STIAEM

Slow Tech Innovation

AI, Ethics and New Teaching Methods

The STIAEM Pedagogical Model: Balancing Digital Literacy and Relational Mentorship

Co-funded by the European Union

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Università di Foggia

Studi Umanistici, Lettere, Beni Culturali, Scienze della Formazione

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OER 1.2.1: The STIAEM Pedagogical Model: Balancing Digital Literacy and Relational Mentorship
Reference Module: Module 1 - Project Introduction and Pedagogical Model
Related Video-Pill: Video 1.2 - The STIAEM Pedagogical Model
Authoring partner: University of Zaragoza – Spain
Topic / Thematic Focus: STIAEM pedagogical model, digital literacy and relational mentorship balance

Introduction and Learning Objectives

This resource accompanies, together with OER 1.2.2, video-pill 1.2 «The STIAEM Pedagogical Model» and constitutes its theoretical deepening. The text presents the framework of the STIAEM pedagogical model: an architecture that holds together digital literacy and relational mentorship, that is, the teacher's critical and intentional supervision of learning processes mediated by artificial intelligence.

The framework connects to the Slow Tech paradigm (Patrignani & Whitehouse, 2014a; 2014b; 2019) and to the international frameworks adopted by the project: the AI4K12 standards, the UNESCO framework for teacher competences (Miao & Cukurova, 2024), the European digital competence framework DigComp 3.0 (Cosgrove & Cachia, 2025) - five areas and twenty-one competences, articulated across four levels of proficiency - and the principles of Universal Design for Learning (CAST, 2024).

By the end of the reading, the teacher will be able to:

recognise the risks of technological acceleration and the principle of cognitive sustainability in one's own classroom context;

describe the three dimensions of the Slow Tech Attitude - Good IT, Clean IT, Fair IT - and apply them to the choice of digital tools;

design activities in which AI operates as cognitive scaffolding and epistemic co-creator, while the teacher retains pedagogical ownership (human-in-the-loop).

1. Technological acceleration and cognitive sustainability

The STIAEM model starts from a diagnosis of the present. The integration of artificial intelligence in the school has imposed itself as a priority that can hardly be postponed; and precisely for this reason, the model document observes, it becomes urgent to confront technological accelerationism, a phenomenon that tends to privilege technical speed over critical reflection and respect for human learning rhythms.

«This development raises the urgency of confronting ‘technological accelerationism’, a phenomenon that often prioritizes technical speed over critical reflection and respect for human learning rhythms» (STIAEM, 2026, our translation).

The response of the model to this risk is called cognitive sustainability: protecting the space of reflection from automatic delegation and ensuring that algorithmic integration strengthens, rather than replaces, the student's epistemic agency. It is not a matter of slowing down on principle, but of claiming the right of thought to unfold in the time that is proper to it: understanding a text, formulating a hypothesis, revising an argument are not instantaneous operations, and they do not become so because a tool accelerates them.

An immediate operational consequence follows. The relevant question, for the teacher, is not «how powerful is the tool?», but «what does it do to the student who uses it, and at what point in the process?». An assistant that produces a commentary on a text in three

seconds may be useful or harmful depending on the point at which it enters the scene: if it arrives after the student has tried to formulate a judgement, it strengthens it; if it arrives before, it empties it.

2. The Slow Tech Attitude: Good IT, Clean IT, Fair IT

The Slow Tech paradigm (Patrignani & Whitehouse, 2014a; 2014b; 2019) offers the model its own interpretive key, articulating technology according to three dimensions: Good IT, Clean IT and Fair IT. In the STIAEM model, AI is redefined as epistemic co-creator - a cognitive partner with whom the student negotiates meanings - and the three dimensions become so many criteria for evaluating classroom practices.

Good IT concerns well-being and the centrality of the person in decision-making processes; at the didactic level it translates into the human-in-the-loop architecture, in which intentional control remains with the teacher and the student, with the aim of mitigating risks such as technostress and cognitive overload. Clean IT concerns the ecological footprint of AI systems in the school environment and calls for sustainable choices, starting from efficient hardware and software. Fair IT concerns the fairness and social desirability of technology, and thus the critical analysis of algorithmic biases - for example of automatic correctors that penalise non-native-speaker students - and of inequalities of access.

The following table summarises the three dimensions with their respective guiding question and a concrete classroom application.

Dimension	Guiding question	Classroom application
Good IT	Does technology promote well-being and respect for human rhythms?	Usage agreements and working times; intentional control by the teacher over the output
Clean IT	Is it sustainable in energy and material terms?	Choice of lightweight tools; reduction of unnecessary processing; digital civic education
Fair IT	Is it fair, transparent and free from bias?	Analysis of an automatic corrector with texts by non-native-speaker students; discussion on training data

One point that distinguishes the model from a generic ethical appeal should be emphasised: the three dimensions are not decorative, they are operational. Asking a class to evaluate a tool according to Good, Clean and Fair IT constitutes in itself an exercise in digital citizenship. And since training data may not be representative, AI must be considered a sociotechnical phenomenon requiring constant human supervision, in order to prevent rights violations and guarantee real inclusion.

3. Integrated reference frameworks: AI4K12, UNESCO, DigComp 3.0

To transform principles into competences, STIAEM integrates three international frameworks. The first is the AI4K12 standard, which organises AI literacy into five «big ideas»: perception; representation and reasoning; learning; natural interaction; social impact. The model adopts them without reducing them to technical notions: the first recalls

that AI systems build models of reality and do not possess an understanding of the world; the second that machine learning depends entirely on the quality and representativeness of data, and that distorted data generate bias; the third warns of the risks of anthropomorphisation; the fourth is the axis most relevant to the project, because it concerns ethics, responsibility and rights.

The second framework is the UNESCO reference for teacher competences (Miao & Cukurova, 2024), articulated in four pillars: human-centred mindset, ethics of AI, pedagogy of AI, professional development. The first requires the teacher to maintain authority and critical judgement in the face of automatic decisions; the second demands constant ethical vigilance over justice, sustainability and transparency; the third invites us to identify where technology genuinely enhances learning and to build the «pedagogical why» of adoption; the fourth makes AI a tool of continuous professional growth.

The third framework is DigComp 3.0 (Cosgrove & Cachia, 2025), the European digital competence framework: five areas, twenty-one competences and four levels of proficiency for each. The fifth edition presents a feature relevant to the school: AI-related competence is present, explicitly or implicitly, in all twenty-one competences. Digital literacy is therefore not a sectoral body of knowledge to be placed in a box, but a transversal axis that runs through the entire curriculum.

The combination of the three frameworks allows STIAEM to look in depth: instead of merely measuring whether a teacher knows how to use a tool, the model assesses their critical capacity to mitigate risks such as algorithmic biases and to protect students' privacy, transforming competence into professional judgement.

The UNESCO guidelines on generative AI call for an assisted and supervised use of technologies, with the teacher holding pedagogical agency (UNESCO, 2023).

The international evidence gathered by the OECD Digital Education Outlook indicates that the transition of teaching practices depends on the competences of those who govern the tools (OECD, 2021).

The UNESCO ICT competency framework for teachers (version 3) represents the institutional antecedent of the shift towards a critical pedagogical use of technology (UNESCO, 2018).

4. From framework to classroom: UDL, ARTE and relational mentorship

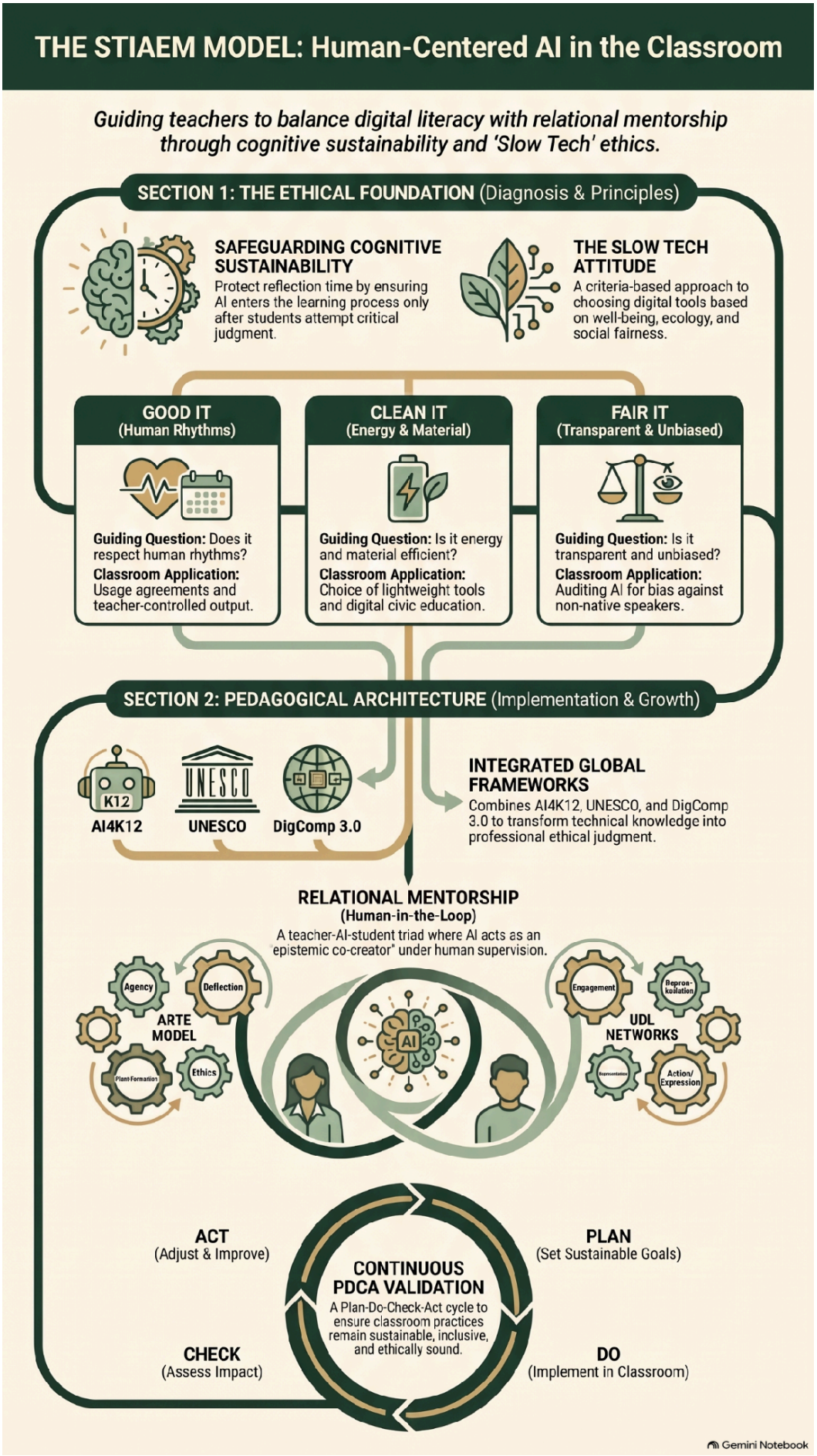
The model does not remain at the level of principles. In didactic design, STIAEM adopts Universal Design for Learning (CAST, 2024) and its three principles - multiple means of engagement, which activate affective networks and respond to the «why» of learning; multiple means of representation, which respond to the «what»; multiple means of action and expression, which respond to the «how» - reading them through the concept of learner variability. AI, in this framework, is not a container of contents but a cognitive scaffolding: it supports executive functions, lightens the mental load, helps to organise the thinking of those who struggle to plan and monitor themselves.

Alongside this is the ARTE model - Agency, Reflection, Transformation, Ethics - which describes the dimensions of the learning experience: the student acts on their own knowledge, reflects on the process, transforms their constructs and assumes an ethical responsibility for what they produce. It is here that relational mentorship is situated: the relationship between student and AI is never a two-way relationship, but a supervised dialogue in which the teacher mediates, questioning the outputs, asking for justifications, making the choices made visible.
The model addresses the 14-19 age group and indicates a precise direction: AI is an epistemic co-creator, not a substitute for judgement. Hence the vigilance over anthropomorphisation - the attribution to software of intentions and feelings it does not possess - and the care taken to prevent forms of excessive cognitive delegation. Relational mentorship is, in a word, the didactic translation of human-in-the-loop.

5. Validation and cooperative development

The model finally adopts an explicit validation method, inspired by the PDCA cycle (Plan-Do-Check-Act): didactic hypotheses are designed, tested in context, verified against emerging data and revised. It is not a bureaucratic detail: it is the way in which a pedagogical model avoids turning into a slogan, because it accepts being corrected by experience.
The convergence between Slow Tech and UDL makes sustainability and inclusion the two criteria for validating classroom practices, while teachers' professional development is supported by the tools foreseen by the project: the MOOC and the repository of Open Educational Resources of which this resource is part. As the UNESCO reference recalls (Miao & Cukurova, 2024), continuous professional growth is the pillar that holds the others together: a teacher who has no time and opportunity to reflect on their own practices will hardly be able to sustain the critical supervision that the model requires.
In summary, the STIAEM model proposes a measured response to acceleration: not the rejection of technology, but the claim of a human time of learning, in which AI operates as a tool of inquiry and expansion of thought, under the responsibility of a pedagogical judgement that remains, by choice and by professional duty, human.

Visual scaffolding



Conclusions and Metacognitive Reflection Prompts

This resource has presented the STIAEM pedagogical model as a coherent architecture: the Slow Tech paradigm provides the ethical foundation (Good, Clean and Fair IT); the AI4K12, UNESCO and DigComp 3.0 frameworks translate that foundation into observable competences; UDL and the ARTE model root it in classroom design, where AI operates as cognitive scaffolding and epistemic co-creator under the teacher's supervision. The common thread is cognitive sustainability: defending the time and space of human reflection from acceleration and automatic delegation.

To transfer these core ideas to one's own practice, the following reflection prompts are proposed:

In the activities you propose, at what point does the digital tool enter? Before or after the student has formulated their own judgement, and with what consequences for learning?

If you applied the three dimensions of the Slow Tech Attitude to an AI tool you use regularly, which dimension would prove the most critical (Good, Clean or Fair), and why?

How would you describe to your students the difference between using AI as an epistemic co-creator and uncritically delegating cognitive work to it?

Technical Metadata Sheet

Metadata Field	Specification / Parameter Value
Identifier	OER 1.2.1
Title	The STIAEM Pedagogical Model: Balancing Digital Literacy and Relational Mentorship
Creator	University of Zaragoza - Spain
Description	The text presents the STIAEM pedagogical model as an architecture balancing digital literacy with relational mentorship. Starting from the diagnosis of technological accelerationism and the principle of cognitive sustainability, it articulates the Slow Tech Attitude (Good IT, Clean IT, Fair IT) and integrates the AI4K12, UNESCO and DigComp 3.0 frameworks. The classroom focus is on designing activities where AI acts as cognitive scaffolding and epistemic co-creator while the teacher retains pedagogical ownership (human-in-the-loop).
Keywords	pedagogical model; digital literacy; relational mentorship; Slow Tech Attitude; cognitive sustainability; human-in-the-loop; AI4K12; pondered delegation
Language	EN (English)
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Contributor	STIAEM Transnational Scientific Board (peer review, Rhodes validation protocol)
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Genre	Training Manual; Educational Guide
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Citation	CAST. (2024). Universal Design for Learning guidelines version 3.0. CAST. https://udlguidelines.cast.org/ Cosgrove, J., & Cachia, R. (2025). DigComp 3.0: European digital competence framework (Fifth edition). Publications Office of the European Union. https://data.europa.eu/doi/10.2760/0001149 Miao, F., & Cukurova, M. (2024). AI competency framework for teachers.

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Educational Level	Secondary School
Associated Module / MOOC Video Lesson	Module 1 - Project Introduction and Pedagogical Model / Video 1.2 - The STIAEM Pedagogical Model
Learning Objectives	recognise the risks of technological acceleration and the principle of cognitive sustainability in one's own classroom context; describe the three dimensions of the Slow Tech Attitude - Good IT, Clean IT, Fair IT - and apply them to the choice of digital tools; design activities in which AI operates as cognitive scaffolding and epistemic co-creator, while the teacher retains pedagogical ownership (human-in-the-loop).
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