teaching new ways of learning Mathematics and Science.

The CreativeLab_Sci&Math® is based on the following principles:

1 Use of the 7E instructional model and Inquiry-Based Learning

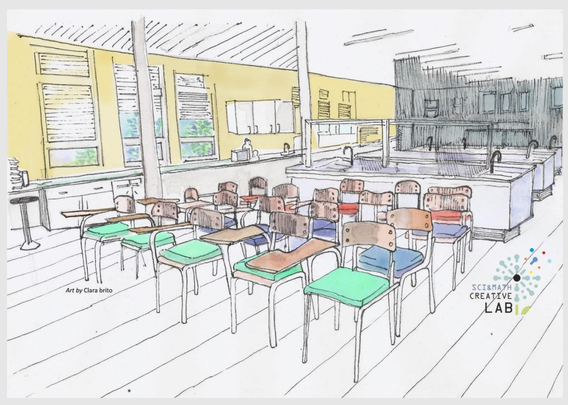
Immersion in this type of **teaching-learning scenarios** prepare future teachers with inquiry-based learning approaches, and actively participate in solving social issues related to science, technology and environment (Linhares & Reis, 2017).

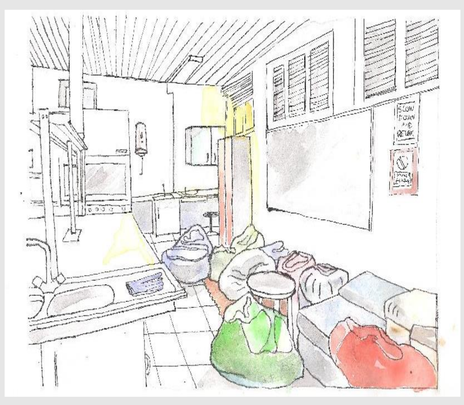
Inquiry-based learning activities allow students to describe objects, raise questions, construct and evaluate explanations, considering current scientific knowledge and communicating their ideas (Pedaste et al., 2015).

ENGAGE
EXPLAIN
EXPLORE
ELABORATE
EXCHANGE
EVALUATE
EMPOWERMENT

2 Use of innovative educational environments

CreativeLab_Sci&Math® has a **spatial organization,** inspired by the initiative *Future Classroom Lab* (European Schoolnet, 2017), with **different learning areas.** These areas are related to the 7E teaching moments and promote different skills associated to mathematics and science.





3 Promotion of interdisciplinary activities

Prepare citizens to be able to **integrate knowledge** from multiple areas (Zhang & Shen, 2015), specifically, the integration of **Mathematics and Science** teaching and learning (AAAS, 2011; Czerniak, 2007).

Interdisciplinary activities contribute to this goal because they promote student learning, engagement, problem-solving skills, critically thinking, real-life application (Ríordáin, Johnston & Walshe, 2016), and better understanding of Mathematics and Science. Therefore, we work together in the definition of **common learning goals, specific learning outcomes** of science and mathematics and **tasks' design.**

4 Curricular integration of digital technologies

CreativeLab_Sci&Math® teachers use **student-centered pedagogies** that explore **digital tools** within the context of the academic subject areas (Niess, 2005), for example, combining real experimentation with virtual experimentation, through interactive simulations (Zacharia, 2005).

CreativeLab_Sci&Math® promotes activities related to **programming and robotics**, which can contribute to enhance students' motivation and creativity, and the development of STEM skills (Eguchi, 2014; Saleiro, Carmo, Rodrigues & du Buf, 2013).

Scratch®

Makeblock®

5 Exchange didactic practices and share activities

Our Open Educational Resources (designed for students from kindergarten to high school) are shared in online platforms for science and mathematics teachers, with peer review, as **Casa das Ciências®** (House of Sciences).

CASA DAS CIÊNCIAS

Some of our activities were awarded with **annual prizes** that distinguishes the best activities published by teachers in Portugal.

Other shared activities were **elaborated by students**. We think involving our students in the process of design, implement and share science and mathematics activities for different school levels contributes to their formation as future teachers.

Find more on our **web page.**

Join us on **Facebook®**

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