3.1 Dimensions

The DUAL.AI.TEACHer Framework is structured as a comprehensive two-dimensional matrix that outlines a total of 18 core competencies, each of which emerges from the intersection of the two main dimensions along which the framework is organised. The horizontal dimension defines the main areas that characterise teaching and learning practices, capturing the pedagogical dimension of the framework. The vertical dimension maps the key aspects of AI, reflecting the technological and ethical facets involved in its integration into educational contexts.

This structure enables the framework to systematically link pedagogical competencies with AI-related knowledge and skills, ensuring that each identified competency reflects both an educational objective and a specific dimension of AI understanding or application.

DUAL.AI.TEACHer Horizontal dimension

The horizontal dimension of the framework is drawn from the DigCompEdu framework, which identifies the key areas that characterise teaching and learning practices in the digital environments. These areas encompass the fundamental pedagogical activities carried out by teachers, ranging from professional engagement and management of digital resources to the design and delivery of learning experiences, the implementation of assessment strategies, and the promotion of learners' active engagement and digital competencies.

By taking into account the AI Pioneers Framework, the DUAL.AI.TEACHer Framework adopts this dimension to ground AI-related competencies in the broader pedagogical practices already recognised as essential for effective teaching, aligning them with those practices. The horizontal dimension is organised into the following six fields:

- **Professional Engagement**: This field focuses on the use of AI-powered resources for professional interactions, such as communication, collaboration and development, in relation with diverse stakeholders within institutional contexts.
- **Digital Resources**: This field focuses on the responsible selection, creation, adaptation, usage, evaluation and sharing of AI-powered resources for learning.
- **Teaching & Learning**: This field focuses on the possible integration and the subsequent management of AI-powered resources in teaching and learning processes.
- **Assessment**: This area focuses on the possible integration of AI-powered resources in the educational assessment processes.
- **Empowering Learners**: This area focuses on the use of AI-powered resources to support and enhance learner-centred teaching and learning strategies.
- **Facilitating Learners' (AI) Digital Competence**: This area focuses on pedagogic competencies required to support and guide learners developing their own AI digital competence.

DUAL.AI.TEACHer Vertical dimension

The vertical dimension of the framework is drawn from the UNESCO AI Competency Framework for Teachers, which originally identifies five key aspects of AI competence relevant for teaching practice: human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy and AI for professional development.

For the purposes of the DUAL.AI.TEACHer Framework, these five aspects have been reduced to three. Two of the original areas, namely the AI Pedagogy and the AI for Professional Development, were removed, as the horizontal dimension already contained those fields, albeit in a slightly different form. Additionally, the intersection between the vertical and the horizontal dimensions generated redundant competencies. Therefore, it was decided to exclude them from the vertical axis in order to avoid overlaps and ensure conceptual consistency across the matrix.

The vertical dimension is articulated across the following three aspects:

- **Human-centred mindset**: This aspect refers to the set of values and attitudes that teachers need to bear in mind when addressing Human-AI interactions, so as to prioritise people's needs, judgement and wellbeing.
- **Ethics of AI**: This aspect outlines the fundamental ethical principles, regulations, institutional policies, and practical guidelines that regulate the use of AI that teachers need to understand, apply in daily practice and help adapt to specific needs and educational contexts.
- **AI foundations and applications**: This aspect defines the conceptual knowledge and transferable skills that teachers need to understand how AI works, as well as to select, apply and creatively adapt to create learning environments that are effectively supported by AI-powered teaching and learning practices.

Of the three aspects retained, two are considered cross-cutting aspects of AI (Human-centred mindset & Ethics of AI), as they do not pertain to a specific subject area but rather represent transversal dimensions that influence and permeate the entire spectrum of teaching practices, values, and professional conduct related to AI. The third aspect (AI foundations and applications) is considered a content-specific aspect of AI, as it pertains to the conceptual knowledge and specific technical skills that teachers need to acquire to understand, select and apply AI tools in their teaching practice.

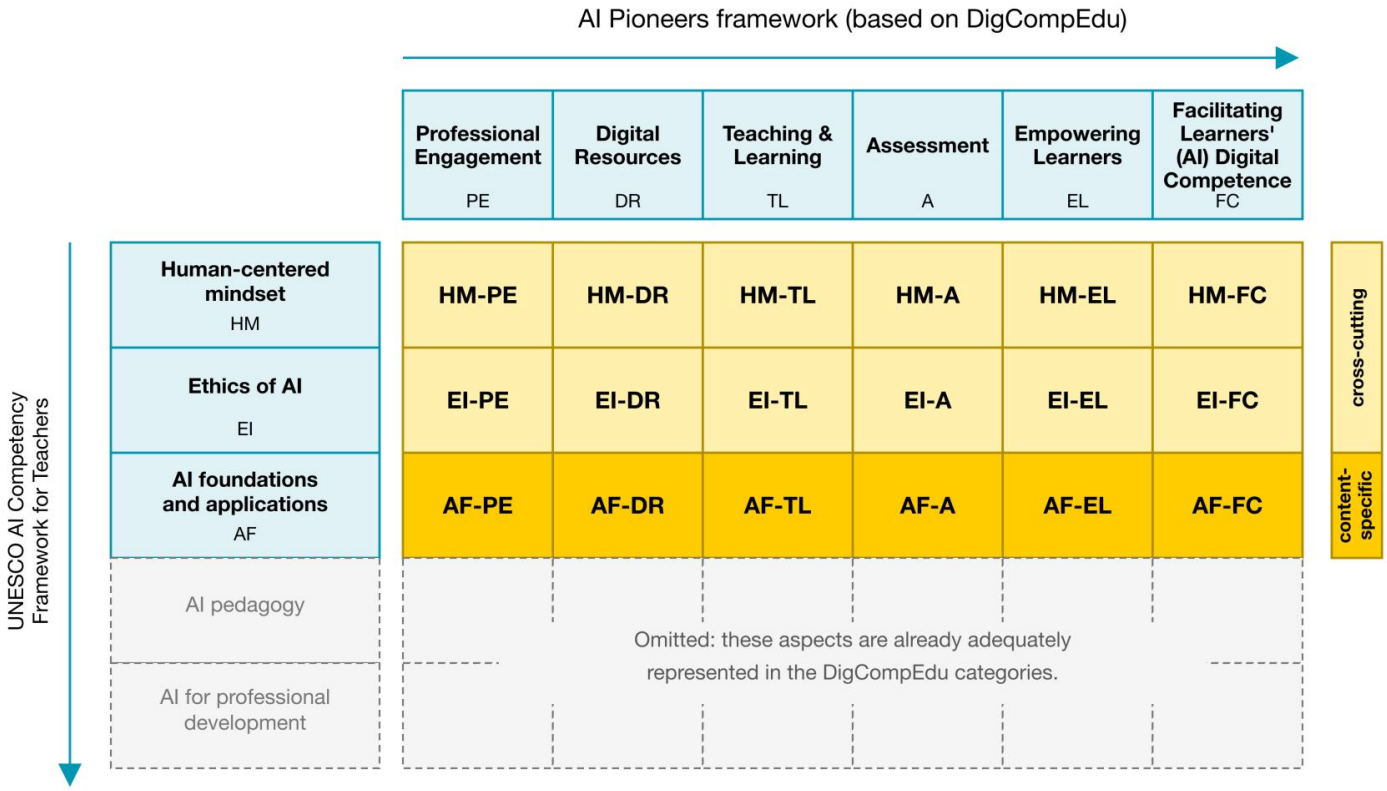


Fig. 1: "The dimensions of the Dual.AI.TEACHer framework" (AI-generated diagram, OpenAI Codex)

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