



Towards 2020
Priorities for STEM education and careers in Europe
Marc Durando

Structure of the presentation

1. **STEM shortages in Europe**
2. **National strategies regarding current policies and practices**
3. **Role and contribution of inGenious**
4. **Organisation of the event**



STEM shortages in Europe



STEM shortages are prevalent throughout Europe

Shortages apply to almost all technical jobs, including ICT.

No shortage of biologists but shortages of mathematicians and physicists.

Shortage of teachers for physics and mathematics in a lot of countries.

Too low percentage of girls opting for STEM studies.



STEM shortages are prevalent throughout Europe

**Germany
2012**

Shortage

200 000 STEM graduates (mainly engineers)

Cost

20 billions per year

**Netherlands
2011 - 2016**

Shortage

25 000 per year technical skills graduates

Need to replace staff

20% of engineers > 55 years are still active in DE, CH and DK

**France
2011**

Shortage

Delta – 10 000
30 000 supply for 40 000 offer

**Switzerland
2009**

Shortage

2000 candidates for 16 000 jobs

Cost

2 billions per year

Challenges of teachers

Age

- Aging population – 1/3 > 50 years
- Gap between students and teachers is growing

Technology

- STEM developments in industry & research move quickly

Training

- STEM teachers require ongoing professional training
- Particularly primary school teachers

Vocation

- Less and less candidates for becoming STEM teachers

National strategies regarding current policies and practices

1. Reasons
2. Aims
3. Generic measures
4. Common trends and impact



Reasons for a national strategy

**Declining interest in science studies
and related professions**

**Rising demand for qualified researchers
and technicians**

Decline in innovation → economic competitiveness

Aims of national strategies

**Promote a positive image
of science**

**Improve public knowledge
of science**

**Improve school based
science teaching & learning**

**Raise pupils' interest in
science subjects**

**Strive for a better gender
balance**

**Provide employers with the
required skills**

5 Generic measures proposed

Implementing curriculum reforms

Creating partnerships between schools and companies

Setting up science centres

Providing particular guidance to encourage youth (girls) to choose scientific careers

Developing CPD for teachers

Very few initiatives dealing with career advisors (issue on the profession).

Need to strengthen high quality career advise in schools

Very few initiatives on recruiting new STEM teachers

Common trends in national strategies

Many separate initiatives but very few overall strategies to improve science education

Integrated approach to science education at lower level
Separate subject teaching in the later stages of schooling

Increased attention to context based issues and hands-on activities

No specific measures for lower achievers in science

Traditional assessment methods still prevail

Many initiatives help to improve teachers' skills

Initial teacher education still curriculum focused

Impact of these initiatives

**More than 1000 initiatives in
Germany - 2011**

470 initiatives in UK - 2004

**Estimation in Europe to have between 3000 and
5000 initiatives**

Has the situation changed radically ?

Contribution of inGenious



4 major questions

Attractiveness of STEM



- How can STEM teaching & learning be reformed?
- How to enhance engagement and uptake of STEM studies

Stereotypes



- How can educators and industry fight the main stereotypes around STEM education and careers?

STEM Educators and Innovation



- How can educators be supported in implementing innovative approaches to STEM education?

Cooperation



- How can all stakeholders cooperate more effectively to tackle the STEM challenge in a more holistic way ?

**High STEM performance in a
country does not lead
to a higher level of interest**



Role and contribution of inGenious

**How can industry-education cooperation contribute to face the STEM challenge ?
inGenious works on:**

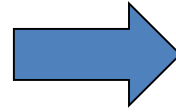
- **Identification of policies & practices**
- **Testing practices in schools**
- **Working with students and teachers and industry via various activities – campaigns, workshops, webinars, online events.**
- **Image of STEM jobs and careers**



Organisation of the event



**Video message
from European Commissioner**



**Results from a study
analyzing school-industry
collaboration
in STEM education
in Europe**



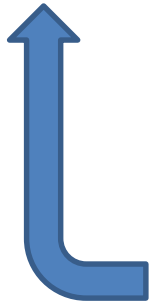
**Lessons learned
and plans for action
Conclusion and closing**

EVENT

**Panel discussion
Overcoming challenges
in STEM education
and careers**

Workshops

- 1. Integrating school-industry collaboration in the curriculum and in teacher's training**
- 2. Establishing, developing and maintaining school-industry collaboration at national level**
- 3. Awareness raising through STEM roles**
- 4. Priorities in STEM education policy and STEM careers at national, regional and European level**



THANK YOU

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