STIAEM

Slow Tech Innovation

AI, Ethics and

New Teaching Methods

Mapping the DigCompEdu framework (Area 6) and AI4K12 standards in secondary schooling

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Università di Foggia

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OER 2.3.2: Mapping the DigCompEdu framework (Area 6) and AI4K12 standards in secondary schooling
Reference Module: Module 2 - AI Fundamentals and LLM Mechanics
Related Video-Pill: Video 2.3 - Anthropomorphisation & DigCompEdu
Authoring partner: Panevėžys "Vyturys" Progymnasium - Lithuania
Topic / Thematic Focus: DigCompEdu Area 6 mapping, AI4K12 standards and secondary schooling

Introduction and Learning Objectives

This resource completes the path of video-pill 2.3 "Anthropomorphisation & DigCompEdu" and, together with OER 2.3.1, constitutes its project outcome. Its purpose is to offer an operational map that relates two reference frameworks: the European DigCompEdu for teachers' digital competence and the AI4K12 standards for artificial intelligence literacy. The underlying question is how Area 6 of DigCompEdu and the "five big ideas" of AI4K12 translate into secondary-school practices.
The text connects to DigComp 3.0 (Cosgrove & Cachia, 2025) and to the UNESCO framework for teachers' competences (Miao & Cukurova, 2024). The perspective is consistent with the previous resources: digital competence is not a separate domain, but a cross-cutting axis of the curriculum, and AI-related competence runs across the whole spectrum of the citizen's competences.
By the end of the reading, teachers will be able to:

- place the teacher's digital competence within the DigCompEdu framework and recognise the specificity of Area 6;
- describe the five big ideas of AI4K12 and their link to the competences of the digital citizen;
- design secondary-school activities that integrate pedagogical modelling and AI literacy.
- A fundamental fact also holds for schools: people tend to respond to computers as social interlocutors (Nass & Moon, 2000).

1. Why a map: two frameworks, one didactic question

Why bring DigCompEdu and AI4K12 together? Because they answer two different but complementary questions. DigCompEdu concerns the professionalism of the teacher: what those who teach need to know and be able to do, in order to use technologies competently. AI4K12 concerns the content of literacy: what it means to understand artificial intelligence, which fundamental concepts students should master. A map that holds them together avoids two symmetrical errors: reducing the teacher's competence to the use of tools, or offering students an abstract theory without teaching practice.
The map, therefore, is not a catalogue to be memorised, but a tool for designing activities in which the teacher models and students exercise critical judgement. It is in this key that the two frameworks become operational: the first says what the teacher must do to help students grow; the second says what students should understand in order to use AI with discernment.

2. DigCompEdu: twenty-two competences, six areas

The European framework for the digital competence of educators, known as DigCompEdu, organises digital professionalism into twenty-two competences distributed across six areas (Redecker, 2017). The first five areas concern the teacher's direct action - engaging professionally, using digital resources, teaching and learning, assessment, empowering learners - while the sixth area concerns students' own digital competence. It is a simple and powerful distinction: a teacher is not competent merely because they can use the tools, but because they help others to become so.

An essential feature of the framework is progression. Competences are not a binary condition; they develop by degrees, from the first steps of beginners to the innovation of the more expert. This choice is pedagogically significant to the same extent as it would be for students: recognising that competence grows in stages invites continuous training and self-assessment, and does not discourage those who start from far behind. It is in this perspective that the European self-assessment tools designed for teachers sit, such as SELFIEforTEACHERS, which help to locate one's own practices and identify their margins for development (Redecker, 2017). The framework, moreover, does not place technical skills at the centre, but the way in which digital technologies can improve and innovate education.

3. Area 6: fostering learners' digital competence

Area 6 is the heart of the map for our question. Its title - fostering learners' digital competence - signals that the goal is not the transmission of technical knowledge, but the building of critical and operational abilities. DigCompEdu groups five competences within it: information and media literacy, digital communication and collaboration, digital content creation, responsible use and digital problem solving (Redecker, 2017).

Here too, as with the anthropomorphisation discussed in OER 2.3.1, the method is modelling: the teacher checks the sources they use in front of the class, verbalises their own doubt, breaks down their own errors. They do not teach verification with an abstract lesson on computation, but exercise it in real time, showing the process. When the teacher says aloud "I will not take this statement at face value, I am checking", they are transmitting an Area 6 competence more effectively than any explanation.The five competences of Area 6, read in this key, lend themselves to a natural integration with AI literacy. Information and media literacy dialogues with the need to distinguish generated content from verified content; digital content creation with transparency about the AI contribution; responsible use with ethics and social impact; problem solving with the ability to design solutions using technologies appropriately.The UNESCO framework for students' competences in artificial intelligence also contributes to this horizon (UNESCO, 2024).

4. AI4K12: the five big ideas

The second pillar of the map is the AI4K12 standard, which organises artificial intelligence literacy around five "big ideas", designed for the different school levels (AI4K12 Initiative, 2024). The first is perception: systems build a model of reality starting from sensor data. The second is representation and reasoning: systems maintain representations of the world and operate on them, without thereby understanding conceptually what they represent. The third is learning: systems learn from data, and therefore distorted data generate distortions. The fourth is natural interaction: dialogue and language are the privileged channel of the human-machine relationship, and it is here that the risk of anthropomorphisation is concentrated. The fifth is social impact: AI raises questions of ethics, responsibility and rights that concern citizenship.
The link with the European framework is immediate and offers the teacher a precise didactic criterion. The five big ideas are not to be taught as computer-science notions, but addressed by everyone, including those who teach humanities subjects, in the form of questions about how systems work and their limits. On this point DigComp 3.0 provides a clear formulation:
"Recognise that while AI systems can generate and integrate digital content, humans are essential to ensure ethical, responsible and context-appropriate outputs" (Cosgrove & Cachia, 2025, DigComp 3.0, CS3.1.04).

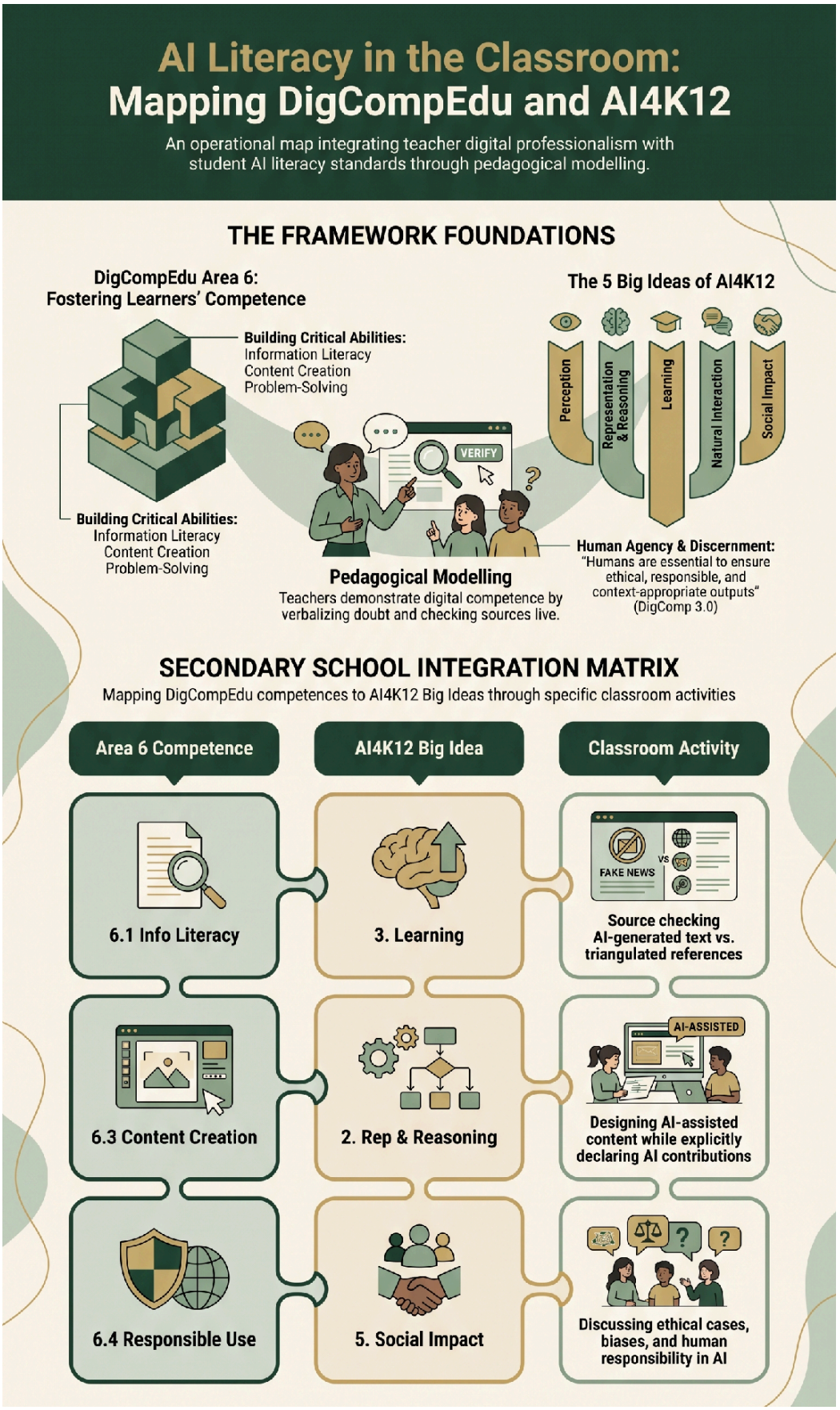
There is then a competence, in the European framework, that acts as a hinge between the two systems: the critical evaluation of information. DigComp 3.0 formulates it as the ability to evaluate and compare the credibility and reliability of sources and to interpret digital content critically, "as well as the processes used to generate them" (Cosgrove & Cachia, 2025, Competence 1.2). Interrogating the generation process: it is precisely this that makes knowledge of how systems work necessary, that is, the big ideas of AI4K12.

5. Few-Shot Prompting Through the STIAEM Pedagogical Framework

What does it mean, concretely, to integrate the two frameworks in a secondary school? It means designing brief and recurring activities in which the competences of Area 6 become real exercise, anchored to the big ideas of AI4K12. A source check on a generated text mobilises information literacy (6.1) and the big idea of learning; a discussion on the responsible use of a study assistant mobilises competence 6.4 and social impact; an exercise in decomposing a system error activates problem solving (6.5) and representation and reasoning.
The condition for success is modelling, not frontal teaching: the teacher shows the process, does not merely talk about it. The UNESCO framework for teachers' competences makes this explicit, asking that AI-related competence be integrated into professional practice and support the building of critical autonomy in students (Miao & Cukurova, 2024). And the European framework recalls, for its part, that the ultimate goal of digital competences is conscious participation in society and democratic life (Cosgrove & Cachia, 2025).
In summary, the map composed of DigCompEdu and AI4K12 offers the teacher a double compass: Area 6 says what they must be able to do to help students grow; the five big ideas say what students should understand in order to use AI with judgement. Holding the two indications together means placing digital competence where it belongs: not in the skilful use of a tool, but in the education of people capable of evaluating, deciding and taking responsibility for their own choices.

Area 6 (DigCompEdu)	AI4K12 big idea	Secondary-school activity	Error safeguard
6.1 Information and media literacy	3. Learning	Source check on an AI-generated text	Triangulation; checking of references
6.3 Digital content creation	2. Representation and reasoning	Designing content while declaring the AI contribution	Transparency about the use of the tool
6.4 Responsible use	5. Social impact	Discussion of an ethical case on the use of an assistant	Recognising limits, *bias* and human responsibility
6.5 Problem solving	4. Natural interaction	Decomposing a system error and re-explaining it	Terminological hygiene; suspension of anthropomorphisation

Visual Scaffolding



Conclusions and Metacognitive Reflection Prompts

This resource has proposed an operational map that holds together DigCompEdu and the AI4K12 standards. Area 6 of DigCompEdu defines the teacher's digital competence as the ability to help students' competence grow, through modelling; the five big ideas of AI4K12 indicate the concepts that make conscious use of AI possible. Integrating the two frameworks means designing activities in which students exercise critical judgement on generated content, under the supervision of a teacher who shows the process before explaining it. It is thus that the primacy of human discernment, the theme of video-pill 2.3, finds its curricular translation.

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

- Which of the five competences of Area 6 of DigCompEdu do you feel closest to your subject, and which activity could you design to exercise it?
- Among the five big ideas of AI4K12, which seems to you most neglected in your school, and how would you link it to a curricular content?
- How could you make modelling visible to students, that is, the moment when you verify a source or suspend judgement on a generated output?

Technical Metadata Sheet

Metadata Field	Specification / Parameter Value
Identifier	OER 2.3.2
Title	Mapping the DigCompEdu Framework (Area 6) and AI4K12 Standards in Secondary Schooling
Creator	Panevėžys "Vyturys" Progymnasium - Lithuania
Description	The resource offers an operational map linking two reference frameworks: the European DigCompEdu for teachers' digital competence and the AI4K12 standards for AI literacy. It examines the specificity of DigCompEdu Area 6 — fostering learners' digital competence — and the five Big Ideas of AI4K12. The didactic focus is on designing secondary-school activities that integrate pedagogical modelling with AI literacy.
Keywords	DigCompEdu; Area 6; AI4K12; Big Ideas; AI literacy; secondary schooling; pedagogical modelling; competence frameworks
Language	EN (English)
Affiliation	Panevėžys "Vyturys" Progymnasium - Lithuania
Contributor	STIAEM Transnational Scientific Board (peer review, Rhodes validation protocol)
Media Format	Text; Infographics
Genre	Training Manual; Educational Guide
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Citation	AI4K12 Initiative. (2024). AI4K12: Five big ideas in AI [Website]. https://ai4k12.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. UNESCO. https://doi.org/10.54675/ZJTE2084 Redecker, C. (2017). European framework for the digital competence of educators: DigCompEdu (Y. Punie, Ed.). Publications Office of the European Union. https://joint-research-centre.ec.europa.eu/scientific-activities/key-competences-lifelong-learning/digcompedu_en

	UNESCO. (2024). AI competency framework for students. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000391107
Educational Level	Secondary School
Associated Module / MOOC Video Lesson	Module 2 - AI Fundamentals and LLM Mechanics / Video 2.3 - Anthropomorphisation & DigCompEdu
Learning Objectives	place the teacher's digital competence within the DigCompEdu framework and recognise the specificity of Area 6; describe the five Big Ideas of AI4K12 and their link to the competences of the digital citizen; design secondary-school activities that integrate pedagogical modelling and AI literacy.
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