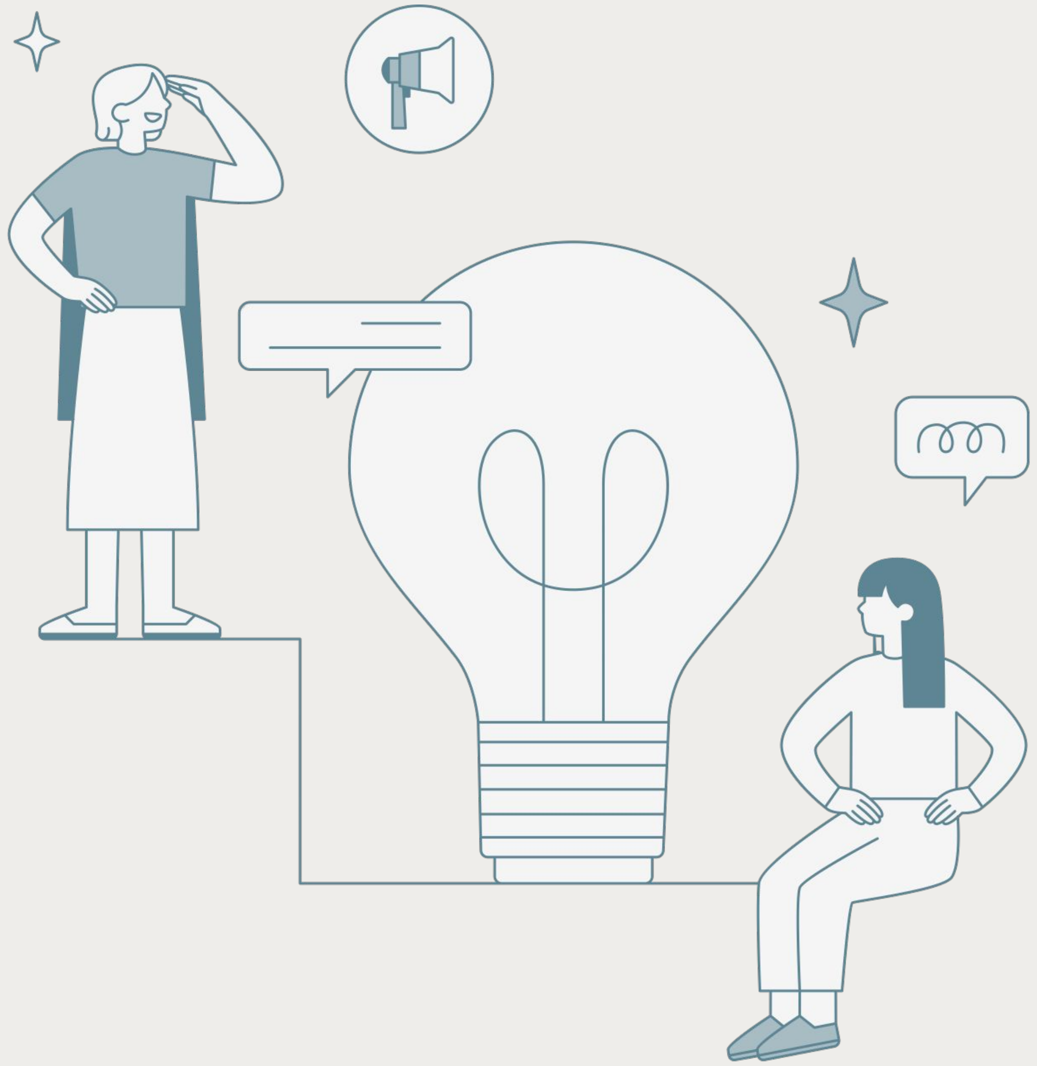
Beyond the Classroom

ACTIVE LEARNING

Reimagining Active Learning for the **Digital Age**



I'd like to introduce myself

Asoc. Prof. Nestor Mora Nuñez
MRES: e-Learning and ICT
Phd: Network and ICT
35 years at the University of Cádiz (Spain)

nestor.mora@uca.es

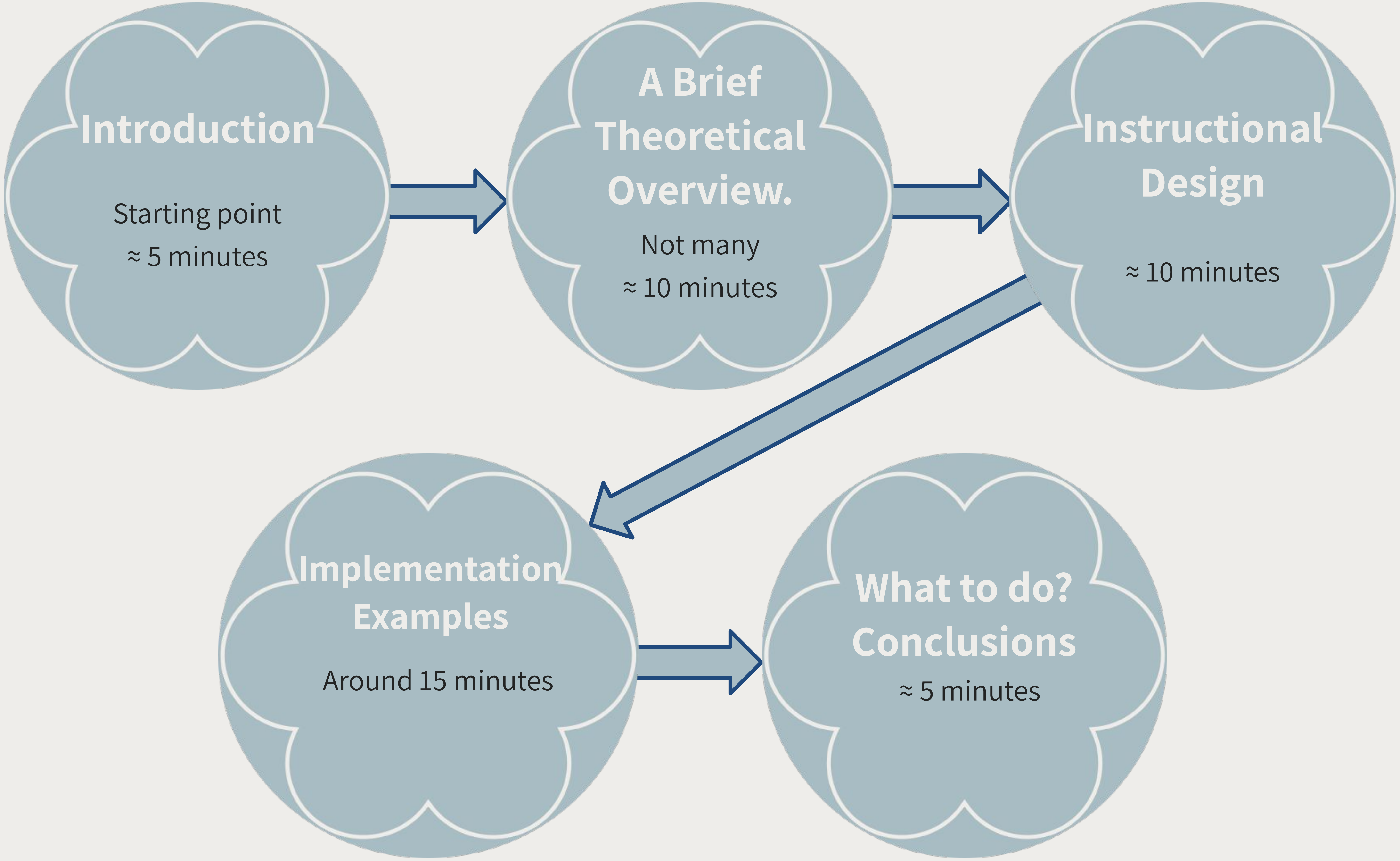
Blog: https://www.ucafe.org/

Main Objective

Introductory

Active learning isn't just a “fashion trend”; it's an **exciting opportunity** that's crucial now than ever.

Navigation Map



Introduction: Active learning

Active learning is an educational approach where each student is **actively** involved in his/her learning process.

It emphasizes **student participation** through **learning activities**: discussion, problem-solving, project based learning, collaboration (face-to face ⟷ Online), and promoting deeper understanding and skill development.

Introduction: Digital Age

Nowaday, education emphasizes the use of **digital tools and technologies** to enhance and personalize learning. The key is know how these tools can help us!

It means: new possibilities for **how, when,** and **where** learning takes place.

It includes **personalized** learning flows, innovative access to **information**, and innovative ways for **collaboration** and **communication**.

Learning levels, levels, levels
ICAP framework

The **ICAP** (**I**nteractive, **C**onstructive, **A**ctive, **P**assive) **framework** is a theory that classifies students' levels of cognitive engagement in learning. It defines four modes of interaction that students can have with learning materials, ranging from passive attention to active participation with manipulation and the construction of new knowledge.

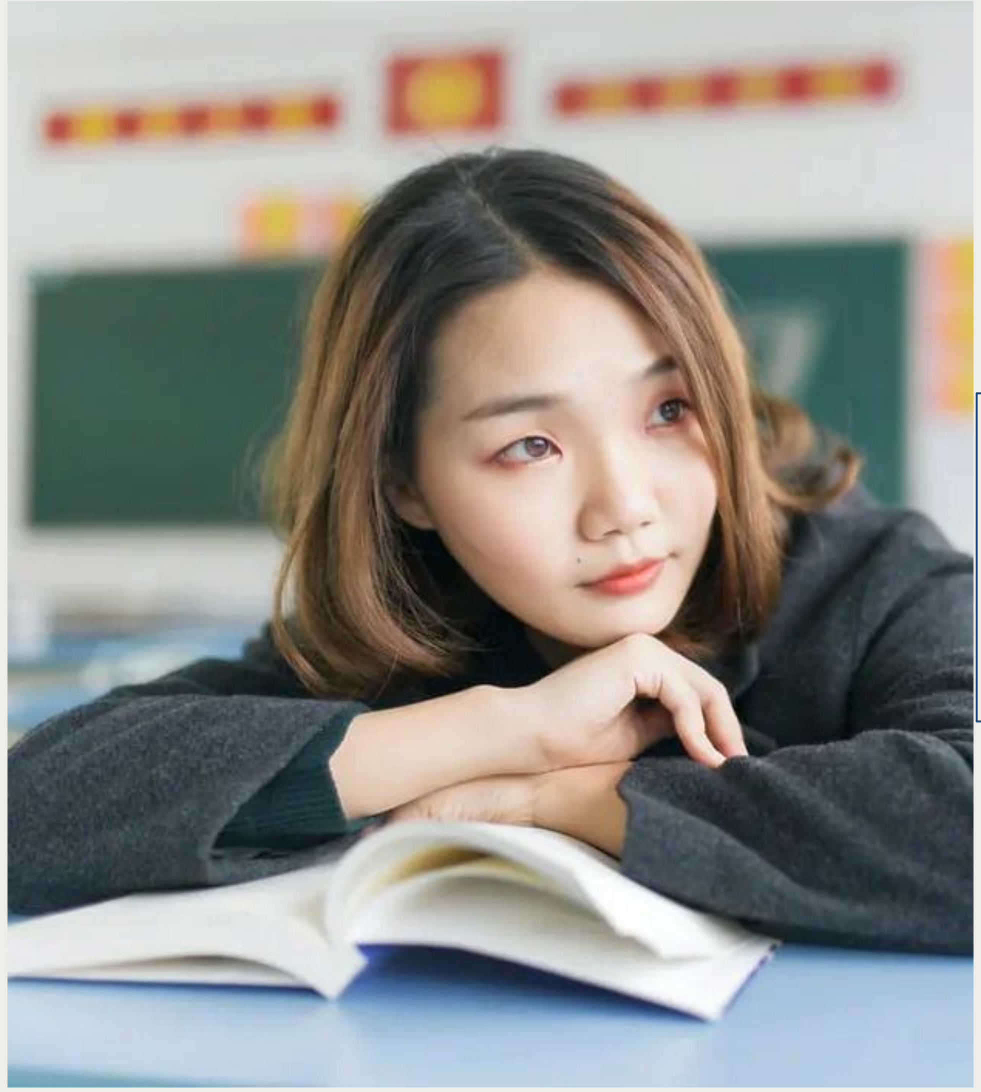
Active learning requires some **preparatory steps** to be truly effective. It is necessary to train students. "*Change the paradigm*"

The students need to know how to use the new **tools** in the new **Smart Learning Environments**.

Learning levels, levels, levels of activity ➔ ICAP

- **P**assive: Students receive information without actively interacting with it. Traditional.
- Initial **A**ctive: students are doing something with the information, but it's often a direct application or manipulation of pre-existing knowledge.
- **C**onstructive: This level involves students generating new knowledge or understanding complex models by integrating and making connections between concepts. They are actively constructing their own meaning. [Constructivism]
- **I**nteractive: This is the highest level of engagement, where students collaborate with others to co-construct knowledge through dialogue and shared problem-solving. This level promotes deeper understanding and critical thinking.

Learning levels, levels, levels of activity ➜ ICAP



Empower

Key Principles for **ICAP framework**

- Increasing Effectiveness: The framework suggests that as you move from Passive to Interactive, the effectiveness of the learning activity generally increases, leading to deeper learning and better retention.
- Cognitive Activity: Each higher level requires **more cognitive activity and mental effort** from the student.
- Knowledge Building: The shift towards **higher levels of engagement** helps increase students' participation in knowledge building.

"Improving the learning environment, dynamics, and efficiency requires trained and committed teachers."

Director and Scriptwriter of the film

But, how we can do it?

Instructional Design

Instructional design is a systematic and creative process used to create effective, efficient, and engaging learning experiences. It's essentially the "architecture" of learning, focusing on how people learn and how to best facilitate the acquisition of knowledge and skills.

Methodology?

A.D.D.I.E

Analysis

Design

Development

Implementation

Evaluation

STOP!!!

STOP!!!

All this is really hard to understand and implement in our institutional learning environment

That's true. But we must be aware of one reality: **AI** will gradually take over learning environments that don't go beyond ***mechanistic*** methods. Humans will always be necessary, but at a creative level that AI is unable to achieve. This is our current challenge:

Go beyond and implement active-smart learning environments where human creativity is the key.

Let's get back to talking about
the script!

ADDIE

A

Analyze: This initial phase involves identifying the instructional problem, defining the target audience's characteristics and needs, establishing clear learning goals and objectives, and assessing existing resources and constraints.

D

Design: Based on the analysis, this phase involves creating a blueprint for the learning solution. This includes outlining learning objectives, selecting instructional strategies and methods, designing assessment tools, structuring content, and planning for media and technology.

D

Develop: In this phase, the instructional materials (tools&procedures) are created or assembled according to the design plan. This can involve writing content, producing multimedia, developing e-learning modules, and creating job aids or support materials.

ADDIE

I

Implement: This phase involves delivering the instruction to the learners. It includes preparing instructors or facilitators, setting up the Smart learning environment, and managing the delivery of the content.

E

Evaluate: This continuous phase assesses the effectiveness of the instruction. It typically involves both formative evaluation (ongoing feedback and revisions during all phases) and summative evaluation (assessing the overall impact and success after implementation).

And…

I

Implement: This phase involves delivering the instruction to the learners. It includes preparing instructors or facilitators, setting up the learning environment, and managing the delivery of the content.

E

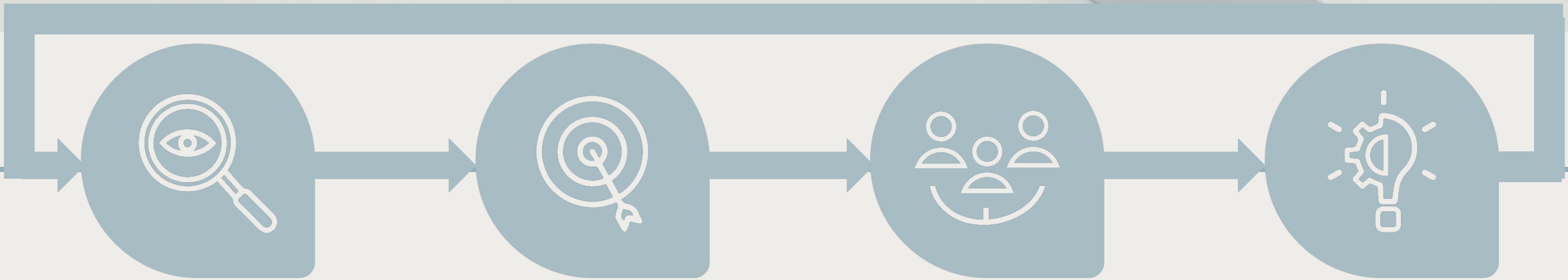
Evaluate: This continuous phase assesses the effectiveness of the instruction. It typically involves both formative evaluation (ongoing feedback and revisions during all phases) and summative evaluation (assessing the overall impact and success after implementation).

LF

Learning flows

ADDIE

Learning Flow



In the context of instructional design, a learning flow refers to the meticulously planned and logical **sequence of activities**, content (concepts, relations and models), interactions, and assessments that guides a student through a learning experience to achieve **specific learning objectives**. (no close, no limited, predisposed to be improve, adapted, or reformed through experience)

Learning Flow

Engagement: It is essential state of complete immersion and energized focus in an activity, where a person loses track of time because the challenge of the task perfectly matches their skills. Instructional designers aim to create learning flows that induce this "flow state" by:

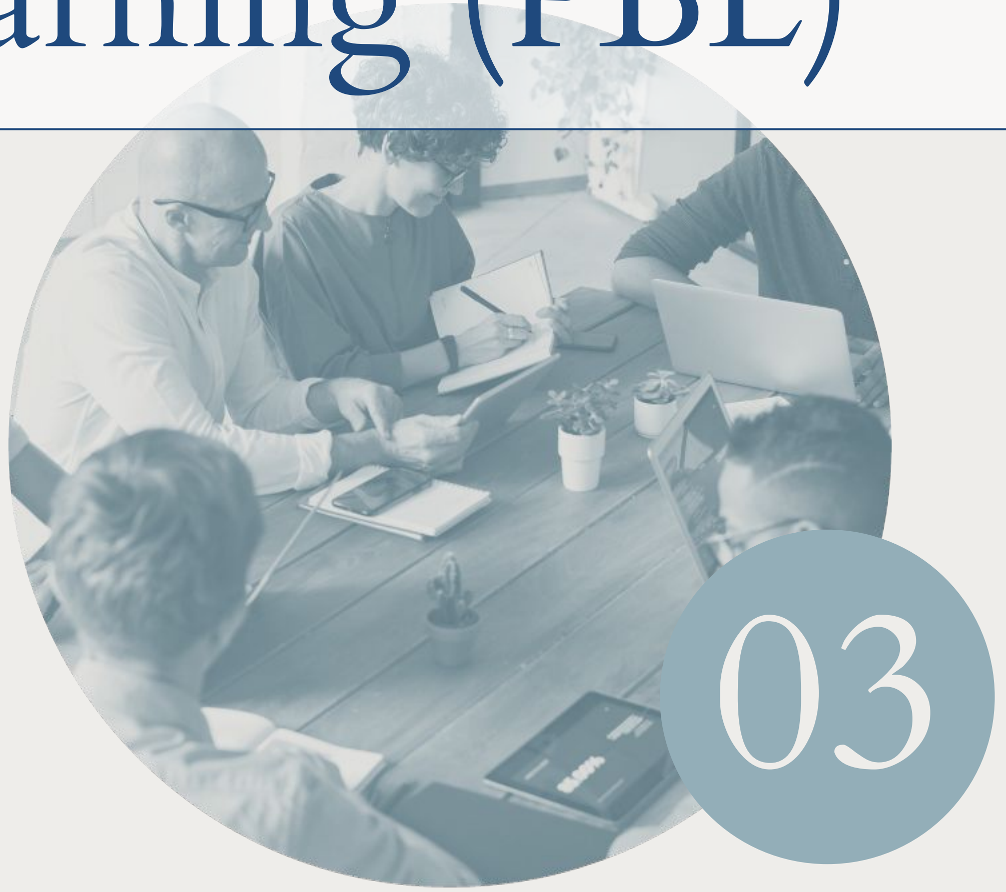
- **Clear Goals**: Learners know what they need to achieve.
- **Immediate Feedback**: They receive constant information on their performance.
- **Balance of Challenge and Skill**: The tasks are challenging enough to be engaging but not so difficult as to cause frustration or anxiety.
- **Elimination of Distractions**: The learning environment must minimize anything that might pull the learner's attention away.

Environments

Learning flows for Project-Based Learning (PBL)

Interactive theoretical classes with questions, answers, challenges, and communication at all levels. Here, the **cognitive substrate** of a project is presented and developed.

Analysis & Design project phases. The project will be designed during this time. Here, the **application conditions** are evaluated to obtain a real and adequate solution.



Practical time classes. Here a project must be developed, implemented and evaluated.

Some examples of **software** Tools

We must focus in the human creativity

Chatbots specialized in answering contextualized project questions.
General-purpose AIs are incapable of participating in creative dynamics. G-AI are limited to providing solutions that "please" the requester.

01

Collaborative **forums** (Chat spaces) where group members can communicate asynchronously online.
Telegram, Google Chat, Matrix, etc
It’s essential this chat spaces be controlled by an smart assistant.

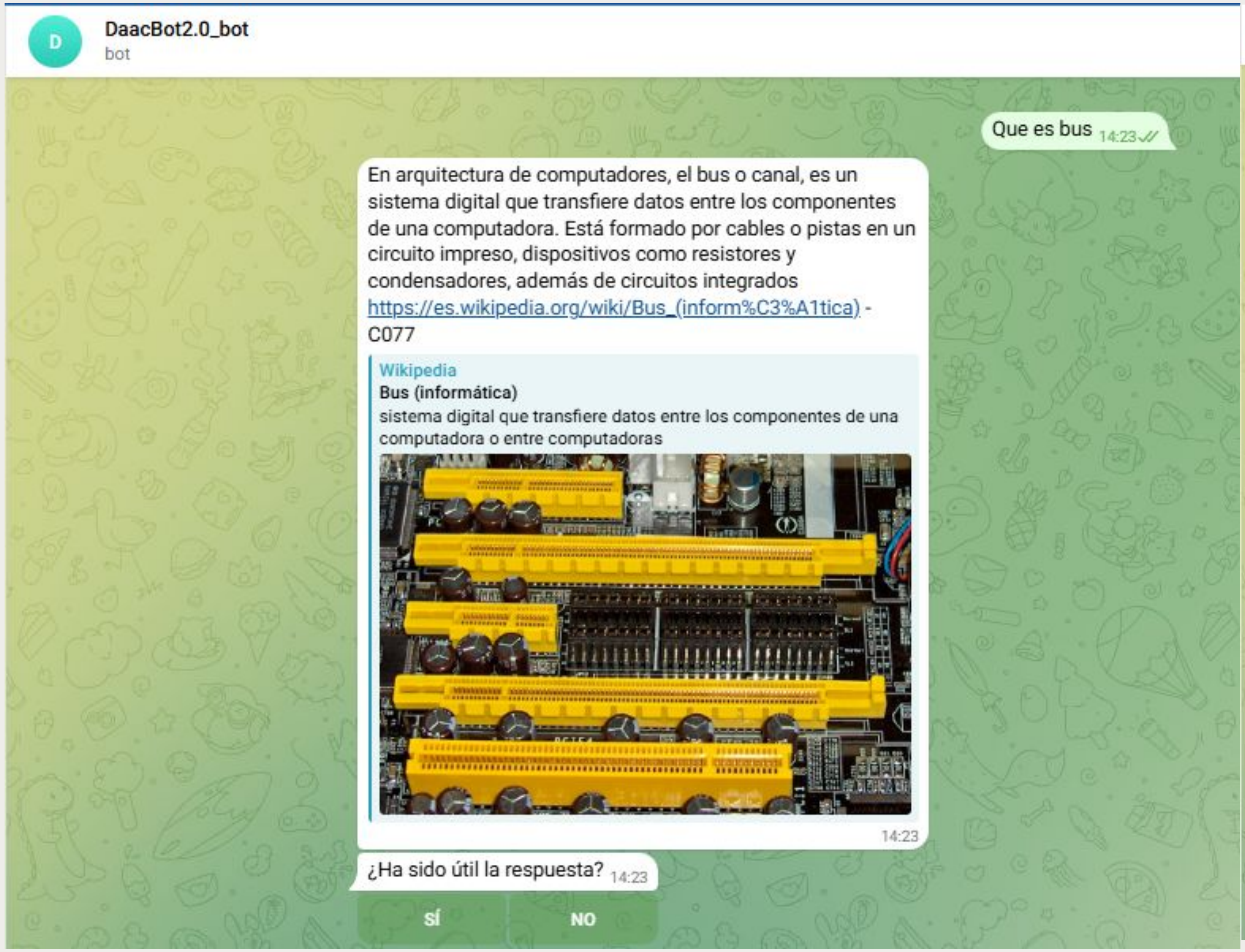
02

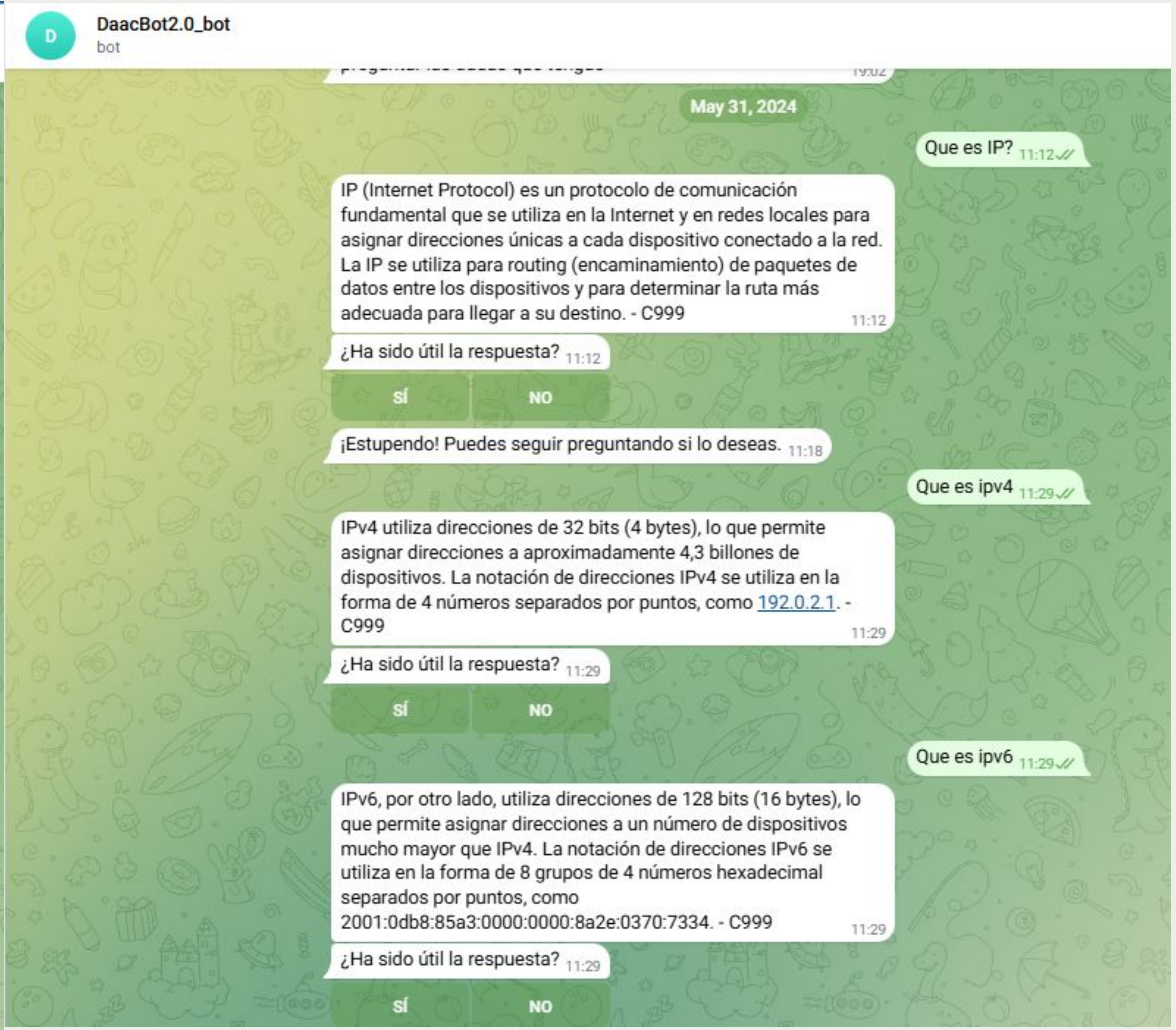
Smart **Gsheets** where students enter the results they develop or verify. These GSheets can also monitor whether work and delivery deadlines are met.

Under development.

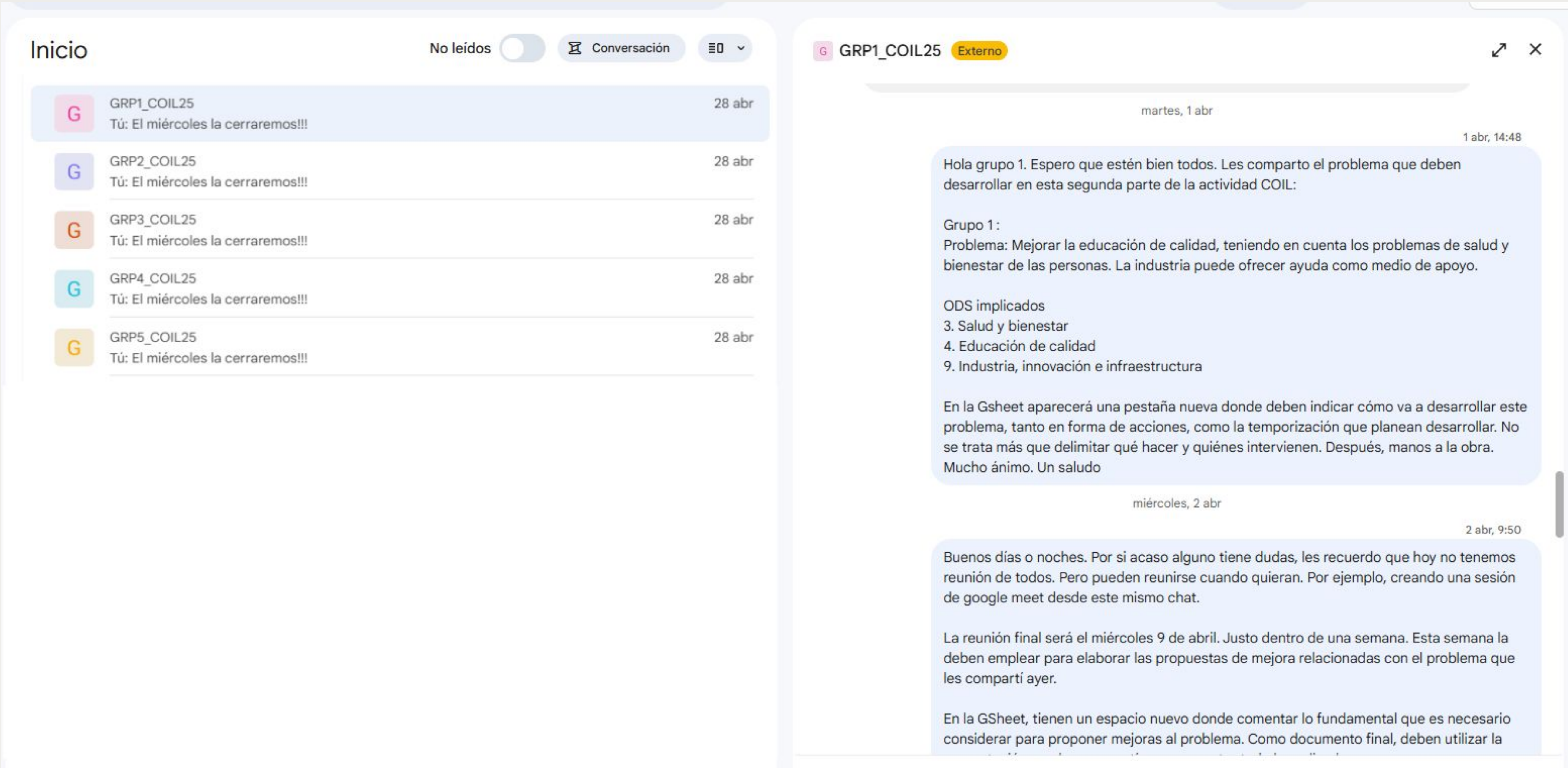
03

Assistance Chatbots (Telegram)





Collaborative forums (Google Chat)



Some examples of **hardware** Tools

We must focus in the human interaction

Interaction assistant devices. To create a direct channel of interaction between each student and the teacher. As the learning flow develops, this assistant collect data to analyze and validate the learning state (individual and collective).

01

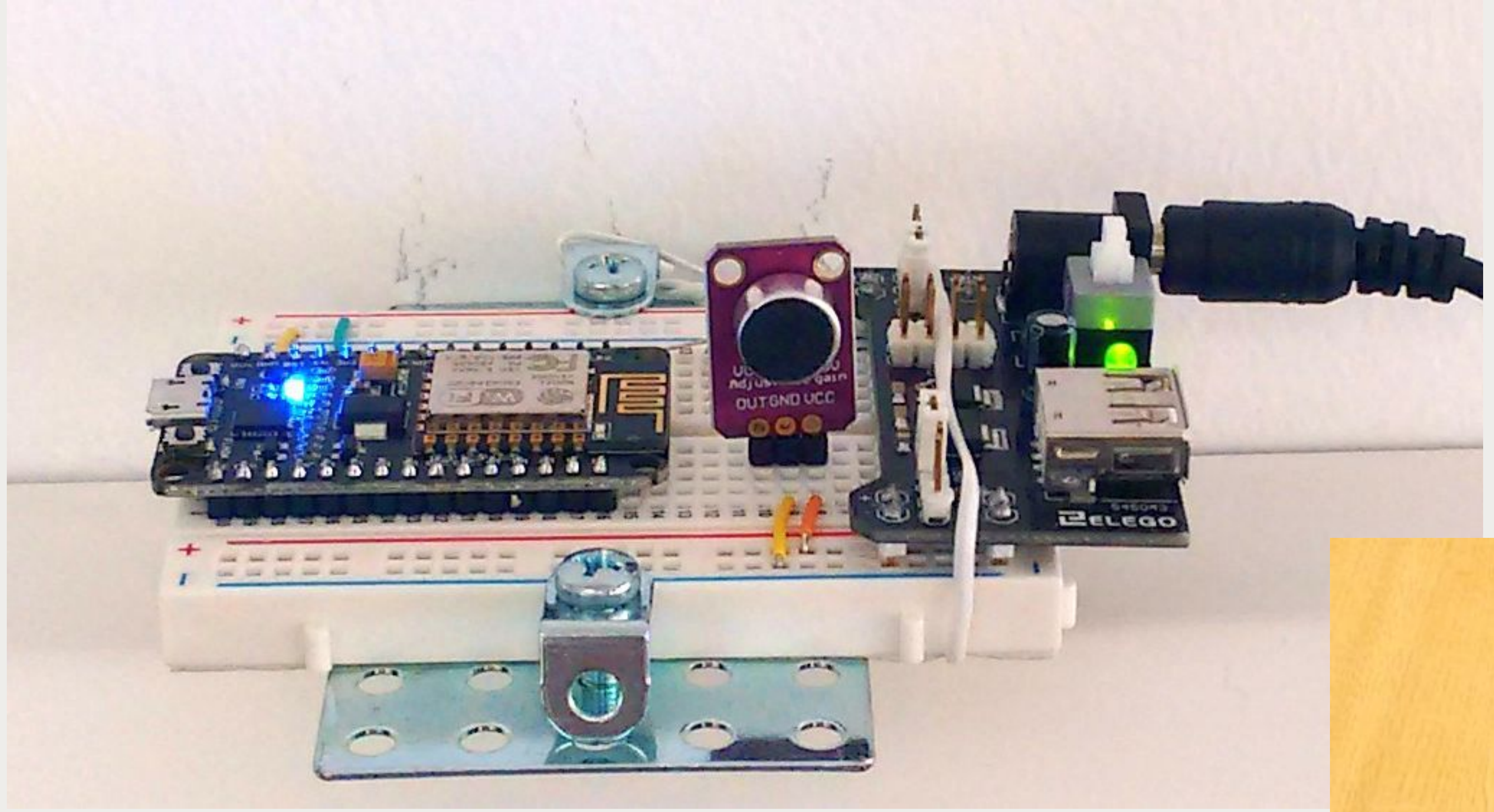
Social and human aspect **sensors.** These sensors capture environmental factors as temperature, humidity, atmospheric pressure, sound level or student motion quantity.

02

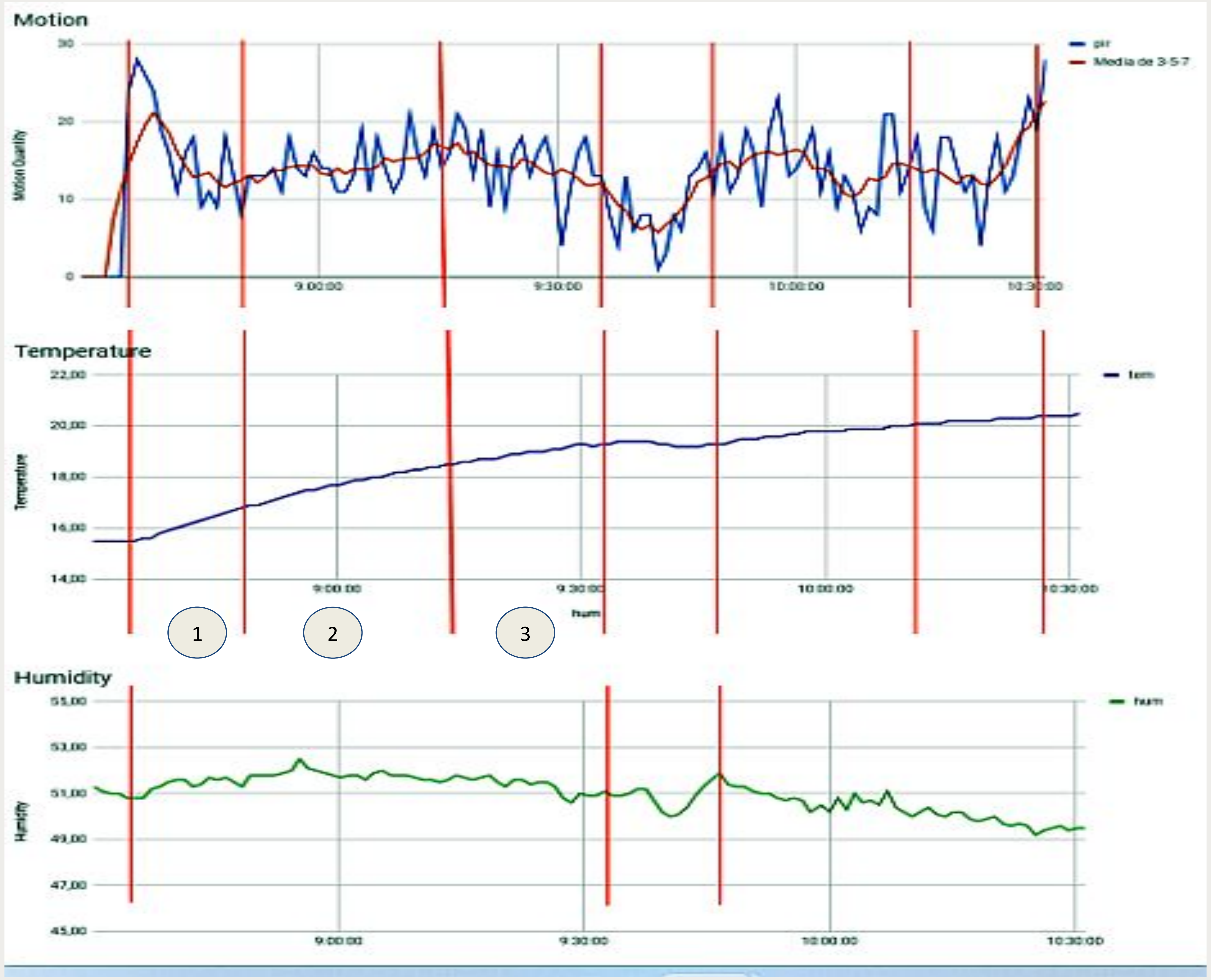
Smart Learning environment **actuators**. Light-colored, air-conditioned, and environmentally sound.
These hardware elements are now under development, but we plan to implement the actuator by the 2025-26 academic year.

03

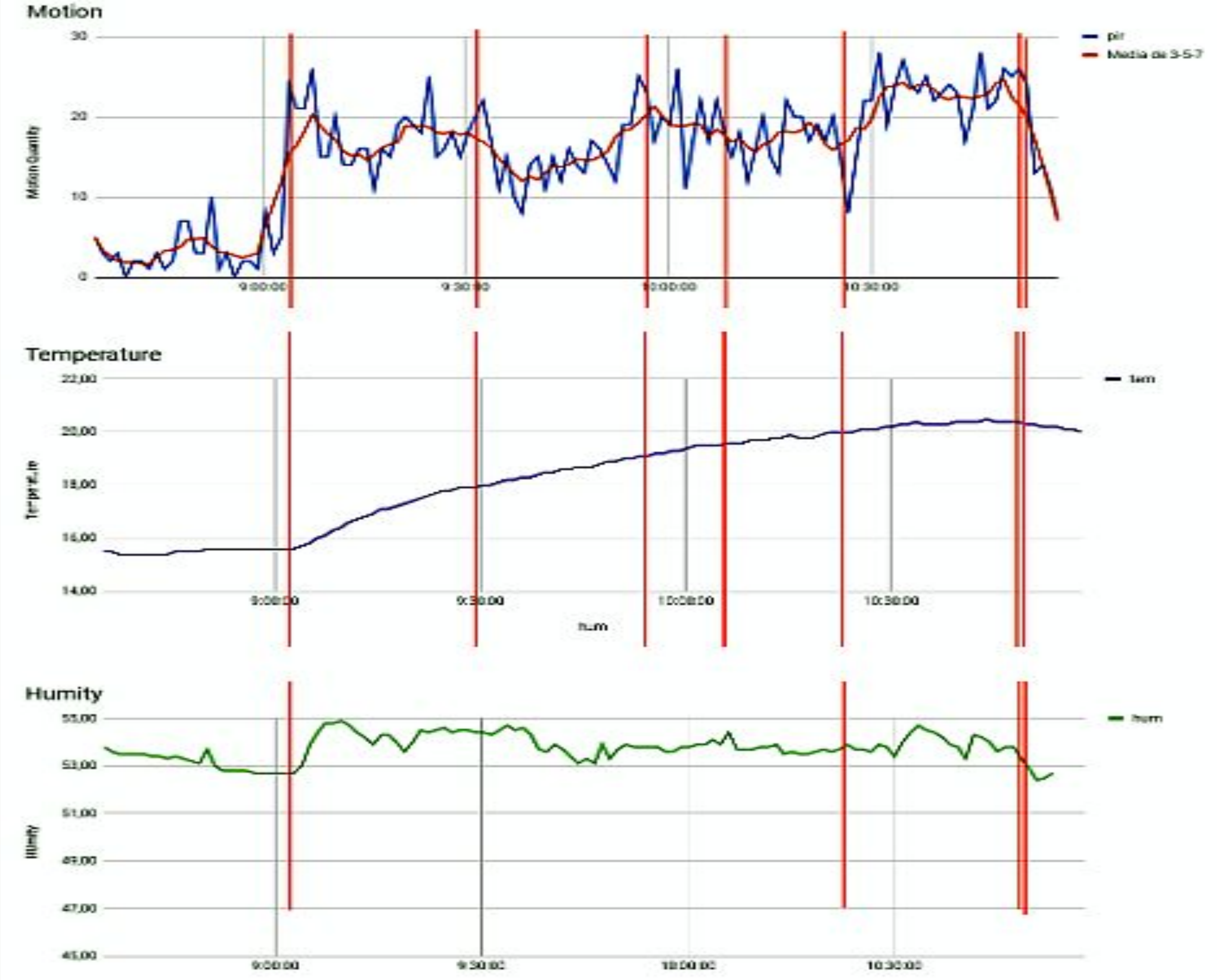
Sensors: Sound level & chair motion.



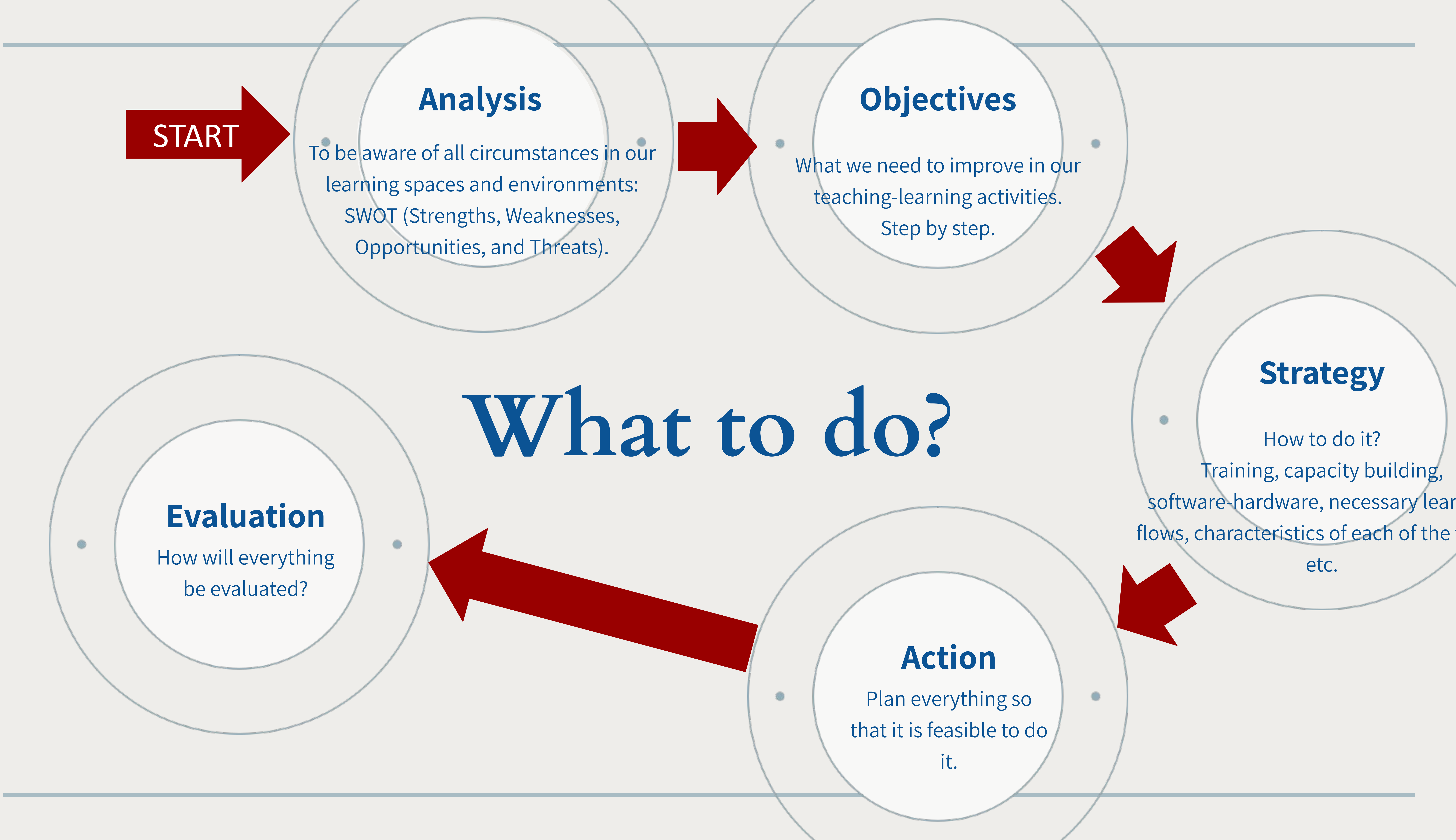
Sensors: temperature, motion and atmospheric pressure



Sensors: temperature, motion and atmospheric pressure



Interaction assistant devices.



START
Analysis
To be aware of all circumstances in our learning spaces and environments: SWOT (Strengths, Weaknesses, Opportunities, and Threats).
Objectives
What we need to improve in our teaching-learning activities. Step by step.
What to do?
Strategy
How to do it?
Training, capacity building, software-hardware, necessary lear
flows, characteristics of each of the
etc.
Action
Plan everything so that it is feasible to do it.
Evaluation
How will everything be evaluated?

Conclusions

“Know how” is essential. The teacher is the director of the movie and the one who develops the script.

01

Student must be (as an individual and as collective) the “main character” of the movie.

02

Learning technologies are the “movie set” that allows the creation of “Smart Learning Environments”. SLE, SCOLE or SCOILE.

03

Thanks so much

Asoc. Prof. Nestor Mora Nuñez
MRES: e-Learning and ICT
Phd: Network and ICT
35 years at the University of Cádiz (Spain)
nestor.mora@uca.es

Blog: https://www.ucafe.org/