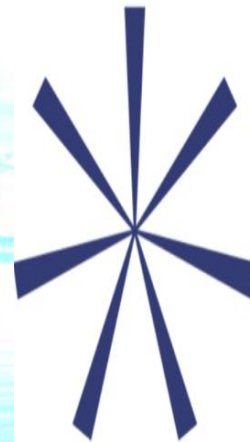


Trends in ICT Workforce Development: Greek and European Perspectives

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ATHENA
EUROPEAN UNIVERSITY

**62nd FITCE International Congress,
Special Session: Competences and Skills in European Universities
Athens, Greece, September 28-29, 2023**



Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο

Επιχειρησιακό Πρόγραμμα
Ανάπτυξη Ανθρώπινου Δυναμικού,
Εκπαίδευση και Διά Βίου Μάθηση
Ειδική Υπηρεσία Διαχείρισης
Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

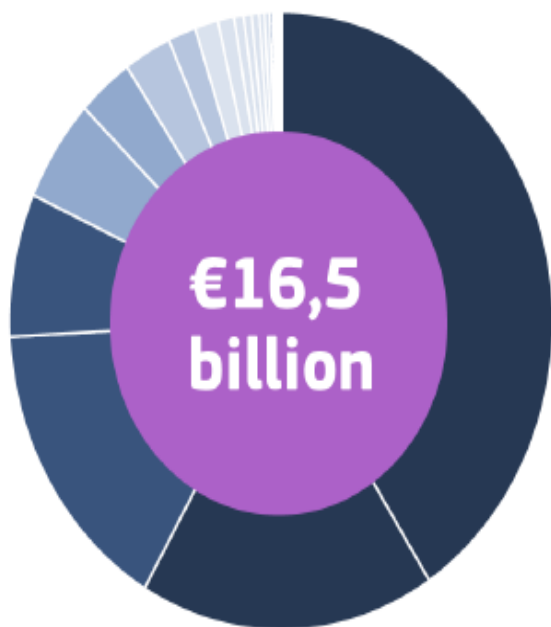
ΕΠΑΝΕΚ 2014-2020
ΕΠΙΧΕΙΡΗΣΙΑΚΟ ΠΡΟΓΡΑΜΜΑ
ΑΝΤΑΓΩΝΙΣΤΙΚΟΤΗΤΑ • ΕΠΙΧΕΙΡΗΜΑΤΙΚΟΤΗΤΑ • ΚΑΙΝΟΤΟΜΙΑ



Recovery and Resilience Scoreboard: Connectivity (Jan. 2023)

Connectivity

Expenditure in EUR millions per Member State



■ Italy, € 6721	■ Spain, € 2887	■ Poland, € 2600
■ <u>Greece, € 1233</u>	■ Austria, € 891	■ France, € 540
■ Sweden, € 464	■ Bulgaria, € 272	■ Czechia, € 227
■ Croatia, € 157	■ Romania, € 94	■ Belgium, € 77
■ Lithuania, € 74	■ Cyprus, € 53	■ Finland, € 50
■ Slovenia, € 30	■ Estonia, € 24	■ Ireland, € 19
■ Latvia, € 17	■ Denmark, € 13	■ Portugal, € 10
■ Germany, € 0	■ Slovakia, € 0	■ Luxembourg, € 0
■ Malta, € 0	■ The Netherlands, € 0	

Recovery and Resilience Scoreboard: Connectivity (Jan. 2023)

- **Main Reforms:**

- ✓ To create an environment which facilitates the **timely roll out** of fixed and wireless very high-capacity networks.
- ✓ In order to **remove unnecessary administrative hurdles** for investments in gigabit and 5G networks.
- ✓ Commitment to a **timely assignment of radio spectrum** for 5G networks.
- ✓ Aimed at **providing financial incentives** for the deployment of very high-capacity networks.
- ✓ To take due account of the **cybersecurity considerations** in the deployment of very high-capacity, and in particular 5G networks.

Recovery and Resilience Scoreboard: Connectivity (Jan. 2023)

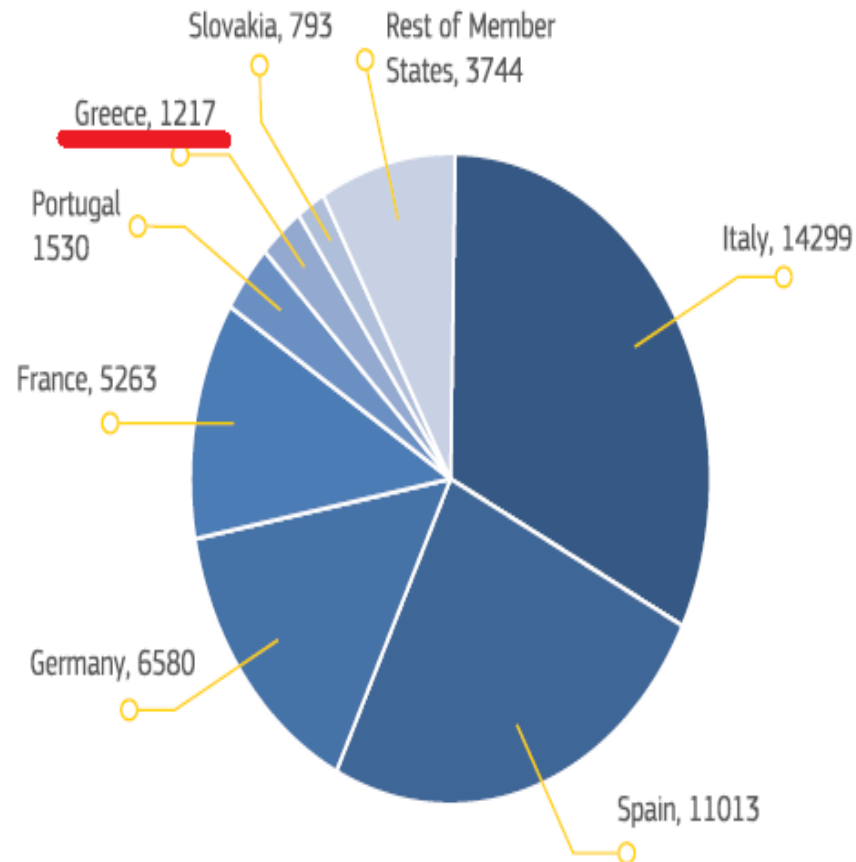
- **Main investments:**

- ✓ Investments in backbone/backhaul networks
- ✓ Investments in fixed very-high capacity access networks
- ✓ Investments in mobile very-high capacity access network
- ✓ Measures aimed at providing fibre backhauling for mobile base stations

Recovery and Resilience Scoreboard: Research and Innovation (Apr. 2022)

Total expenditure on R&I per Member State

In EUR millions



Recovery and Resilience Scoreboard: Research and Innovation (Apr. 2022)

- **Main reforms:**

- ✓ Support **knowledge and technology transfer** (between public research institutions and private companies) through the creation of appropriate entities (offices, agencies) and the removal of barriers to academia-business collaboration
- ✓ Improve the coordination between the different levels of governance to Research & Innovation **and** education policies, in order to respond to skills needs **and** enhance employability, especially for the young

Recovery and Resilience Scoreboard: Research and Innovation (Apr. 2022)

- **Main investments:**

- ✓ **Thematic investments for the green transition** (in energy, environment, transport/smart mobility, circular economy)

- ✓ **Horizontal investments** include a variety of cross-cutting measures such as strengthening of **innovation ecosystems** (including through **innovation clusters**), upgrade of research infrastructures, support for business innovation including start-ups and SMEs, grants for researchers, and the support of existing or new **regional clusters**.

Recovery and Resilience Scoreboard: Digital Skills and Education (Apr. 2022)

Digital skills and education

Expenditure in EUR millions per Member State



■ Italy, € 11252	■ Spain, € 4752	■ Germany, € 2256
■ France, € 1948	■ Portugal, € 1412	■ Romania, € 1267
■ Greece, € 754	■ Czechia, € 446	■ Austria, € 385
■ Slovakia, € 298	■ Belgium, € 292	■ Lithuania, € 184
■ Croatia, € 168	■ Latvia, € 124	■ Ireland, € 64
■ Slovenia, € 60	■ Cyprus, € 24	■ Estonia, € 10
■ Finland, € 7	■ Luxembourg, € 7	■ Malta, € 3
■ Denmark, € 0		

Recovery and Resilience Scoreboard: Digital Skills and Education (Apr. 2022)

- **Overview of main plans:**

- ✓ Skills development as enabler for the digital transformation
- ✓ Contribution to closing the ICT specialist gap in the EU
- ✓ Strengthening of cyber resilience by boosting the necessary skills
- ✓ Targeted support for vulnerable or underrepresented groups (for example, through digital up- or reskilling support)

Questions:

Given the aforementioned context described in terms of the EU Recovery and Resilience funding, reforms, investments and plans, etc.:

Which is the role of the Higher Education Institutions for a successful ICT workforce development?

How should students be better prepared to meet the labor market needs?

ATHENA (Advanced Technology Higher Education Network Alliance)

European University: Vision and Mission

ATHENA European University is an alliance of 9 universities in Europe



ATHENA European University: Vision and Mission

- **ATHENA vision:**

ATHENA delivers inclusive, innovative, high-quality **international education** permanently aligned with **global market needs**, addressing societal and environmental challenges as well as **European research priorities**, thus granting the **highest employability standards**, effective career transitions to our students and added value to our ecosystem.

- **ATHENA mission:**

With a strong focus on research and education **in the fields of science, technology and engineering** ATHENA aims at accompanying and shaping the **digital transformation of societies**, and thus supports the development of an inclusive, sustainable and safe **digital economy**.

ATHENA European University: Research priorities

- **Sustainable Materials and Energy** (Optoelectronics, plasma technology, 2d materials, nano-structural materials)
- **Emerging Manufacturing Technologies** (Robotics, 3D, printing, digitization of manufacturing, FabLabs/MakerSpaces, etc.)
- **Artificial Intelligence**
- **Information and Communication Technologies**
- **Digital Society and Digital Arts**
- **Health & Food Technologies**
- **Assistive Technologies**

ATHENA European University:

Competence clusters

- The **ATHENA Joint Education Model** relies on Competence Clusters to assure student centered education and to mainstream new opportunities for lifelong learning.
- **Competence Clusters** are cohesive groups of courses, or course modules, granting learners equivalent learning outcomes with a similar workload.
 - ✓ Courses and modules integrated in Competence Clusters are named **Skills and Competencies Units (SCU)**. In other words, a SCU is any structured academic activity (full course, course module, lab, etc.) offered in the ATHENA space that promotes learners' skills and competences and is assessed and certified in its own through **micro-credentials**.
 - ✓ Through SCUs, ATHENA European University can offer its students **more international, diversified and personalised education**.

ATHENA European University: Competence clusters

- Competence Clusters (see below) go far **beyond just homogeneous groups** of course units or learning modules. They are **open to any learner**, whether they are students of the ATHENA university, former students or citizens willing to acquire certain skills and competences for professional or personal development.

Competence Clusters Management
Computer Vision

Competence Clusters Management
Embedded Systems

Competence Clusters Management
Programming &
Algorithms



Competence Clusters Management
Data Management

Competence Clusters Management
Fundamentals of
Electronics

Competence Clusters Management
Physics Fundamentals

ATHENA European University: ONOS graduate course

- **Instructors of the “Optical Networks & Optoelectronic Systems (ONOS)” course:** Dr. Francisco Pereira (Polytechnic of Porto), Dr. Francesco Scotognella (Politecnico di Milano), Dr. Kostas Petridis, Dr. Papadogiannis Nektarios, Dr. George Liodakis (HMU).
- **Optical Networking issues covered in ONOS course:**
 - ✓ Coherent optical networks
 - ✓ Passive Optical Networks
 - ✓ Data Center Interconnection networking
 - ✓ Optical networking for cellular communication systems
 - ✓ Research topics for optical networking

ATHENA European University: ONOS graduate course

The screenshot displays the Athena European University Learning Management System (LMS) interface. The top navigation bar is dark blue with the university logo and name on the left, and notification and chat icons on the right. A dark blue sidebar on the left contains a menu with the following items: Course sections, Participants, Badges, Competencies, Grades, Dashboard, Site home, Calendar, My courses, Private files, Content bank, Athena Network Menu (TEST), and Accessibility settings. The main content area has a white background and features a course title 'Optical Networks by Liodakis George (Lecturer @ HMU, Greece)'. Below the title is a list of course items, each with a small icon and a checkbox on the right. The items are: 1. Optical Technologies for Networking, 100Gbps PM-QPSK optical system, Optiperformer8, 3. Optical Technologies for Data Center Networking, Lecture of 23-6-2022 (Part 1 of 2), Lecture of 23-6-2022 (Part 2 of 2), Lecture of 7-7-2022 (Part 1 of 3), Lecture of 7-7-2022 (Part 2 of 3), Lecture of 7-7-2022 (Part 3 of 3), Lecture of 2-7-2022 (Part 1 of 3), Lecture of 2-7-2022 (part 2 of 3), Lecture of 2-7-2022 (Part 3 of 3), Lecture of 9-6-2022, and 2. Optical Technologies for Access Networks (July 2022).

ATHENA EUROPEAN UNIVERSITY

Course sections

Participants

Badges

Competencies

Grades

Dashboard

Site home

Calendar

My courses

Private files

Content bank

Athena Network Menu (TEST)

Accessibility settings

Optical Networks by Liodakis George (Lecturer @ HMU, Greece)

- 1. Optical Technologies for Networking
- 100Gbps PM-QPSK optical system
- Optiperformer8
- 3. Optical Technologies for Data Center Networking
- Lecture of 23-6-2022 (Part 1 of 2)
- Lecture of 23-6-2022 (Part 2 of 2)
- Lecture of 7-7-2022 (Part 1 of 3)
- Lecture of 7-7-2022 (Part 2 of 3)
- Lecture of 7-7-2022 (Part 3 of 3)
- Lecture of 2-7-2022 (Part 1 of 3)
- Lecture of 2-7-2022 (part 2 of 3)
- Lecture of 2-7-2022 (Part 3 of 3)
- Lecture of 9-6-2022
- 2. Optical Technologies for Access Networks (July 2022)

ATHENA European University: Student-centered activities

- **Career counselling:** Provision of individual career counselling and job advice to ATHENA European University students, always following new technological trends and the latest labour market developments



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Vice-Rector of Internationalisation
and Extroversion



Małgorzata Czarnomska

*Maria Curie-Skłodowska
University in Lublin, Poland*

Competence Development Center
UMCS



Matej Kosi Hederih

University of Maribor, Slovenia

Head of Career Centre



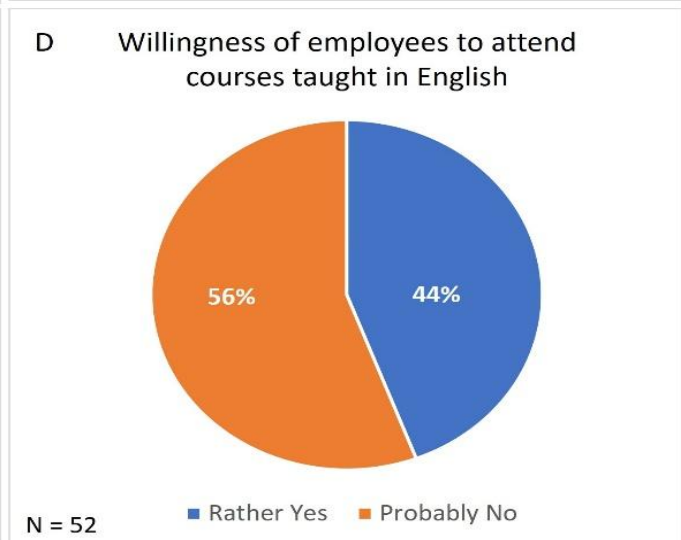
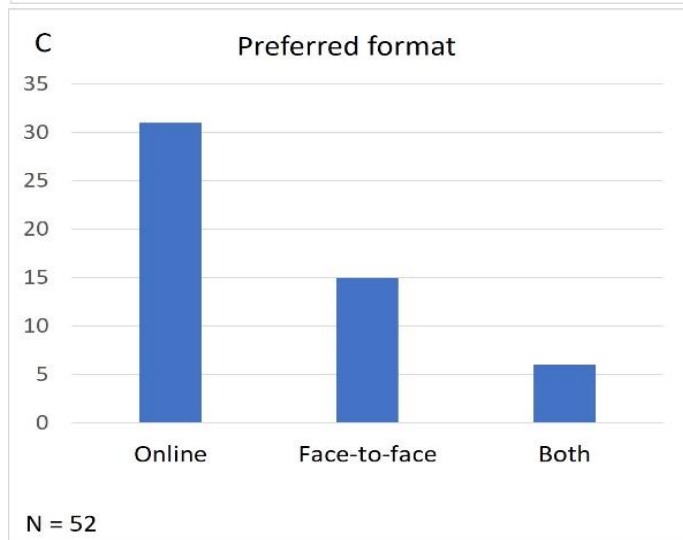
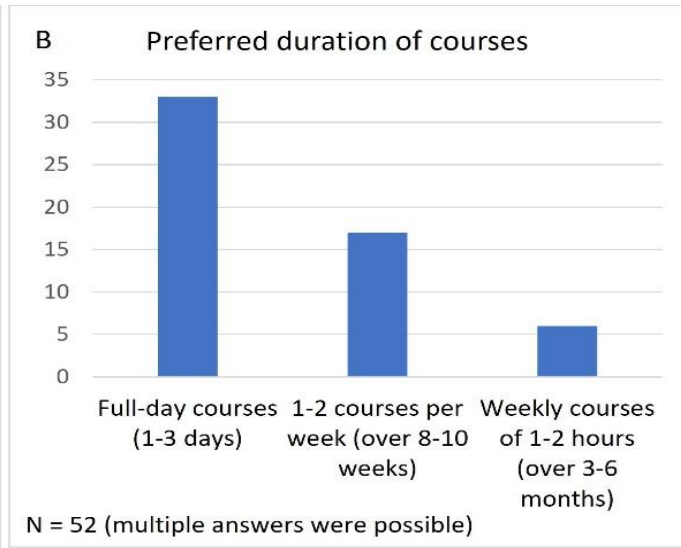
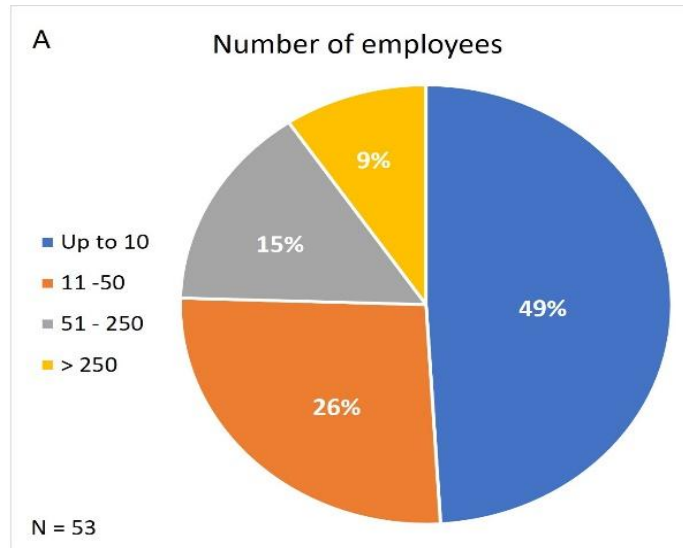
ATHENA European University: Student-centered activities

• **Soft/Digital/Research Skills development (online lectures and face to face workshops):**

- ✓ Time Management Skills
- ✓ Problem solving using creative & critical thinking
- ✓ How to develop/improve emotional intelligence
- ✓ How to develop/improve cultural intelligence skills
- ✓ Building Team Collaboration Skills
- ✓ Entrepreneurial skills for the 21st century
- ✓ Building your digital profile using social media
- ✓ Online presentation/communication
- ✓ Fintech / Blockchain skills
- ✓ How to read and write a research paper & technical report
- ✓ How to publish a paper
- ✓ How to design and run a poster session
- ✓ How to disseminate your research

ATHENA European University: Industry Collaboration

• Labour Market Needs for further education & training (Report, Sep. 2023)



ATHENA European University: Industry Collaboration

• **Labour Market Needs for further education & training (Report, Sep. 2023)- Demand for technical/technological offers in the following fields:**

- ✓ Digitalisation
- ✓ Robotics
- ✓ Programming
- ✓ Artificial Intelligence/ Machine learning
- ✓ IoT
- ✓ Sustainability and circular economy
- ✓ Energy transition
- ✓ Sensors linked to micro-controllers/FPGA connection
- ✓ Video recognition
- ✓ CAD
- ✓ Digital platforms
- ✓ Smart home technology
- ✓ Technological solutions for car industry and logistics

ATHENA European University: Industry Collaboration

• Internships/challenges for ATHENA University students
(www.praxisnetwork.eu)



Praxis

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Conclusions

- A **complex of activities** either already implemented or in progress/planned at the ATHENA European University in science, technology, engineering, and more specifically in ICT, aim to strengthen the **ICT workforce development**.
- Competence clusters, most of them in ICT, are addressing **upskilling** (same field, new context; acquiring new skills and competences to succeed in new environment) and **reskilling** needs (new field; moving from one professional/study area to a new one) for students, alumni, and any other prospective learner.
- Many of ATHENA European University activities are entirely **student-centered** (Career Services events, Soft Skills Talks, Alumni Talks).
- **University-industry collaboration** is promoted through internships, further education & training courses, and Co-creation Hubs (FabLabs) where students, industry, and other stakeholders can access the resources and support they need to turn ideas into reality.
- A **transformative wave** impacting higher education and research is crossing Europe, as exemplified by the ATHENA European University.