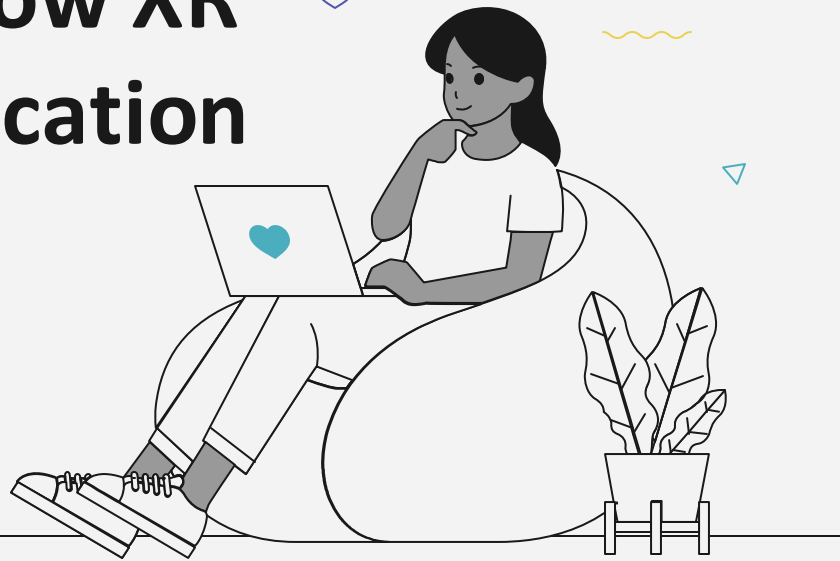
The Future of Learning: How XR and AI Are Reshaping Education

Epameinondas Koutavelis
Research Project Delivery Manager at Konnektable Technologies, LTD and Educator
Projects: HECOF, GenAI4ED



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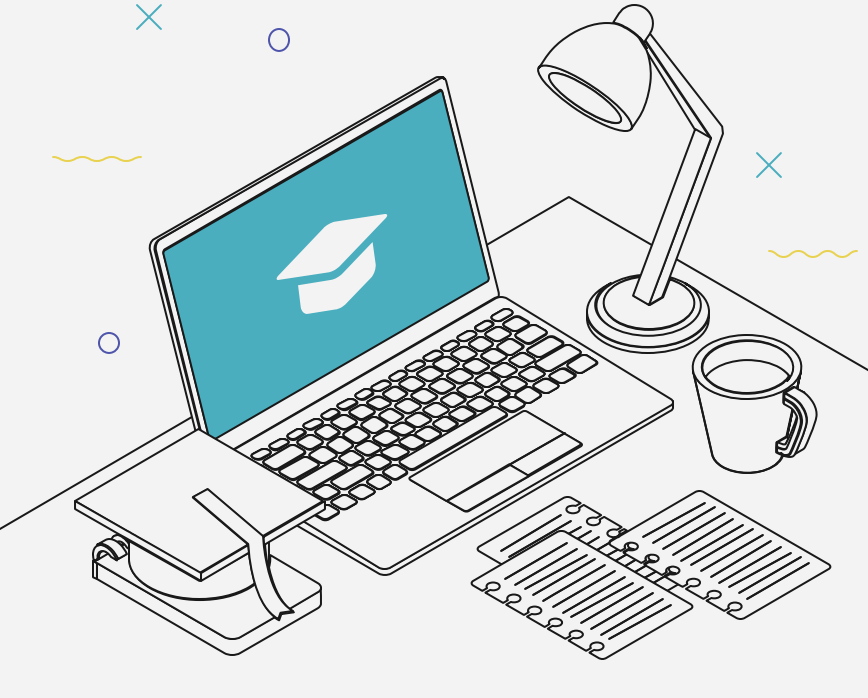


"65% of children entering primary school today will work in jobs that don’t yet exist." – WEF

Innovation in Education

Education is evolving, but **challenges remain**:

- Traditional methods **lack engagement and adaptability**.
- Students today need **personalized, immersive learning experiences**.

The role of emerging technologies:

- AI personalizes learning.
- XR makes education immersive and experiential.

A human-centric approach ensures:

- Technology complements educators rather than replaces them.

XR in Education Content

XR (Extended Reality) = VR + AR + MR

- XR applications in learning:
  - Virtual Field Trips: Travel back in time or explore space.
  - Medical Training Simulations: Surgeons practice in a risk-free environment.
  - STEM Experiments: Conduct physics or chemistry experiments in AR.
- **Key Benefits:**
  - Engages students through immersion.
  - Supports hands-on learning without physical limitations.
  - Enables accessible education for remote learners.

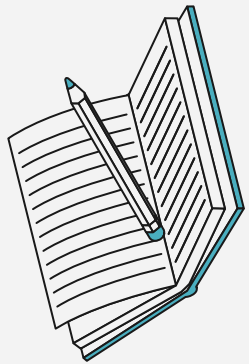
Improving student engagement

AI’s role in modern learning

•**Adaptive Learning**: AI adjusts content based on student progress.
•**Automated Grading & Feedback**: Reduces teacher workload.
•**AI-Powered Tutors & Chatbots**: 24/7 student support.
•**Generative AI**: Creates quizzes, lessons, and study guides.

Key benefits

- **Personalization** → Tailored learning paths.
- **Efficiency** → Automates repetitive tasks.
- **Scalability** → Reaches large student groups.



AI & XR – The Future of Learning Content

Combination of AI & XR

- AI-driven real-time feedback in XR environments.
- Personalized AI-generated XR learning experiences.
- Virtual classrooms with AI tutors guiding students.

Example

AI-enhanced VR labs where students conduct interactive science experiments.

Challenges

- Accessibility & cost.
- Ethical concerns (privacy, AI bias).
- Teacher training for new tools.

HECOF

Higher Education Classroom Of the Future

https://hecof.eu/

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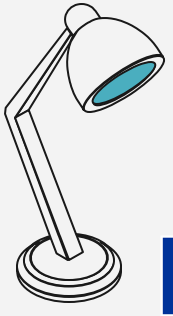
Summary of the project

•**Goal**: Revolutionize higher education by developing a personalized and adaptive learning system using **AI** and **VR** to enhance chemical engineering education.

•**Key Technologies**: AI for adaptive learning, **VR** for immersive simulations, and data-driven analysis to personalize education.

•**Approach**:
•**Transdisciplinary** approach involving stakeholders from various sectors.
•**Co-design process**: Collaboration with students and teachers for system development and testing.
•**Pilot Studies**: Two pilot universities to test the system in real classroom settings.
•**Focus**: Address ethical and legal concerns around AI in education



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HECOF's impact

HECOF
Higher Education Classroom Of the Future

Student Benefits:

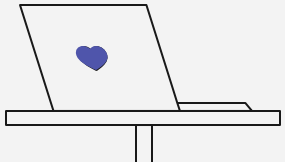
- Increased motivation and engagement through personalized learning.
- Enhanced self-directed learning, problem-solving, and communication skills.
- Improved interest and competencies in chemical engineering.

Teacher Benefits:

- Enhanced digital competence and better tracking of student progress.
- Reduced administrative burden through automated support.

Broader Impact:

- Drive systemic change in education by promoting AI for personalized learning.
- Influence policy at EU and national levels.
- Share evidence on ethical AI applications in education.



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Steps taken for the project

01

Requirements analysis & privacy, social and ethical impact assessment

02

Instructional strategies and assessment design

03

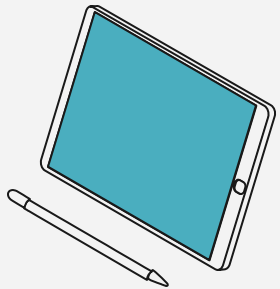
Agile development of HECOF system

04

Pilot tests, evaluation and impact assessment

05

Dissemination and exploitation



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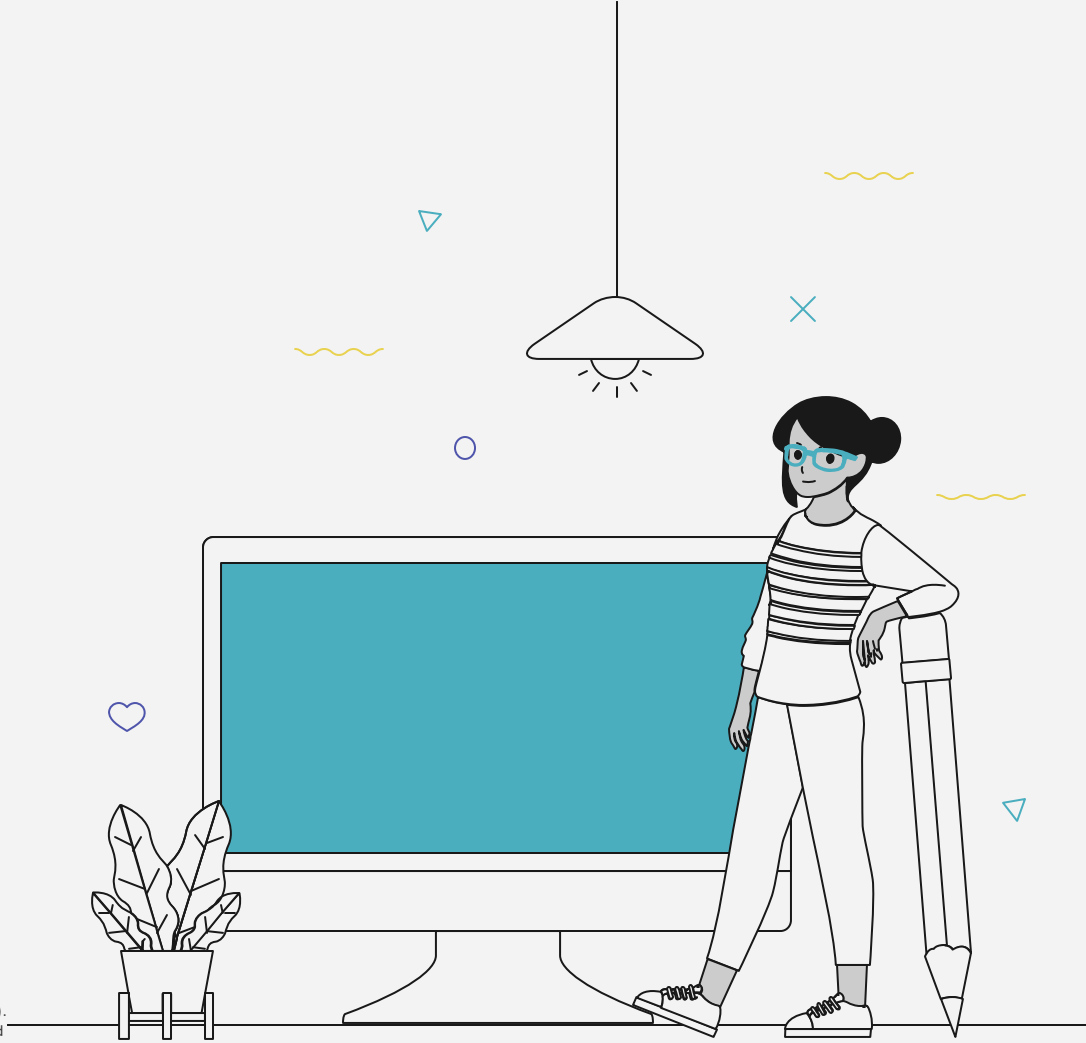
Future of Education
GenAI4ED

https://genai4ed.eu/



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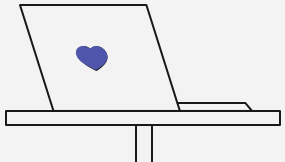
GenAI4ED

Challenges addressed

- **Digital Literacy Gap**: Improve digital skills for students, teachers, parents, and guardians.
- **Responsible Use**: Provide guidelines for using GenAI in education while preserving academic integrity.
- **Human Connections**: Ensure AI complements, rather than replaces, mentorship and social roles in teaching.

Focus Areas

- **Interdisciplinary Research**: Analyze AI's impact on secondary education (ages 11-18) across various fields.
- **Student-Centered Approach**: Enhance learning experiences while maintaining originality.
- **Educator Support**: Help teachers master GenAI tools, ensuring their wellbeing and work-life balance.
- **Parental Engagement**: Involve parents and guardians in understanding and shaping AI's role in education.



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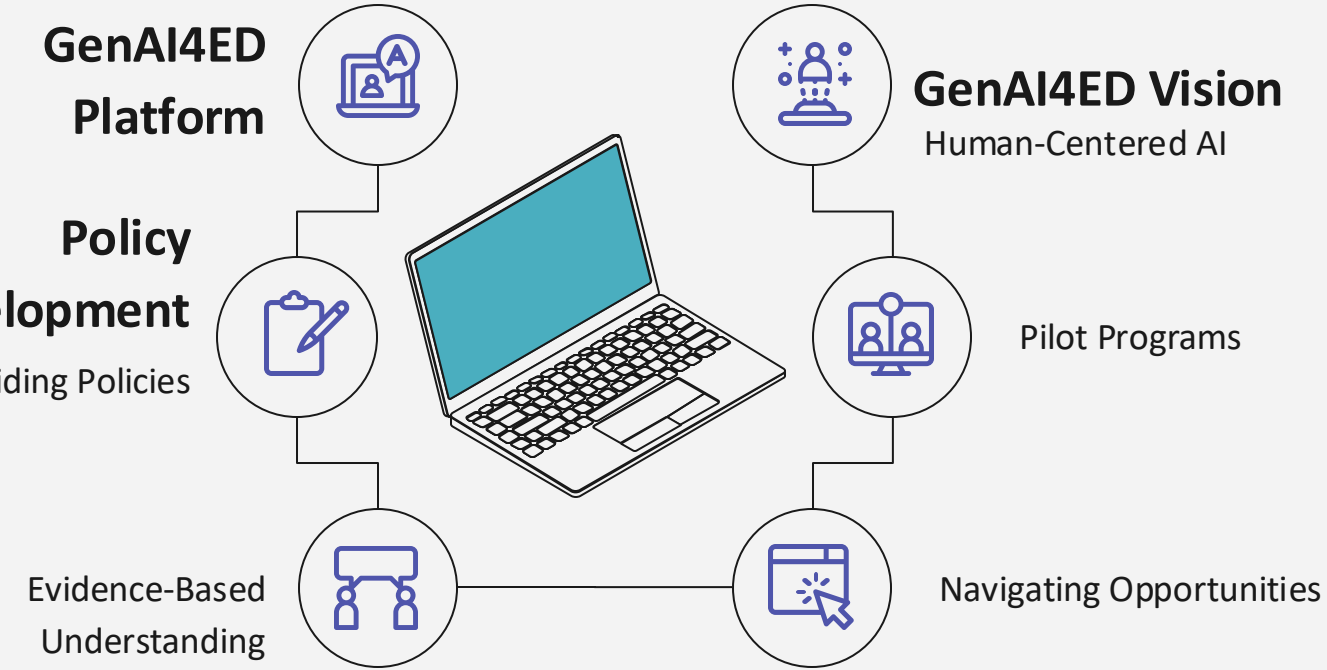
GenAI4ED vision and technological solution



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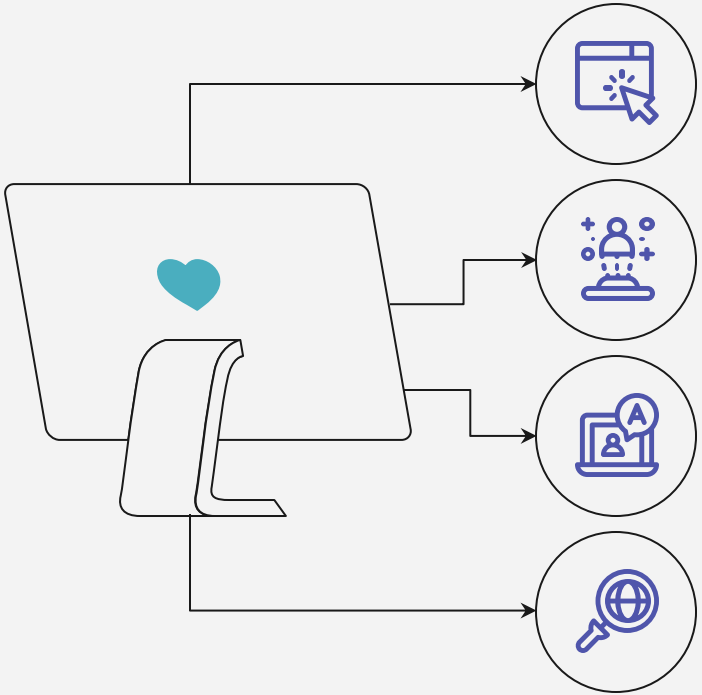
Project Content



Conceptual Framework Specification and User- Centric Requirements Elicitation

GenAI for education: social, ethical and psychological implications

GenAI tools Assessment and Bridging with Human Skills

GenAI4ED Platform Design and Development and Pilots

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The future of learning is immersive, intelligent, and human-centered. Let’s shape it together!

XR & AI are transforming education.

AI personalizes learning, while XR makes it immersive.

Projects like HECOF & GenAI4ED lead this transformation.

Thank you!

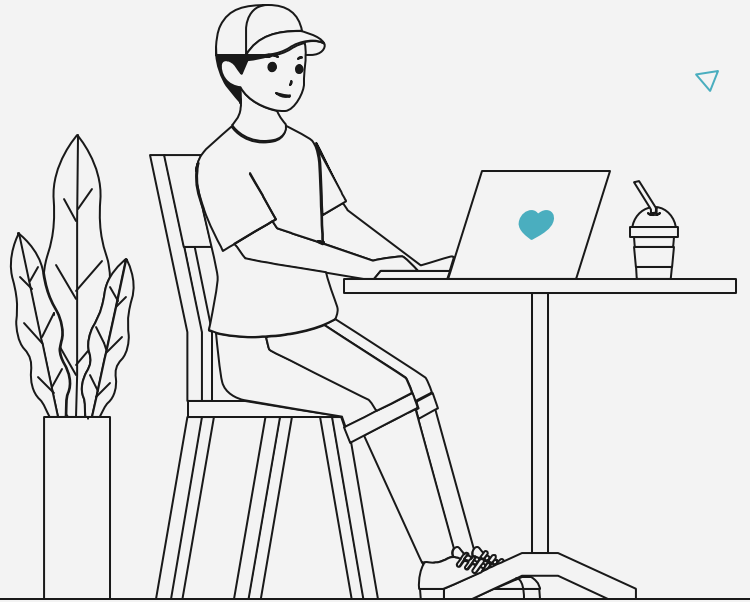
To learn more about the projects visit:

https://hecof.eu/

and https://genai4ed.eu/

To learn more about Konnektable:

https://konnektable.com/



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