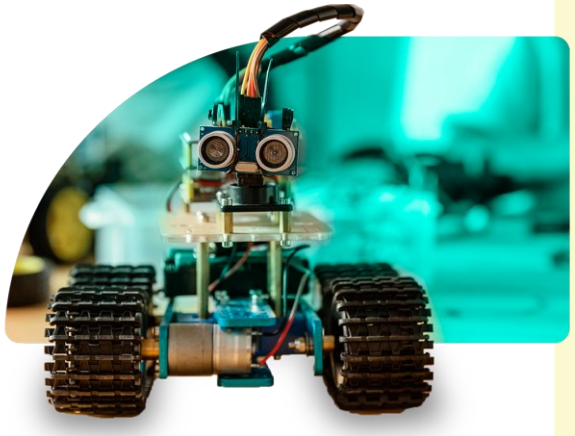
Innovation Centres

in the 13 Regional Directorates of Education



Ioannis Kostikas

Member of the Innovation Centers Research Team,

CTI DIOPHANTUS

General Description of the Innovation Centers

What are the Innovation Centers?

Structure & Infrastructure

Location – Mapping

How will they operate?

HELLENIC REPUBLIC
Ministry of Education, Religious Affairs and Sports

CTI DIOPHANTUS

Greece 2.0 NATIONAL RECOVERY AND RESILIENCE PLAN

Funded by the European Union NextGenerationEU

Innovation Centres in the 13 Regional Directorates of Education

Project Owner: Ministry of Education, Religious Affairs and Sport

Implementing Body:: CTI "Diophantus"

- Design and supervision of the implementation of the Innovation Centers (including both the central digital infrastructure and the physical Innovation Centers)
- Maintenance, support, and operation of the Central Support Infrastructure

Duration: 3 years

Project Budget: €4.7 million (excluding VAT)

Funded under «**Recovery and Resilience Facility (RRF)**»

Enhancing Experiential and Participatory Learning

They offer a holistic approach to knowledge by combining elements of both formal and non-formal education

Students and teachers gain access to cutting-edge technologies through hands-on interaction
Key criteria for equipment selection include:

- Pedagogical suitability
- Technological superiority
- Functionality
- User-friendliness

21st-Century Skills Development

The Innovation Centers are partly inspired by the Future Classroom Labs framework (European Schoolnet), which promotes the transformation of traditional classrooms through the integration of state-of-the-art technologies

Blending Learning Environment

Blended learning refers to an educational approach that integrates face-to-face (physical) learning settings with a combination of digital and analogue tools, offering a flexible and enriched learning experience.

Innovation Centers in the 13 Regional Education Directorate

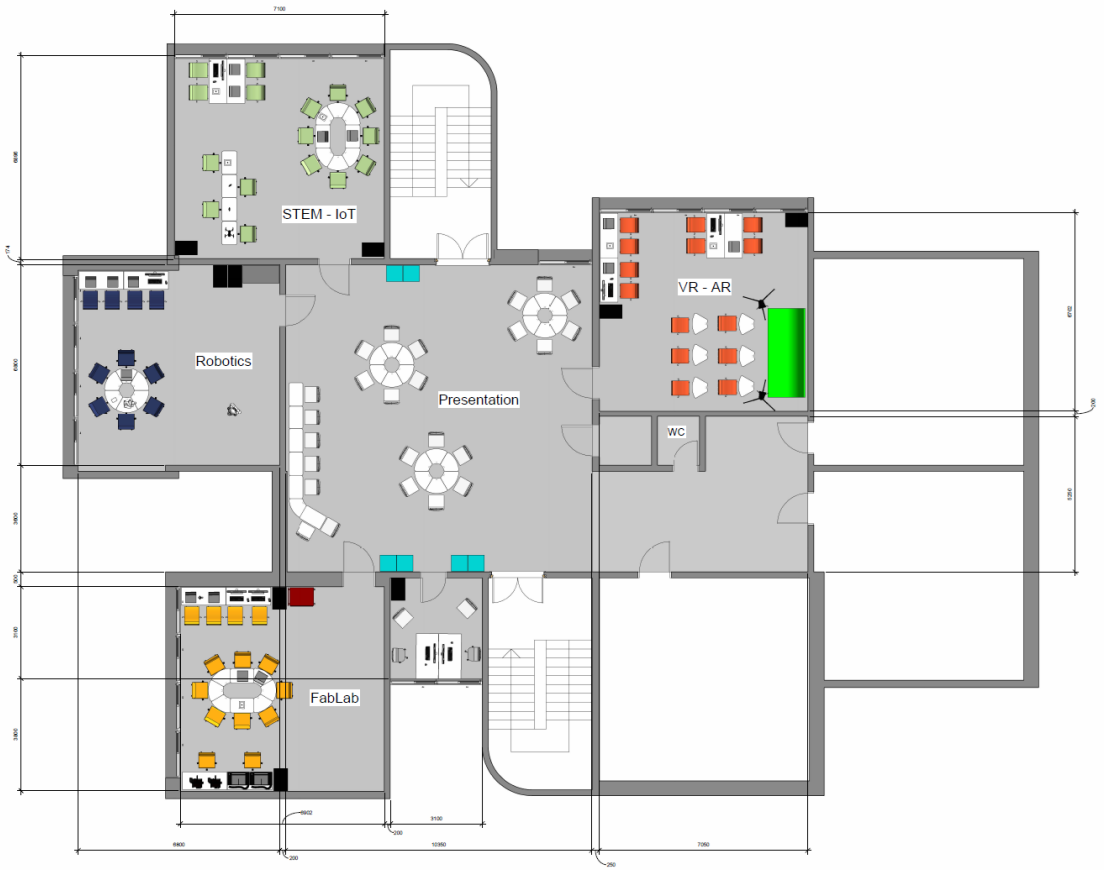
Project Objective

The objective is to create a knowledge ecosystem (Innovation Centres) that integrates and interconnects the school community, the local society, research institutions, **universities**, and local businesses, while simultaneously establishing links with similar educational ecosystems across Europe and worldwide.

Innovation Centres in the 13 Regional Education Directorates

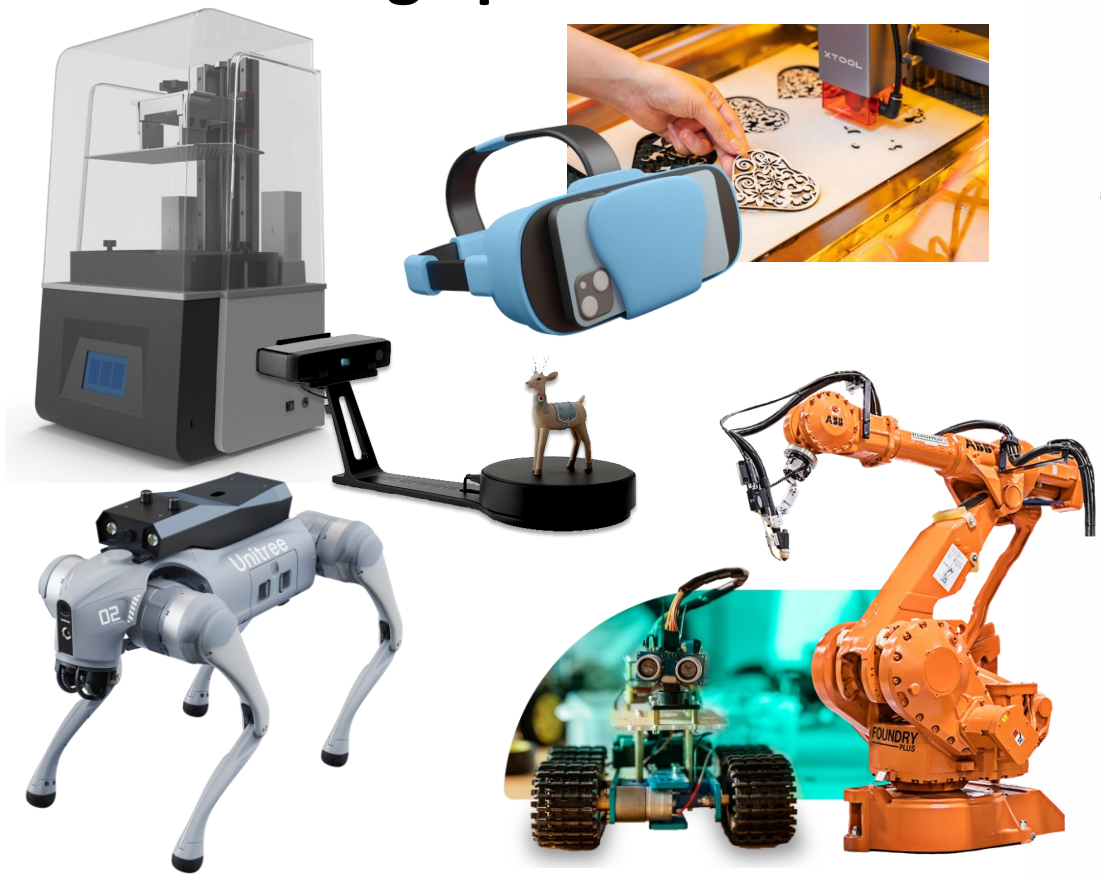
Learning Spaces

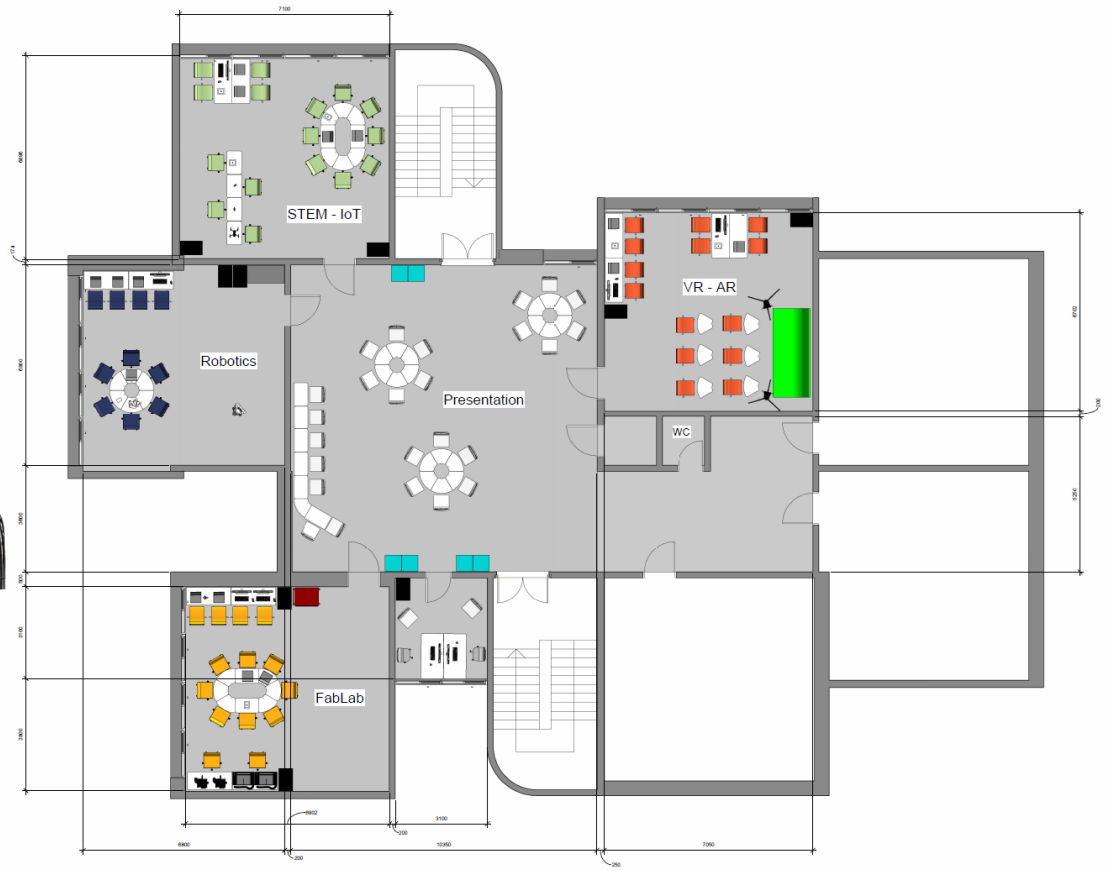
- Extended Reality
- Internet of Things
- Robotics
- Fabrication
- Interaction



Innovation Centres in the 13 Regional Education Directorates

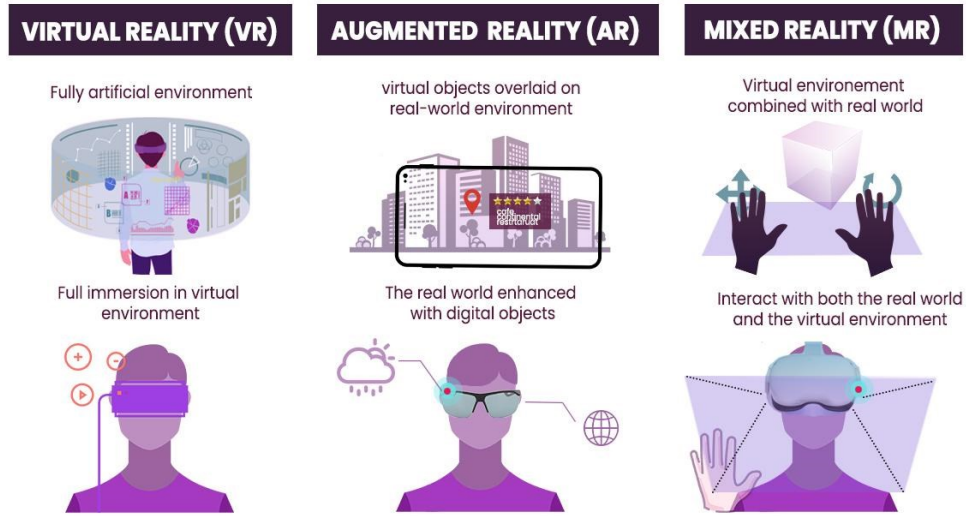
Learning Spaces





XR (Extended Reality) Learning Space

- **Autonomous state-of-the-art Virtual and Augmented Reality (VR/AR) glasses** equipped with a powerful processor, at least 512 GB of storage, and integrated front-facing cameras for creating Extended Reality (XR) environments.
- **High-performance development workstations** suitable for running demanding software applications including video and image editing, 3D graphics creation, mobile device emulators, and other applications necessary to fully support the accompanying equipment.
- **3D Projector:** A high-powered projector capable of displaying 3D video content.
- **Stereoscopic camera:** Designed for content creation, capturing high-resolution video and photography.
- **Brain-Computer Interface (BCI) Headset:** Introducing an innovative mode of interaction that enhances the learning experience and accessibility.
- **Green Room:** A dedicated space for video development and production.



Robotics Learning Space

- **Robotic arm** with high degrees of freedom, featuring at least 6 degrees of freedom (DoF) and the capability of highly precise repeatable movements with an accuracy of 0.5 mm. It supports multiple programming options, including Python and visual programming languages.
- **Drones** (programmable and non-programmable) equipped with high-resolution video and image recording capabilities.
- **Construction robotics kits** for hands-on learning and building of robotic systems.
- **Mobile robots** designed for introducing primary and secondary education students to concepts in artificial intelligence and programming.
- **Programmable robots for young children** that enable the understanding of basic programming concepts through educational activities.
- **Portable Laboratory Kits** integrated with various sensors for practical experiments and data collection.
- **Stereoscope** for 3D visualization and depth perception enhancement.

IoT Learning Space

- **Animal-like social robot** with AI capabilities, equipped with high-resolution cameras to capture the environment and perform real-time recognition of objects, faces, and surroundings. It can interact with humans through voice communication.
- **Humanoid social robot** featuring a wide range of supportive functions. It can express emotions such as joy, sadness, and anger via an integrated display representing its face.
- **AI Bionic robotic system kit** with advanced capabilities, suitable for learning fundamental concepts of programming, robotics, and artificial intelligence. It incorporates numerous embedded sensors and offers extensive degrees of freedom in movement. Programming support is available via Python or visual programming languages.
- **Kits compatible with Microbit, Arduino, and Raspberry Pi**, accompanied by various sensors (temperature, ultrasonic, pressure, conductivity, particulate matter, etc.) enabling the implementation of Big Data and IoT educational scenarios.

Fabrication Learning Space

- ✔ **3D Object Printer** using appropriate filaments. With accompanying software, it allows the design or printing of 3D objects available from online libraries.
- ✔ **3D Object Scanner** creates a digital replica of a real-world object, which can be edited with suitable software and utilized in various applications.
- ✔ **Laser Engraver** is a laser cutting and engraving device capable of cutting wood and other materials, producing a wide variety of high-precision shapes and patterns. With appropriate software, it enables the design of complex shapes and objects.
- ✔ **Manual craftwork** using safe and pedagogically appropriate wood processing systems.

Interaction Learning Space

- ✔ **Interactive whiteboard** of at least 85’’ suitable for presenting digital content, equipped with an integrated mini PC running Windows OS. Additionally, it is accompanied by an advanced video conferencing camera and an appropriate audio system to enhance presentation capabilities.
- ✔ **High-performance tablets** with Windows and Android operating systems. They offer programming capabilities via suitable software, internet browsing, and the use of a wide range of applications (educational, design, sharing, presentation, e-reading) available from official stores. Moreover, with compatible peripherals such as keyboards or styluses, they can be used as portable touchscreen laptops.
- ✔ **Use of appropriate presentation and sharing software** to improve online interaction and communication.

Κέντρα Καινοτομίας στις 13 Περιφερειακές Διευθύνσεις Εκπαίδευσης

1. **Thirteen Innovation Centers**
   with physical infrastructure, established in physical locations (one per administrative region).
2. **Innovation Lab at CTI (Computer Technology Institute & Press “Diophantus”)**
   dedicated to conducting preliminary studies and activities, as well as supporting the educational community through hands-on applications, webinars, and a help desk.
3. **Central Support Infrastructure**
   will be developed by CTI to support remote areas and educational institutions, as well as the Innovation Centers themselves.

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Greece 2.0 Funded by the European Union NextGenerationEU

Fundamental Design Principles

•**Multifunctionality of Spaces:** Creation of a dynamic system capable of flexibly hosting diverse teaching formats. The spaces within the Innovation Centers (ICs) must be adaptable and easily configurable to meet different needs.

•**Integration of Interactive Media:** Interactive tools have become an integral part of modern education, aiming to facilitate direct communication between educators and learners.

•**Operational Transparency:** Transparency pertains to the organizational structure and the functioning of the spaces, reinforcing a sense of collectivity. Designing spaces that promote transparency fosters an environment that encourages collaboration and open communication among members of the educational community.

•**Familiarity and Safety:** A welcoming and secure environment is essential for the inclusion of participants and the smooth conduct of activities. Learners should feel comfortable and safe—both physically and psychologically—while engaging in educational processes.

•**Common Identity:** A shared identity connecting the 13 Innovation Centers, even when located in different regions. This common identity is ensured through the use of specific color palettes, logos, and equipment, symbolizing participation in a broader network of educational and research activities.

ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ

Innovation Centres
Operational Framework

Innovative Pedagogical / Teaching Approaches

Artificial Intelligence in Education – Preparing for Life and Learning in the Age of AI
Emphasizing the importance of AI literacy and equipping learners with the skills and mindset required to navigate and co-create in a world increasingly shaped by artificial intelligence.

Post-Humanist Perspectives – Addressing the Relationship Between Humans and Technology
Exploring philosophical and educational approaches to redefine human identity, agency, and ethics in technologically mediated environments.

Learning from Open Information Sources – Using Real-World Data for Personalized Learning
Promoting data-driven, inquiry-based learning by leveraging publicly available datasets and open knowledge platforms to foster autonomy and critical thinking.

Embedding Data Ethics – Ethical Use of Data in Digital Life and Learning
Integrating data ethics into curricula to cultivate responsible digital citizenship, focusing on privacy, algorithmic transparency, and informed consent.

Pedagogy of Social Justice – Addressing Inequities in Life and Society
Encouraging inclusive education practices that challenge systemic injustice and empower students to become agents of equity and change.

Esports – Learning and Teaching Through Competitive Virtual Gaming
Utilizing the motivational and strategic aspects of esports to support learning in teamwork, problem-solving, communication, and digital literacy.

Learning Through Animation – Watching and Interacting with Short Animated Narratives
Harnessing the power of visual storytelling and animation for engagement, comprehension, and emotional connection in diverse learning contexts.

Multisensory Learning – Using Multiple Senses to Enhance Learning
Designing immersive educational experiences that activate visual, auditory, kinesthetic, and tactile modalities for deeper and more inclusive learning.

Offline Networked Learning – Connectivity Beyond the Internet
Developing infrastructures and methodologies that support collaborative learning in environments with limited or no Internet access, through local servers, mesh networks, or offline platforms.

Online Labs – Workshops for All
Delivering scalable, accessible, and participatory online laboratory experiences, allowing learners to explore science, technology, engineering, and the arts regardless of location.

- Each Center will host daily visits from student groups who will participate in structured educational scenarios in collaboration with their teachers.
- The Centers will be supported by specialized personnel, consisting of seconded educators, and will offer learning scenarios connected to future technologies.
- Simultaneously, they will have the capability to develop partnerships with universities, research institutions, businesses, and the local community.

http://ic.cti.gr/el/

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