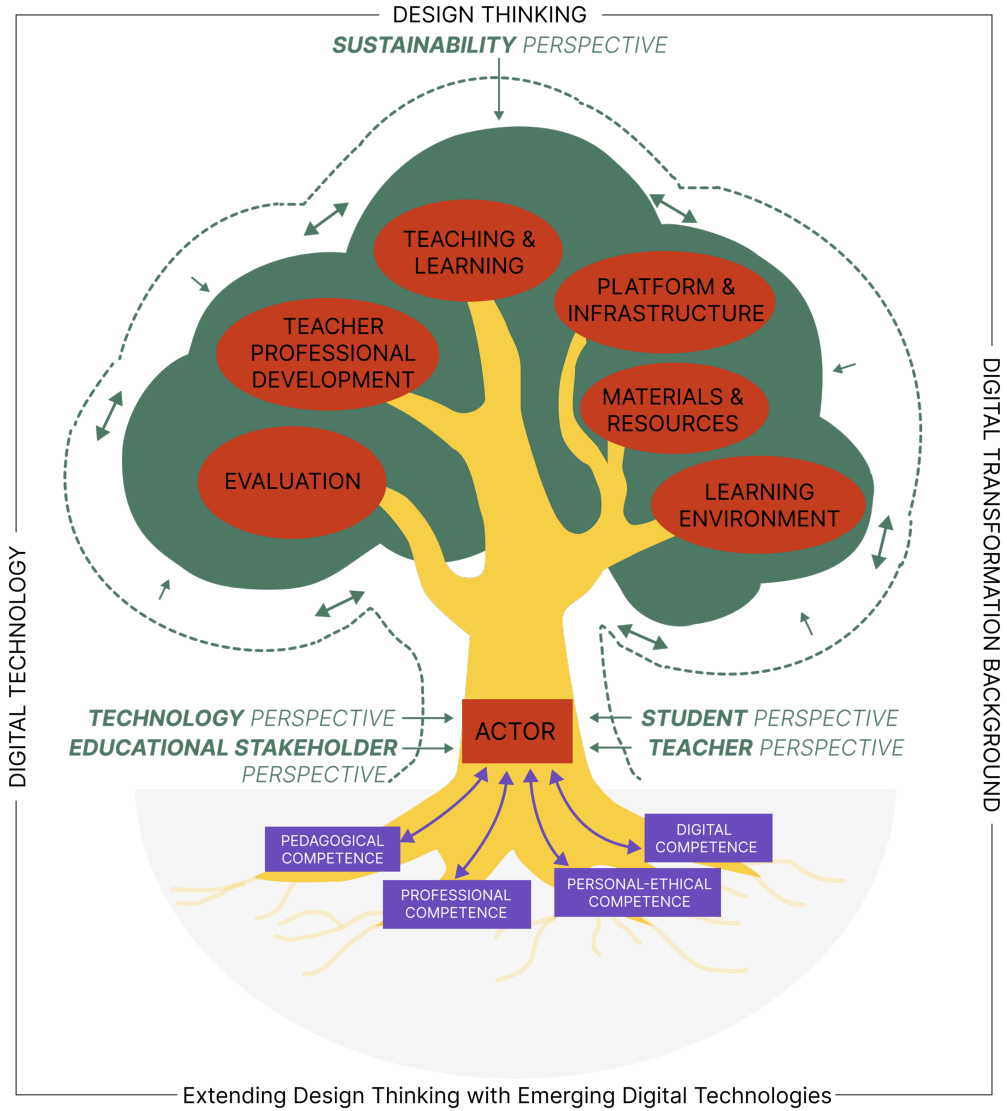

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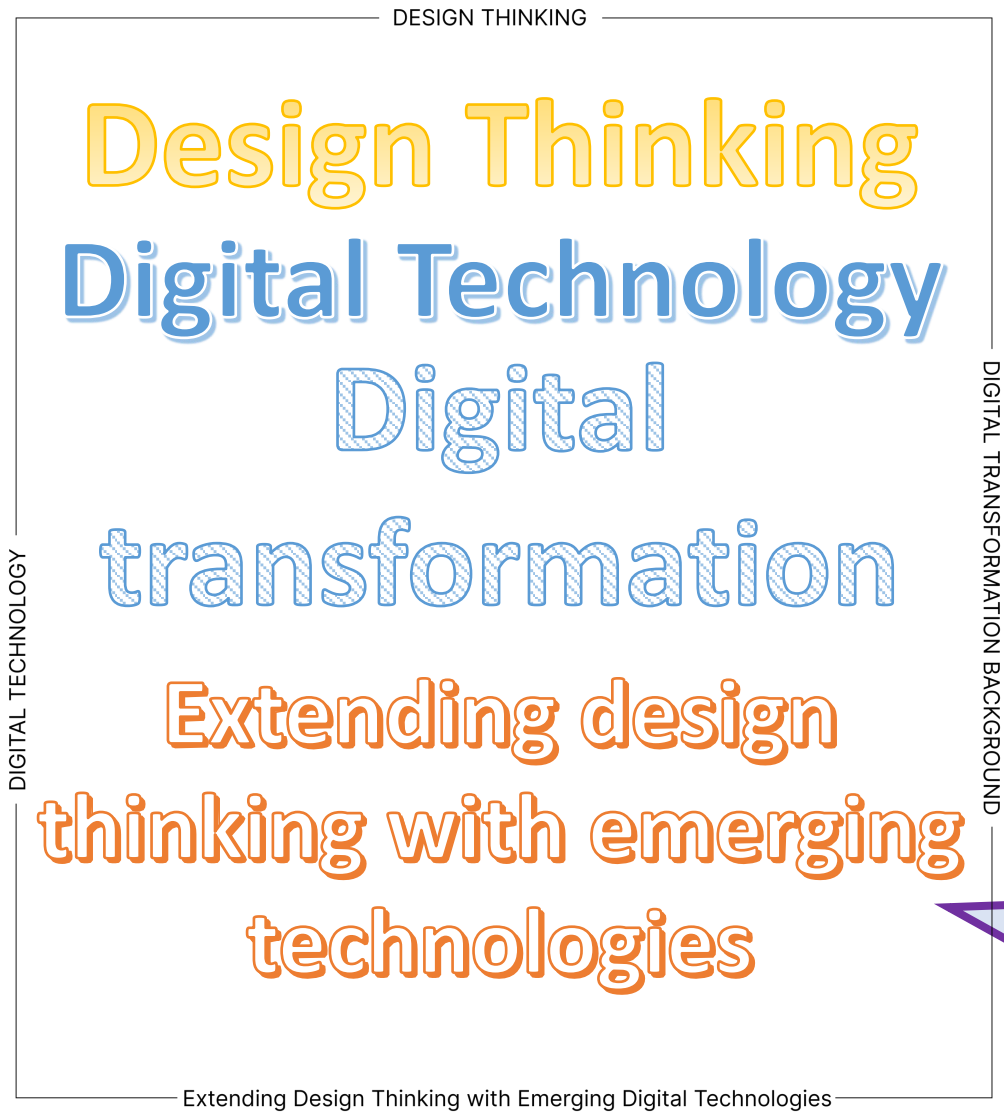
The Exten.(D.T.)^2 Framework

A brief introduction to version 1.1

This is an updated version based on the implementation of our project and feedback on the initial version published on our website: https://extendt2.eu/guidelines-for-mass-deployment/

Exten DT^2



Background and Objectives

Background: Within the backdrop of digital transformation, the vision is to extend *design thinking* (DT) activities in schools with *emerging technologies* (ET).

Objective: This framework aims to identify crucial elements supporting DT with ET, and present them in a holistic manner.

Target users: Teachers or others (e.g., educational designers, policymakers, and all involved educational stakeholders) who may be interested in incorporating DT and ET into their practices.

Using the framework: Ensure you consider the key elements outlined in the framework for implementing DT with ET. Refer to the associated guidelines for detailed instructions on how to adapt and apply the framework effectively in practice.

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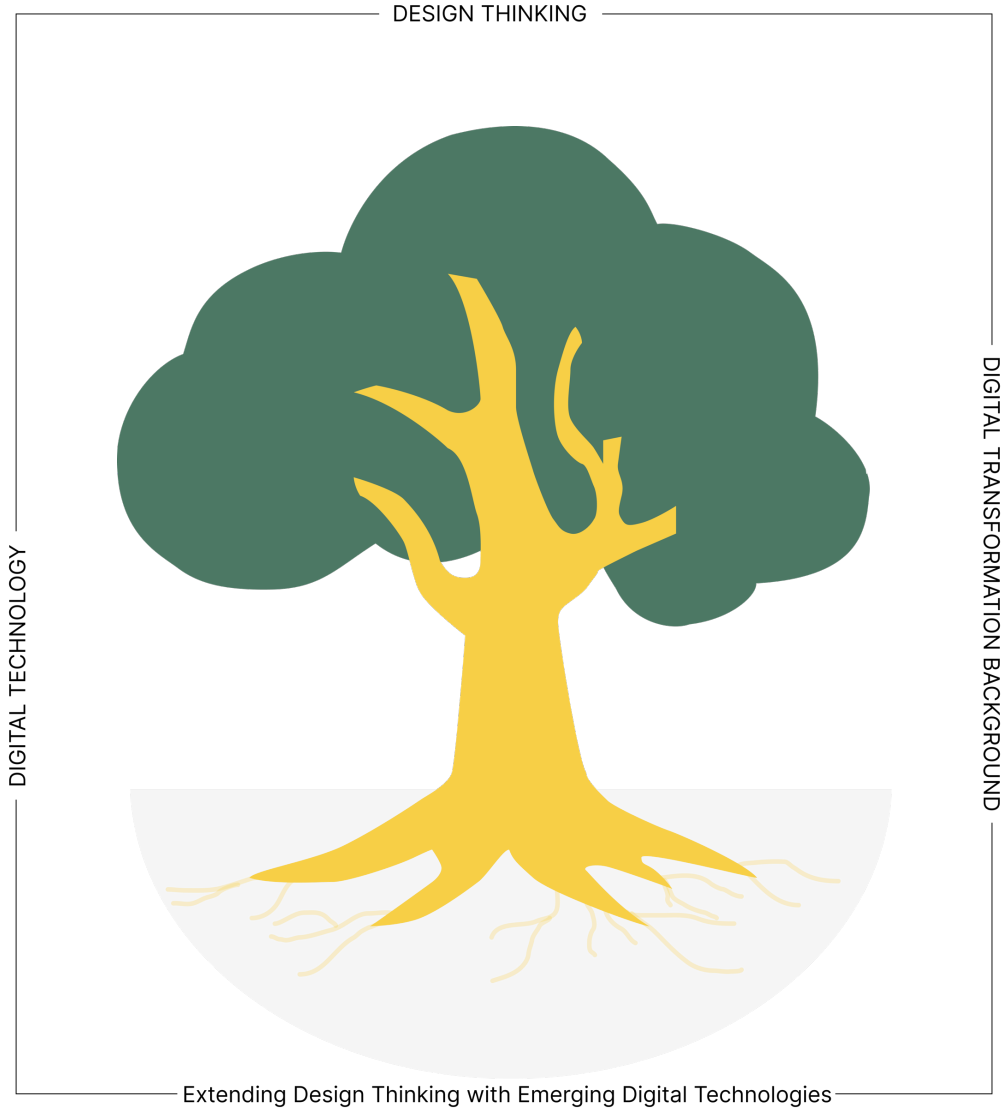

The Tree Metaphor

A tree is a metaphor symbolising various interconnected aspects of supporting *design thinking* (ET) with *emerging technologies* (ET).

A tree is a metaphor that emphasises the importance of a holistic approach to integrating ET in DT education.

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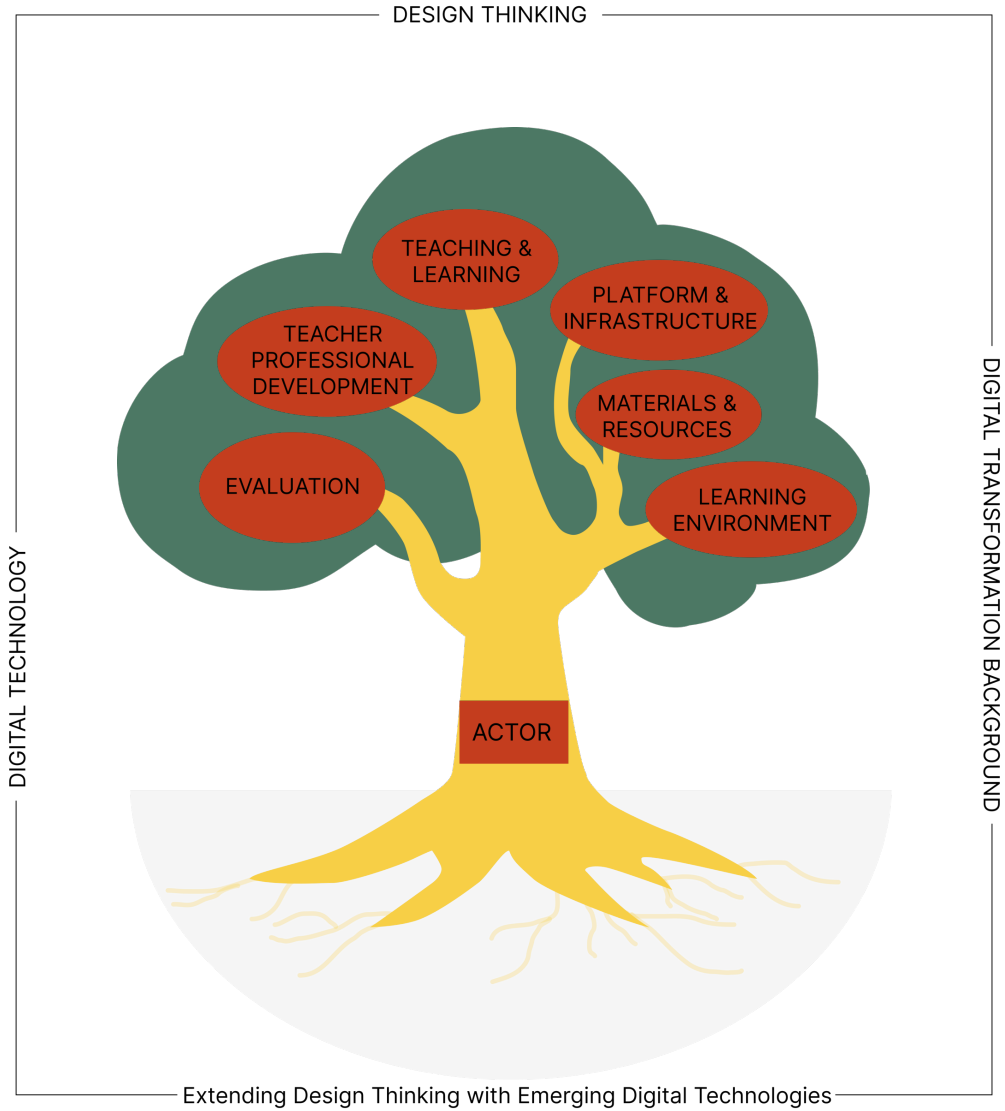

The Tree Metaphor - components

The trunk symbolises the different actors (shown as one core component in the red block) who will be empowered by their competencies to actively engage in *design thinking* (DT) activities with *emerging technologies* (ET).

The cluster of leaves represents the six core components (shown in the red bubbles) that are related to the actor component and are essential for supporting DT with ET.

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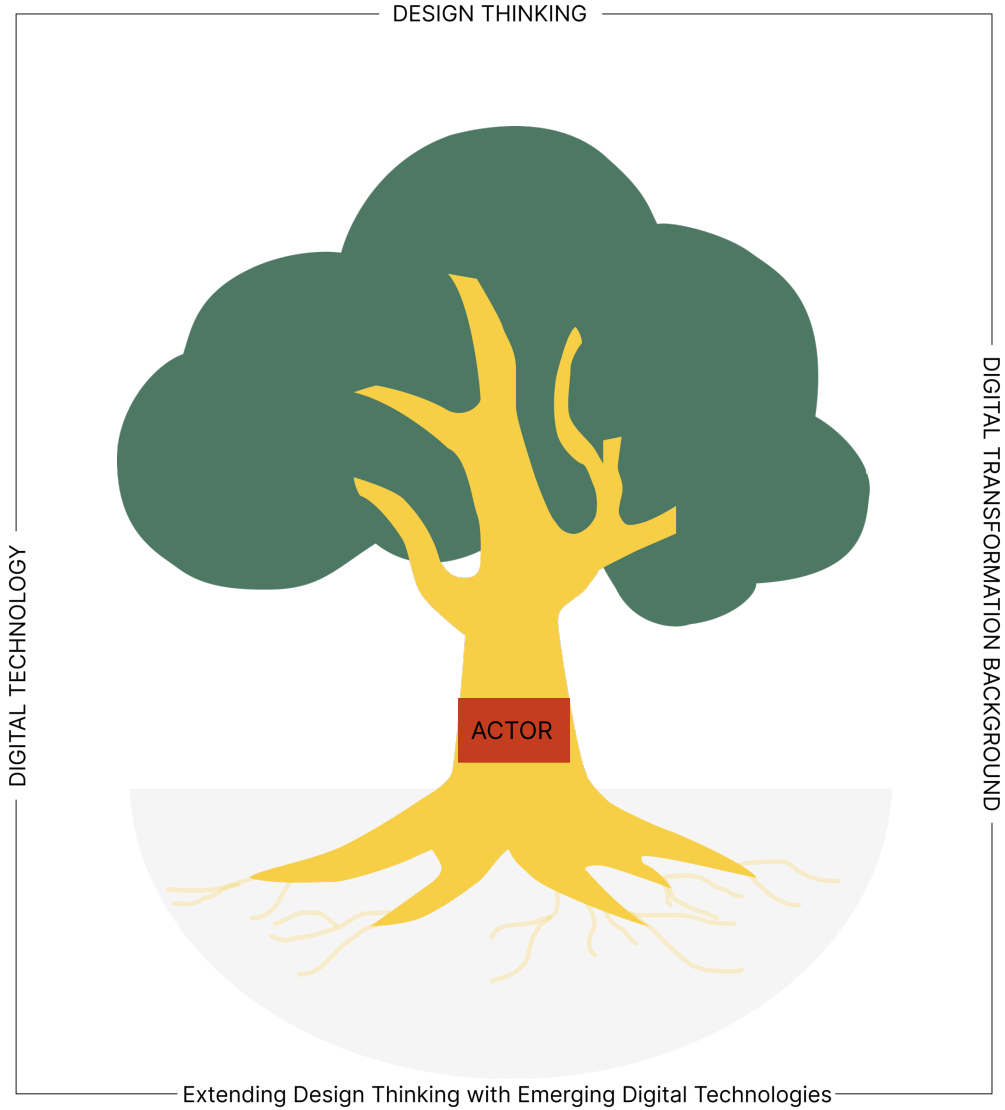

The Tree Metaphor - components

ACTOR: the end-users and stakeholders involved in the learning and teaching processes. This refers to any individual who plays a role or is actively involved in *design thinking* (DT) activities with *emerging technologies* (ET).

Guidelines for ACTOR component: e.g.,

- Identify and consider relevant actors' needs, expectations, and roles in your context.
- Involve and communicate with the actors who are relevant to your design thinking activities with emerging technologies.

For more guidelines, see here: *https://tinyurl.com/ye24wvmz*

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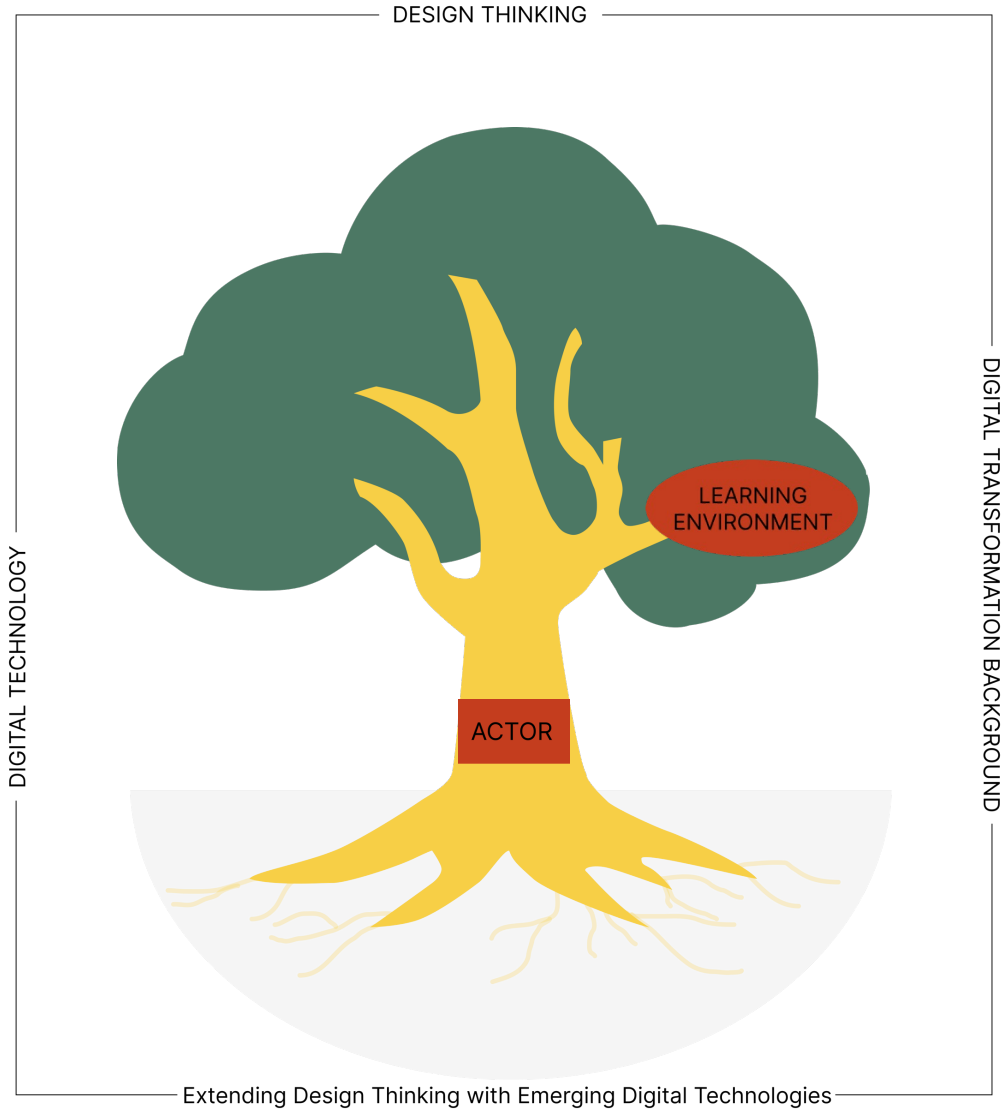

The Tree Metaphor - components

LEARNING ENVIRONMENT: the (physical or virtual) place and context in which learning and teaching may occur. The context can vary widely, including traditional classrooms, online learning, or workshops.

Guidelines for LEARNING ENVIRONMENT component: e.g.,

- Consider different situations such as online, blended or face-to-face classroom learning.
- Ensure physical and virtual learning environments are accessible and adaptable to promote inclusivity and accommodate diverse learner needs.

For more guidelines, see here: *https://tinyurl.com/3unr8x9h*

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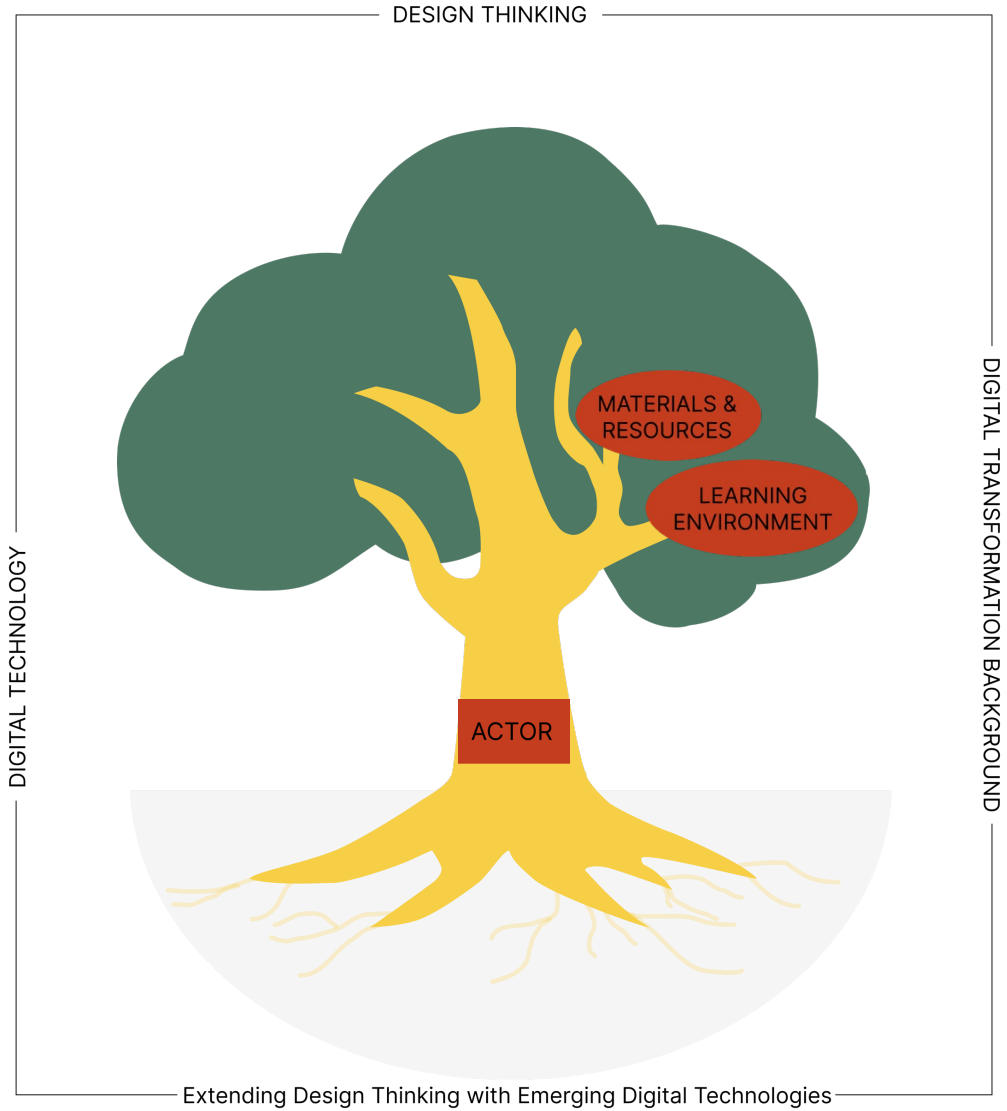

The Tree Metaphor - components

MATERIALS & RESOURCES: a wide range of resources (e.g., financial, physical, human, and other educational resources) and various forms and formats of materials (e.g., physical or digital lesson plans and activity plans, etc.) that are needed or related to support teaching and learning.

Guidelines for MATERIAL & RESOURCES component: e.g.,

- Check and ensure the teaching/learning materials and resources about religious and cultural beliefs and practices are handled with sensitivity and are appropriate to the age group of students.
- Be aware of the use of AI-generated materials and the ethical issues accompanying it.

For more guidelines, see here: *https://tinyurl.com/yaadsjkp*

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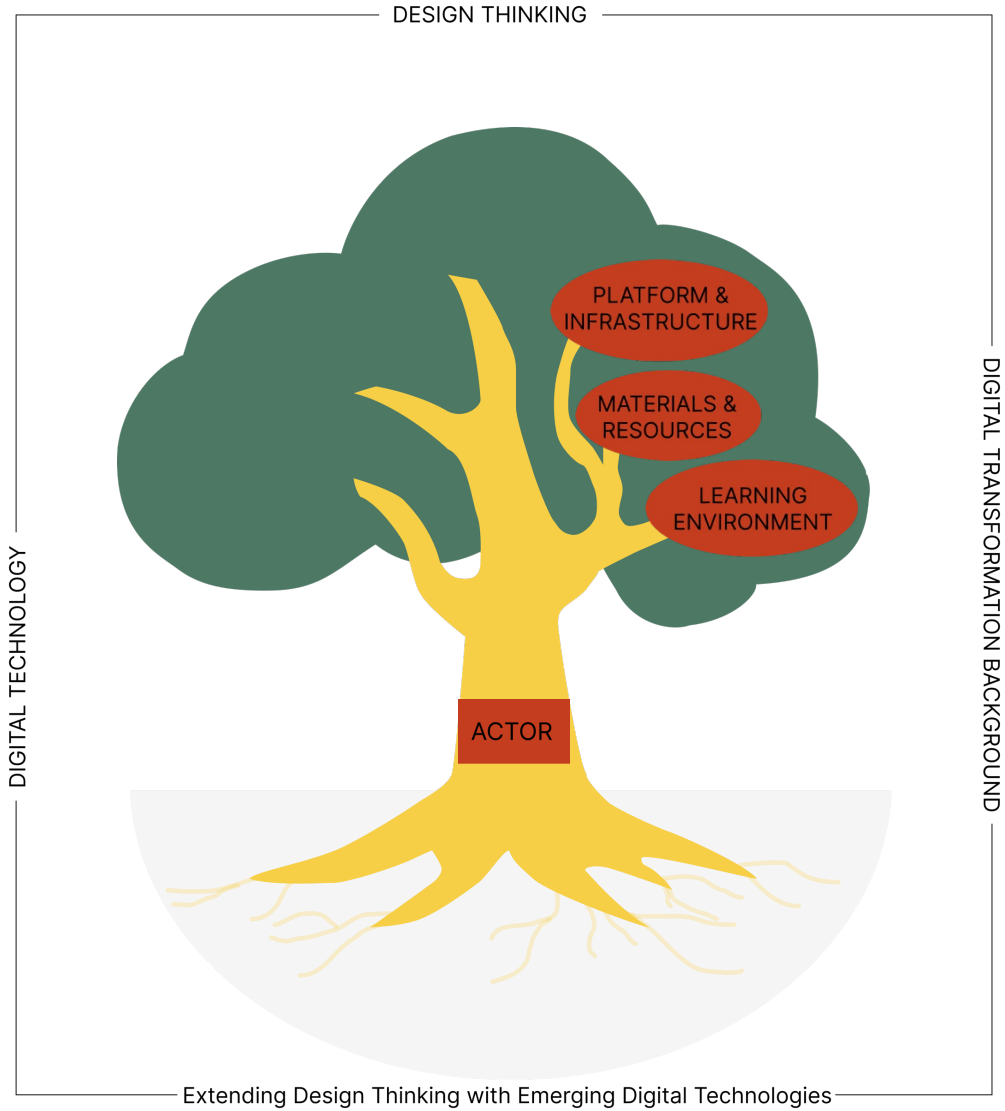

The Tree Metaphor - components

PLATFORM & INFRASTRUCTURE: this includes feature-rich platforms, technology-empowered infrastructure, educational tools and technologies, and repositories essential in enabling efficient interactions and operations and maintaining digital ecosystems.

Guidelines for PLATFORM & INFRASTRUCTURE component: e.g.,

- Consider integrating digital media and tools, allowing students to create, model, co-construct, and share rapid prototyping, and providing tangible and accessible means to structure the design thinking process.
- Select tools and platforms designed in a way that students find them appealing to use regularly.

For more guidelines, see here: *https://tinyurl.com/7zzht29t*

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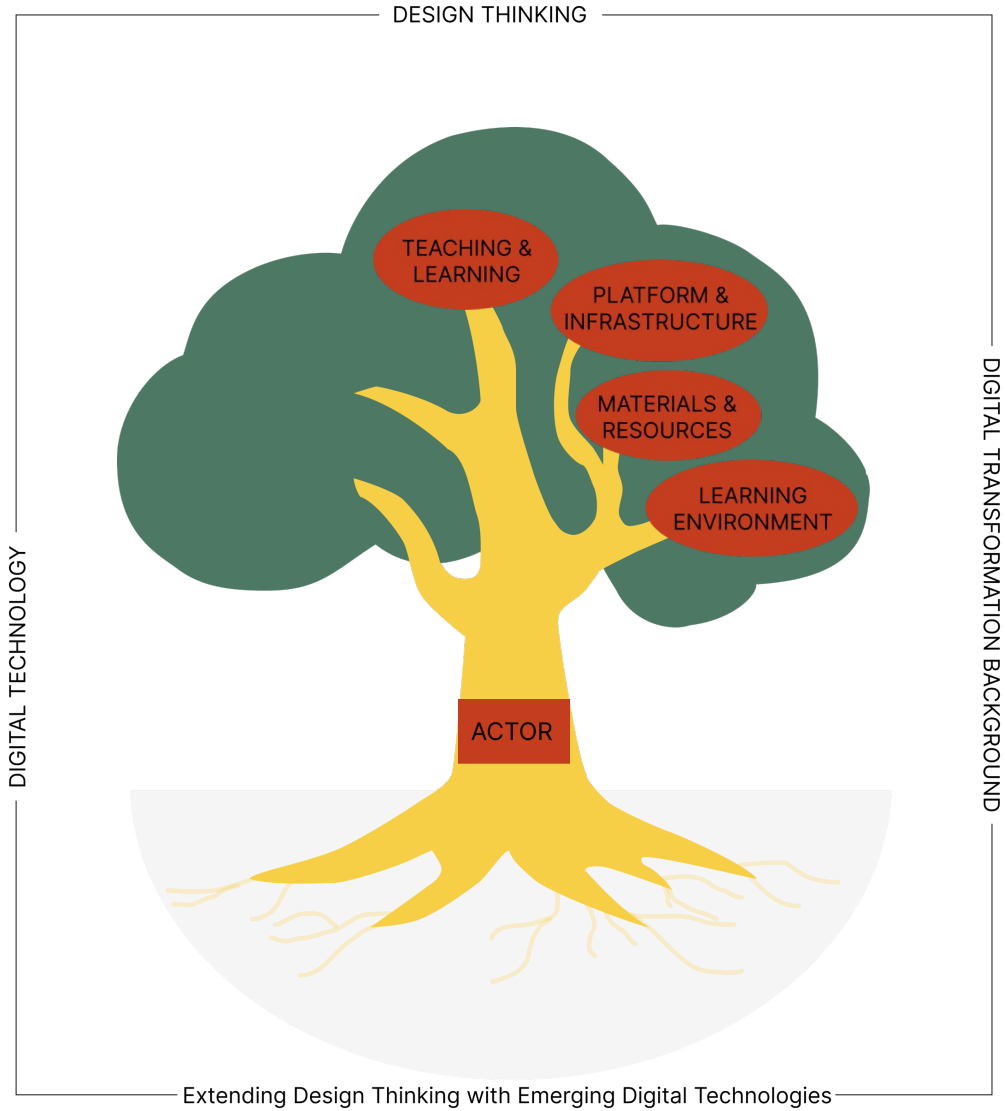

The Tree Metaphor - components

TEACHING & LEARNING: how the practices of educational design thinking activities (e.g., designing activities, plans, material, digital microworlds, rubrics, spreadsheets) are prepared and practised to foster students' learning experiences.

Guidelines for TEACHING & LEARNING component: e.g.,

- Before starting a design thinking project in the classroom, organise a short session with students to become familiar with the technology they will use.
- Develop students' time management skills and help them manage their own time for their design thinking projects.

For more guidelines, see here: *https://tinyurl.com/ynbkba99*

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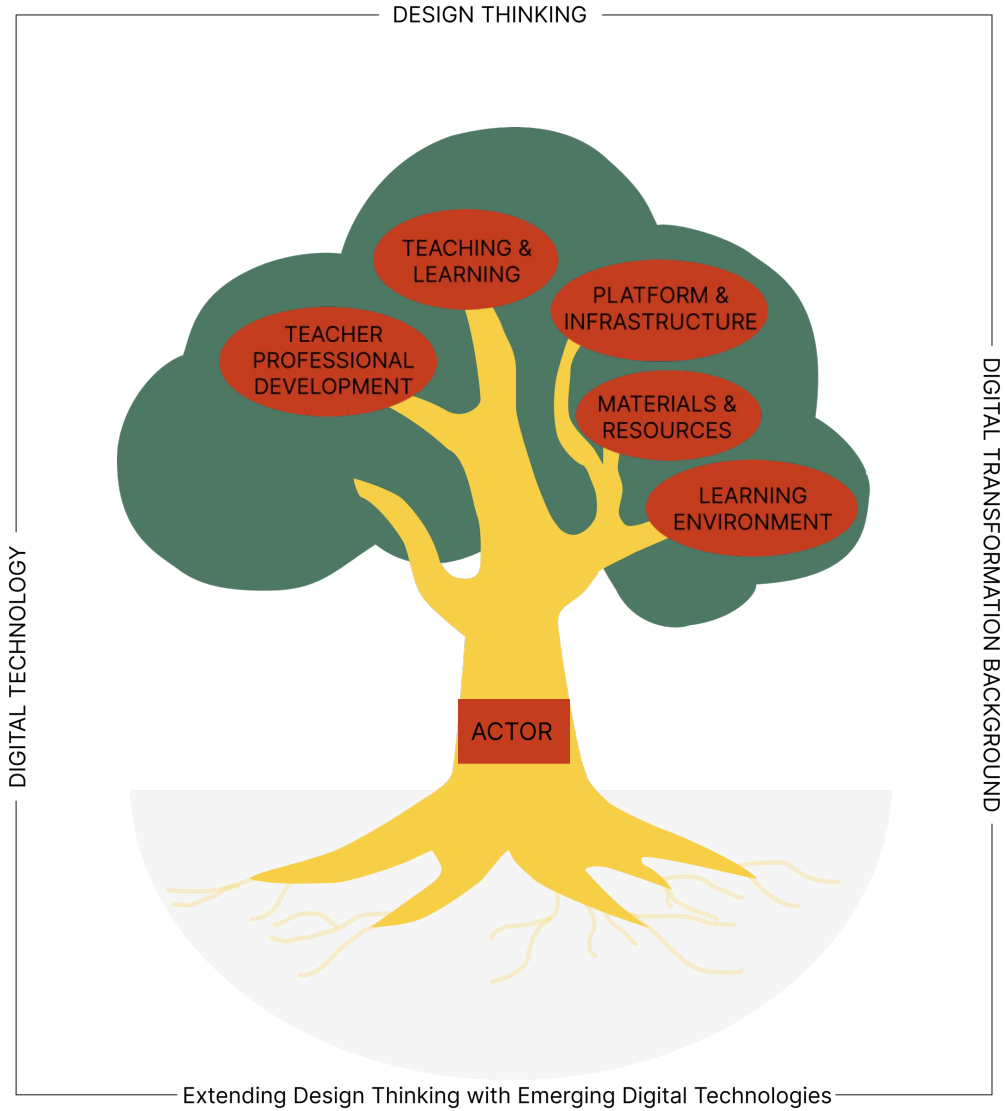

The Tree Metaphor - components

TEACHER PROFESSIONAL DEVELOPMENT: how teachers (or other relevant educational stakeholders) are educated and prepared for instruction regarding learning tasks, pedagogical objectives, experience, implementation, and guidance.

Guidelines for TEACHER PROFESSIONAL DEVELOPMENT component: e.g.,

- Ensure teachers recognise the value of design thinking during teacher professional development, pointing out the differences with traditional teaching.
- Encourage teachers to take the role of the “student” while designing design thinking activities with emerging technologies.

For more guidelines, see here: *https://tinyurl.com/c2vwj42s*

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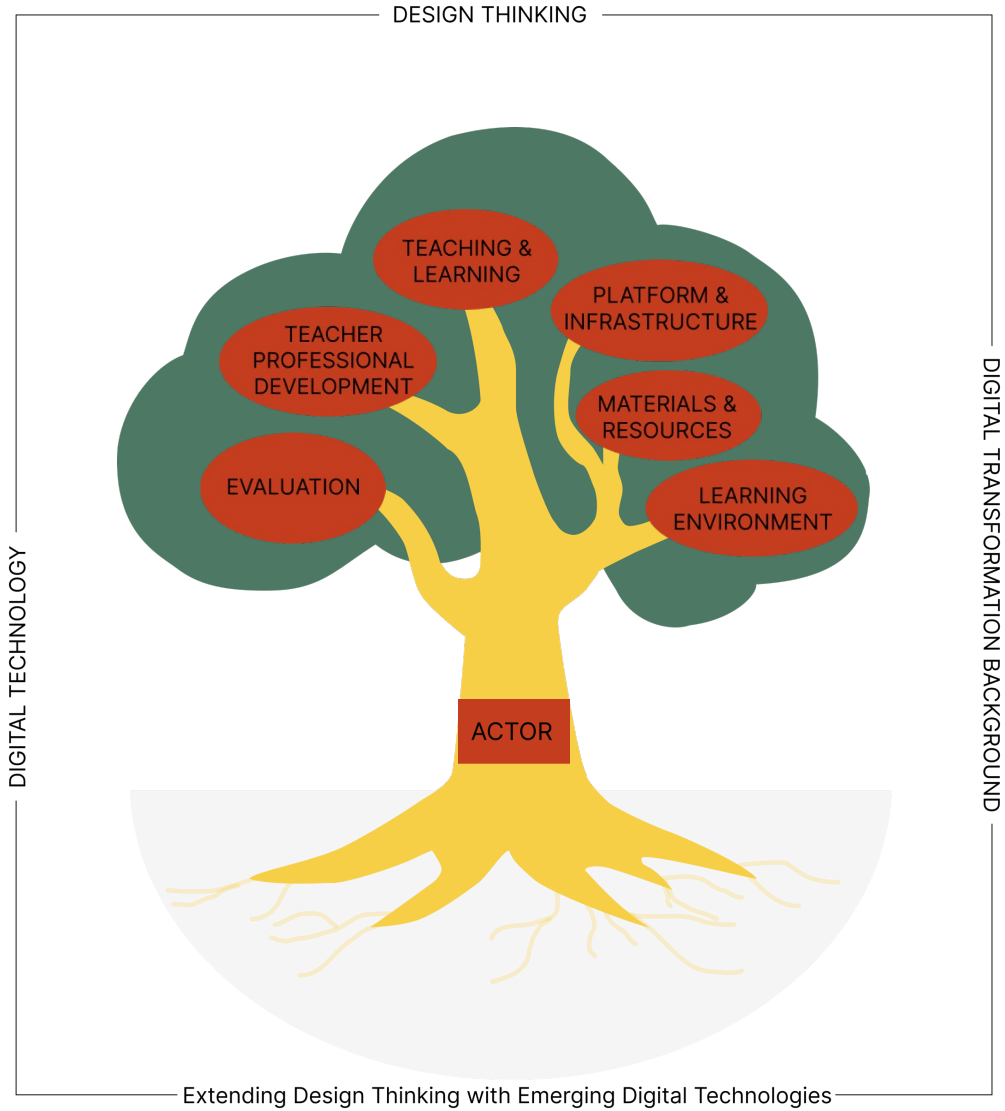

The Tree Metaphor - components

EVALUATION: assessing design thinking learning with emerging technologies from multiple sources and diverse angles, such as students' learning outcomes, teachers' professional development, the role of technologies, and the effectiveness of the instructional design.

Guidelines for EVALUATION component: e.g.,

- Ensure the assessment is aligned with the learning goals.
- Implement regular data collection and use the feedback and data collected to inform ongoing iterations of design thinking activities with emerging technologies.

For more guidelines, see here: *https://tinyurl.com/526pkvy6*

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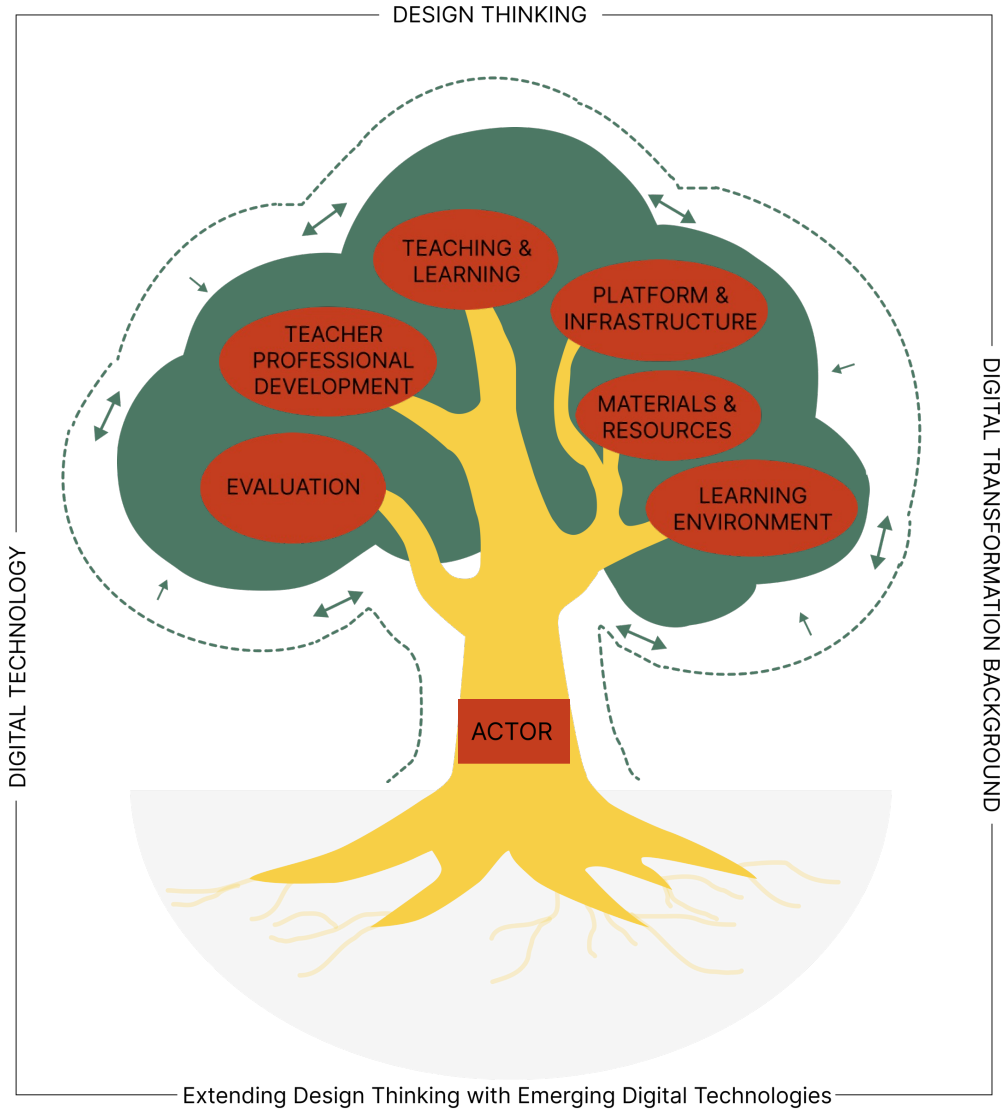

The Tree Metaphor - perspectives

Perspectives are listed around the tree as crucial considerations, which symbolise the air to promote the growth of the tree.

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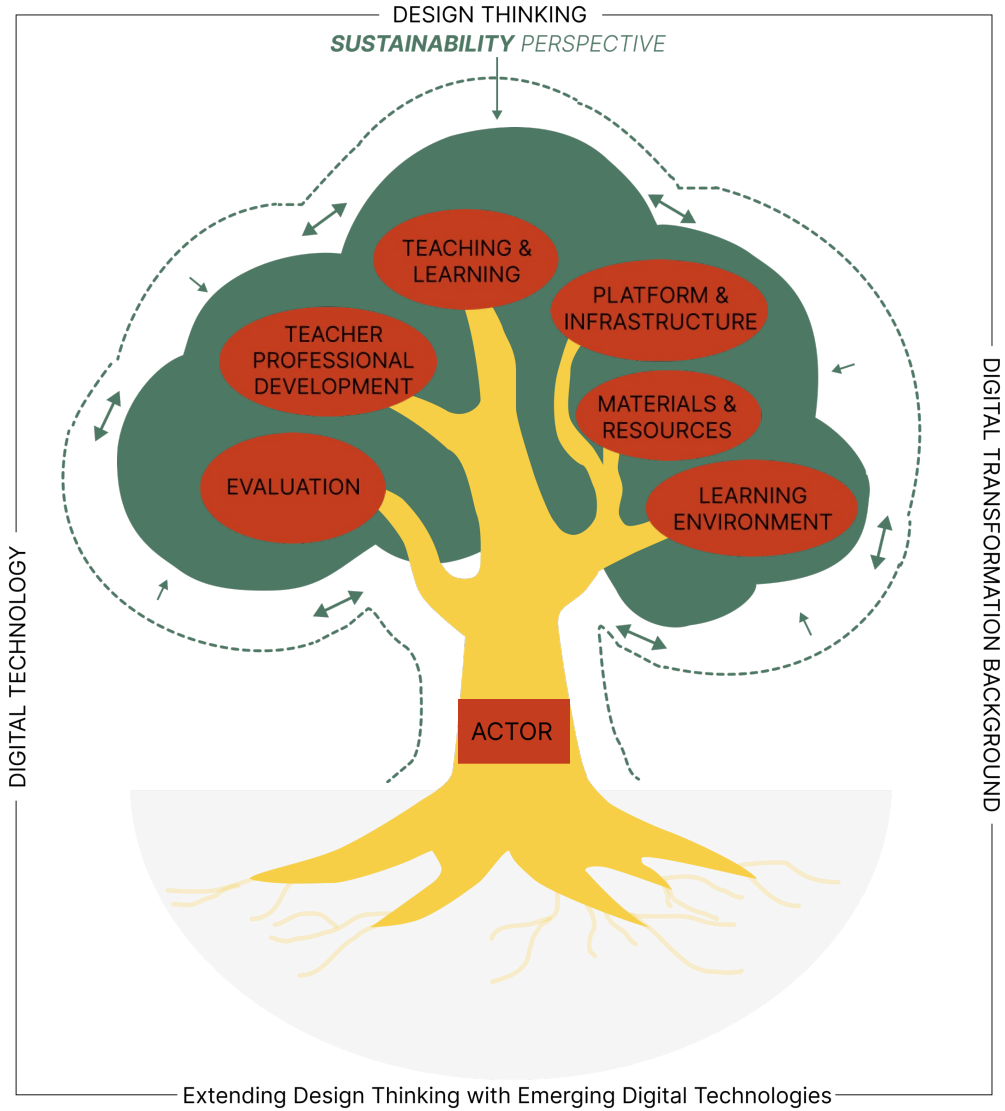

The Tree Metaphor - perspectives

SUSTAINABILITY: views on how all aspects of design thinking learning with emerging technologies should be integrated and transformed to empower people, especially young students, to take responsibility and actively contribute to a more sustainable world.

Guidelines for SUSTAINBILITY perspective: e.g.,

- Consider sustainable education and address global sustainability challenges in design thinking projects, including climate change, unsustainable use of resources, and inequality.
- Promote sustainable practices in technology procurement, usage, and disposal within educational institutions.

For more guidelines, see here: *https://tinyurl.com/24jn3622*

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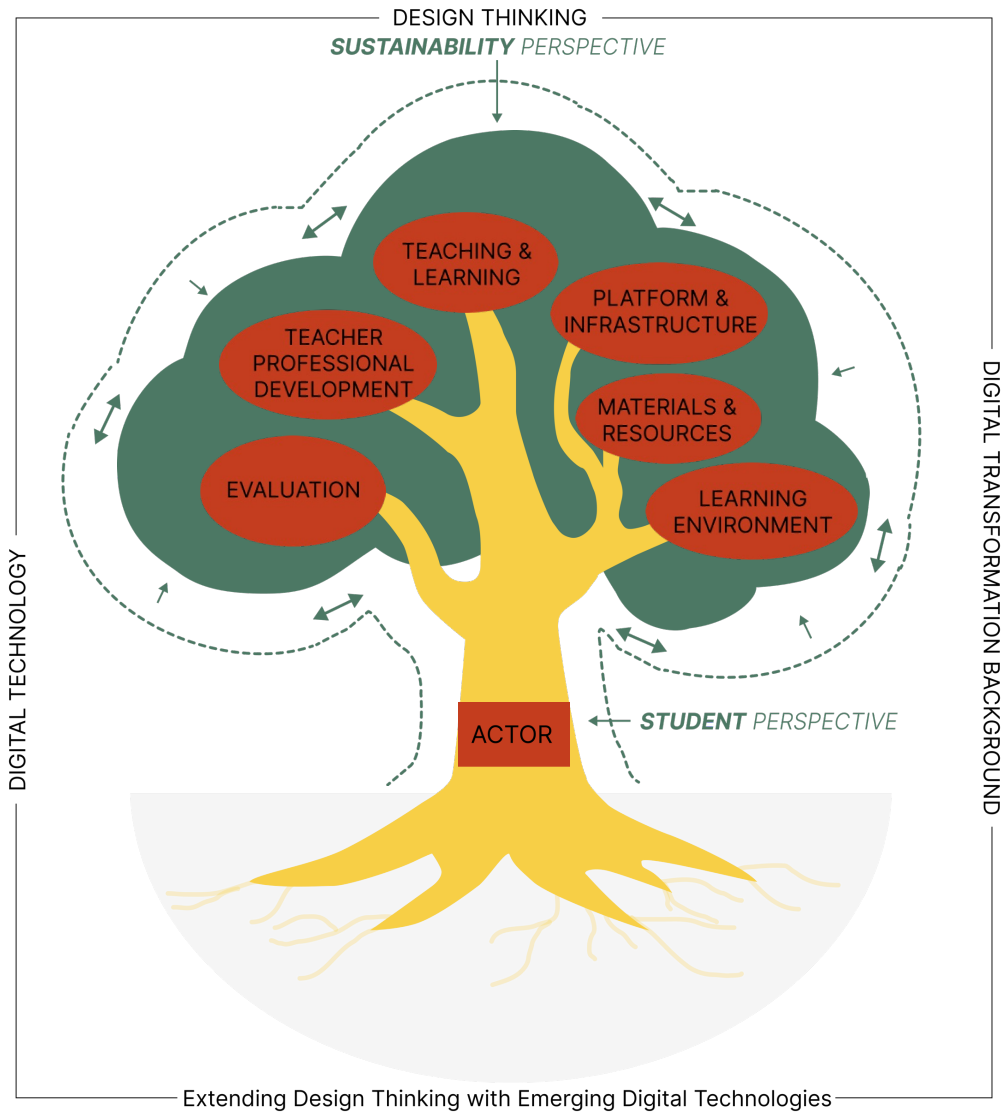

The Tree Metaphor - perspectives

STUDENT: includes perspectives on inclusive education (e.g., supporting persons with disability, language and culture diversity, and gender equality) and fostering resilience and persistence in students when facing failures and frustrations.

Guidelines for STUDENT perspective: e.g.,

- Promote diversity and equality in the classroom and ensure that all genders, races, ethnicities and socio-economic backgrounds are treated fairly when using technology so everyone can benefit from it.
- Promote students to develop open and growth design thinking mindsets.

For more guidelines, see here: *https://tinyurl.com/mcn48avu*

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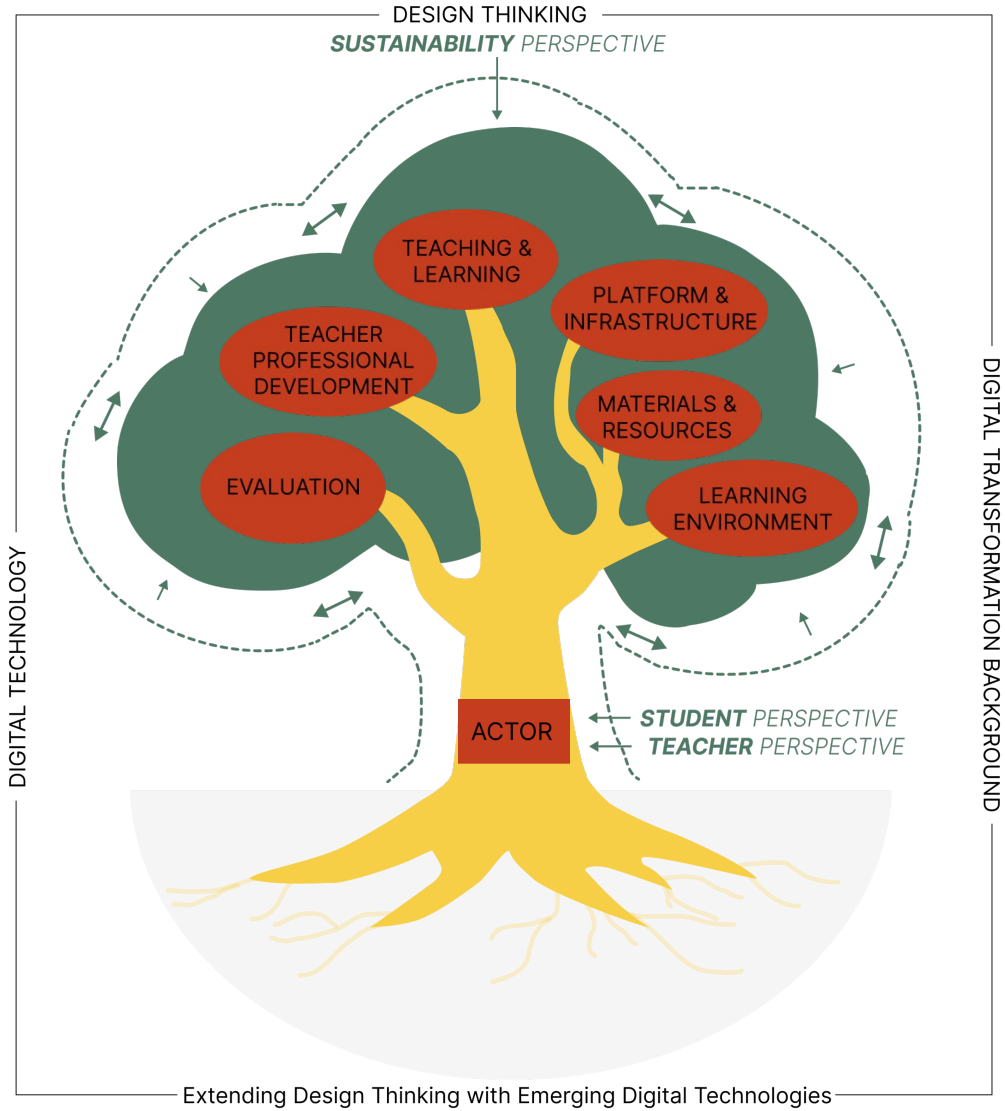

The Tree Metaphor - perspectives

TEACHER: includes developing an open and growth mindset towards quickly changing teachers' roles, pedagogical considerations on using the Universal Design for Learning (UDL) Framework and Equality, Diversity, and Inclusivity (EDI) Framework to sustain an inclusive education for students.

Guidelines for TEACHER perspective: e.g.,

- Develop teachers' mindsets, entailing openness, curiosity, responsiveness, and willingness to use technology and materials.
- Provide teachers with different forms of supporting material and training in their own time and pace.

For more guidelines, see here: *https://tinyurl.com/5cjrfvfc*

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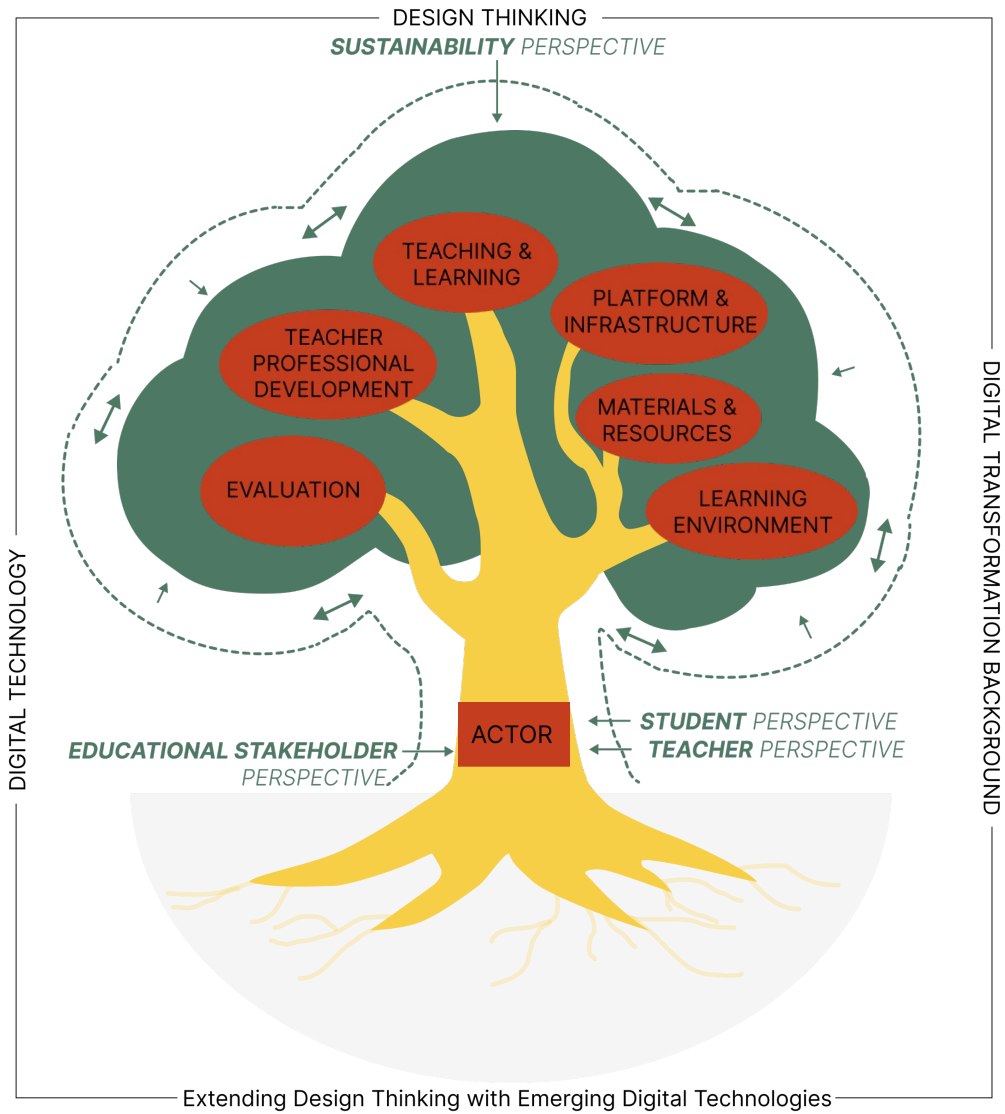

The Tree Metaphor - perspectives

EDUCATIONAL STAKEHOLDER: includes promoting and facilitating collaboration between educational stakeholders (e.g., but not limited to, educational researchers and technologists) and the transferability of knowledge and best practices in different institutions.

Guidelines for EDUCATIONAL STAKEHOLDER perspective: e.g.,

- Be open to collaboration opportunities and technological development opportunities (e.g., seminars) with other educational stakeholders.
- Arrange workshops that include stakeholders from different backgrounds, thus bridging the gap between what's learnt and how it can be implemented later in the future.

For more guidelines, see here: *https://tinyurl.com/577z7kj6*

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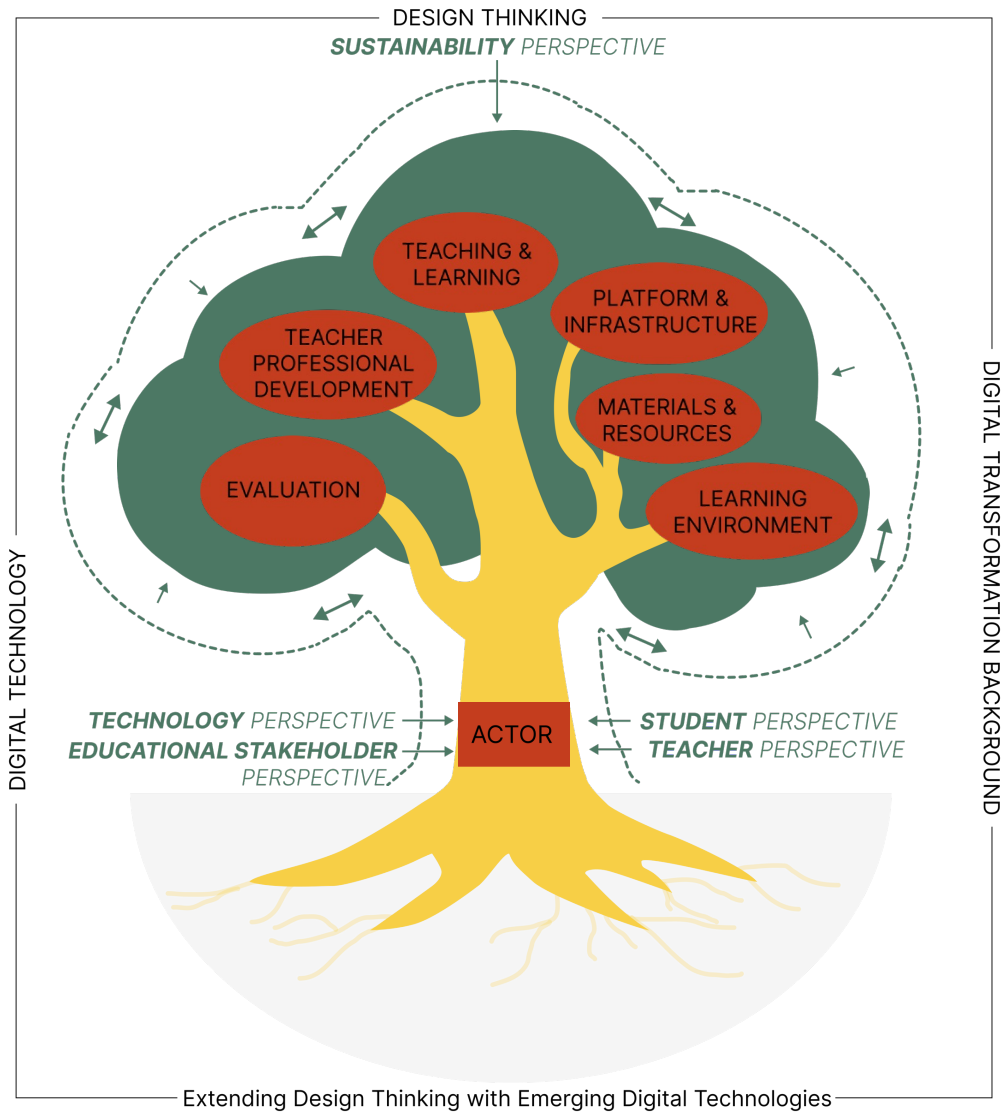

The Tree Metaphor - perspectives

TECHNOLOGY: views on how technology supports design thinking with emerging technologies, including how data will be collected and analysed, especially from young students, and how this will impact people and society.

Guidelines for TECHNOLOGY perspective: e.g.,

- Equip students with flexibility in modalities and playfulness in technologies and tools used in design thinking learning activities.
- Encourage the development of long-term plans for integrating design thinking with emerging technologies in educational settings.

For more guidelines, see here: https://tinyurl.com/mw4a8jmw

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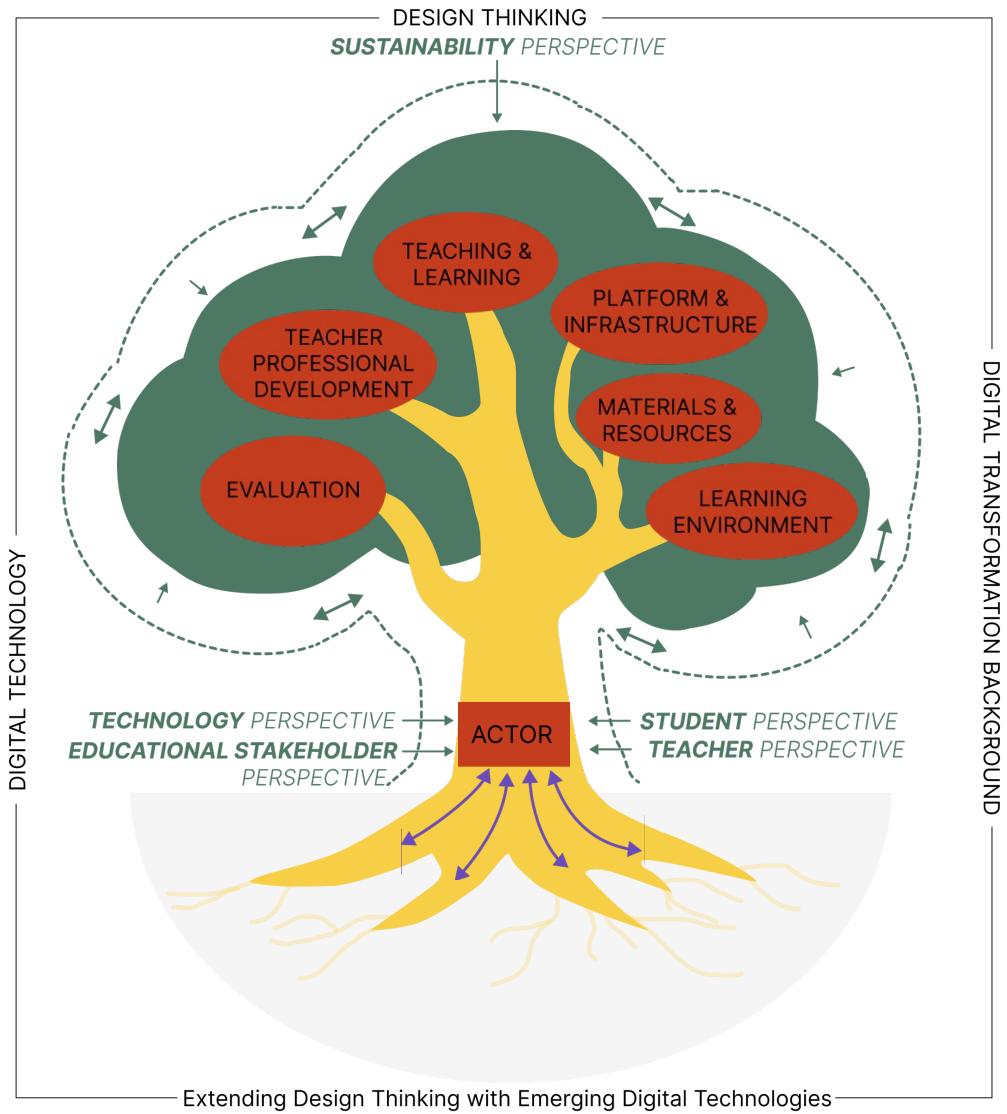

The Tree Metaphor - competencies

The roots signify the foundational **competencies** that students, teachers, or educational stakeholders possess. These suggest that branches should be connected to the roots, and they are the essential building blocks for further growth and development and underpin effective design thinking learning with emerging technologies.

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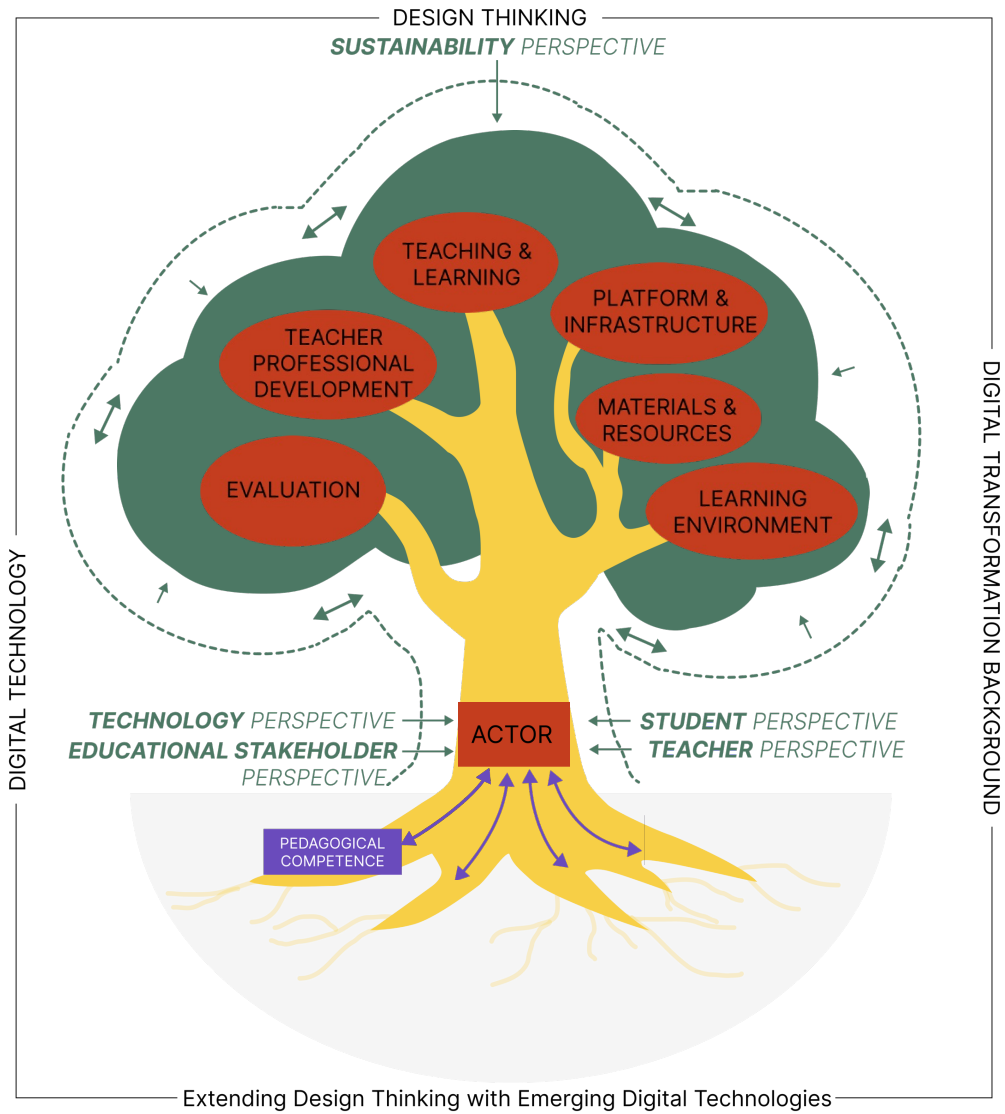

The Tree Metaphor - competencies

PEDAGOGICAL: the ability of teachers and educational practitioners to plan a learning program, relate design thinking activities to learning goals and possible school curricula subject, manage and guide the learning process, and perform an assessment.

Guidelines for PEDAGOGICAL competencies: e.g.,

- Emphasis on teachers' design thinking knowledge and mindset, e.g., understanding the design thinking methodology and its potential benefits to learning and related 21st-century skill development.
- Focus on teachers' content knowledge, e.g., understanding of the subject matter or discipline to teach.

For more guidelines, see here: *https://tinyurl.com/3b9bjjmw*

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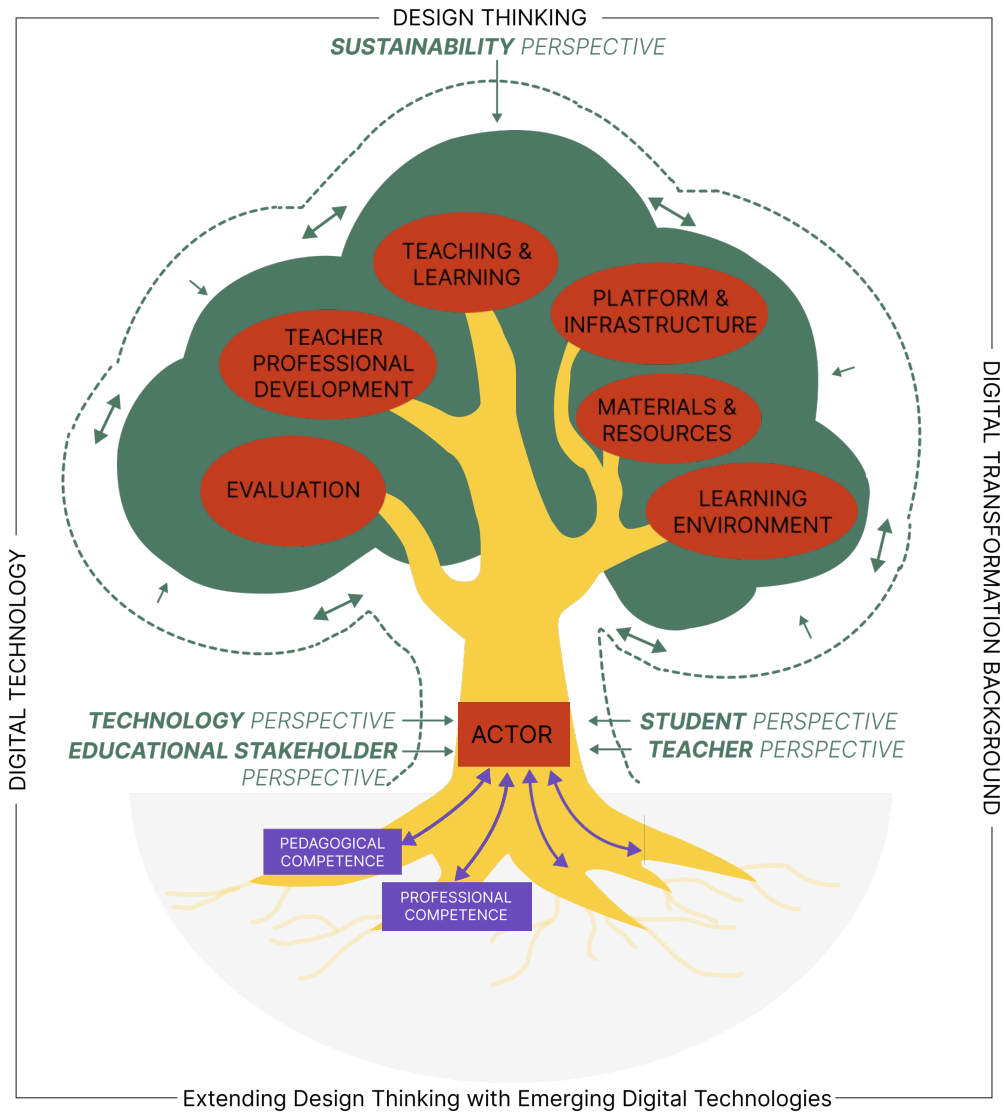

The Tree Metaphor - competencies

PROFESSIONAL: such as communication, collaboration, time management, reflection, creativity, critical thinking and design thinking that enable students, teachers, educational researchers and technologists to carry out design thinking activities and learning effectively.

Guidelines for PROFESSIONAL competencies: e.g.,

- Focus on **teachers'** professional engagement, such as organisational communication, professional collaboration, and reflective practice.
- Focus on **students**' skills, knowledge and attitudes that support their learning and personal growth.

For more guidelines, see here: *https://tinyurl.com/578ddjsd*

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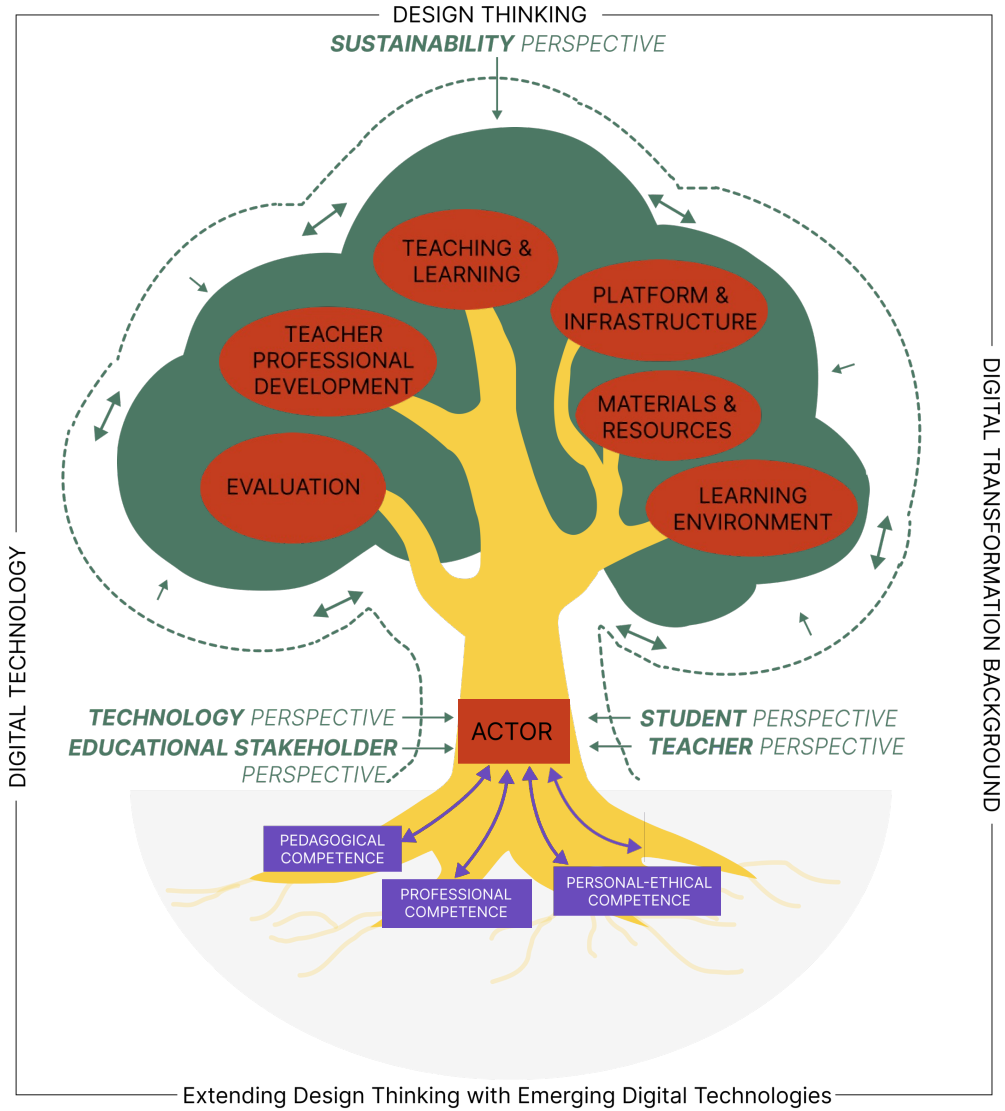

The Tree Metaphor - competencies

PERSONAL-ETHICAL: the abilities of students, teachers, educational researchers, and technologists on the individual or collective level. These include competencies in exercising digital citizenship, ethics and judgement, managing personal experience, safety and well-being, positive acceptance of failure, and constructive feedback.

Guidelines for PERSONAL-ETHICAL competencies: e.g.,

- Beware of and manage personal experience and well-being of themselves and others (e.g., students, teachers).
- Promote the expression of personal ideas, values, and cultural backgrounds while designing solutions for design thinking projects.

For more guidelines, see here: *https://tinyurl.com/k7x68kf3*

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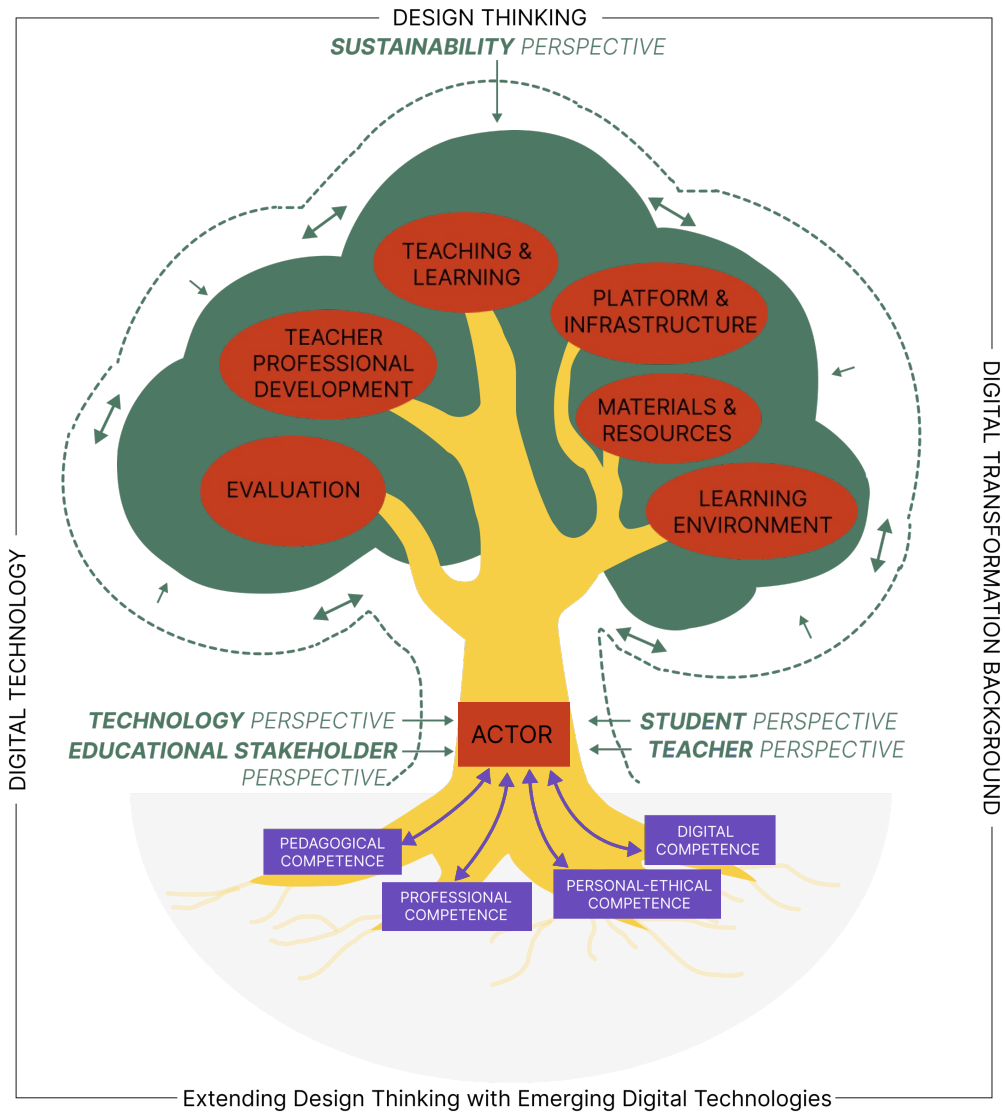

The Tree Metaphor - competencies

DIGITAL: such as ICT skills, literacy, and technology proficiency, are necessary to prepare students, teachers, educational researchers and technologists to access data and navigate information and interactively and effectively use emerging technologies during design thinking.

Guidelines for DIGITAL competencies: e.g.,

- Give students and teachers opportunities to acquire and enhance the basic skills, knowledge and attitudes necessary in the use of digital tools and technologies.
- Connect the use of technologies for design thinking and skills acquisition for students and teachers.

For more guidelines, see here: *https://tinyurl.com/56hxc8f4*

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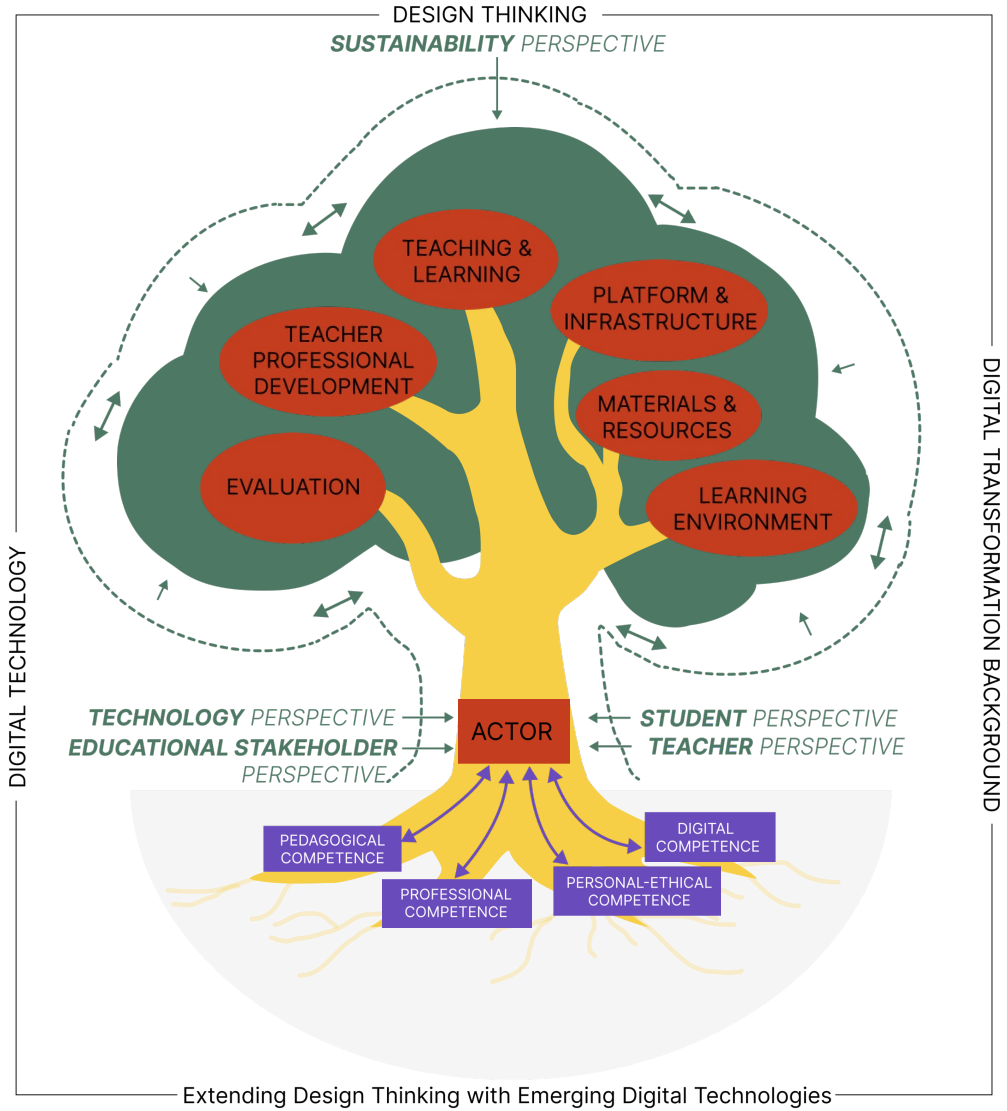

For the complete collection of guidelines for using this framework, see here: https://tinyurl.com/5t67eusv

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We invite you to take part in **a mini-anonymous survey**, which may take up to 5 minutes to complete.

You may scan the QR code on the left or visit the link below to access the survey https://nettskjema.no/a/456749

Thank you for your participation and time!

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