

# SCIENTIX

The community for science  
education in Europe



Developing and Evaluating Skills for Creativity and Innovation

Panagiota Argyri

29 June 2018 | for Desci European Project



# Webinar: Developing and Evaluating Skills for Creativity and Innovation

Date : 29 June 2018.  
Time : 5.30 PM-6.15 PM

Presenter : Panagiota Argyri (M.Sc, M.Ed)  
Mathematician & Researcher National  
Kapodistrian University of Athens

DESCI ([www.desci.eu/](http://www.desci.eu/)) is funded  
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Union Erasmus+ programme



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# Introduction



Internet of Things, Big Data,  
Autonomous robots



Skills Gap



Mismatching skills

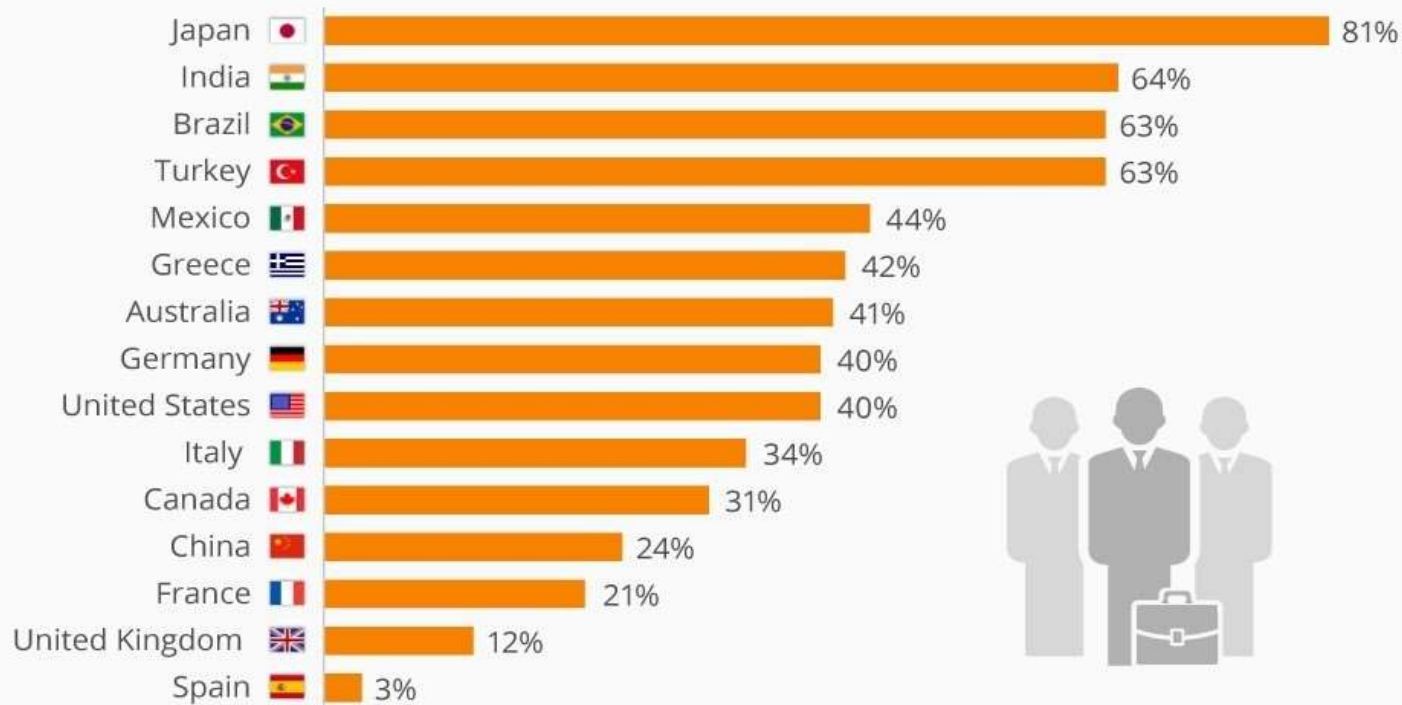
Numbers of  
**STEM students**  
and graduates  
are both  
**increasing**

The inability to fill  
**vacancies**, because  
candidates do not  
have the skills, **they**  
**needs for skilled**  
**staff stemming**

European Commission/EACEA/Eurydice, (2013); Eurydice, 2011; Cedefop, 2014

## The Countries Facing The Greatest Skill Shortages

Skills shortage as a % of firms with 10 or more employees in selected countries\*



\* 2014

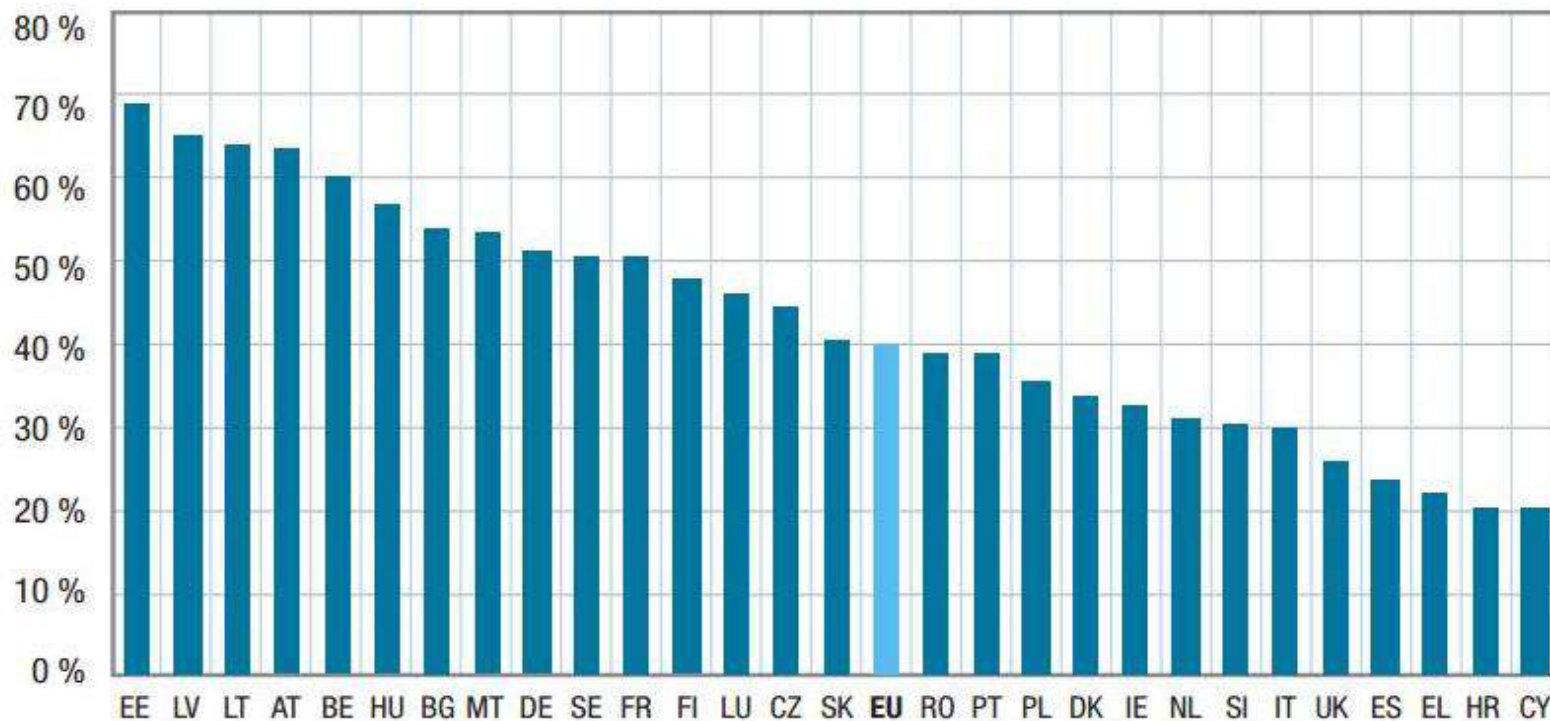
@StatistaCharts

Source: Manpower Talent Shortage Survey via OECD

statista

## Research Data

### Difficulties finding staff with required skills in EU firms, 2013, EU-28



NB: Proportion of establishments replying affirmatively to the question 'Did your establishment encounter difficulties in finding staff with the required skills?'

Source: Eurofound, ECS-2013.

# Introduction

Cedefop's European Skills Index is a composite indicator that measures the performance of a country's skills system.

- <http://www.cedefop.europa.eu/>

- [Cedefop publication: Insights into skill shortages and skill mismatch](#)

➤ Skills Panorama turns labour market data into accurate and timely intelligence to offer new insights into skill needs in the European Union.

<http://skillspanorama.cedefop.europa.eu/bg/node/13006>

## Why Skills Panorama?

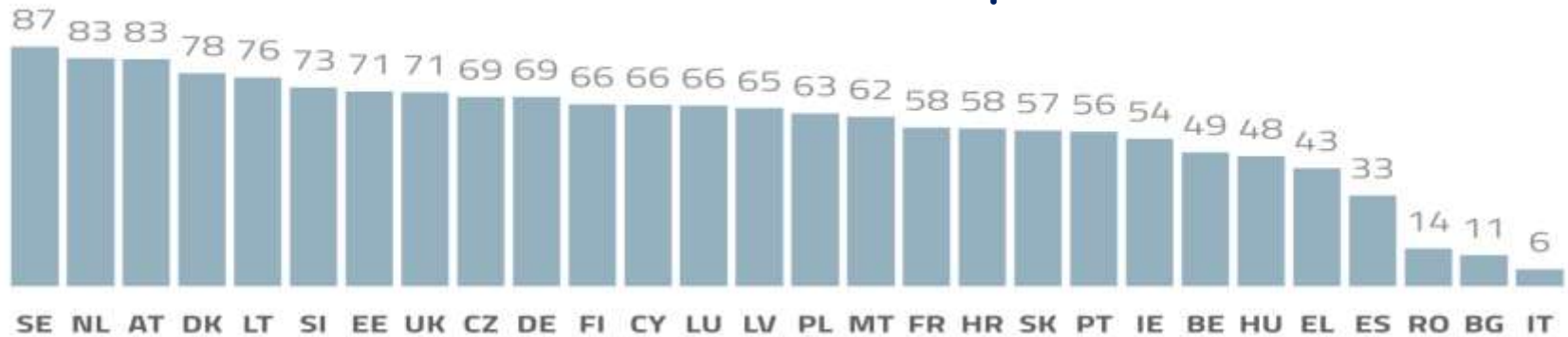
➤ Labour markets and skill needs are constantly evolving



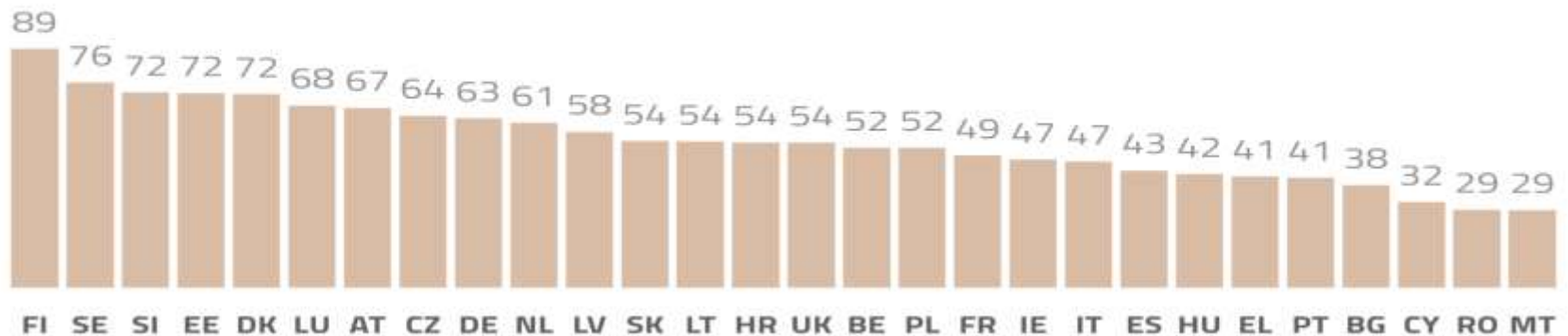


## Skills Activation

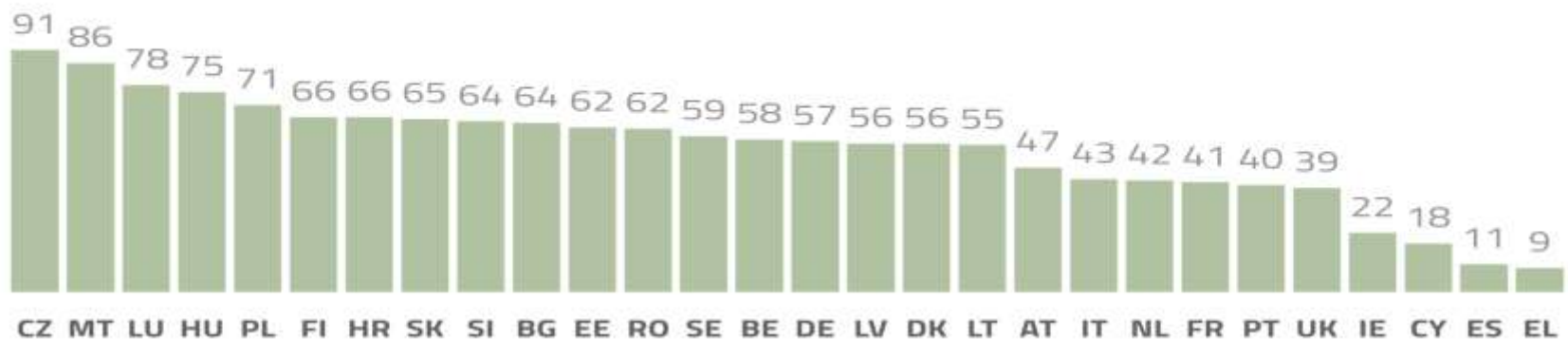
## European Skills Index



## Skills Development



## Skills Matching



## References

### European Skills and Jobs Survey

<http://skillspanorama.cedefop.europa.eu/en/content/european-skills-and-jobssurvey>

### Skills forecast

<http://www.cedefop.europa.eu/en/publications-and-resources/country-reports>

### Skills anticipation in Europe

[http://skillspanorama.cedefop.europa.eu/en/analytical-highlightscountry?](http://skillspanorama.cedefop.europa.eu/en/analytical-highlightscountry?f[0]=field_collection%3A765)

[f\[0\]=field\\_collection%3A765](http://skillspanorama.cedefop.europa.eu/en/analytical-highlightscountry?f[0]=field_collection%3A765)

### European Skills Panorama

<http://skillspanorama.cedefop.europa.eu/en>





# Introduction

- ❖ The requirement for development **basic skills and lifelong skills & competences** is basic priority
- ❖ Formal education and training should equip everyone with **a broad range of skills** which opens doors to personal fulfilment and development, social inclusion, active citizenship and employment (*literacy, numeracy, science and foreign languages*)

Cedefop, 2008; European Union, 2012



# Competences

digital  
competences

entrepreneurship

*critical thinking*

*problem solving*

*learning to learn*

*financial literacy*

### Soft skills

- Organizational Skills
- Communication Skills
- Creativity
- Collaborative Skills
- Problem Solving,
- Leadership Skills,

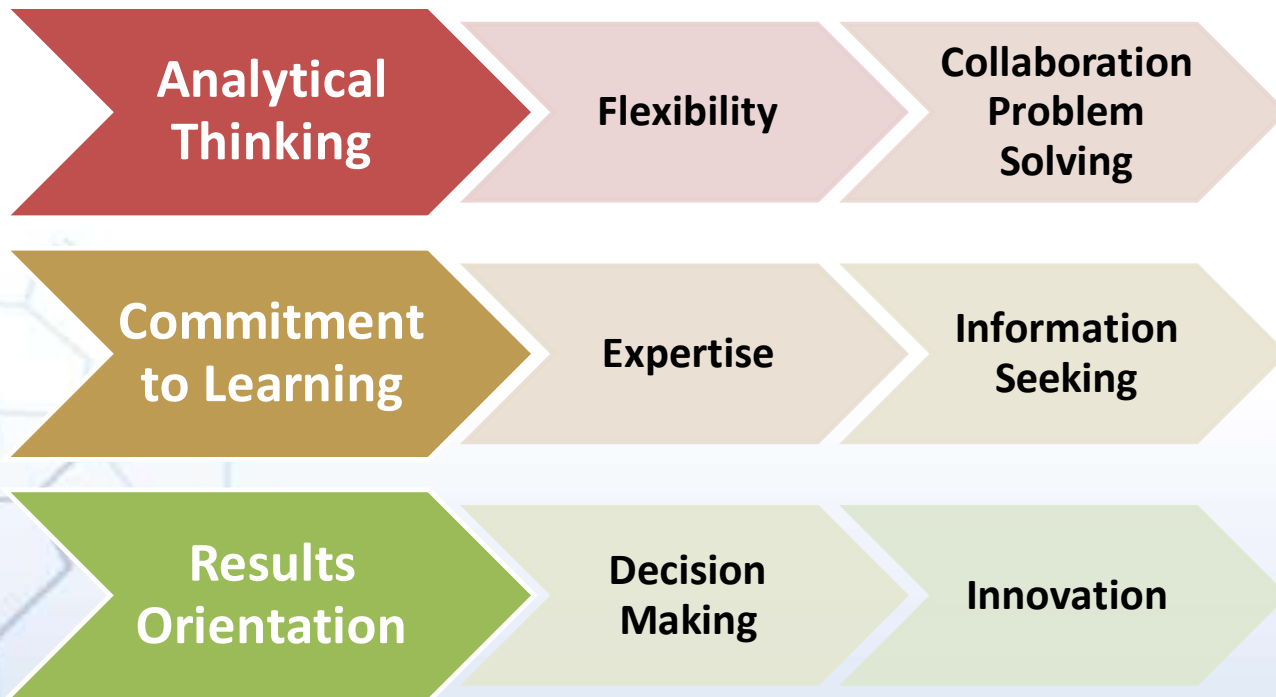
### Social Skills

- creativity
- innovation
- initiative
- consistency and trust
- entrepreneurship

### Hard Skills

- The total of skills that a person possesses and determine his ability to perform a particular type of work or activity.

# Transversal skills



# European Schoolnet is a network of 34 European Ministries of Education



DIGITAL CITIZENSHIP



EVIDENCE FOR INNOVATION



STEM EDUCATION

**innovation in teaching and learning**

**key stakeholders:**

**Ministries of Education, schools, teachers,  
researchers, and industry partner**

# Digital Citizenship

## Online safety and responsibility

- A safer online environment: [Better Internet for Kids](#)
- A global day of focus on a safer and better internet: [Safer Internet Day](#)
- Certified accreditation for schools: [eSafety Label](#)
- Combat bullying through online and offline interactions: [ENABLE](#)
- Foster confidence in behaviour changes through serious games: [eConfidence](#)

## Digital skills for jobs and life

- Empowering youth for employability: [I-LINC](#)
- Bridging the digital skills gap: [Digital Skills and Jobs Coalition](#)

## Coding and computational thinking

Promoting teaching and learning coding and programming:

[European Coding Initiative](#) and [DIS-CODE](#)

Understanding the uptake of computational thinking in formal education:

[Computhink](#)

<http://www.eun.org/projects/digitalcitizenship>



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# Open Book of Educational Innovation

  
**Driving Innovation in Education**  
*How far we have come and where we are going*



## European Schoolnet Annual Report 2017





# Scientix, the community for science education in Europe





# SCIENTIX SURVEY ABOUT STEM PRACTICES



Available in 25 languages  
Participate by 18 July 2018

## TEACHERS SURVEY ON STEM PRACTICES

[scientix.eu/observatory/stem-education-practices](http://scientix.eu/observatory/stem-education-practices)



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# CREATIONS: DEVELOPING AN ENGAGING SCIENCE CLASSROOM

Share this project



BASIC INFORMATION

RESEARCH INFORMATION

TEACHER INFORMATION



**In CREATIONS, a project funded by the European Union, 16 partners from 10 countries develop creative approaches based on art for an engaging science classroom.**

How can young people's interest in science be increased? 16 partners from 10 European countries want to break new ground. In CREATIONS, a project funded by the European Union, they develop creative approaches based on art for an engaging science classroom. The partners are planning a variety of events with theatre, photography and exhibitions in which young people can experience an active and playful role within science and research. CREATIONS establishes a pan-European network of scientists, teachers, artists and students.

<http://www.scientix.eu/web/guest/projects/project-detail?articleId=593964>

<http://portal.opendiscoveryspace.eu/en/creations>



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# DESCI, DEVELOPING AND EVALUATING SKILLS FOR CREATIVITY AND INNOVATION

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BASIC INFORMATION

RESEARCH INFORMATION

TEACHER INFORMATION



territory.

DESCi (Developing and Evaluating Skills for Creativity and Innovation) promotes alternate training paths based on the Living Lab approach, adopting participatory design methodologies, connecting school, enterprise, research and

<http://www.scientix.eu/web/guest/projects/project-detail?articleId=741678>



Developing and Evaluating Skills for Creativity and Innovation

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DESCI

DESCI has been funded within the framework of the European Union Erasmus+ programme  
<http://www.desci.eu/>



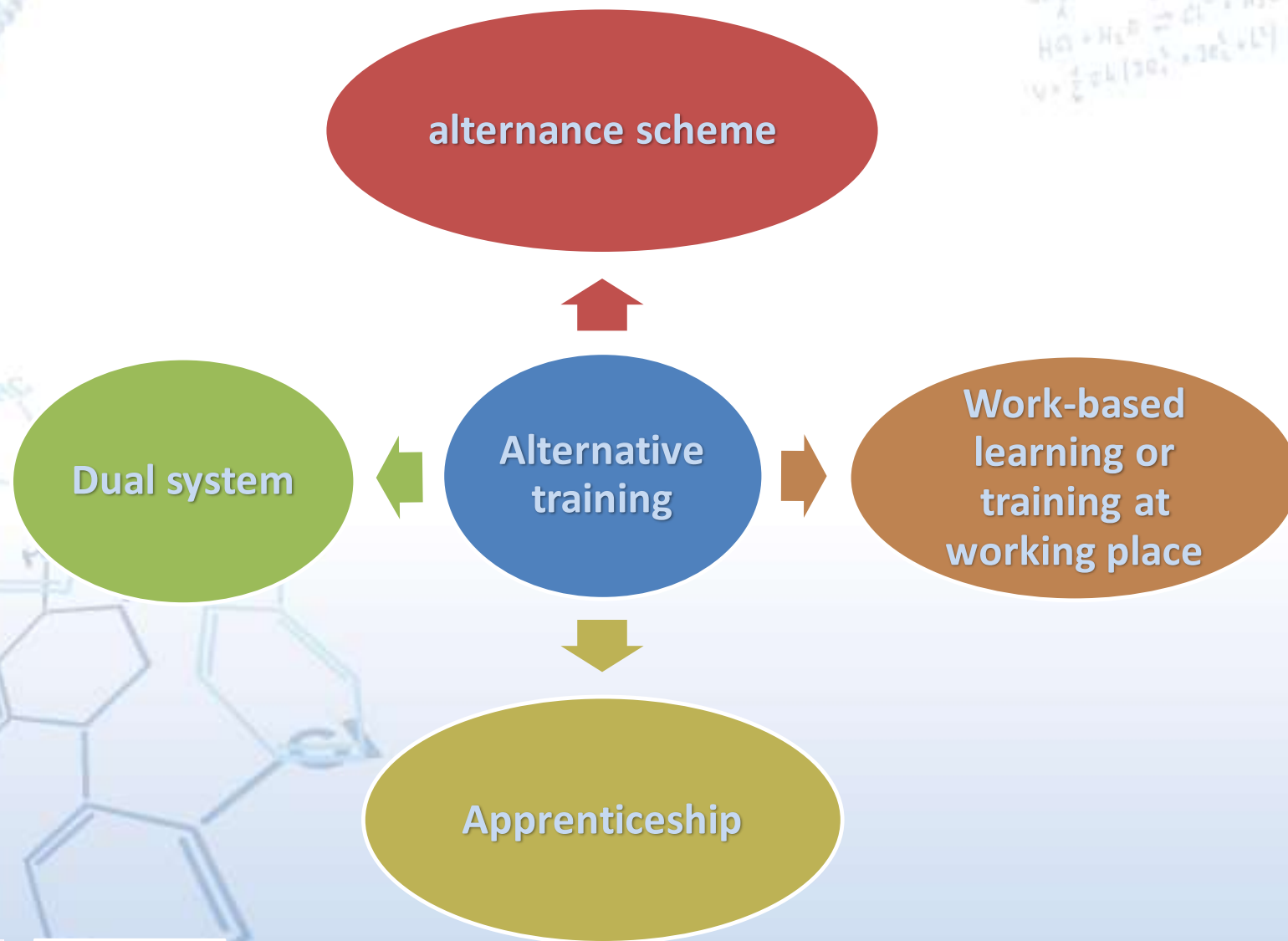
Design and Evaluating Skills for Creativity and Innovation  
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## The project Developing and Evaluating Skills for Creativity and Innovation (DESCI)

- Promotes **alternate training paths** based on the **Living Lab approach**
- Adopting participatory design methodologies
- Connecting School, Enterprise, Research and Territory.

# The alternating training approach



## The alternating training approach

**Decrease the mismatch between education and labor market**

**Promote a structural link between educational institutions, labor market and civil society**

**Correlate the educational offer to the cultural, social and economic development of the territory**

**Widen the range of learning contexts, transforming businesses in places of training and investment in human capital**



**A Living Lab** is “an open innovation environment in real-life settings in which user-driven innovation is fully integrated within the co-creation process for new services, products and societal infrastructures”

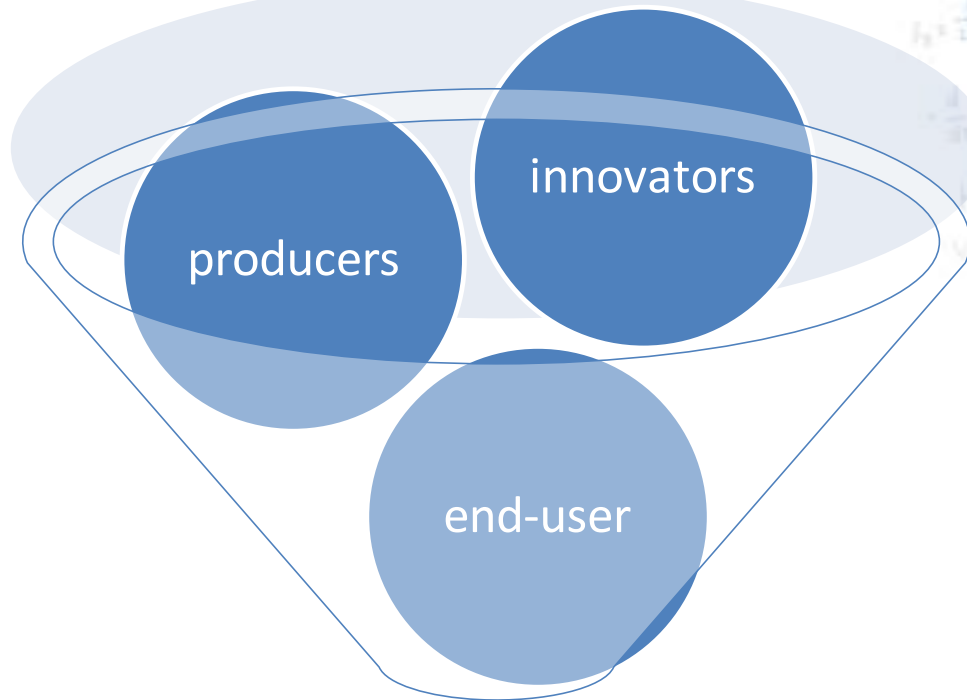
Open  
innovation

Real-life  
settings

End-user  
engagement



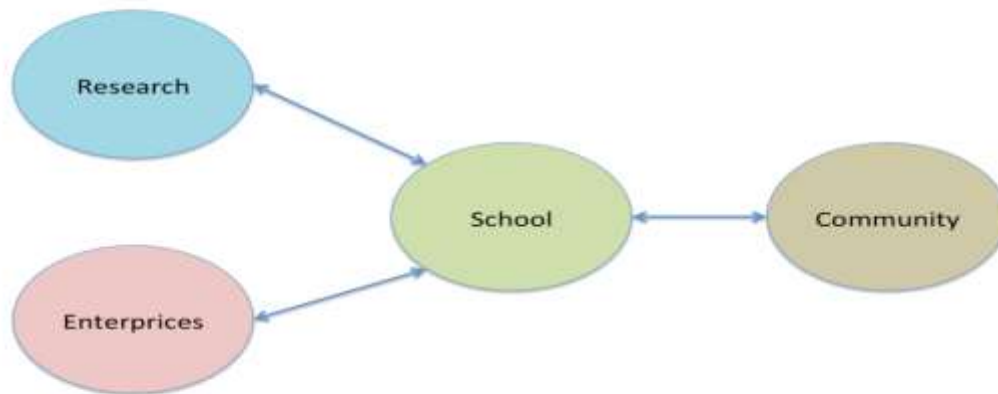




Enterprises, research organizations, interested communities and associations (patients, citizens, consumers, environmentalists, etc.), other institutions (other schools, municipalities, policy institution, health units, etc.) cultural institutions, institutions active on human rights, equity, gender (trade unions, disabled people associations, migrants associations, associations for protecting women, children, detainees, GLBT associations ...), school departments, different group classes (internal stakeholders), individuals from all these entities and potential users of products and services



Living Labs for their  
territory and for  
their local  
community.



- An **innovation laboratory** for the local community
- Guided by researchers and company tutors, can
  - Develop innovative ideas and products**
- Socially, ecologically and economically sustainable



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## AIMS &amp; OBJECTIVES

Increase in schools the development of adequate basic competences as necessary components for learners to enter the labour market (scientific analytical skills, problem solving, creativity and technological skills);

Promote a bottom-up creation of tools for the management of alternate training;

Enhance the capacity of teachers and schools to impact on the alternate training process;

Promote the creation of communities of innovation encouraging the School to reach out to the territory ;

Improve School-Business relationships favouring a strategic mutual interaction;

Increase scientific training and the importance of science in daily life.

# DESCI & STUDENTS

- **Face the challenge** of learning “in the field”, enhancing not only “formal” but also “non- formal ” and “informal” competences;
- **Discover and enhance** their individual potential through direct contact with the business world, thus favouring professional guidance and integration;
- **Acquire skills** for creativity and innovation;
- Come in contact with other students, from different territorial contexts;
- **Learn to behave** according to the living lab approach thus becoming active and responsible individuals within the school’s local community;
- **Understand** the importance of research as a vehicle for innovation.

# DESCI & TEACHERS

- **Try out** new methods and new tools;
- **Network** with other teachers from different contexts;
- **Promote** their continuous professional development;
- **Involve the school** in the problems of the local community delivering innovative solutions to respond to its needs and aspirations.

# DESCI & ENTERPRISES

- **Become active** parties in the educational process, offering students the precious opportunity of “learning by doing”;
- **Learn and experience** the Living Lab approach and consequently operate in the spirit of responsible innovation;
- **Come into direct contact** with the innovative potential of the young generation, marked by a natural flair for new technologies and new languages;
- **Develop innovative products** transferring innovation from research centres.



# DESCI & ENTERPRISES

- **Become active parties** in the process of analysis and identification of innovative solutions to citizens' needs and aspirations thereby finding new areas of research;
- **Learn and experience the Living Lab** approach and consequently operate in the spirit of responsible innovation;
- **Come into direct contact** with the innovative potential of the young generation, introducing them to the world of research and its importance for the growth of a society;
- **Cooperate in finding and developing innovation** in the light of technology transfer.





## DESCI's generic scheme of skills

**Thematic / domain competences**

(e.g. innovating in the domain of ICT, entrepreneurship, technical skills, professional skills),

**Basic skills**

(e.g. numeracy skills, literacy skills, maths, economics, acquisition of foreign languages)

**Social skills and (4) Affective skills (e.g. optimism, endurance, determination, sustain motivation for learning).**



## ACTIVITIES AND PRODUCTS

Innovative  
modules for the  
alternate training  
paths in partner  
schools;

### Toolkits

Training,  
awareness-raising  
and dissemination  
events

- 1 toolkit for teachers
- 1 toolkit for students
- 1 toolkit for the evaluation of the skills acquired at the enterprise/during practice

The toolkits, therefore, **PREPARE** (the teachers), **INSPIRE AND MOTIVATE** (the students), **SUPPORT** (all the actors in their operational work) and **EVALUATE** (the activities carried out).

<http://www.desci.eu/educational-resources/>

## ACTIVITIES AND PRODUCTS

**"Comparative analysis of European upper secondary schools and alternating training systems"**

**a DESCi check list (that outlines the minimum requirements of a DESCi Alternating Training)**

**A document on "Skills and competences for creativity and innovation",**



DESCI







# Developing and Evaluating Skills for Creativity and Innovation

DESCI arises from the need to address the problem of the mismatch between education and professional integration, to strengthen the links between educational systems and the world

of work, relating training programmes to the cultural, social and economic development of the territory. A key issue is the teaching of innovation in its various facets and its vital connection, emphasized in many studies, to ethical, sociological and environmental aspects. (DESCI is funded under the Programme Erasmus+, Key Action K2 (Strategic Partnerships). This group is created by Greek partner of the project : National Kapodistrian University of Greece)



DESCI

<https://groups.etwinning.net/67705/home>



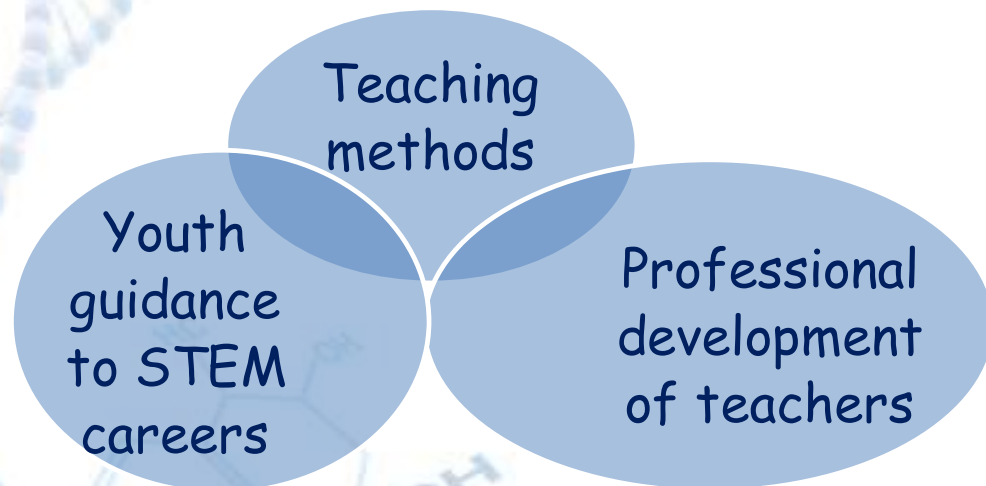
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# Conclusions



*An increasing recognition of the importance of school- industry partnerships*

- Games on careers, interests and vocational choices related to industry for younger students
- School projects and simulations to support career counselling activities for secondary level students
- Prepare students for visits to working places, mentoring initiatives and internships
- Prepare interviews and visits by experts to the school

# Thank you for your participation !

## Have a nice Summer!

