The Art of Scientific Communication

Designing a Hands-on Educational Lab

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IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
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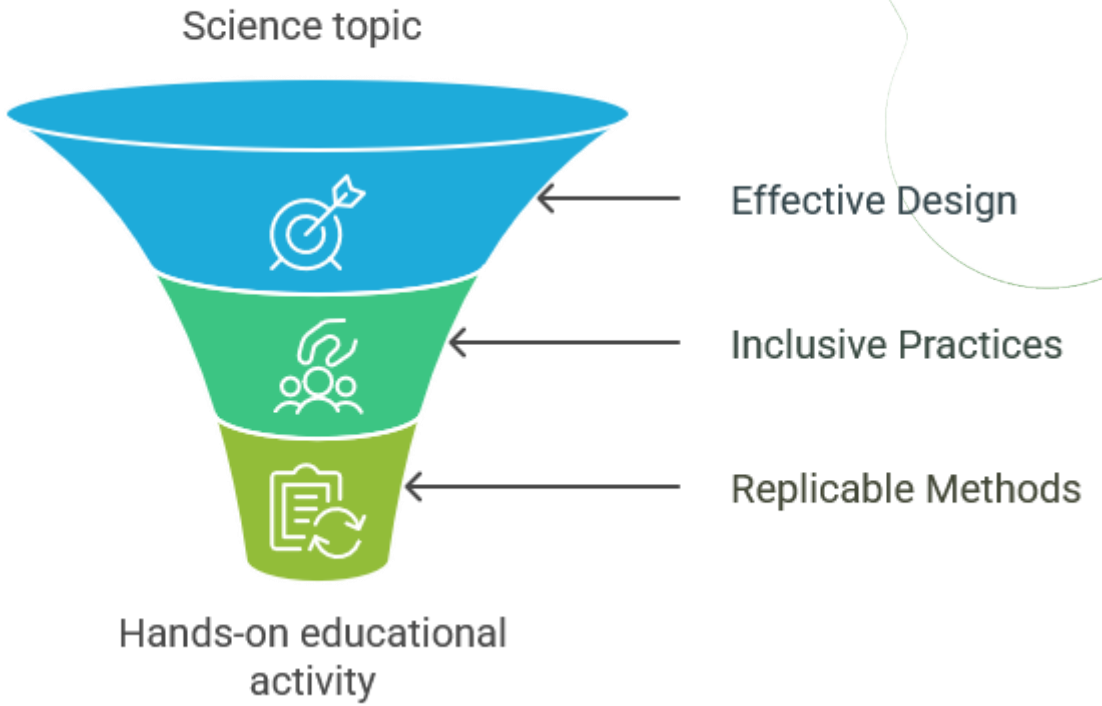
Goal

To equip participants with a practical framework for designing effective, inclusive, and replicable hands-on educational activity.



Introduction

- What is a hands-on educational lab?
- Why hands-on learning works?

Defining Educational Goals

- Clear goals: what should participants **know**, **do**, or **feel**?

- Match goals with audience type and context:
  - Age group
  - Prior knowledge
  - Event type (festival, school, museum)

1hr hands-on activity structure

- Start: brief intro or teaser (5-10 min max)

- Middle: core hands-on activity with clear steps. Keep instructions simple and visual. Allow exploration, but guide outcome. (35-40 min)

  Tips: Alternate explanations with different practical tasks, like following step-by-step instructions.

- End: short wrap-up or discussion (5-10 min max)
  - What did we learn?
  - Connect to real-world science or everyday life

Materials & Setup

Essentials:

- Safe, affordable, easy-to-source items
- Pre-assembled kits or shared stations
- Reusable vs consumable
- Organized layout (color-coded, labelled, minimal)

Environment considerations:

- Tables, seating, access to power or water
- Storage and waste disposal

Setup tips:

- Space-efficient layouts
- Label everything clearly
- Always have backup supplies

Inclusion, Replicability, Scalability

Inclusion:

- Use simple language, visual support always wins
- Age-appropriate instructions
- Consider physical and neurodiversity

Replicability:

- Create reusable documentation and checklists
- Clear documentation (instructions, scripts, diagrams)

Scalability:

- Design to work for small groups or large crowds
- Modular session design (stations or rotating groups)
- Use of volunteers or facilitators

Final Tips & Q&A

- Start small, test early, improve often
- Get feedback from both participants and facilitators
- Q&A or shared tips from the audience

Practical Activity (30m)

Design a hands-on lab for your project/study

- choose a topic you want to communicate about (bonus: choose a “Lab Title”)
- designing a hands-on lab is something that takes days/weeks, and since time is short, try searching online for activity that can be adapted to communicate your chosen topic.
- Try making a list of materials needed for a 50-person hands-on lab.

THANKS!

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