

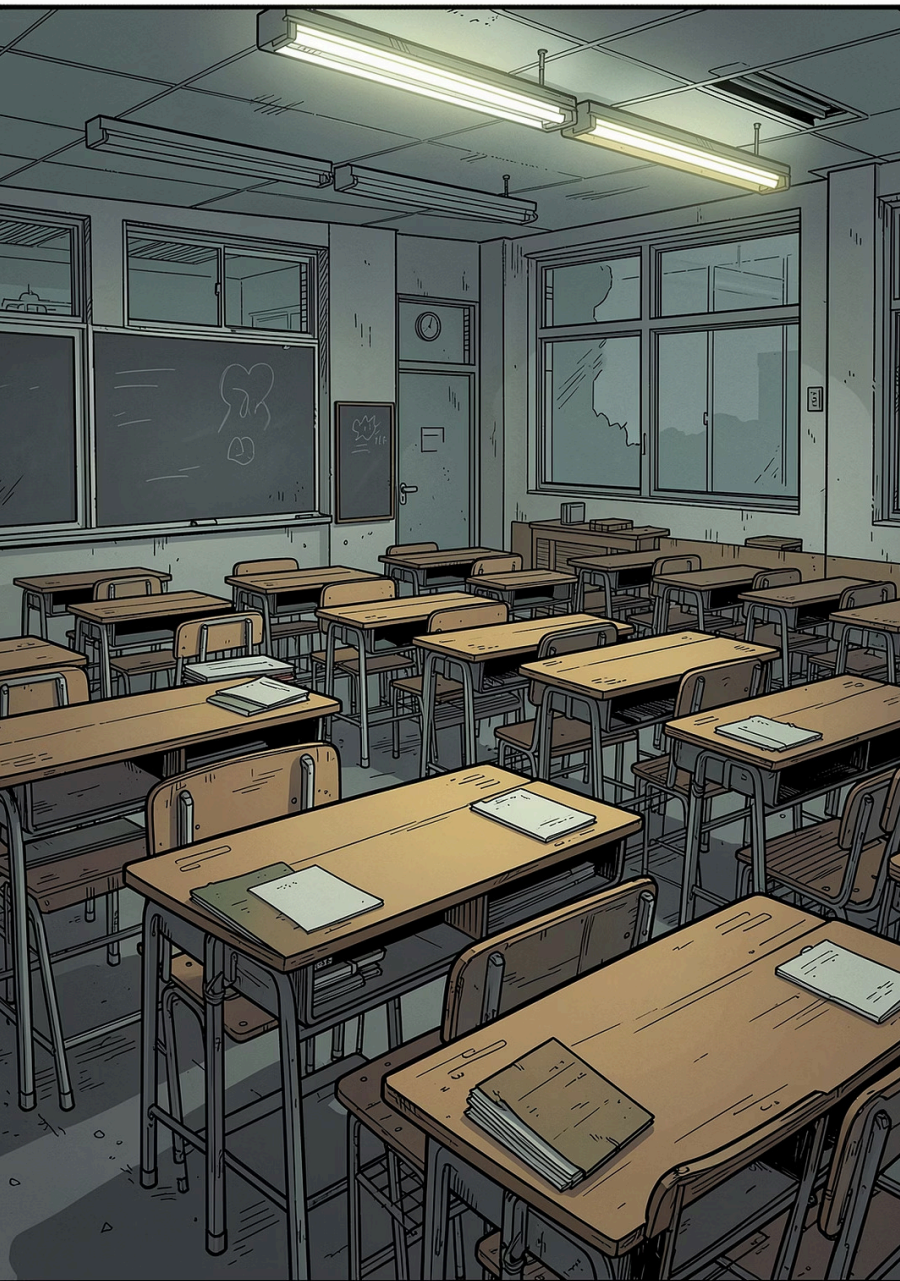
Phygital Learning Ecosystems

Places Beyond 2030

By Carlo Giovannella & Giuseppe Roccasalva

A vision for redesigning education — moving from factory-model classrooms to living ecosystems where people learn, grow, and belong.



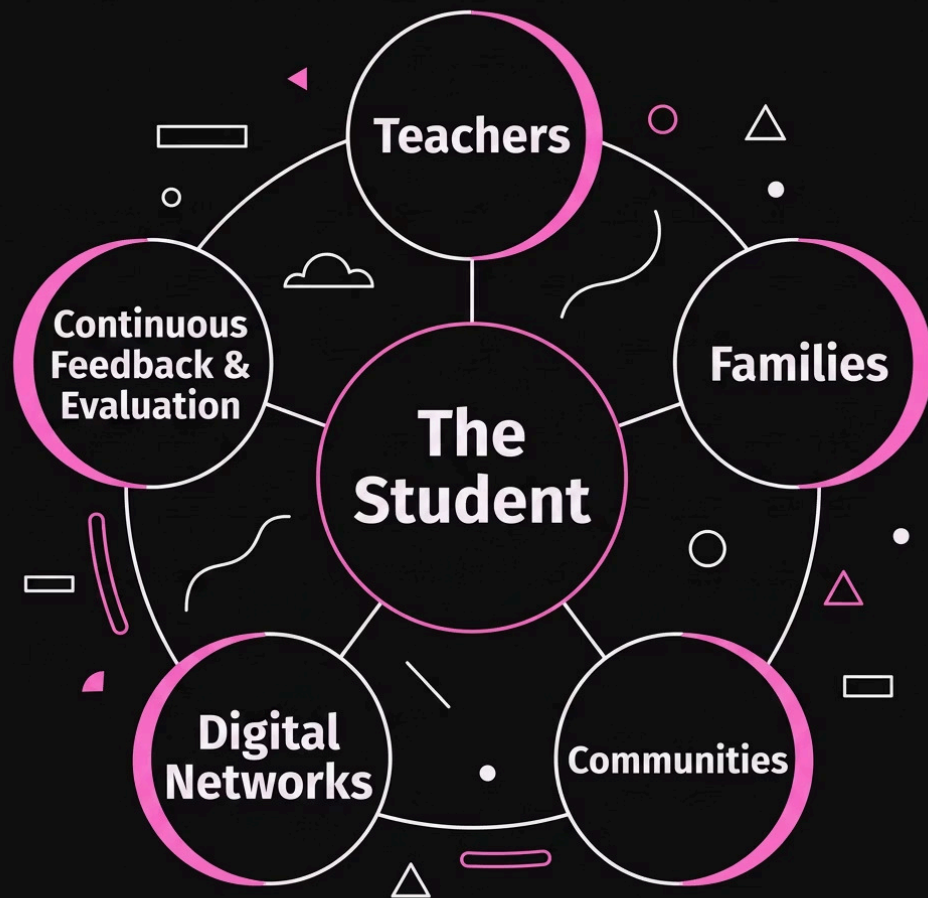


THE PROBLEM

The Factory-School Model Is Running Out of Time

Schools were designed to optimize **teacher efficiency, mass instruction, and standardization** — producing rows of desks, age-based grouping, and teacher-centered delivery. This model transmits knowledge, but fails to nurture creativity, collaboration, autonomy, or student wellbeing.

What Is a Smart Learning Ecosystem?



A Smart Learning Ecosystem (SLE) is a **human-centered system** – not a technology upgrade. It places the student at the center, surrounded by teachers, families, communities, and digital networks, all connected through continuous feedback.

Purpose 1

Develop competences needed to thrive in society

Purpose 2

Improve wellbeing for everyone involved in learning

Three Conceptual Foundations

People-in-Place Centered Design

Learning spaces should be designed around **human needs and relationships** — not just buildings or technology. Place shapes identity.

Learning by Being

Education must help students develop as **whole persons** — not only acquire skills, but also identity, agency, and social responsibility.

P3BL

Problem–Project–Process Based Learning replaces passive listening with **active participation**: solving real problems, building projects, reflecting on process.

DESIGN PRINCIPLE 1

Centrality + Openness to the Territory

Schools must connect with their surrounding community. Outdoor learning, civic activities, and partnerships with local actors transform the school into a **community hub** — not an island.



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Designing Spaces That Work With People

1

Functional Specificity

Different learning goals need different spaces — labs, studios, collaborative zones, reflection areas, outdoor environments. Not every room should look like a classroom.

2

Flexibility

Spaces should adapt easily: movable furniture, reconfigurable rooms, and seamless hybrid physical/digital use.

3

Affordance

Spaces should naturally **invite** the intended behavior — a room should make collaboration or experimentation feel intuitive.

What Makes a Space Truly "Phygital"?

Technology should not be added on top — it must be **integrated**. Three qualities define a phygital learning space:



Sensitive

Uses sensors and IoT to respond to users and context — smart lighting, environmental monitoring, adaptive systems.



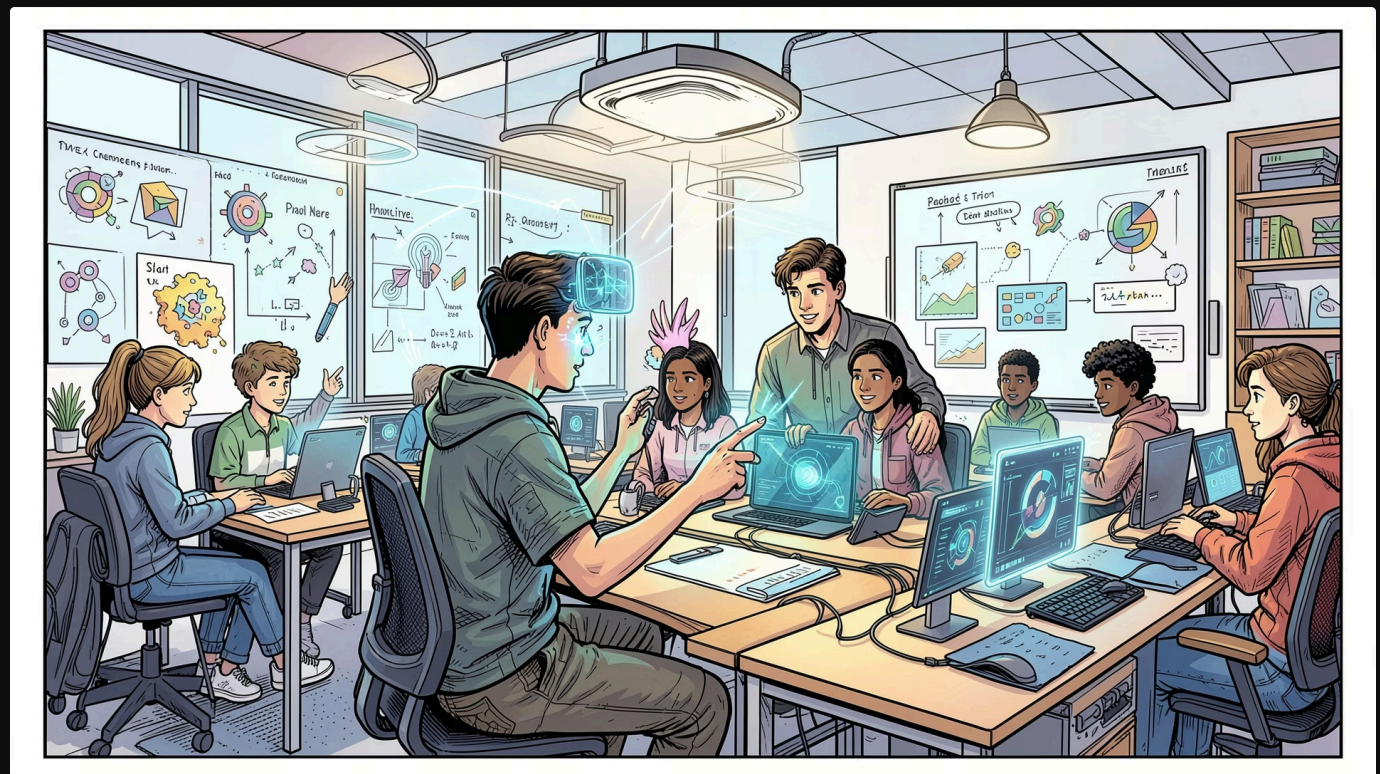
Enabling

Makes more activities possible and easier — mixed reality, remote collaboration, seamless hybrid learning.



Engaging

Increases interaction through digital-physical integration — interactive walls, immersive environments, augmented spaces.



CRITICAL WARNING

Technology Serves People – Not the Other Way Around

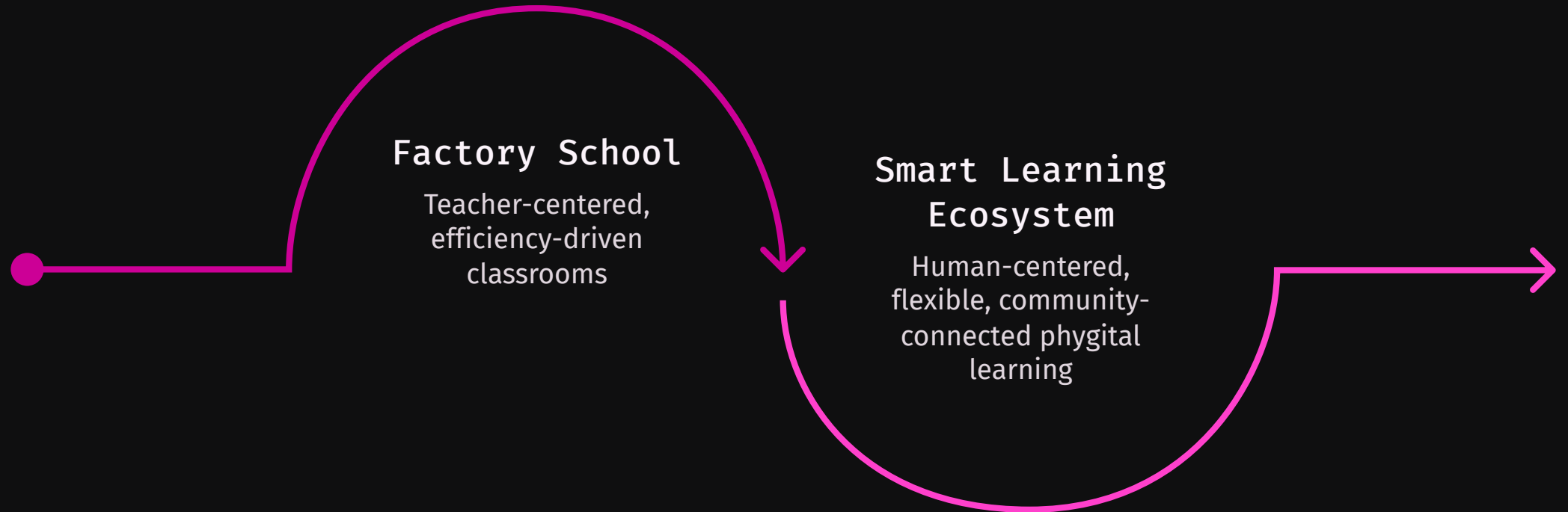
The danger is turning schools into **technology playgrounds** — places where devices are abundant but pedagogy is absent.

Technology must serve **pedagogy, inclusion, and wellbeing** — never become the goal itself. A "smart" school without a human-centered philosophy is just a better-equipped factory.

Technology should serve:

- Pedagogy & learning design
- Inclusion & equity
- Student & teacher wellbeing
- Community connection

From Factory to Ecosystem: A Summary



The shift is not incremental — it is a **fundamental redesign** of what a learning environment is, who it is for, and how it functions in the world.



The Ecosystem Where People Learn, Grow, and Belong

Human-Centered

Designed around people, relationships, and wellbeing

Community-Connected

Open to the territory, civic life, and local partnerships

Flexible & Phygital

Spaces that adapt and integrate digital + physical seamlessly

Meaningful Participation

Learning through doing, not passive attendance