

# Experimentation in secondary education: how to develop higher-order scientific skills?

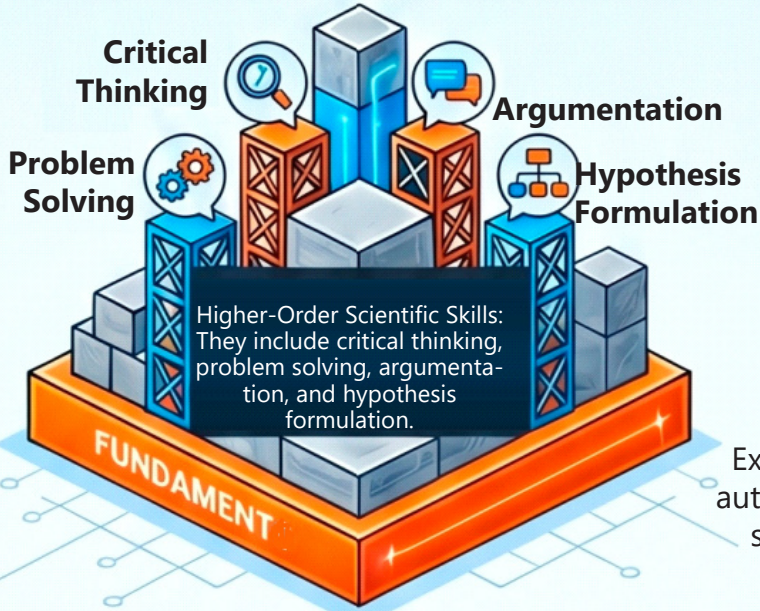
Transforming professional practices into guided experiences to develop critical thinking and close the learning gap in Latin America.

## The core of learning: What are HCOs?

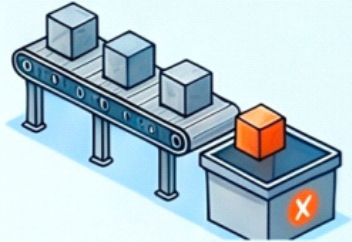
### FROM RECIPE TO INQUIRY



Overcome following manuals to foster questioning of scientific phenomena.



### THE MYTH OF "AUTOMATICITY"



Experimentation does not automatically develop these skills; the teacher is the indispensable guide.

## Keys to pedagogical success



### SCAFFOLDING AND CONTEXTUALIZATION

Teacher support, linking science with real-life problems.



### CULTURA MAKER Y STEM

Implement the 'Design – Do – Test' cycle to materialize knowledge through creativity.



### RESOLUCIÓN COLABORATIVA Y REFLEXIÓN

A space for exchange to make thinking visible and foster collective argumentation.



### GUIDED INQUIRY

Foster the active search for answers under the teacher's guidance.



### SCIENTIFIC MODELING

Use representations to understand and explain complex phenomena.



### EVIDENCE-BASED ARGUMENTATION

Develop the ability to support ideas with experimental data.

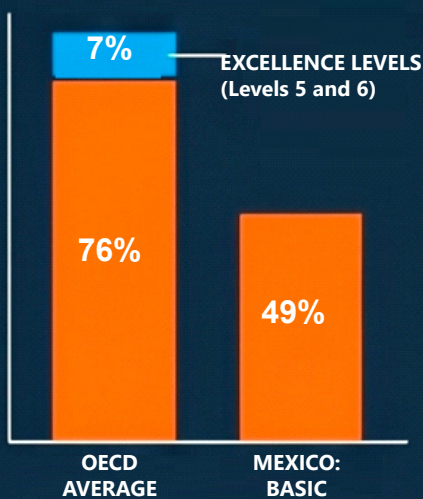


### SCIENTIFIC COMMUNICATION

Share findings in a clear and structured manner.

## Call to action: Close the Gap in Latin America

### THE CRITICAL CHALLENGE (PISA 2022)



While 76% of the OECD reaches basic levels, in Latin America the results are alarmingly low.



### ESCARCITY OF EXCELLENCE

Countries like Mexico, Colombia, and Paraguay show excellence levels close to 0%.



IT'S TIME TO IMPROVE! The lack of infrastructure and teacher training limits the region's scientific potential.

### PISA 2022 Results: Basic scientific competence (Level 2) vs. Excellence Level (5 or 6)

País / Región	Basic competence (Level 2)	Excellence Level (5 and 6)
OECD average	76%	7%
Japón	92%	18%
México	49%	--0%
Dominican Republic	23%	--0%