

STEM EDUCATION CHALLENGES

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TRANSFORMING EDUCATION IN EUROPE

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IMPORTANCE OF DIGITAL SKILLS

Digital society & digital economy
are now a fact of life

Innovative capacity of technology is conditioned by
the level of digital skills of the population

Basic knowledge of digital technologies
is vital for daily life

DIGITAL SKILLS ARE ESSENTIAL

TECHNOLOGY TRANSFORMATION

80% of technology which will be used in 10 years not yet invented

To be implemented by 80% of people already in activities

50% of current jobs worldwide (30% in EU) will disappear in 25 years

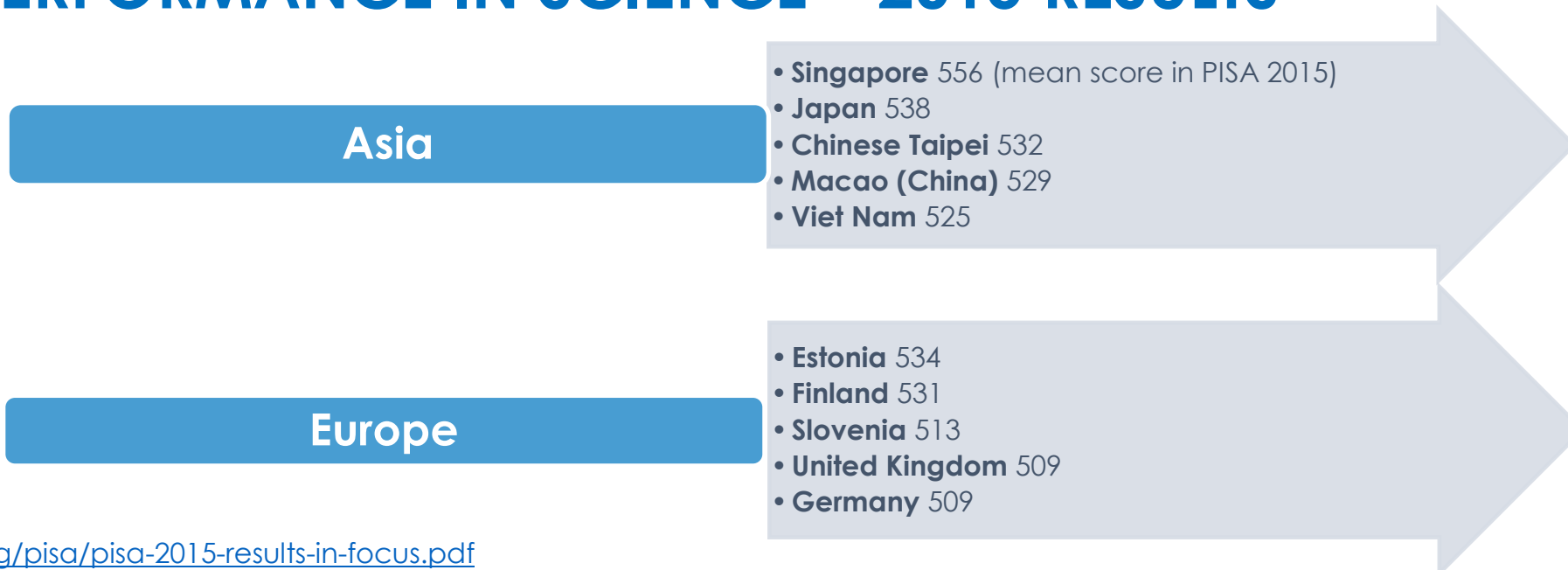
9 out of 10 jobs will require digital skills

44% of the EU population (ages 16 ≈ 74) lack basic digital skills

Towards a **new social divide ?**

IT IS ESSENTIAL THAT EDUCATION INSTITUTIONS PREPARE STUDENTS AND TEACHERS FOR THIS RAPID ECONOMIC AND SOCIAL CHANGES

PISA PERFORMANCE IN SCIENCE – 2015 RESULTS



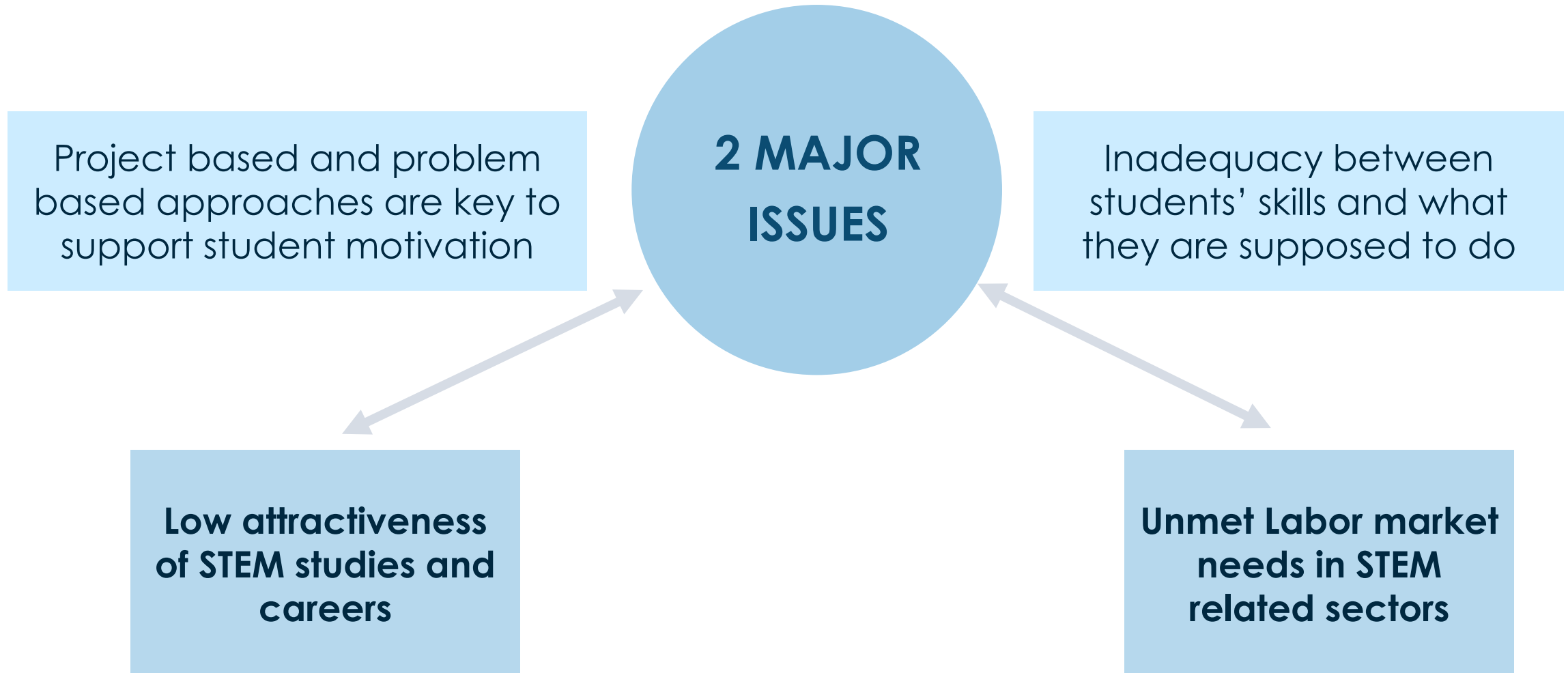
<https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf>

“In 2015, only two EU Member States (EE, FI) reach the ET2020 benchmark and have a share of low achievers that is below 15%. The average share of low achievers in science in the EU is 20.6%, more than five percentage points above the benchmark aspired for 2020.”

https://ec.europa.eu/education/sites/education/files/pisa-2015-eu-policy-note_en.pdf

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

WHAT ARE THE KEY ISSUES REGARDING STEM EDUCATION IN EUROPE ?



STEM IN SCHOOLS

Curricula are «over stuffed» with factual content –
More & more topics while few are removed

Pedagogy

Text based – factual recall → Exploratory learning modes (IBSE)

What is the relevance of content to the pupils' lives and future careers? Pupils fail to see how STEM relates to society's current challenges (climate change, energy, ...)

NECESSITY TO CHANGE OF APPROACH

“How to”

- Apply “recipes” to already known problems
- Factual recall



“Why”

- Inquiring about problems that are not yet documented



EVALUATION STILL TOO CONSERVATIVE

Teachers encourage students to work together, to use technology, to be creative

Paradox

It is expected for students to demonstrate their knowledge by sitting in rows taking summative tests or examinations in isolation

New assessment approaches linked to IBSE?



4 MAJOR AREAS OF DEVELOPMENT

Capacity building of teachers

- Innovative pedagogies
- Primary school teachers
- Future teachers

Cooperation with industry

- Role models - STEM jobs
- Contextualization of STEM teaching
- Teacher placements in industry

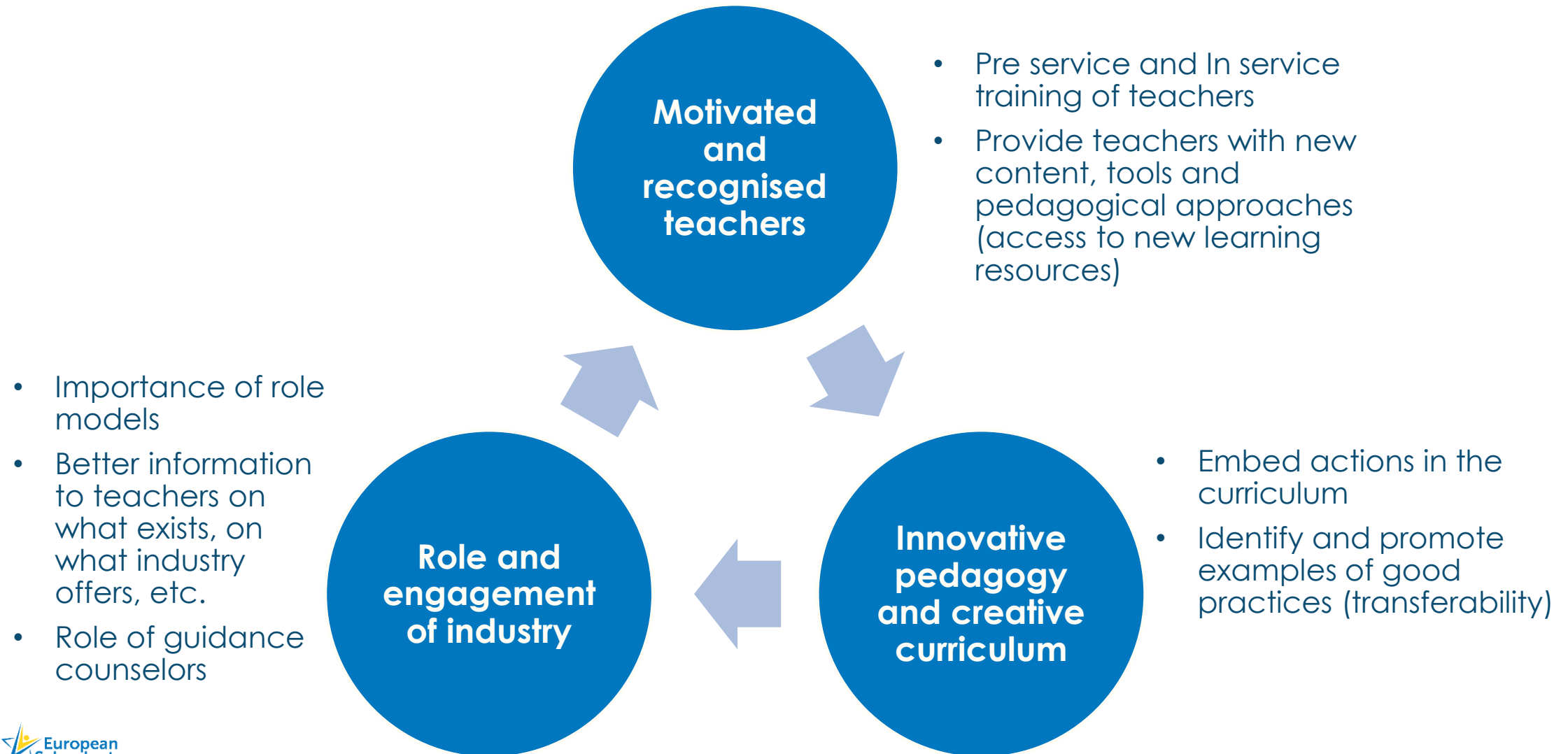
STEM school strategy

- STEM school label
- Guidance counsellors

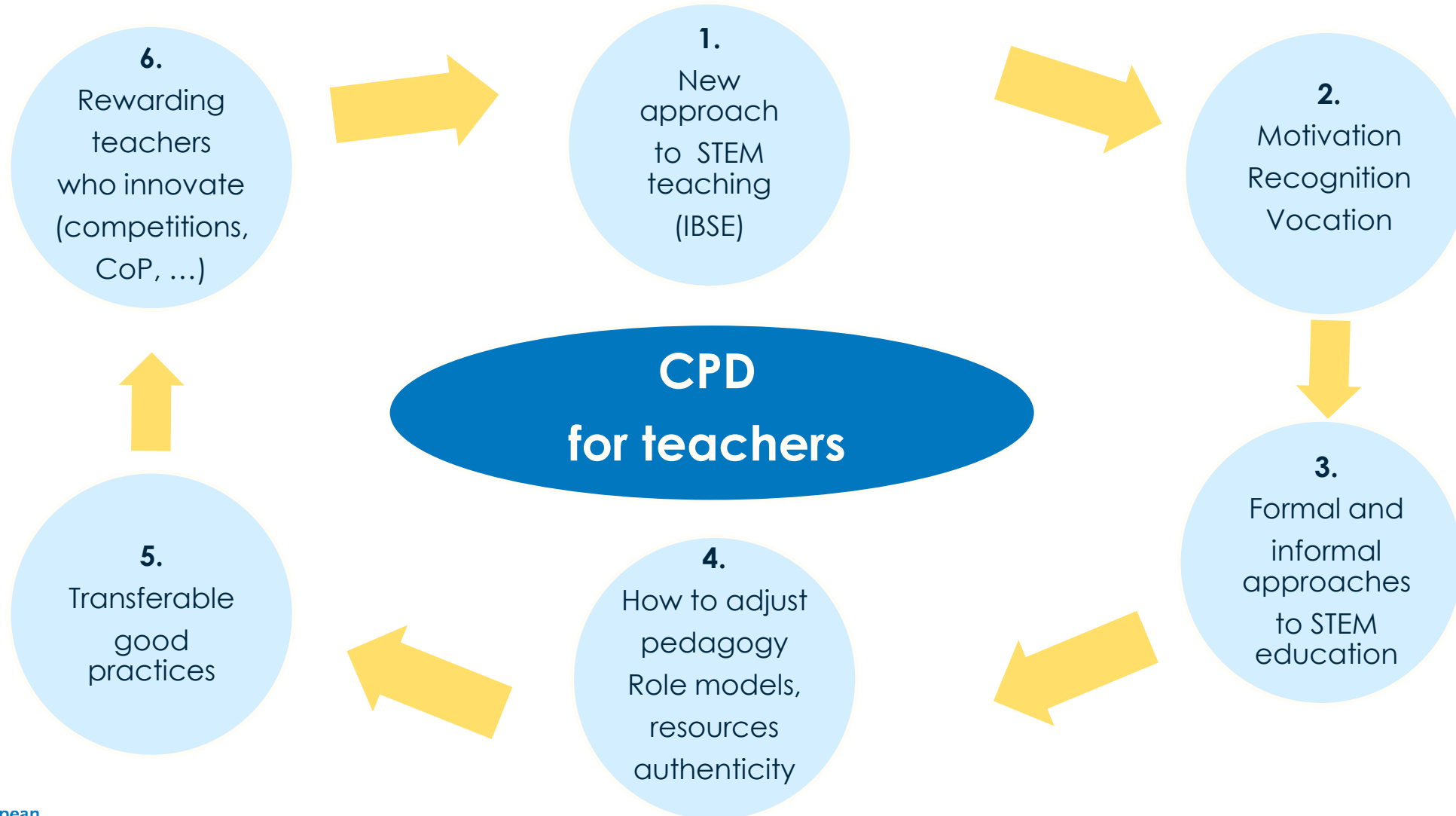
Cooperation

- Exchange of practices
- Communities of practices between teachers

HOW TO MAKE STEM STUDIES MORE ATTRACTIVE - 3 KEY INTER RELATED FACTORS



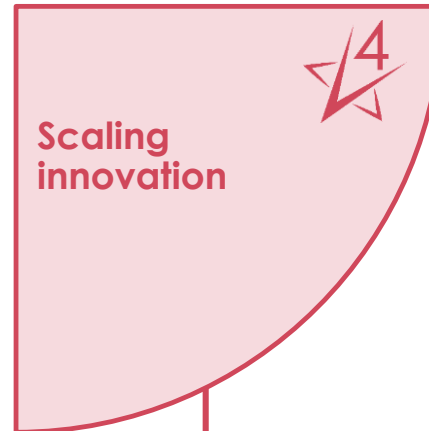
WE NEED MORE SUPPORT FOR STEM TEACHERS



WHAT SHOULD OUR EDUCATION SYSTEMS DO ?

- Media and digital literacy
- Digital competence
- Digitalisation of education
- Digital citizenship education

- Developing (shared) leadership approaches in school
- Linking formal, non formal and informal learning opportunities
- Connecting the school and wider community - industry-education STEM initiatives
- New flexible learning spaces - Future Classroom Lab



- Teacher professional development
- Initial teacher education
- European Schoolnet Academy

- Pilot and demonstration projects
- Defining appropriate innovative ecosystems to support large scale deployment
- Associating territorial authorities (regions, cities)

THE 3 CRITICAL SUCCESS FACTORS

Make it known

- Evidence demonstrating it can happen

- Thousands of STEM Education stakeholders using Scientix every day

Recognition & Time

- Giving recognition and time to teachers

- 500+ Ambassadors (even more)
- Important impact

Political decision

- No way backwards possible

- > 19 MoEs already convinced
- > 10 000 teachers
- Industry

Increase the desire to learn

Rediscover the joy of teaching