STRATEGIC FRAMEWORK, PRIORITIES AND INSTRUMENTS FOR THE DIGITAL TRANSFORMATION OF EUROPEAN SCHOOL EDUCATION

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About the speaker

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  Athens University of Applied Sciences
- Head of Department of Informatics
- Scientific Director of Institute for Lifelong Education
- Project Leader European Learner Mobility (ELM)
- Vice-Chair of the European standardization committee CEN/TC 353 “ICT for Learning, Education, and Training”
- ISO JTC1 SC36 “Learner Mobility Achievement Information”
- Convener TC48-WG3, Hellenic Mirror Committee – ICT for Learning, Education, and Training

Overview

21st century challenges

Building the 'new' learning ecosystems

Europe's vision and strategic frameworks

European best practices for digital transformation

The EU K-12 education strategy

Closing Remarks

21st century challenges

- Digitalization of economy and society: IT is everywhere
- Automation of industrial world
- "Greening" of human practices
- Rise of net-centric society

Changing world

- growing complexity of socio-technical systems (transport, energy, telecom, mass production etc.),
- rise of volatile, uncertain, complex & ambiguous socio-economic and cultural landscapes

New skills and knowledge

Facts

- evolving demand for new skills and knowledge
- growing skills mismatch key problem of the job markets for the majority of large economies of the planet

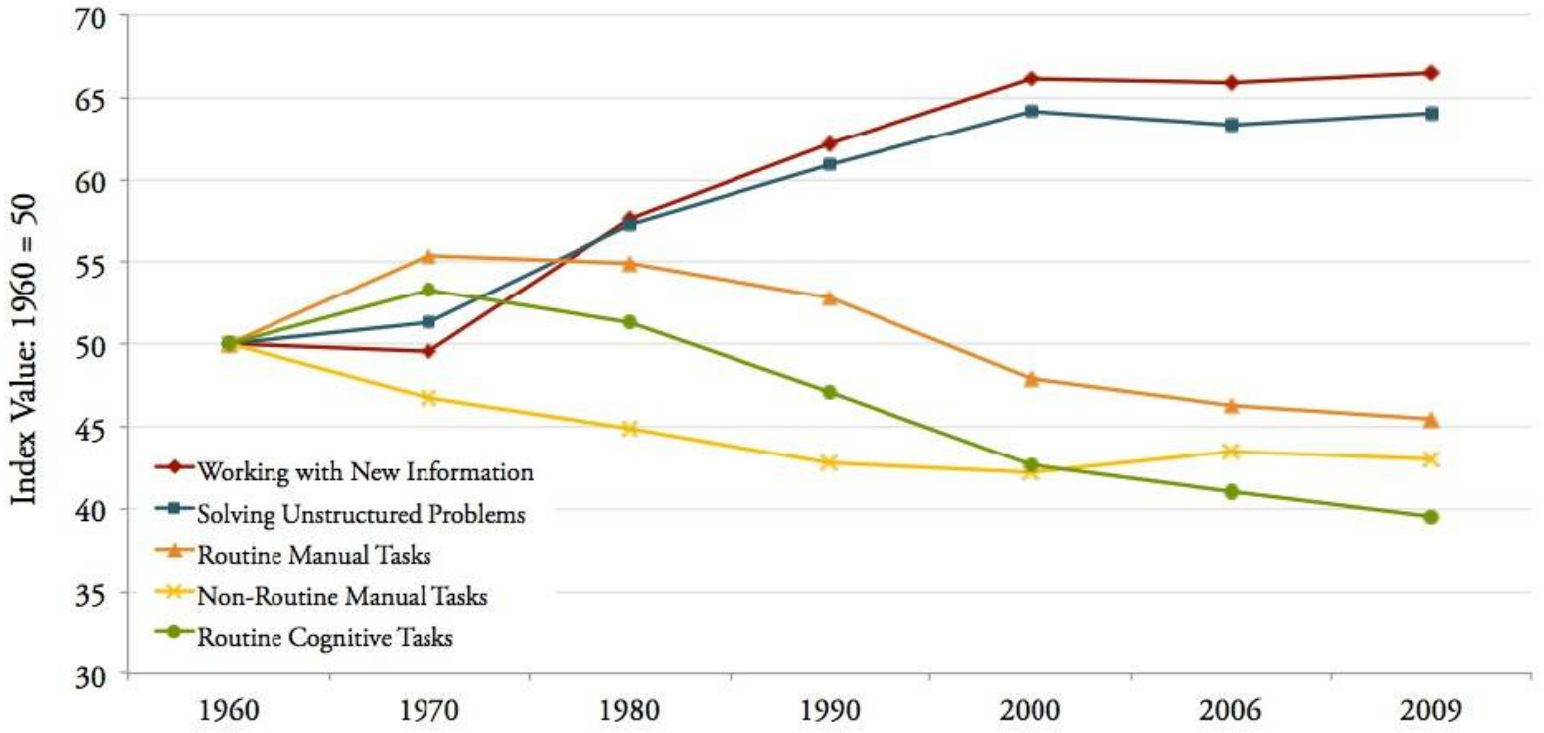
Questions

- What skills and knowledge do we need to survive and prosper in the changing world?
- How can these skills be acquired?

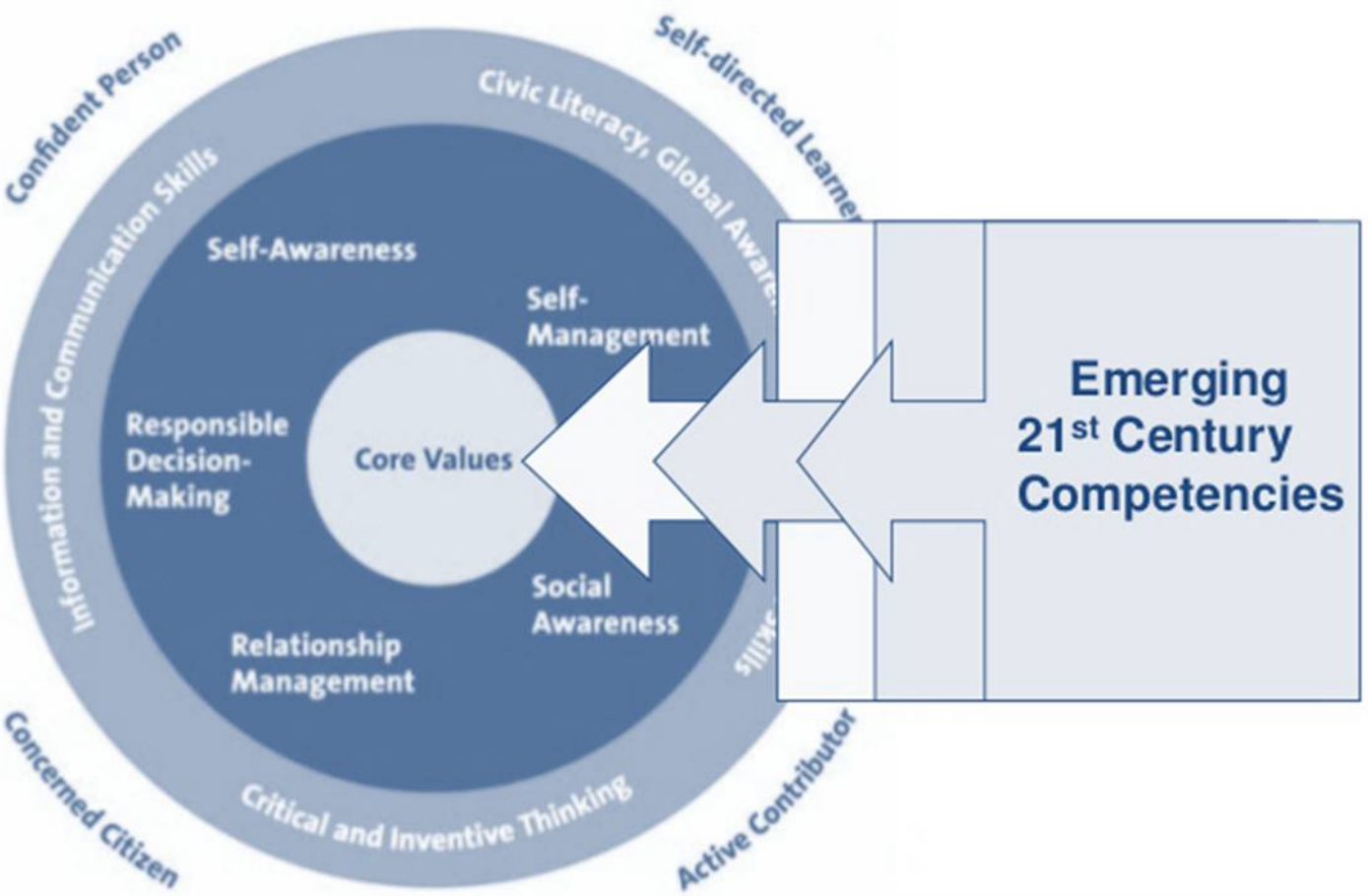
Transformation of economies

Changed nature of working tasks

Figure 3: Index of Changing Work Tasks in the U.S. Economy 1960-2009[21]

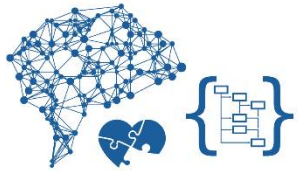


Emerging 21st century skills



WEF top 2020 skills

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity



Source: Future of Jobs Report, World Economic Forum

Education for 21st century challenges

> Education is the most sophisticated social technology of societal transformation and intentional evolution

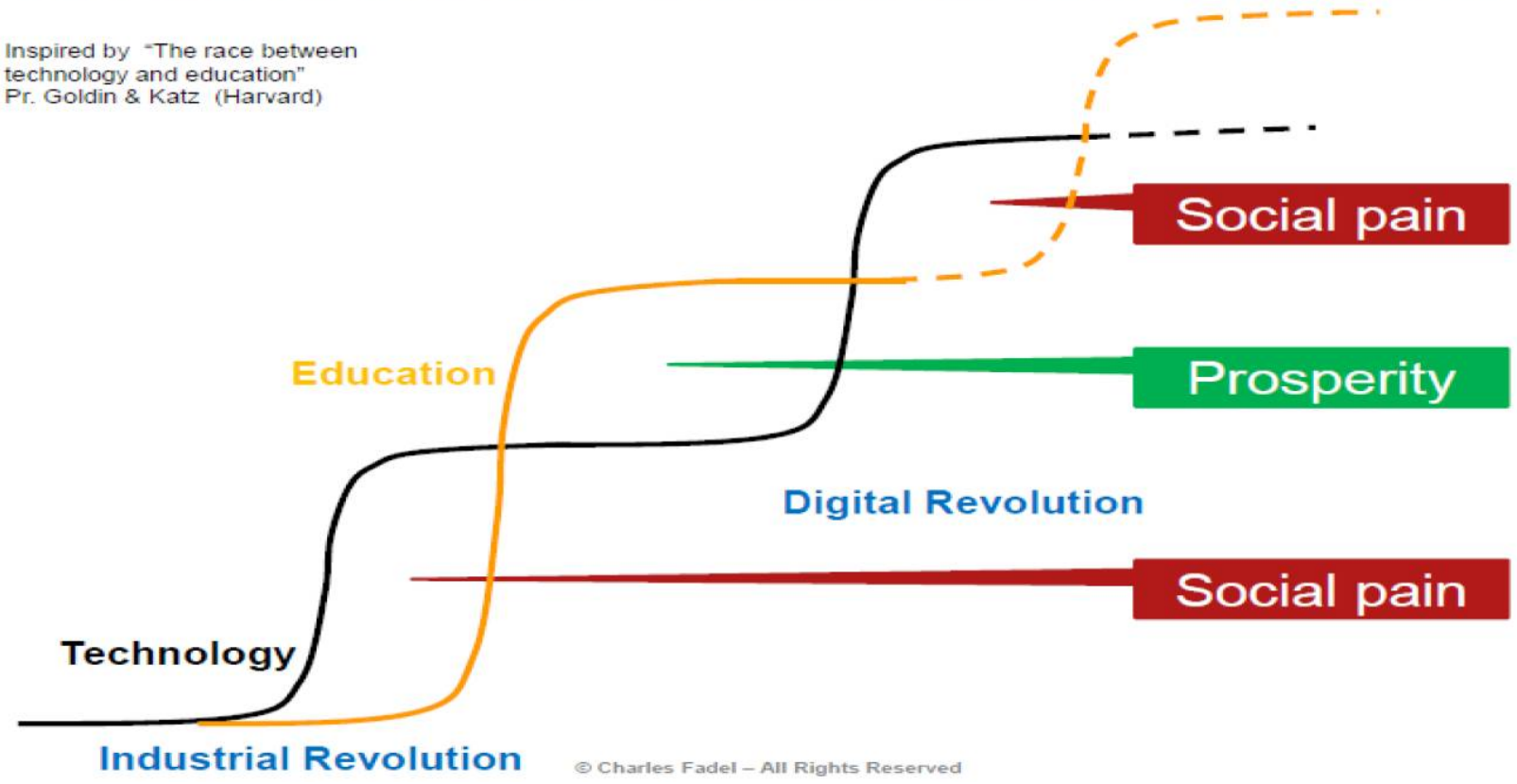
Advances in learning sciences and proliferation of educational technologies

However,

> **WHY HAS EDUCATION NOT YET BENEFITTED FROM THE PRODUCTIVITY AND EFFICIENCY GAINS THAT ICT HAVE PROVOKED IN OTHER SYSTEMS?**

OECD project, Innovative Learning Environments

The Race between Technology and Education



The ‘New’ Education paradigm

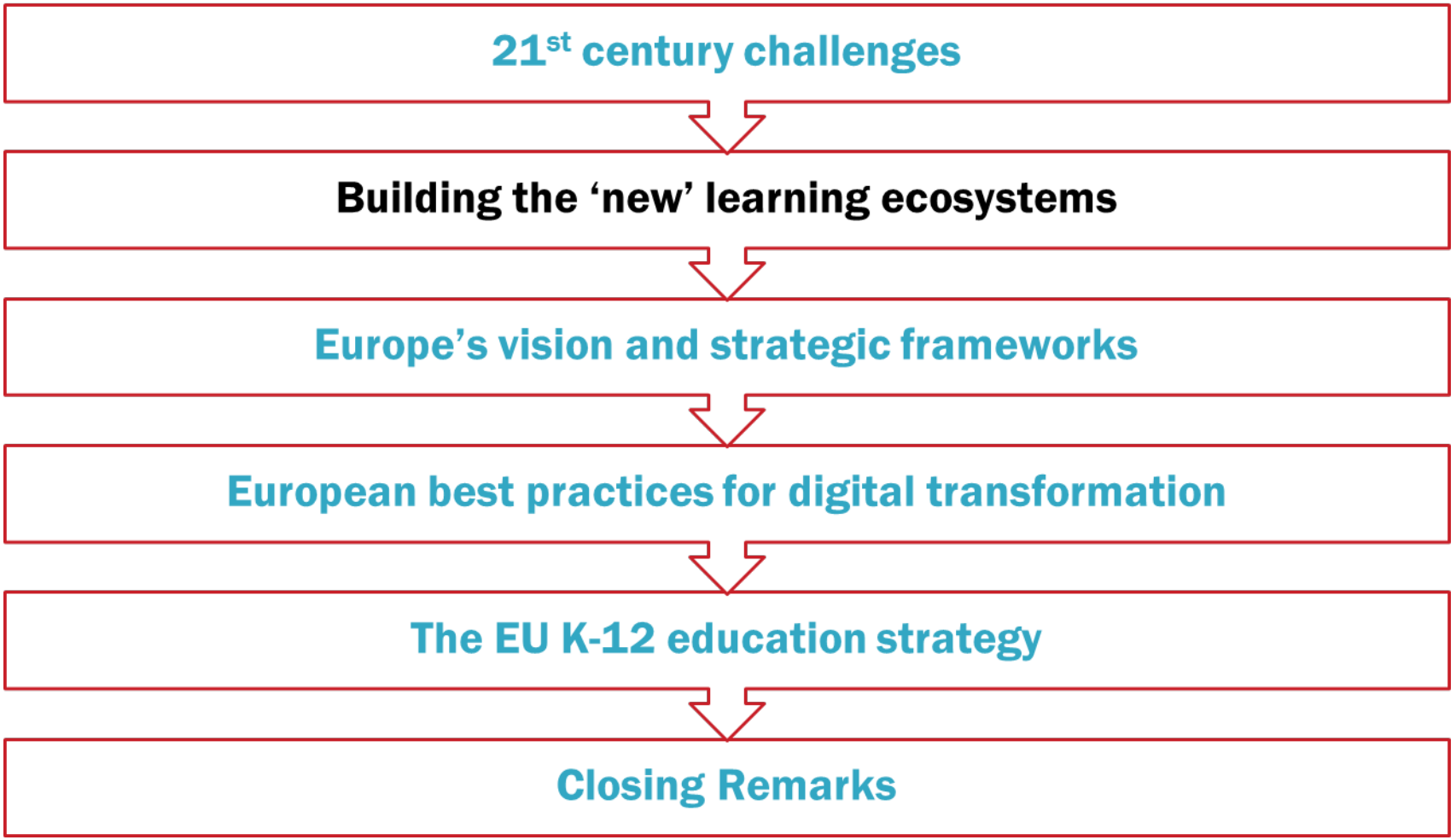
The current educational model is flawed by design:
it prepares people for skills of the past, not skills of the future!

Increasing gap with the existing educational systems due to insufficient capacity for adaptation, their continued investment in conventional industrial processes

Revolutionary potential of new educational technologies currently low because of the context of their application

Need for ‘new’ education within and outside traditional settings, development of ‘new’ effective, technology-rich learning ecosystems

Overview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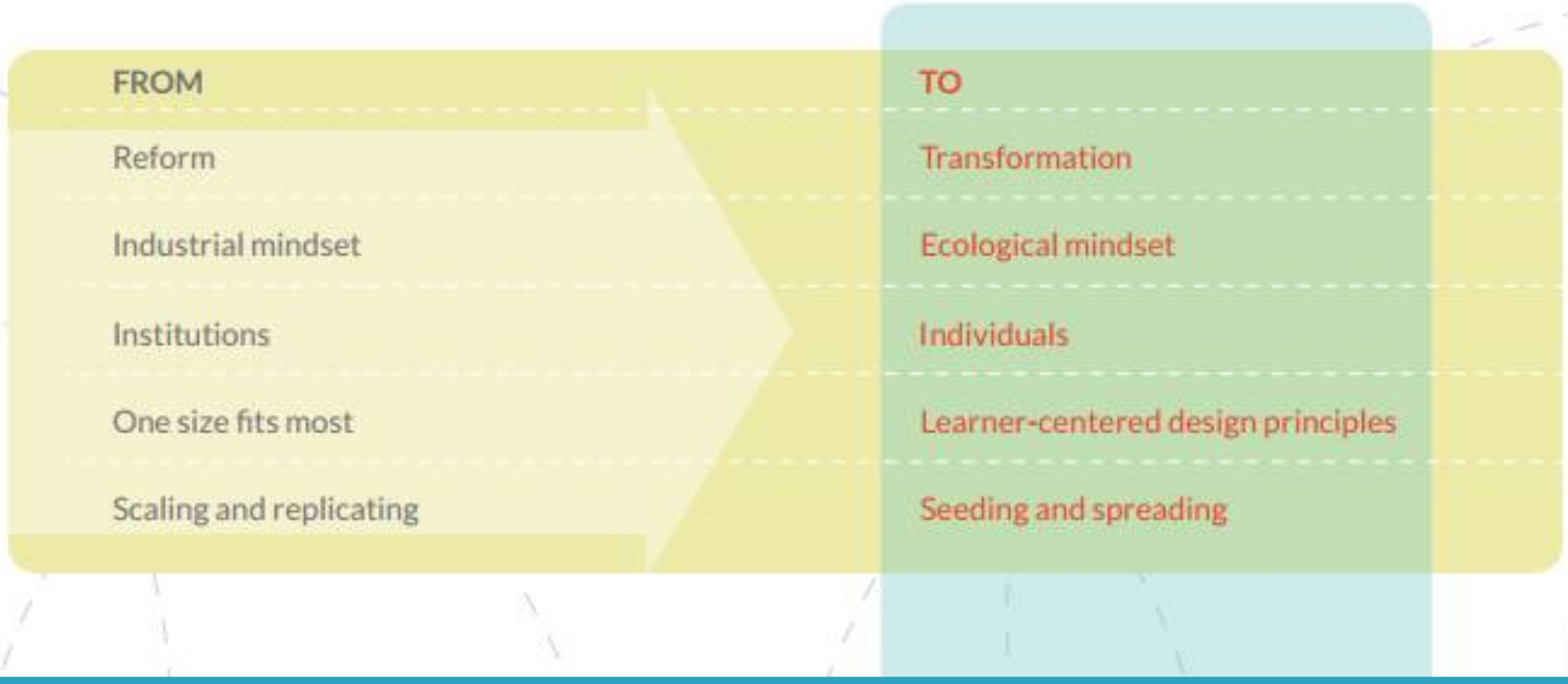
Learn for life, Learn to learn!

"You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it."

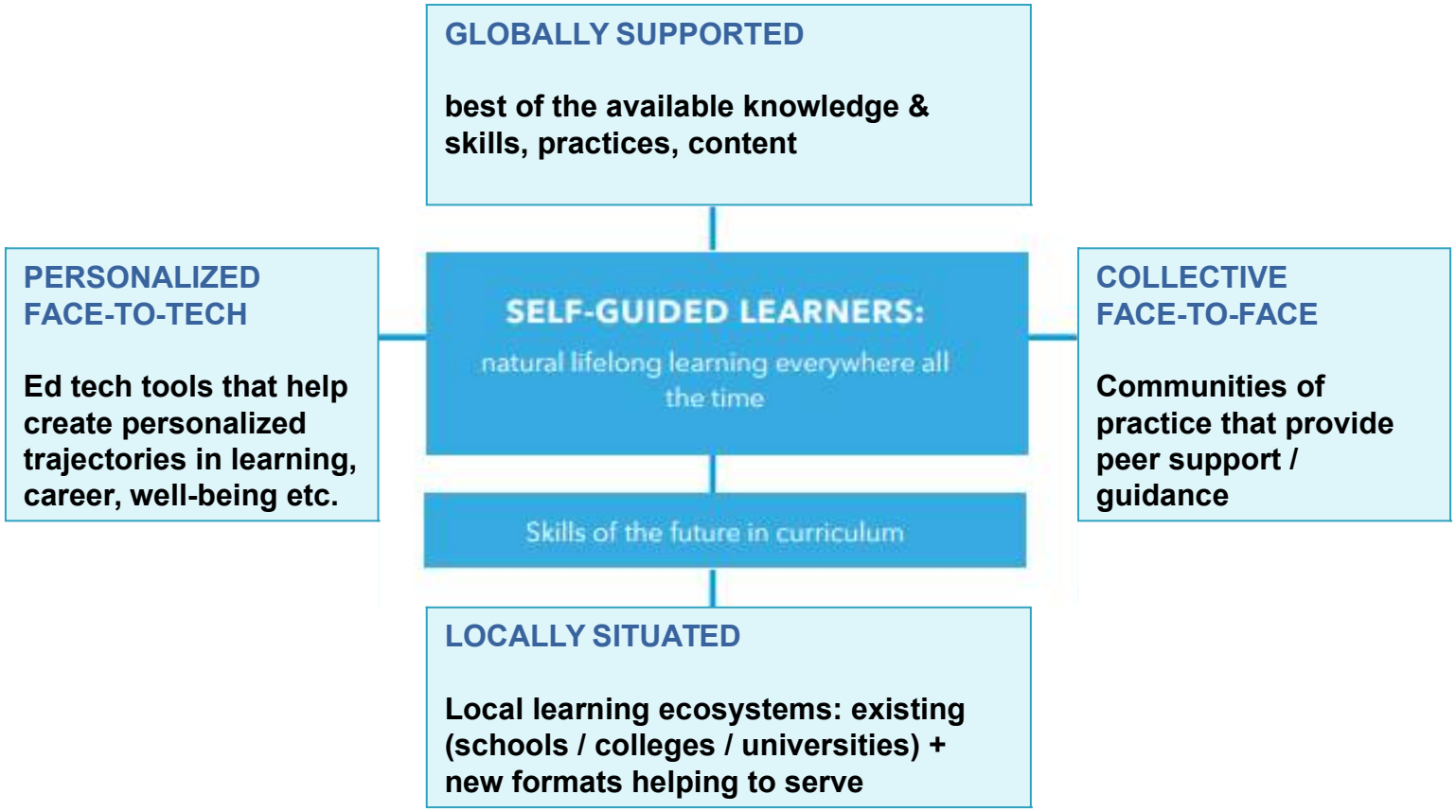
Seymour

From industrial-era system to diverse learning ecosystem



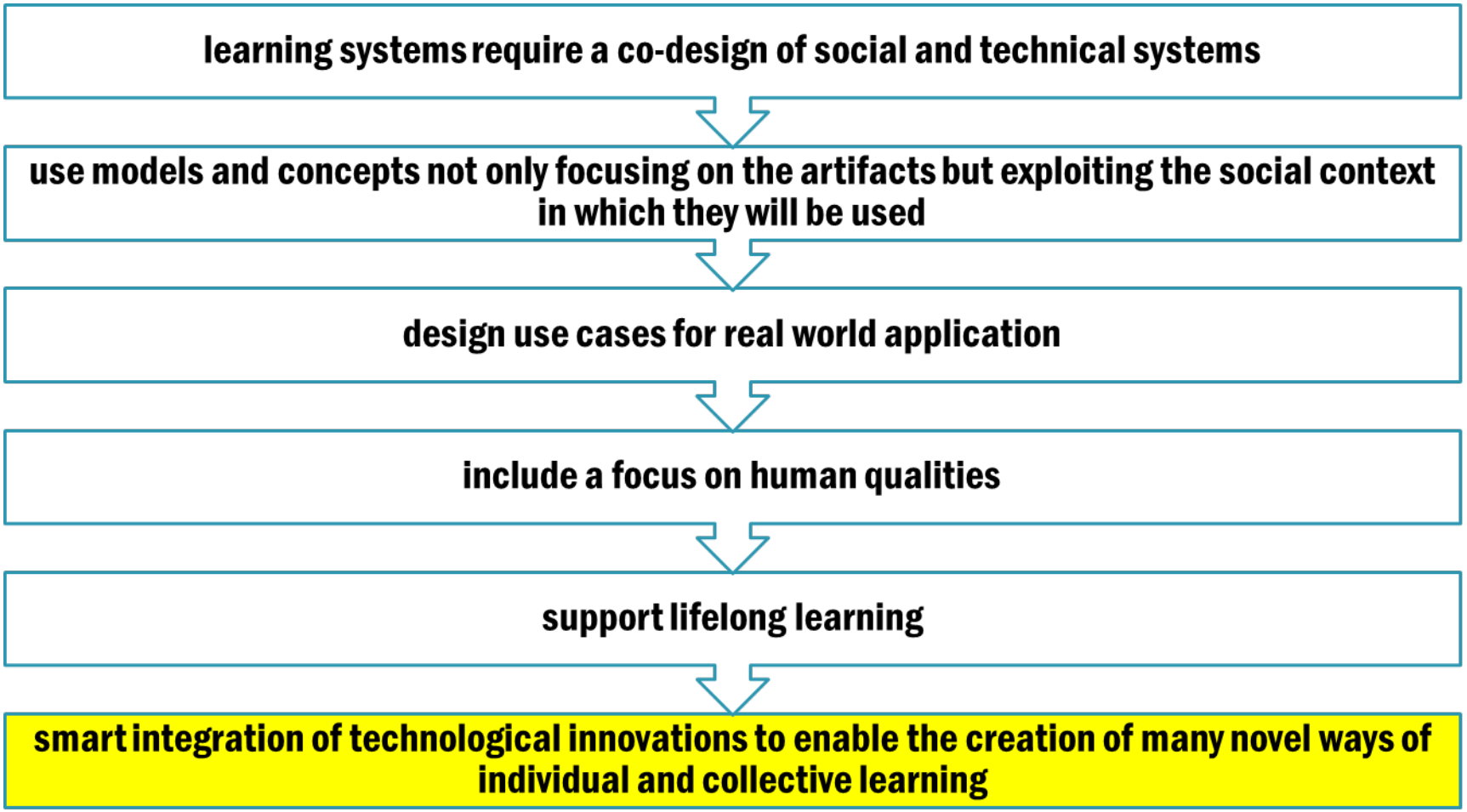
Omnipresent Digital Educational Technologies

Learner-centred lifelong education



Adapted from EDUCATIONAL ECOSYSTEMS FOR SOCIETAL TRANSFORMATION, Global Education Futures

Re-design of learning systems



Key areas of change in education
Learning environments and pedagogy

Transition from competitive to **collaborative** learning processes

Focus on **self-development** & self-guidance, **collaborative** design of **learning process** & **content** to be explored

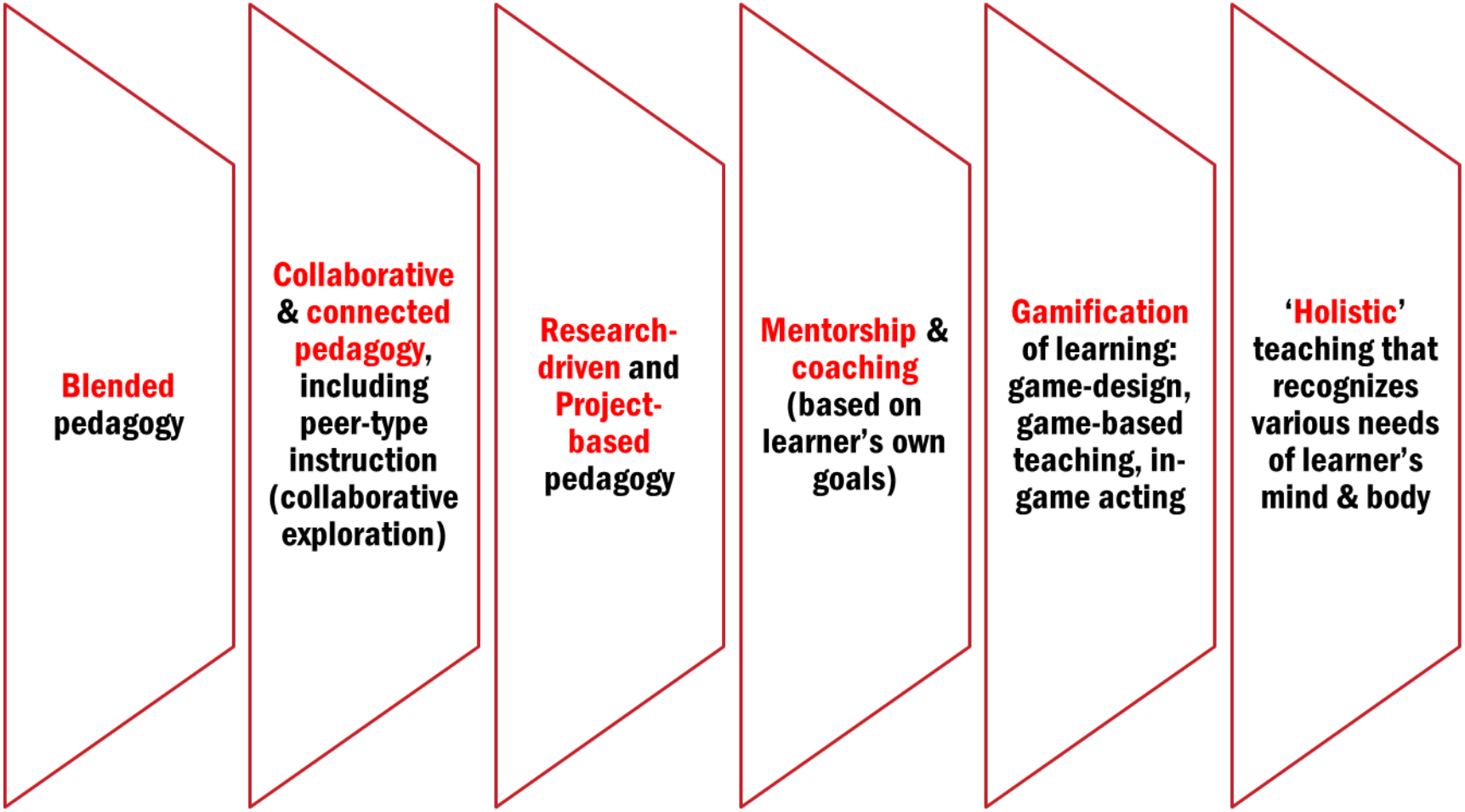
Personalized learning combining

- Learning in virtual environments (online courses, virtual reality lectures, social & AR simulators etc.)
- Practice-based learning in real-life settings
- Peer-based learning (F2F & online) with mentors & community

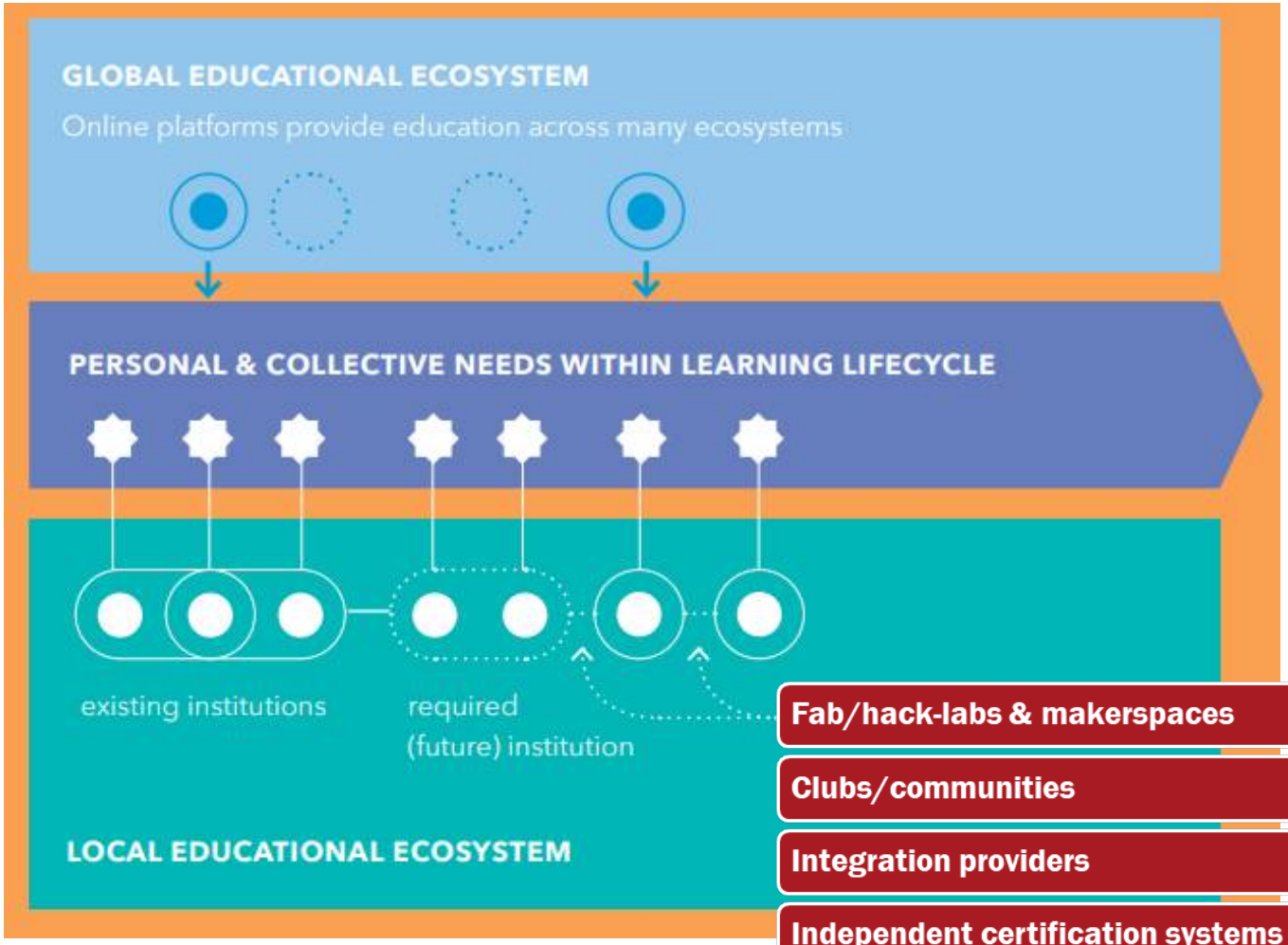
Learning built around **real-life problems** & challenges rather than subjects

Environment for physical exercises & interaction, **emotional** / artistic interaction etc.

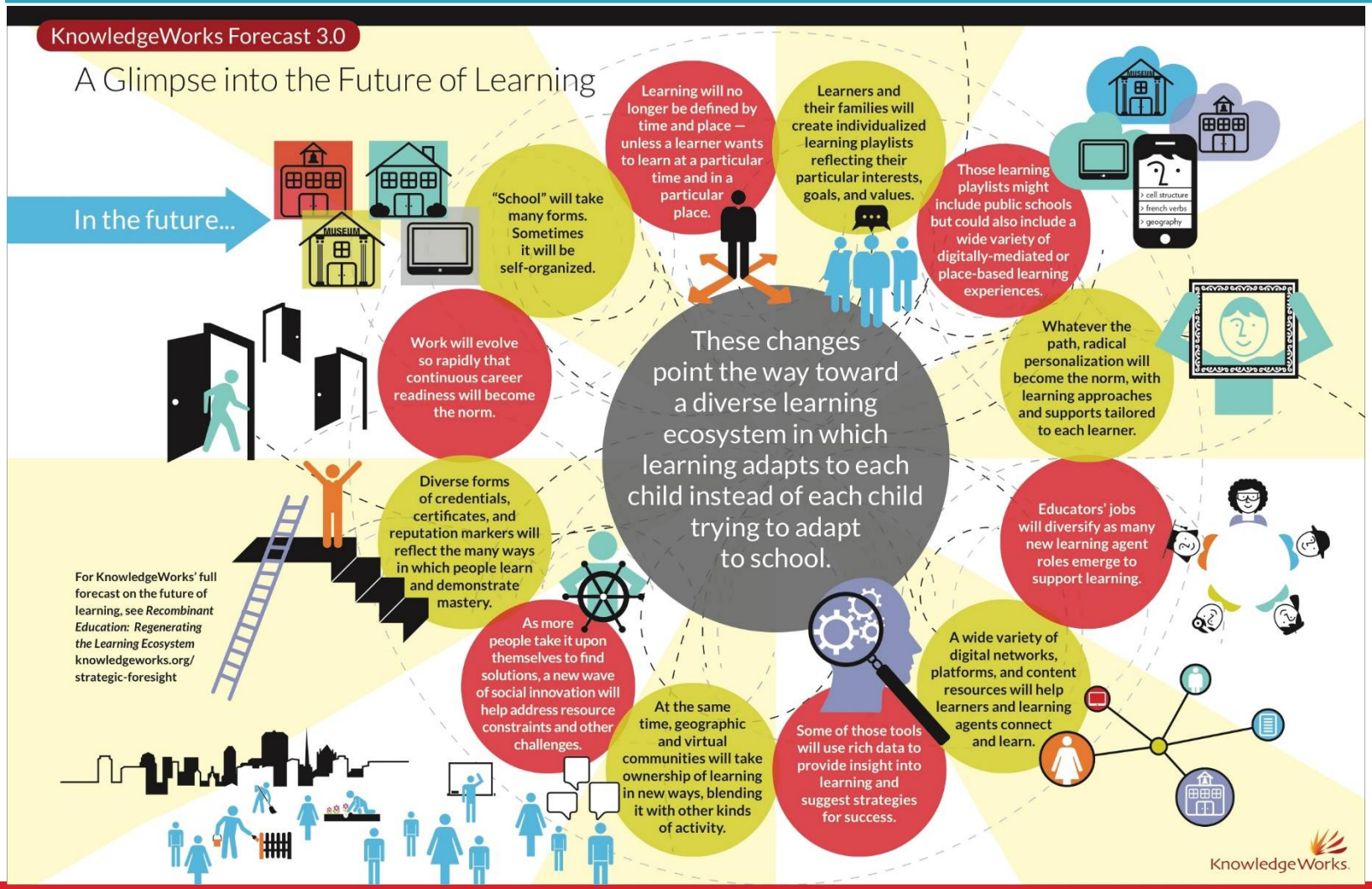
Key areas of change in education
Teacher skills



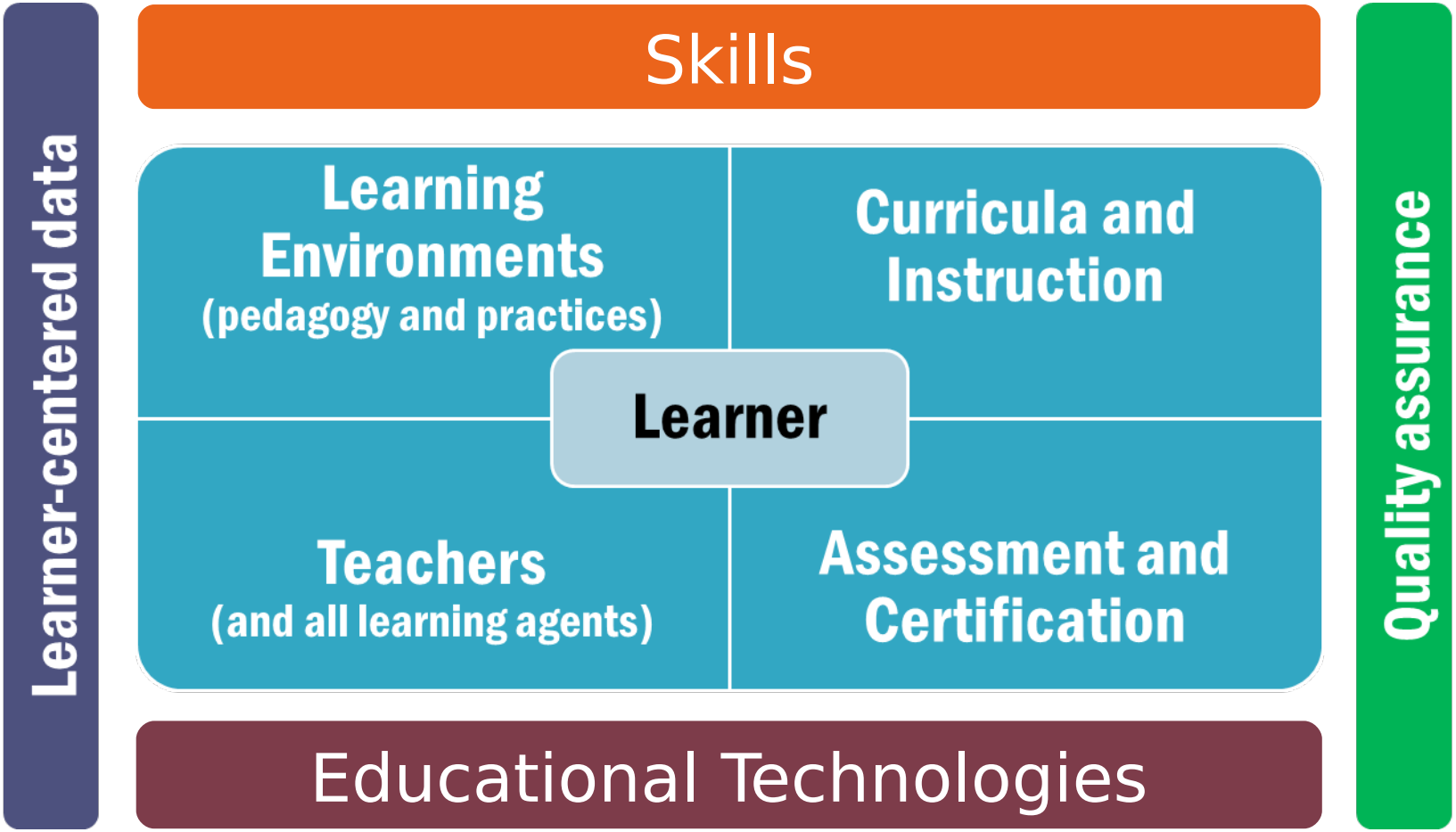
A new ‘educational ecosystems’ model



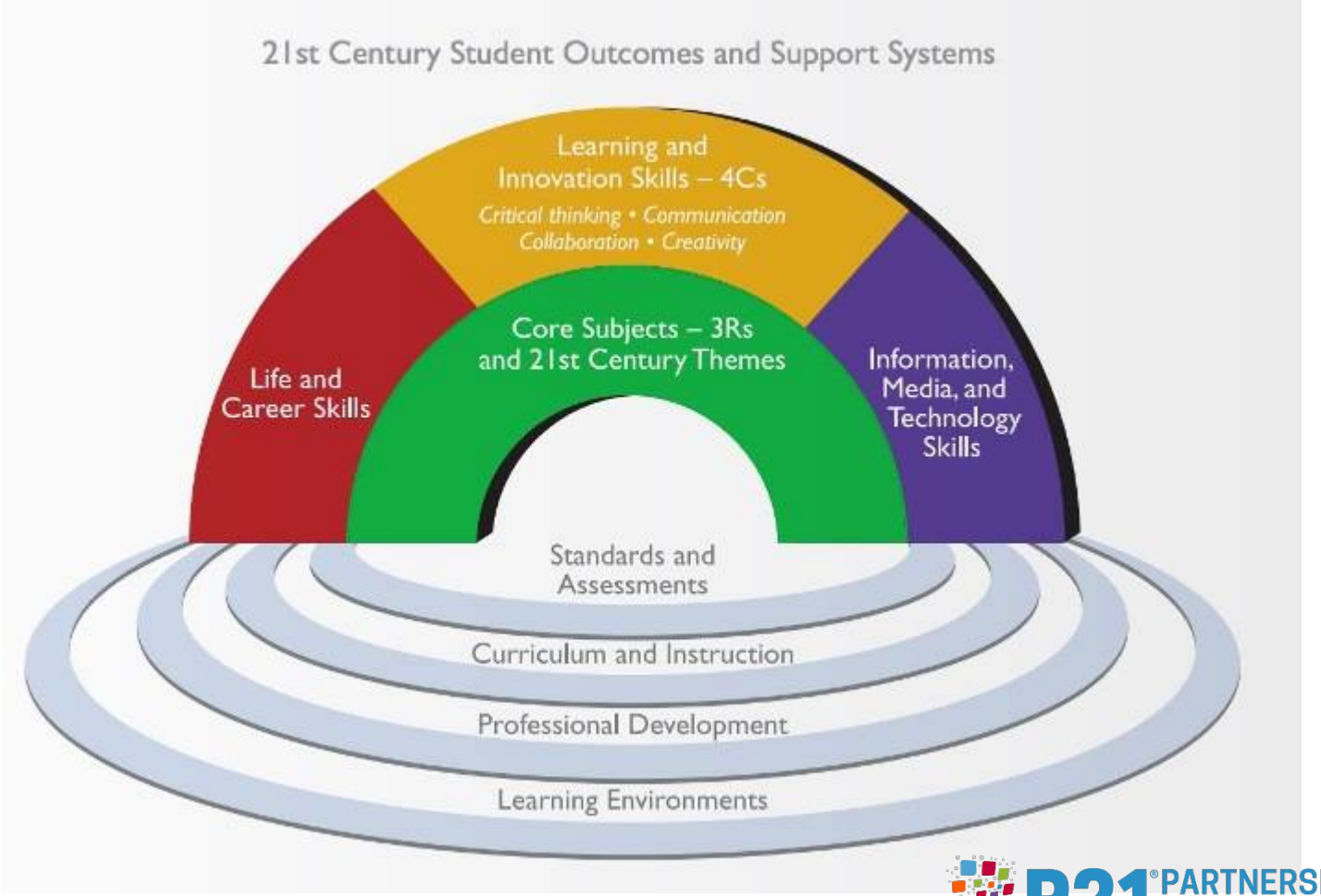
The future of learning



The ‘big picture’ themes & challenges

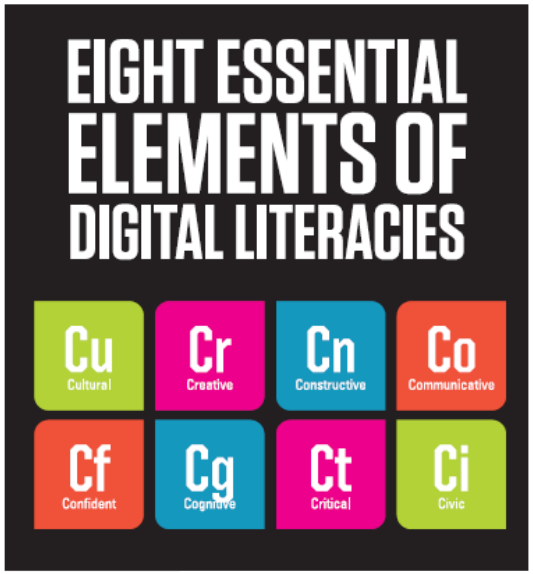


Students 21st Century Skills



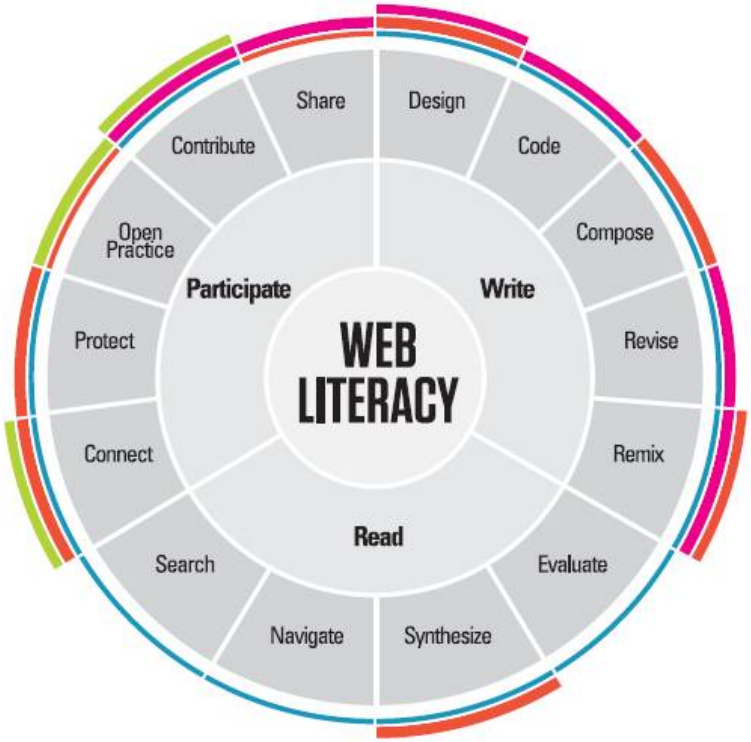
P21 PARTNERSHIP FOR 21ST CENTURY LEARNING

Digital transformation essential for 21st century skills



Belshaw

go.nmc.org/belshaw



Open University

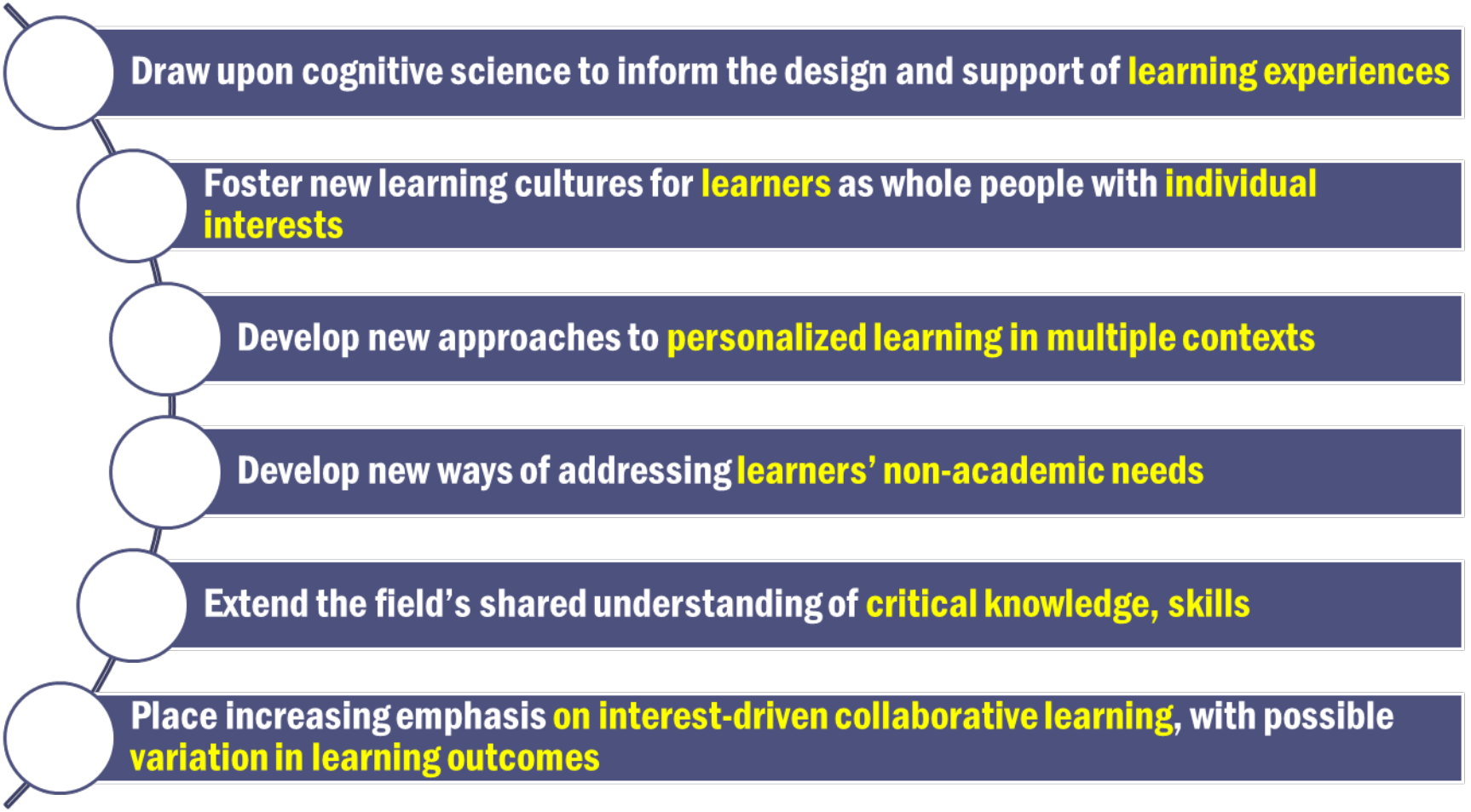
go.nmc.org/oudigilit

MOZILLA WEB LITERACY

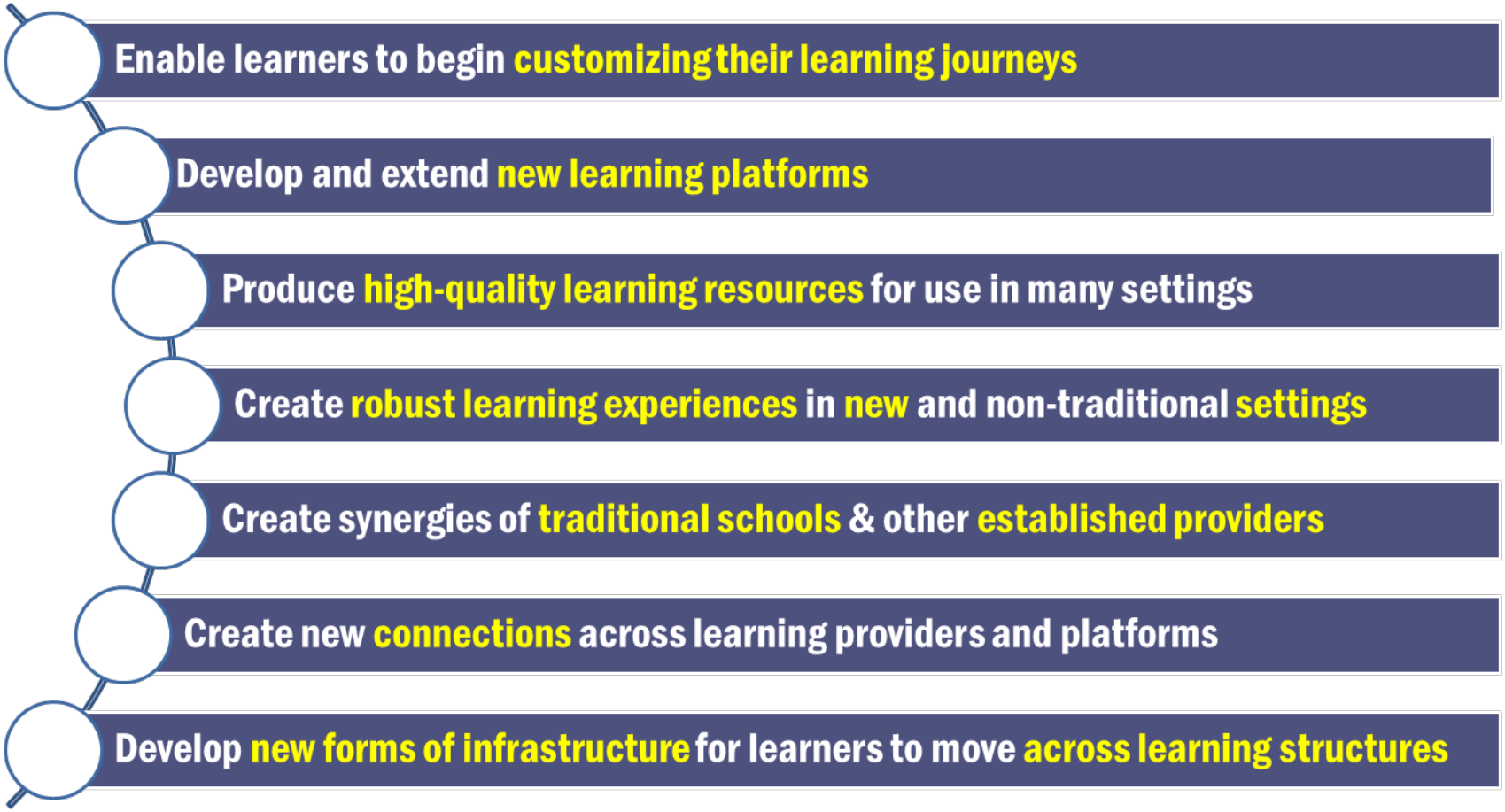
Mozilla Foundation

go.nmc.org/mozweb

Learning environments: pedagogy

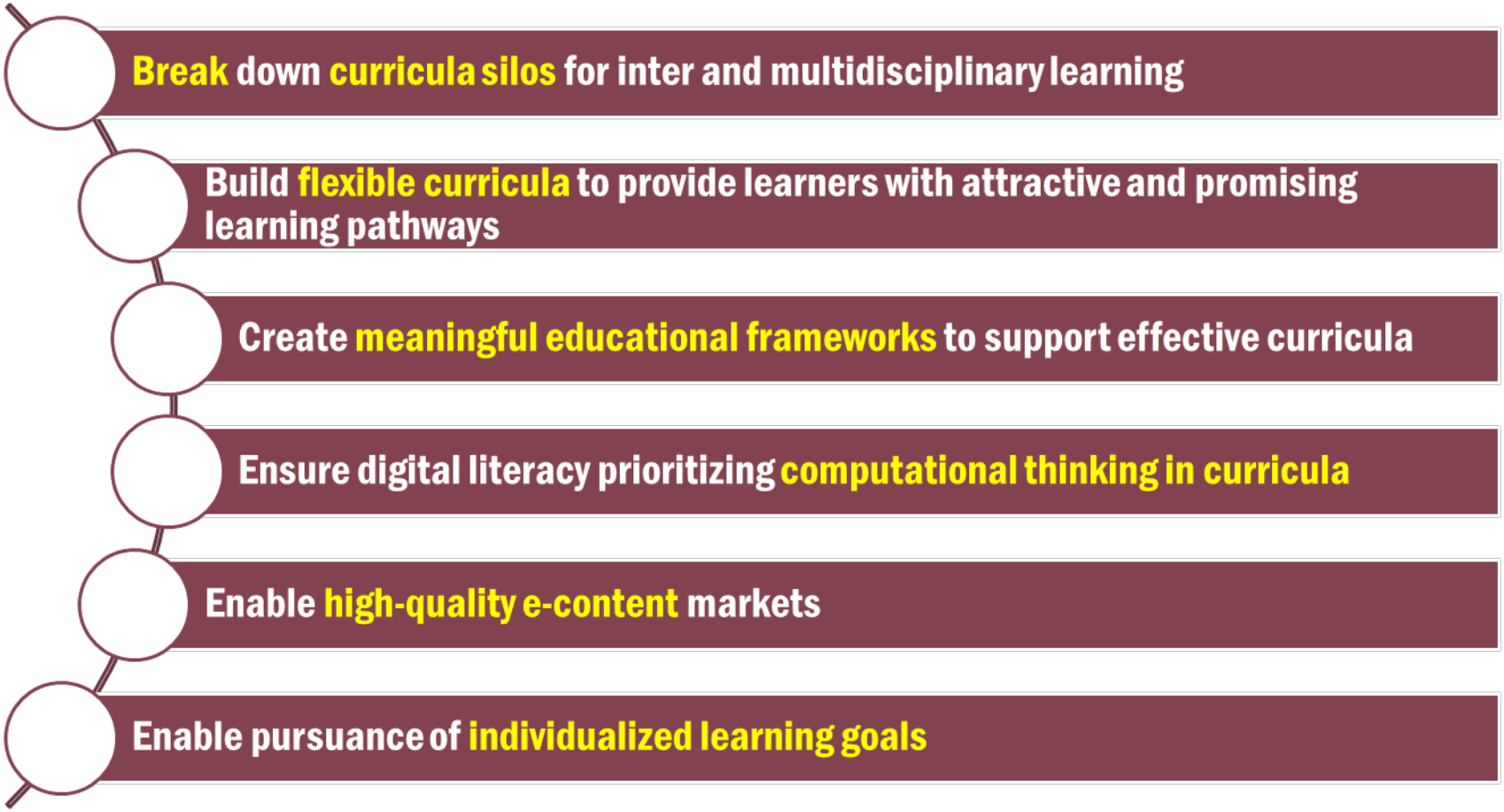


Learning environments: practices



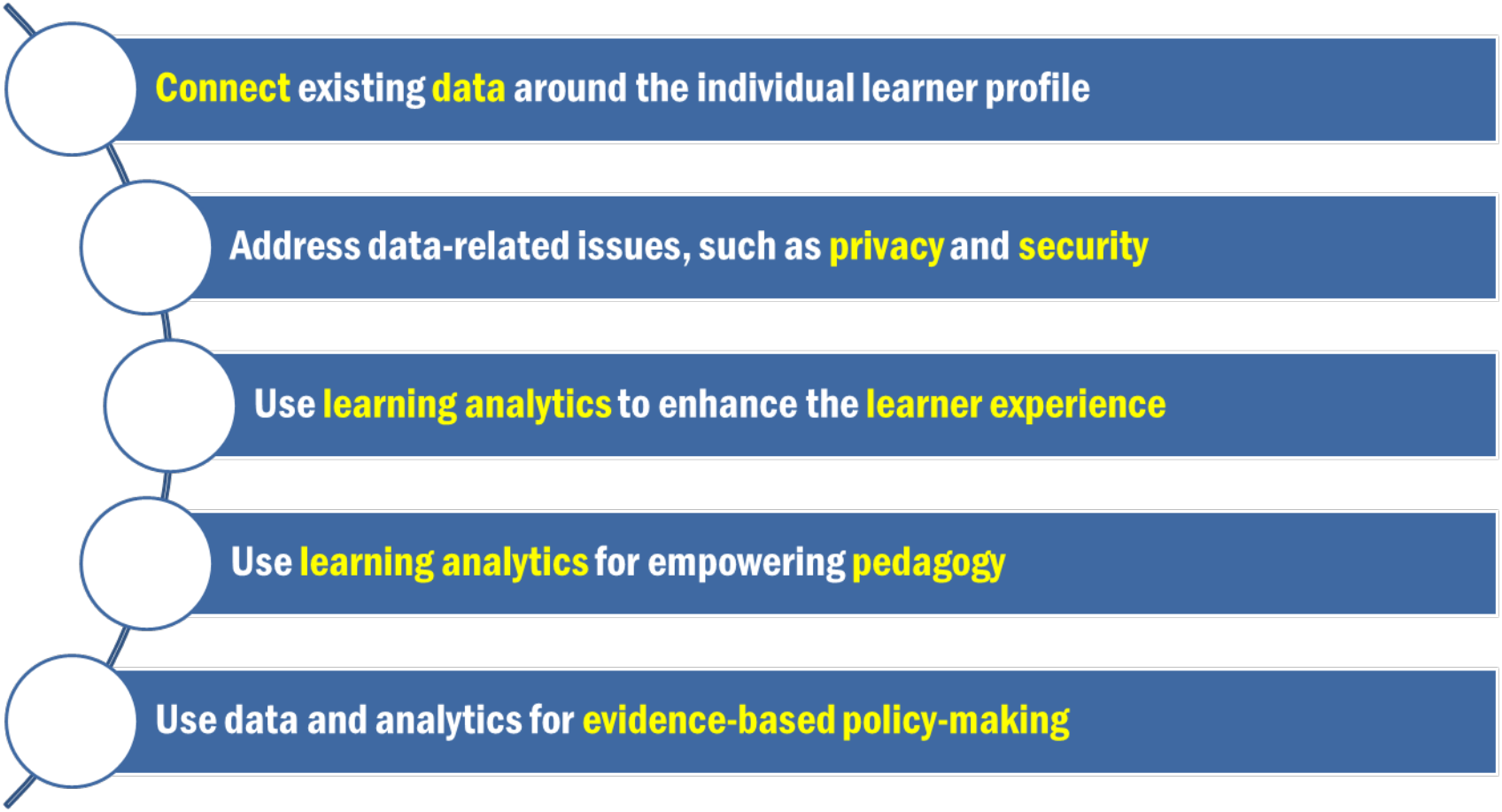
Teachers and learning agents

Curricula and instruction

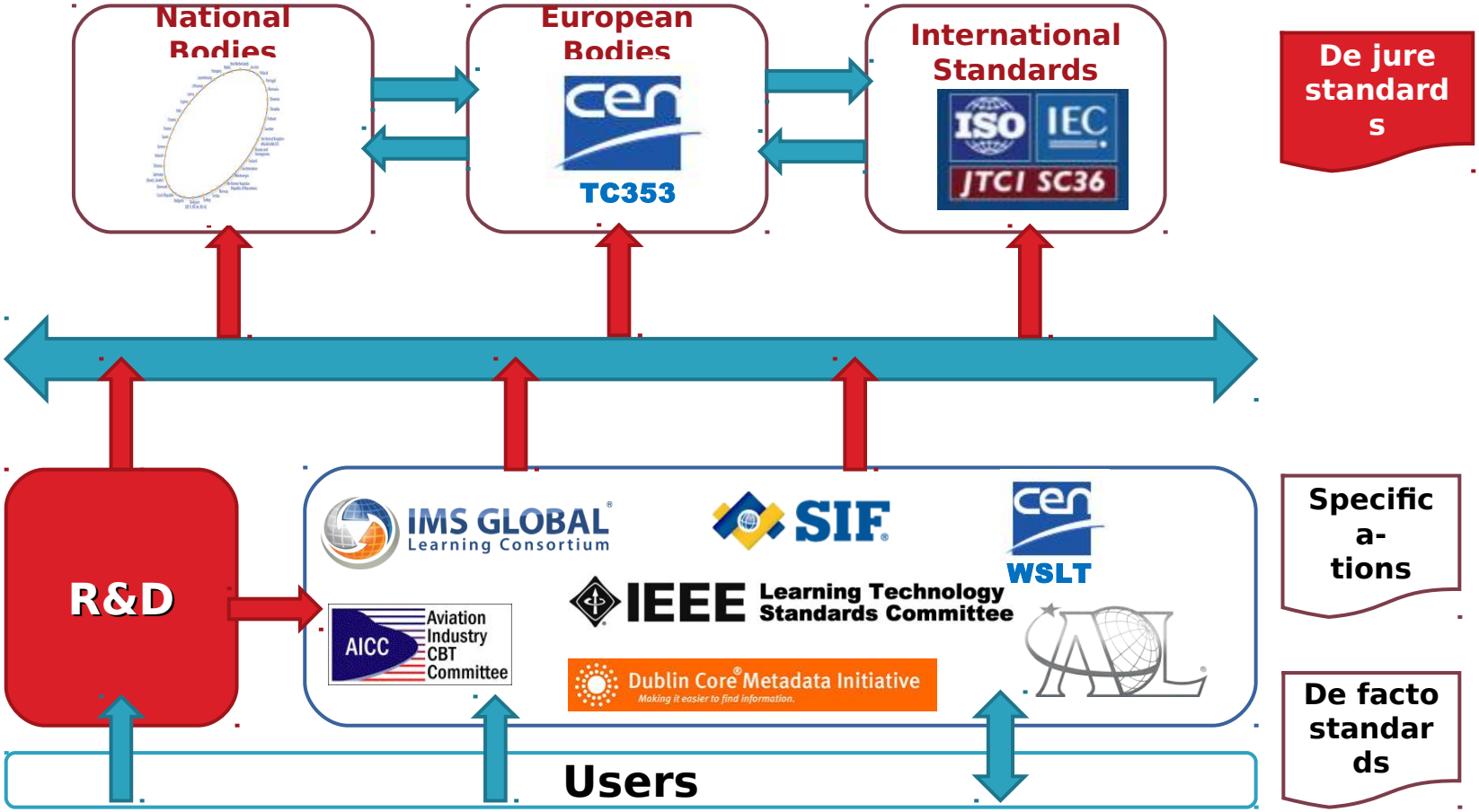


Assessment and Certification

Learner-centered data



International Standards Development



Learning Object Repositories

Competence Frameworks

European e-Competence Framework 2.0

A common European framework for ICT Professionals in all industry sectors

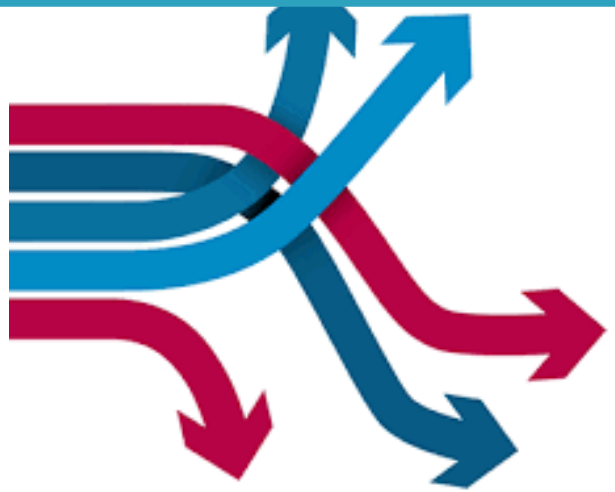
This title refers to the overall LOC structure

Dimension 1 e-Competence area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	A.2. Service Level Management Defines, validates and makes applicable service level agreements (SLA) and underpinning contracts for services offered. Negotiates service performance levels taking into account the needs and capacity of customers and business.				
Dimension 3 e-Competence proficiency levels (on e-CF levels e-1 to e-5, related to EQF levels 3 to 8)	Level 1 —	Level 2 —	Level 3 Influences and prepares the final Service Level Agreement (SLA) and accounts for the final content.	Level 4 Provides leadership to amend the enterprise strategy with respect to Service Level Agreements (SLA) in order to achieve forecasted results.	Level 5 —
Dimension 4					
Knowledge examples	Knows/ Aware of/ Familiar with: K1 service level agreement documentation K2 how to compare and interpret management data K3 the elements forming the metrics of service level agreements K4 how service delivery infrastructures work K5 impact of service level non-compliance on business performance				
Skills examples	Able to: S1 analyse service provision records S2 evaluate service provision against service level agreement S3 negotiate realistic service level targets S4 use relevant quality management techniques S5 anticipate and mitigate against potential service disruptions				

Everything outlined in red – everything that could possibly be separately assessed or evidenced – is a separate LOC definition.

Learning opportunity pathways

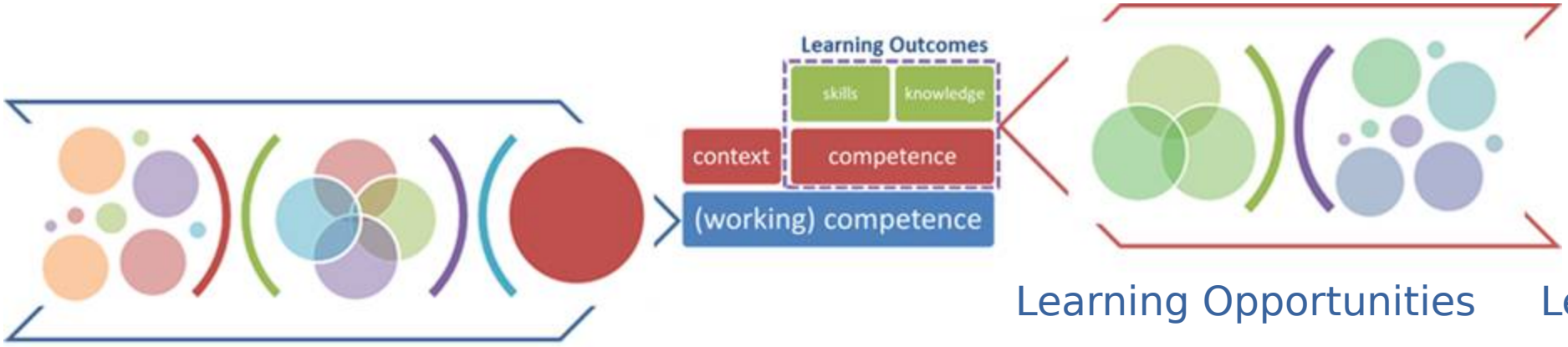
Composing Lifelong Learning Opportunity Pathways through Standards-based Services



LEARNING COMPASS

http://www.learning-compass.eu/

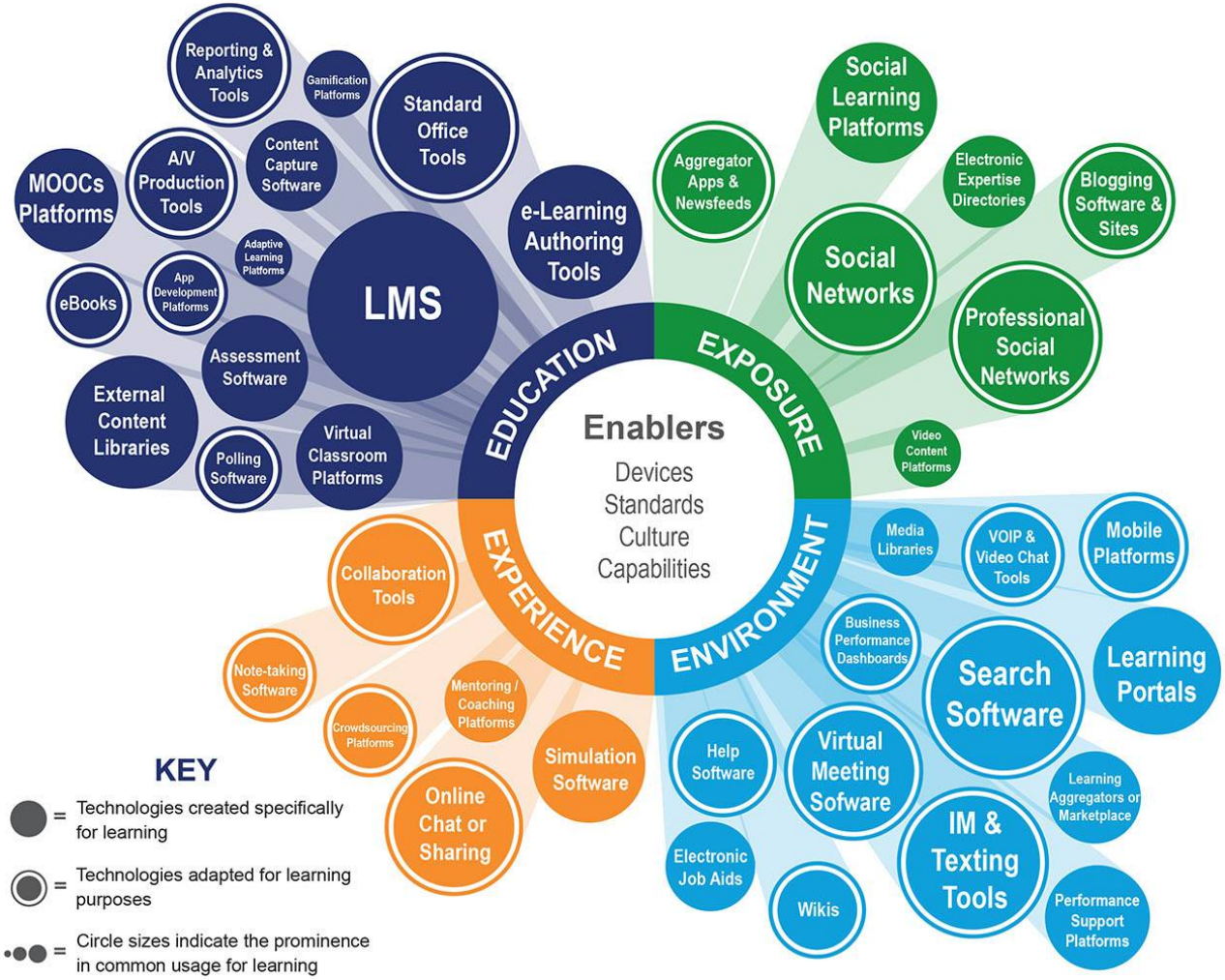
Learning to employment pathways



Learning Opportunities Le

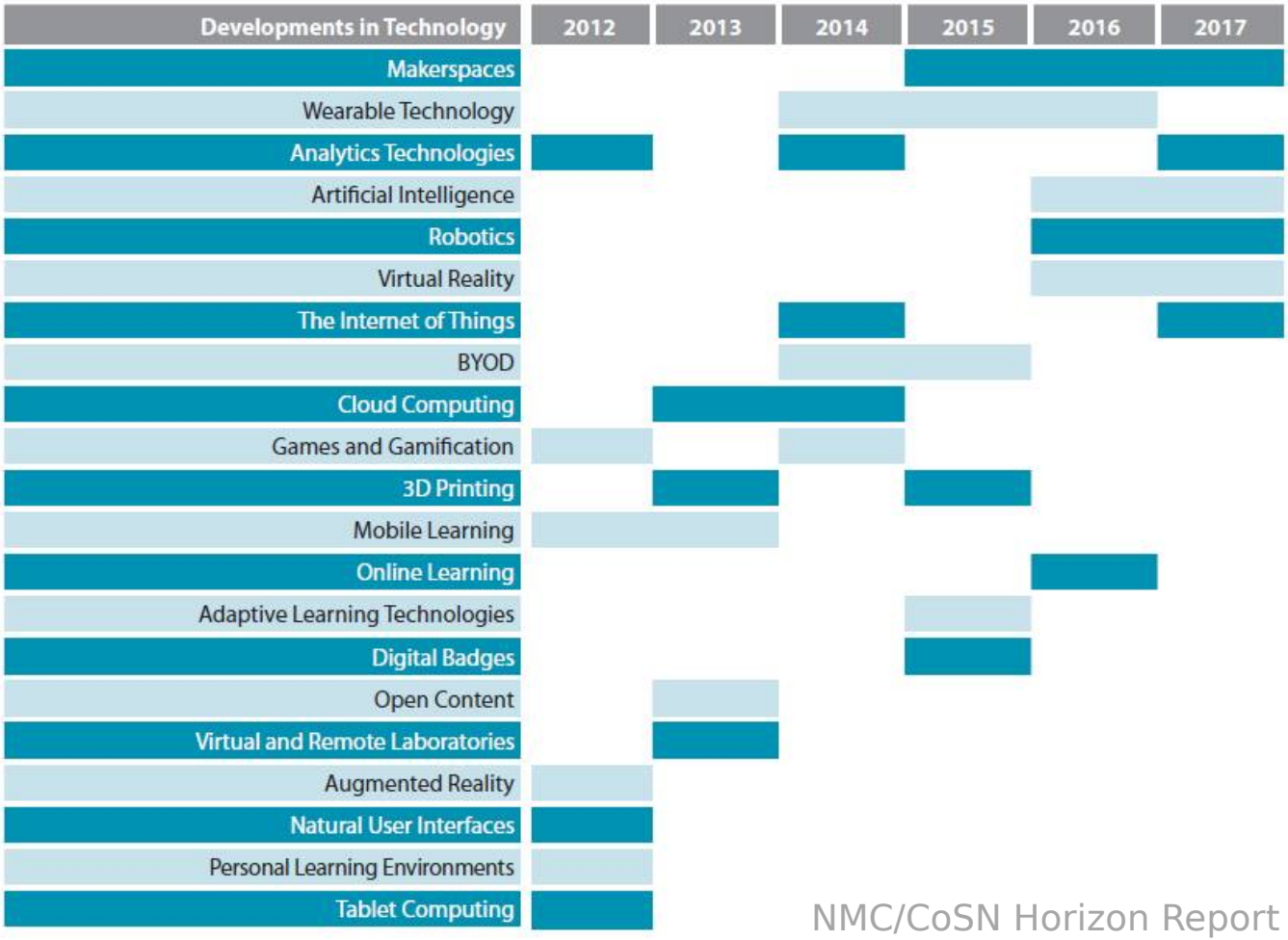
Employment Job Profiles Qualifications

Educational technologies



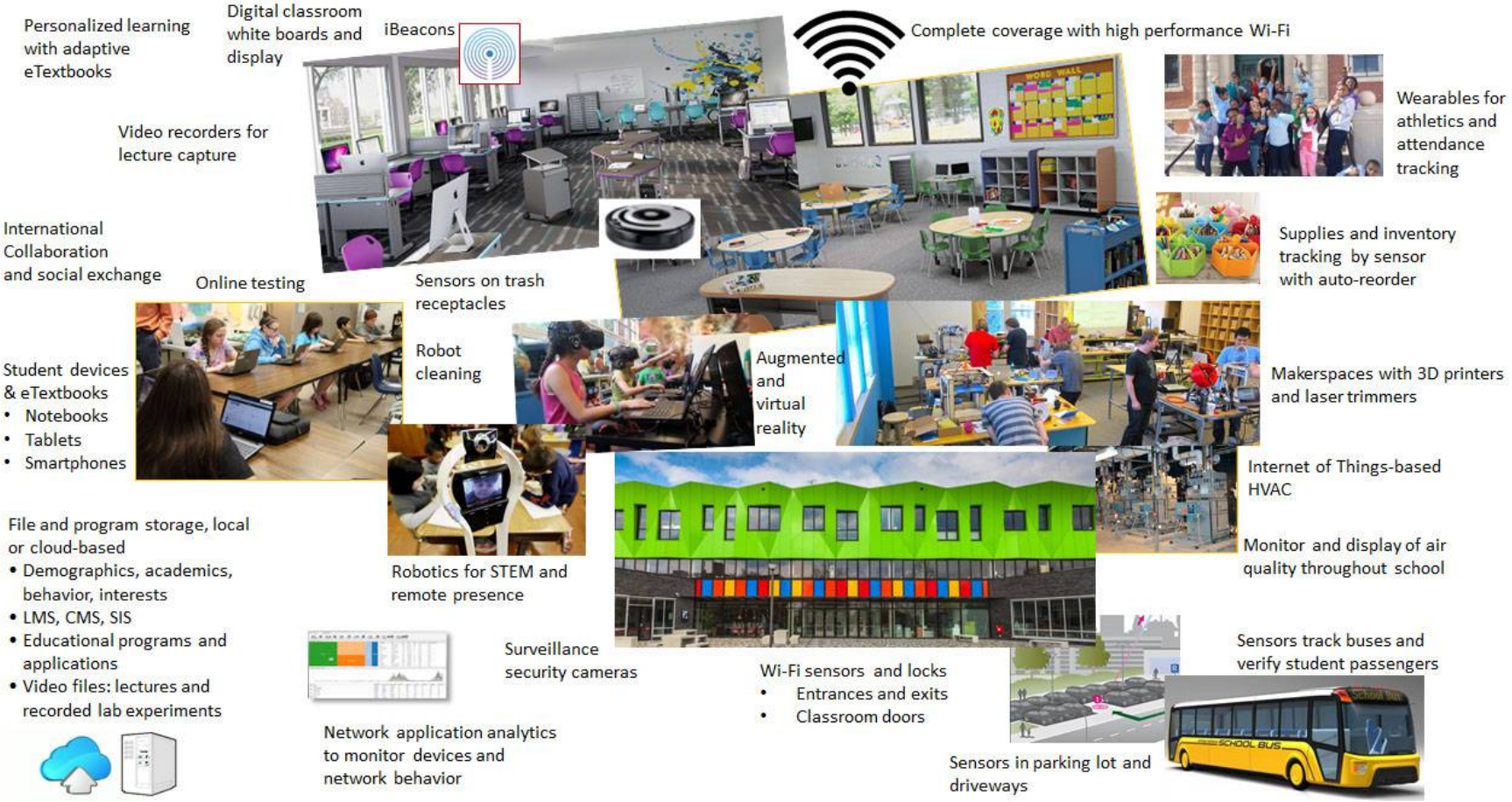
Bersin by Deloitte "Learning Technology Stack"

New technology developments



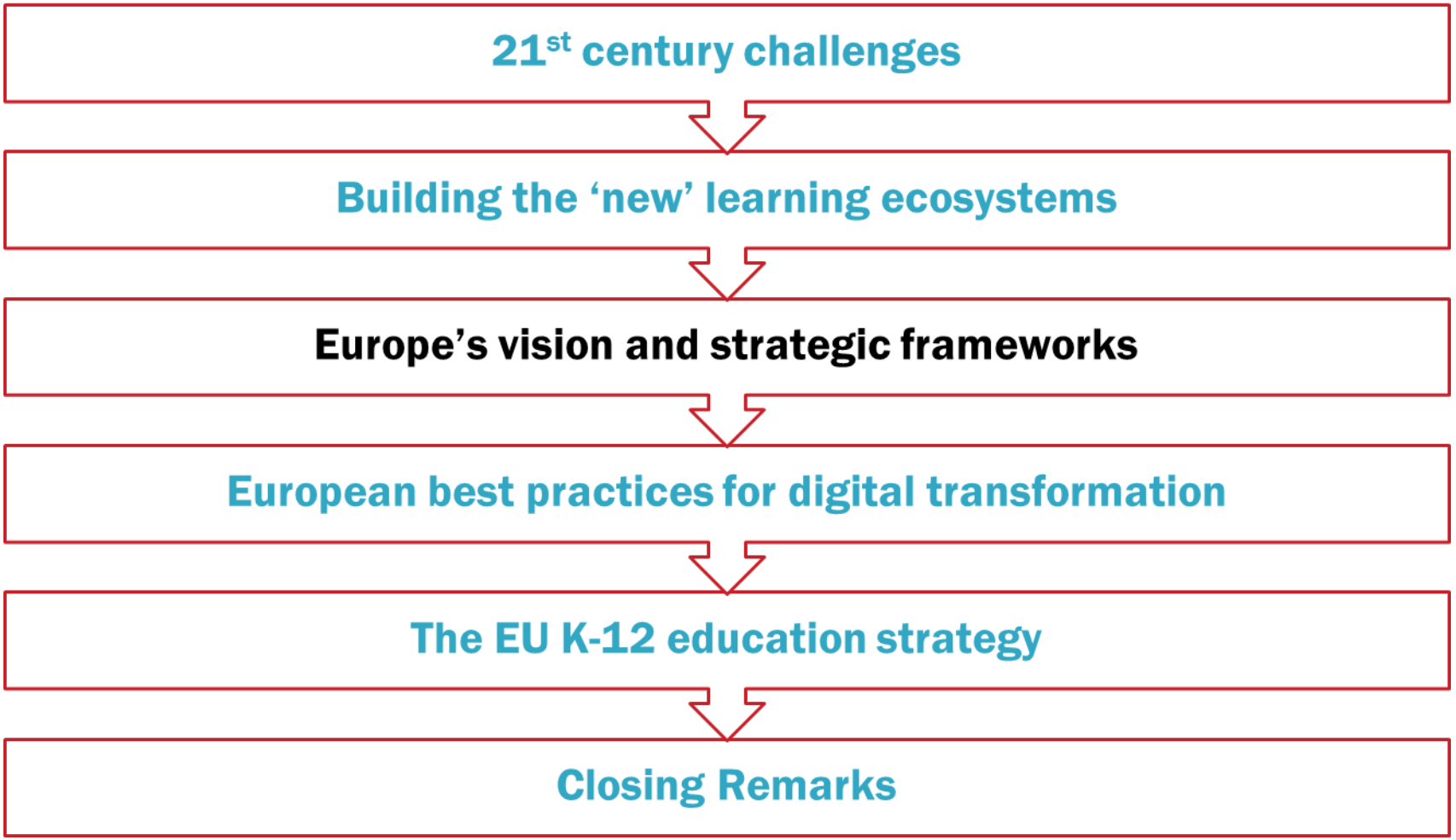
NMC/CoSN Horizon Report > 2017 K–12 Edition

Digital transformation of the learning ecosystem




Global Education Platforms
Teacher Reputation Models
Mentors
Role Models
Personalized Education
Big Data
Personal Goals
Digital Competence Portfolio
Portfolio of Projects
Simulators of Real Life Activities
GLP
MOOC Platforms
Biometrics Monitoring
Personal Learning & Career Trajectory
Tracking Achievements
Game Universes
Social Learning Platforms
Blended Environments
Reputation
Preventive Healthcare & Sustainable Living
Parenthood Skills & Intergenerational Learning
Multifamily Learning
Education Opportunity Fairs
Big Data
Me
Education Insurance
Talents Investing
Reputation Investing
Family Universities
Co-financing of Learning Within Community
Direct Investment Into Learning & Career Trajectory
Social & Volunteer
Career & Professional
Communities
Big Data
Urban Environments
Leisure & Entertainment
Research & Development
Artificial Intelligence
Citizen Governance
Urban Skills & DIY
Long Games
Virtual Labs
Digital Knowledge Depositories
Fundamental Cross-discipline Knowledge
Internet of Things, Robotics, Mobile Technologies & Augmented Reality
Big Data Models
Big Science Equipment
Cities & Urban Communities
GLOBAL EDUCATION FUTURES
FUTURE EDUCATION MAP
Knowledge Creation Communities

Overview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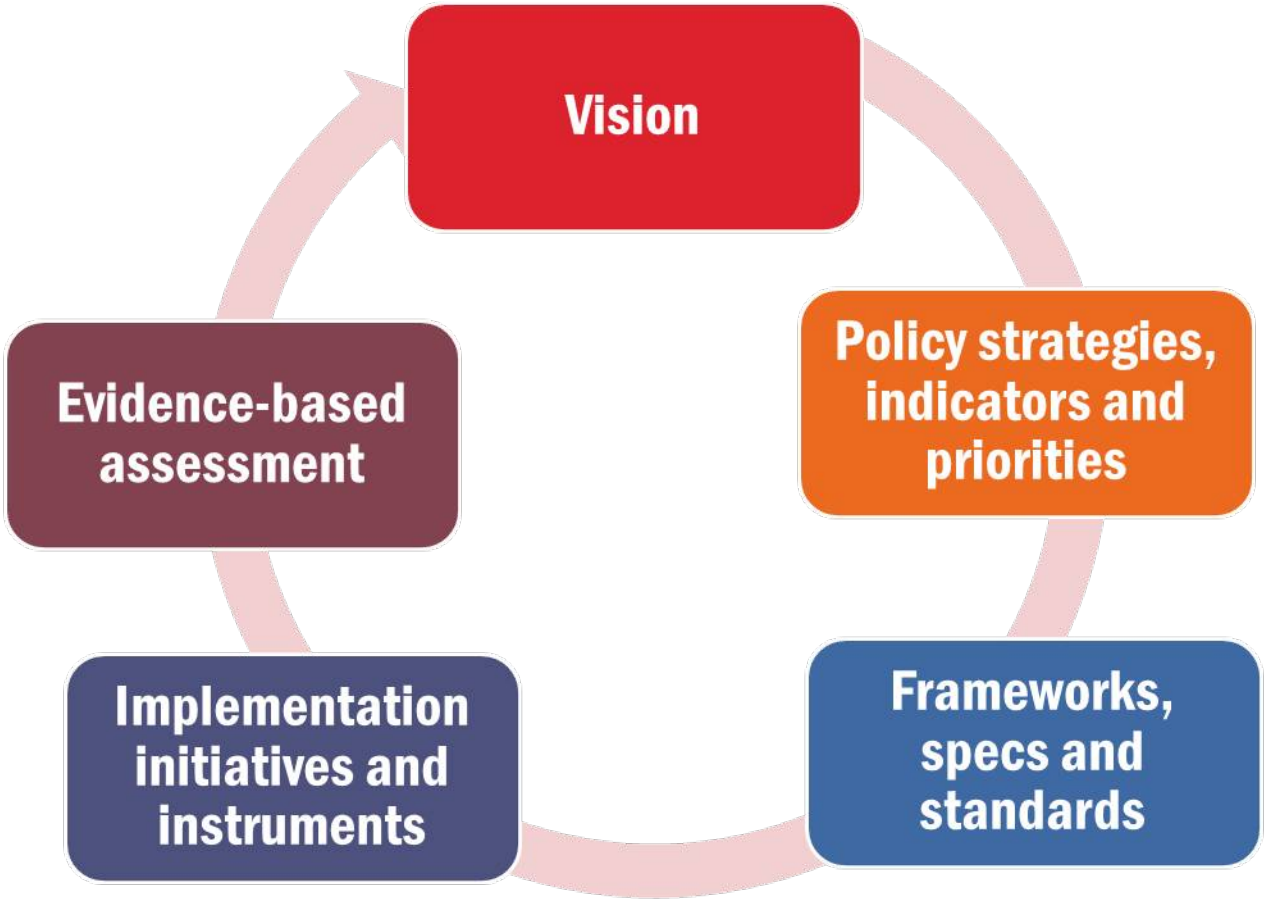
European Requirements 2000

CONSILIUM European Council, Lisbon (Mar. 2000)

The policy-making process



Europe 2020 strategy

In a changing world, the EU wants to become a smart, sustainable and inclusive economy, goals to be

Smart Growth	Sustainable Growth	Inclusive Growth
Innovation ***« Innovation Union »***	Climate, energy and mobility ***« Resource efficient Europe »***	Employment and skills ***« Agenda for new skills and jobs"***
Education and employment ***« Youth on the move »***	Competitiveness ***« An industrial policy for the globalisation era »***	Fighting poverty ***« European platform against poverty »***
Digital society ***« A digital agenda for Europe »***		

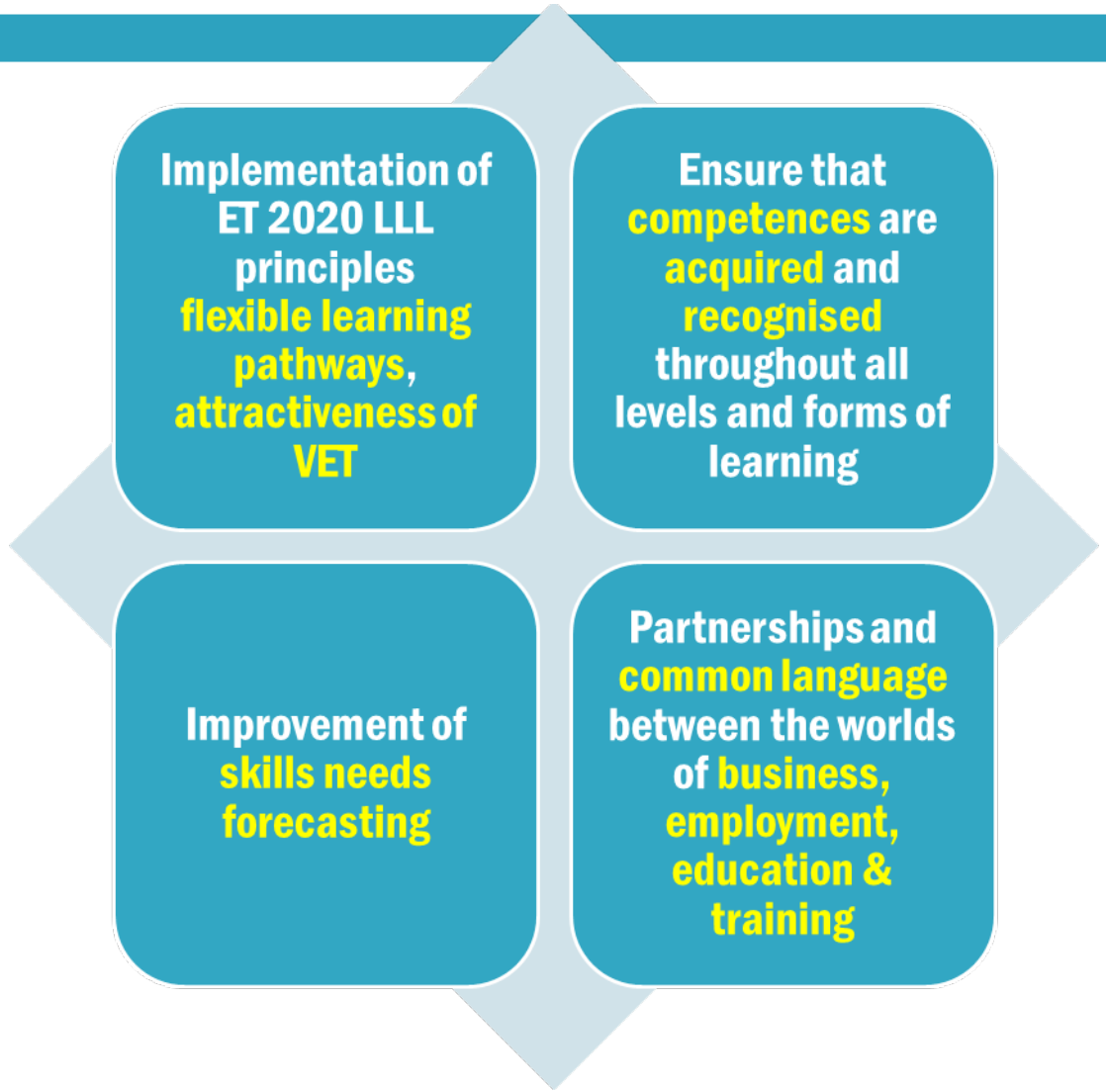
Education in Europe 2020

Key role for **Education, Training and Youth** in **Europe 2020**

Smart growth	developing an economy **based on knowledge** and **innovation**
Sustainable growth	promoting a more efficient, greener and more **competitive** economy
Inclusive growth	fostering a **high-employment economy** delivering social and territorial cohesion

From student to lifelong learner

From learning to employment



The ET 2020 Framework

“

In an increasingly globalized and knowledge-based economy Europe is in need of a well-skilled workforce to compete in terms of productivity, quality, and innovation.

Education and training are crucial for both economic and social progress and aligning skills with labor market needs.

Education and training also bolster the personal development and active citizenship and promote equity, social inclusion and cohesion.

The ET 2020 objectives

High-quality pre-primary, primary, secondary, higher and VET keeping in mind that they contribute to employment, economic su
society

- Making lifelong learning and mobility a reality
- Improving the quality and efficiency of education and training
- Promoting equity, social cohesion and active citizenship
- Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training

Priorities for 2016-2020

Relevant and high-quality skills and competences, focusing on learning outcomes, for employability, innovation and active citizenship

Inclusive education, equality, non-discrimination and promotion of civic competences

Open and innovative education and training, including by fully embracing the digital era

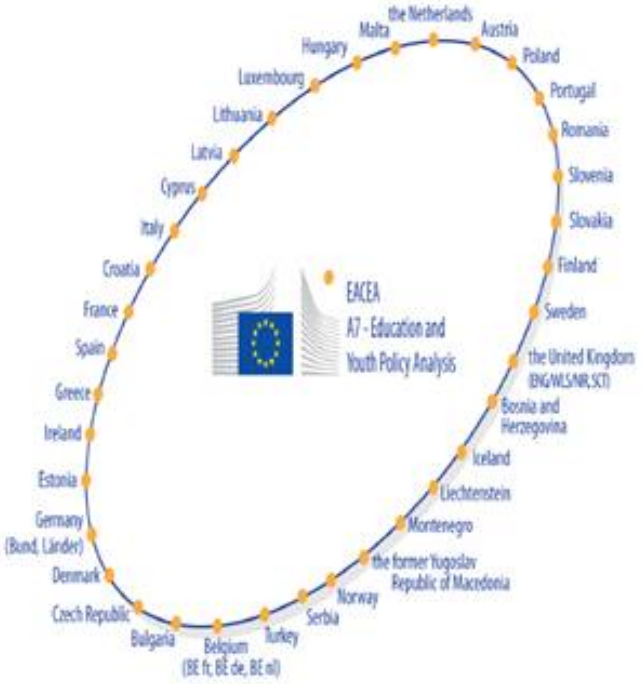
Strong support for educators

Transparency and recognition of skills and qualifications to facilitate learning and labour mobility

Sustainable investment, performance and efficiency of education and training systems

Supporting organizations

Eurydice national units provide normative and qualitative information (laws, decrees, regulations and recommendations)



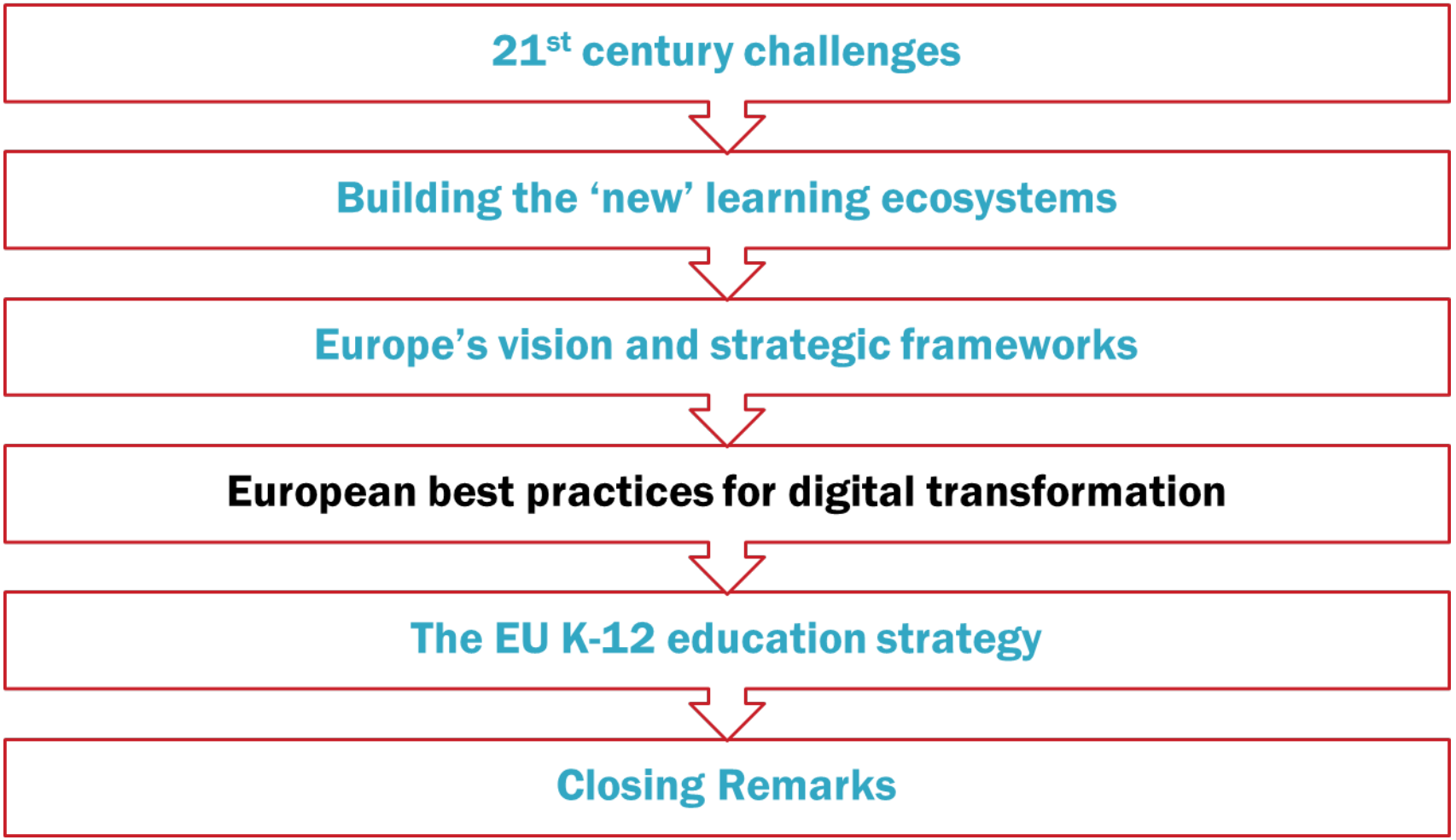
eurostat · CEDEFOP · CRELL Centre for Research on Lifelong Learning · OECD · Council of Europe · United Nations Educational, Scientific and Cultural Organization

European Schoolnet
Transforming education in Europe

EACEA
A7 - Education and Youth Policy Analysis

Descriptive, comparable information on European education systems and policies
Comparative analyses on various topics

Overview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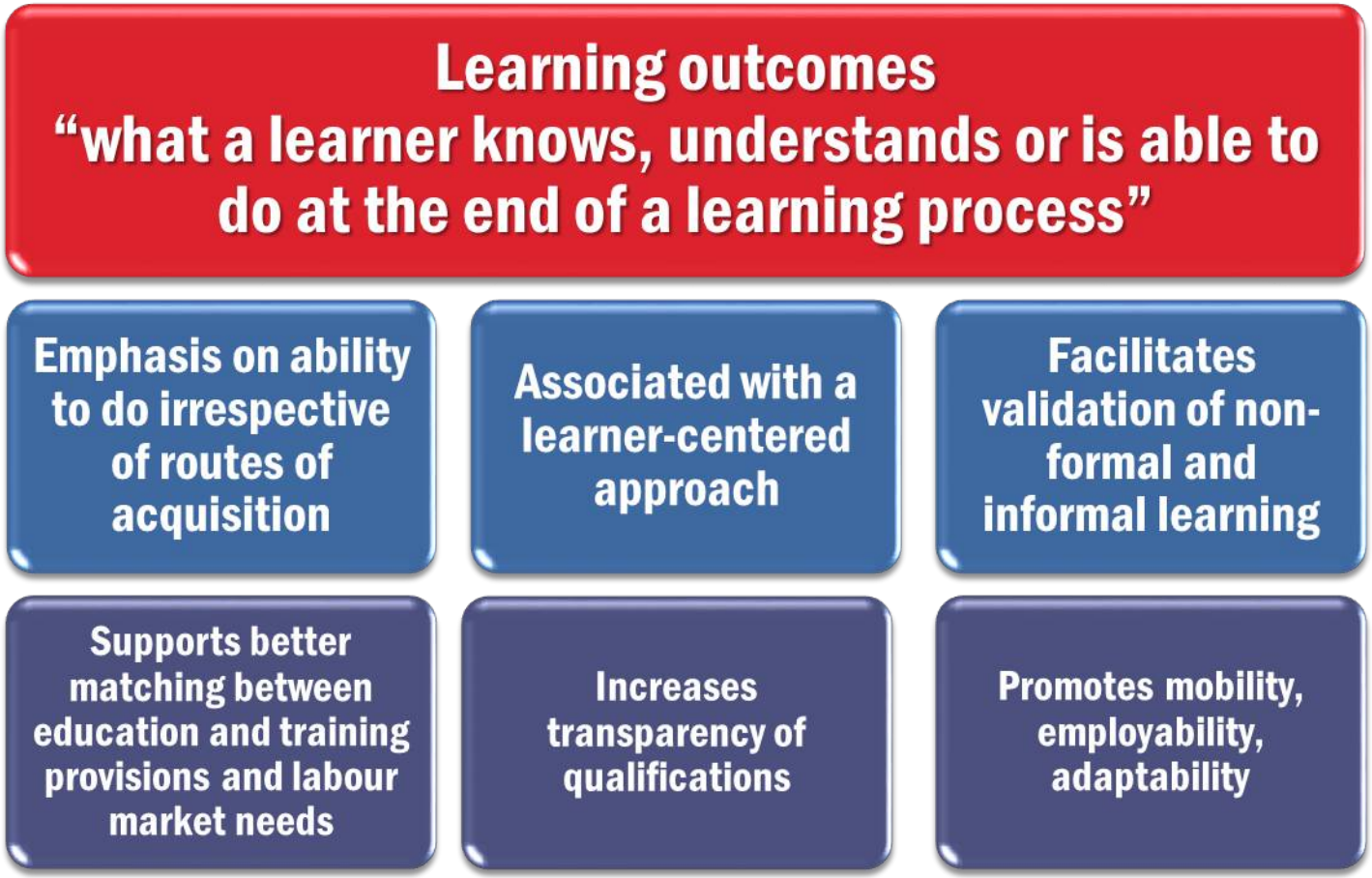
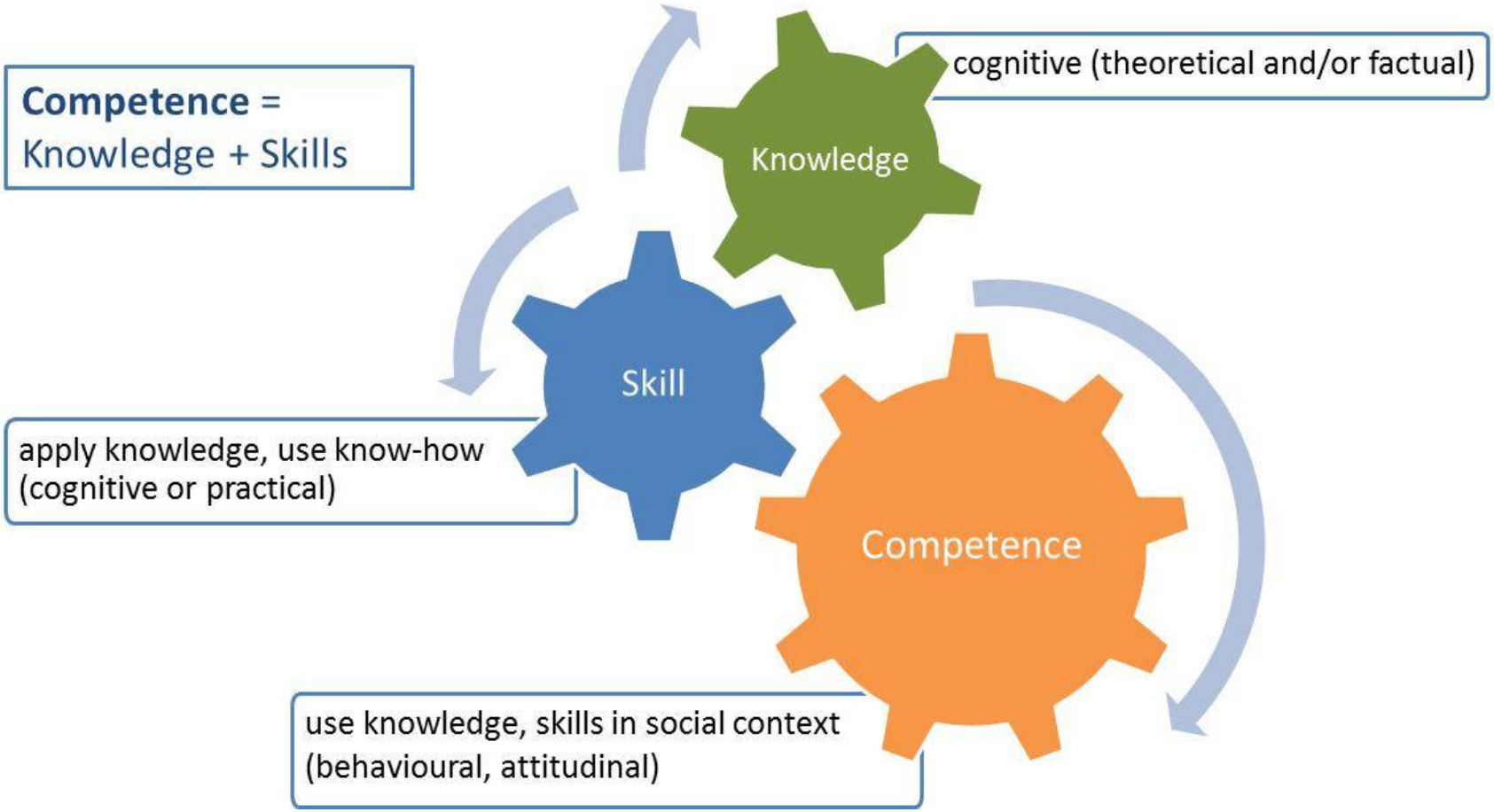
Shift to Learning Outcomes



Typology of Learning Outcomes



EU Competence frameworks

Skills and qualifications transparency instruments

System

Learning Outcomes

Learning Outcomes

Educatio n & Training

Labour Market

Learning Outcomes

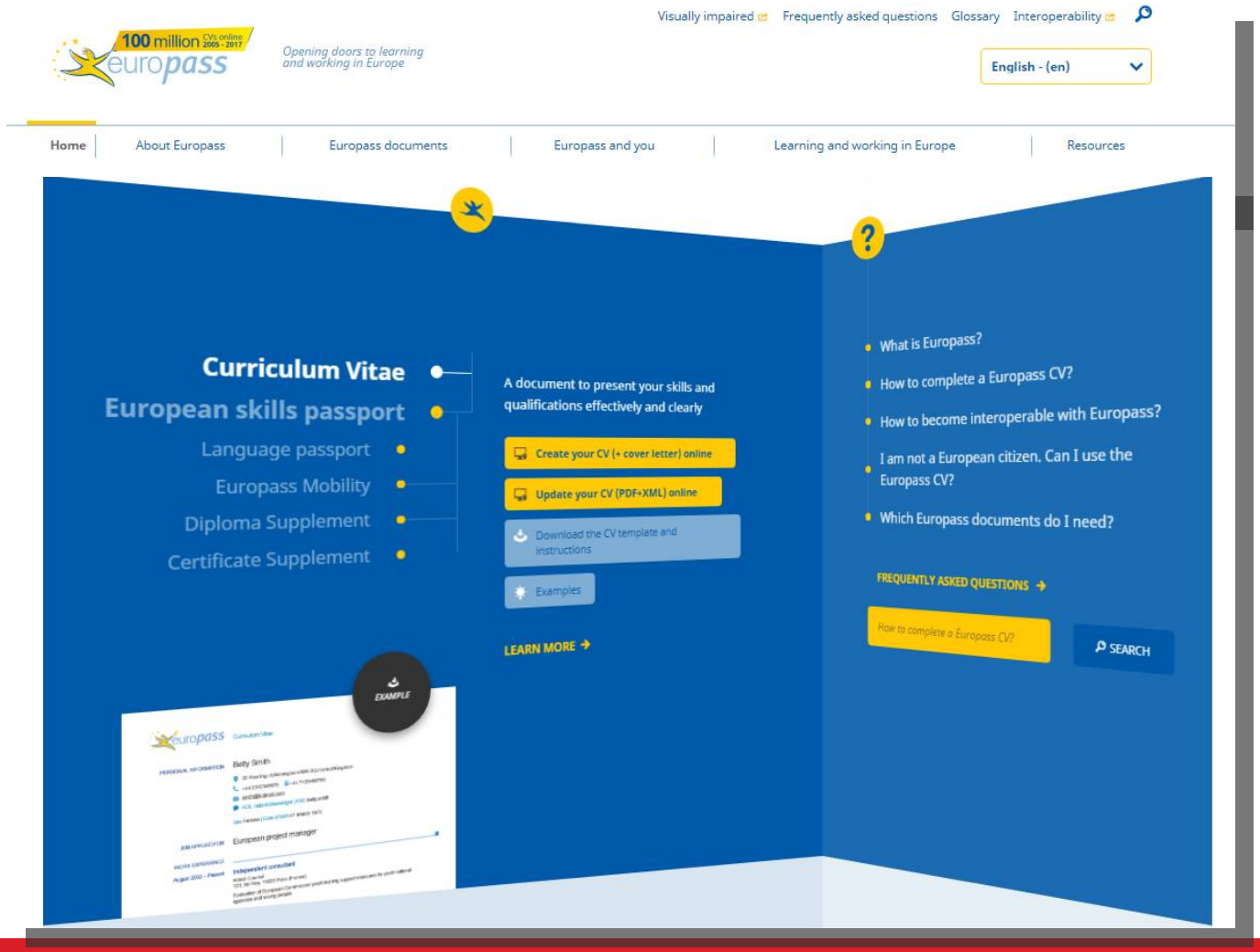
Learning Outcomes

Individu al

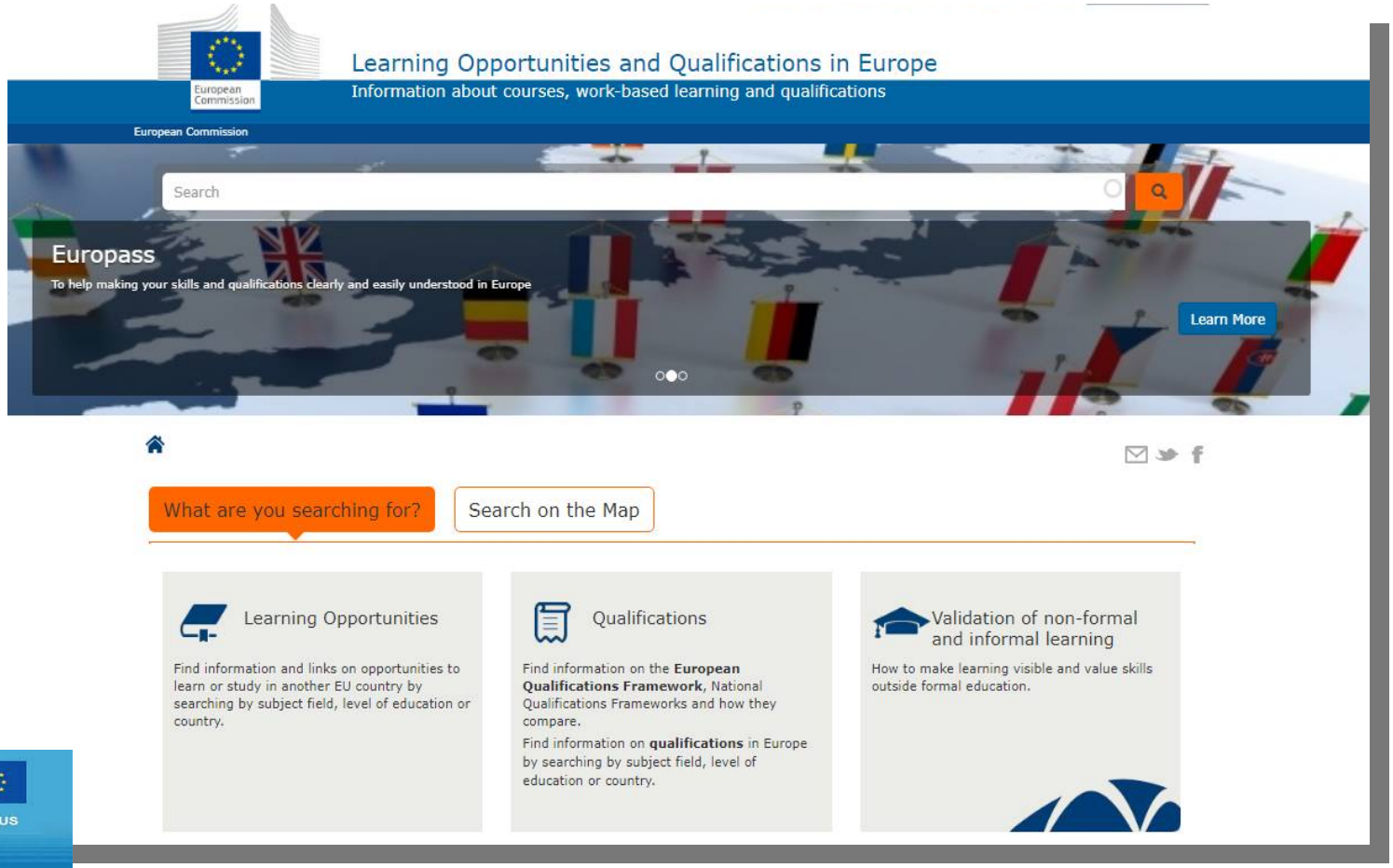
European Qualifications Framework

		KNOWLEDGE	SKILLS	COMPETENCE
Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.		In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of EQF, competence is described in terms of responsibility and autonomy.
LEVEL 1	The learning outcomes relevant to Level 1 are	basic general knowledge	basic skills required to carry out simple tasks	work or study under direct supervision in a structured context
LEVEL 2	The learning outcomes relevant to Level 2 are	basic factual knowledge of a field of work or study	basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	work or study unde with some autonon
LEVEL 3	The learning outcomes relevant to Level 3 are	knowledge of facts, principles, processes and general concepts, in a field of work or study	a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	take responsibility f tasks in work or stu adapt own behavio stances in solving p
LEVEL 4	The learning outcomes relevant to Level 4 are	factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

EUROPASS Service



European PLOTEUS Service



Open Education Framework

Open education is a collective term to describe institutional practices and programmatic initiatives that **broaden access** to the learning and training traditionally offered through formal education systems.

The qualifier "**open**" of open education refers to the **elimination of barriers** that can preclude both opportunities and recognition for participation in institution-based learning

Open Education constituents

Open educational resources

- freely accessible, openly licensed educational material

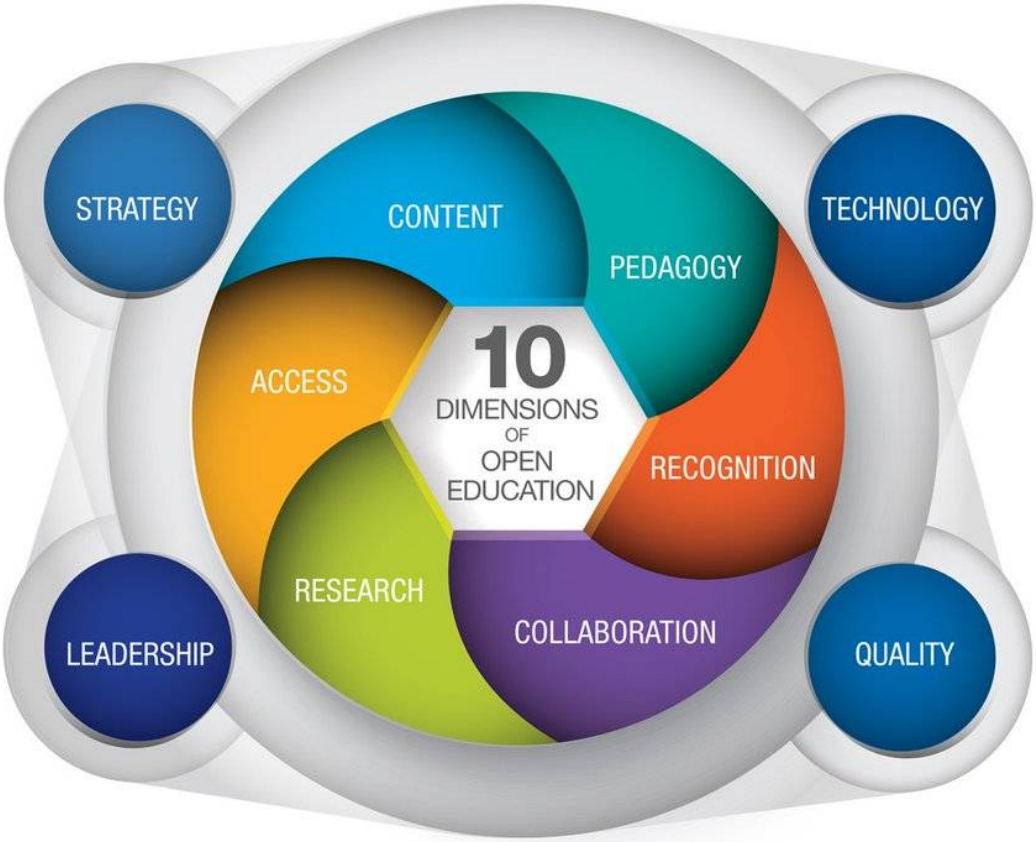
Open educational practices

- draw upon open technologies and high-quality open educational resources in order to facilitate collaborative and flexible learning

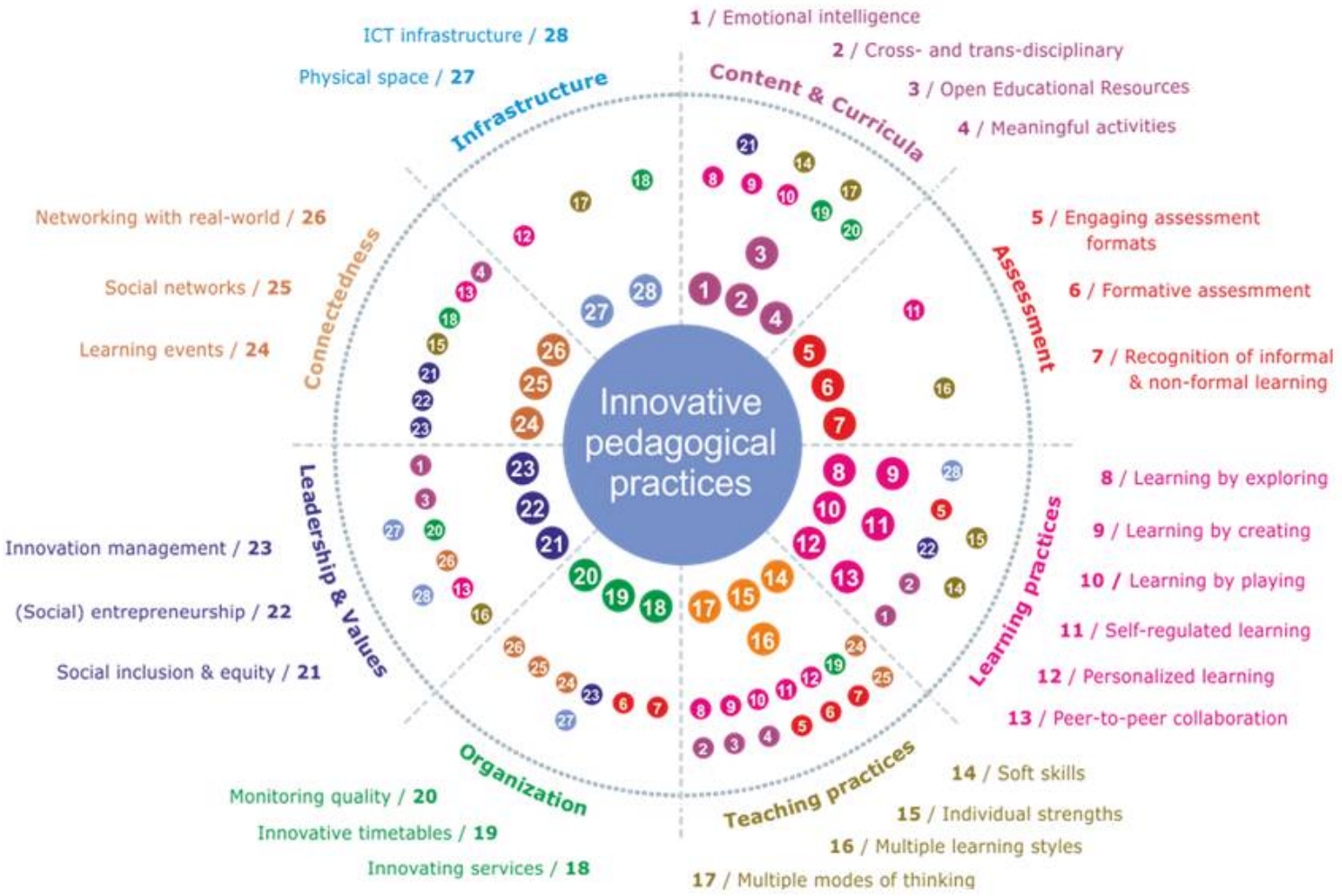
Open learning environments

- Learners are involved in establishing the context and activities. They determine what, when and how learning will occur. Learning is a social negotiation.

The European Open Education framework

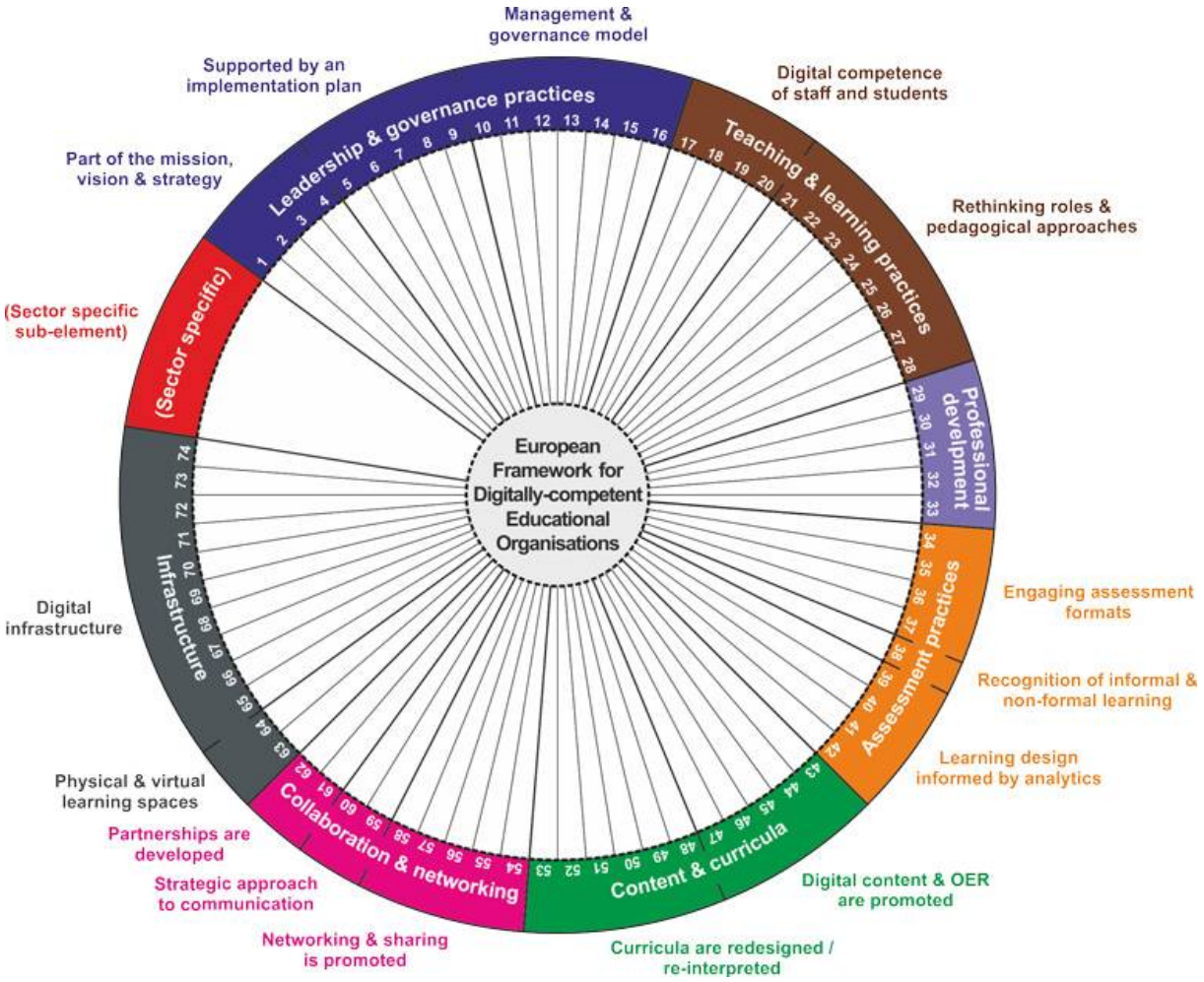


Innovative pedagogical practices



http://is.jrc.ec.europa.eu/pages/EAP/SCALECC

Framework for digitally-competent educational organizations



European Skills Panorama

SKILLS PANORAMA
Inspiring choices on skills and jobs in Europe

EXPLORE DATA | ANALYTICAL HIGHLIGHTS | USEFUL RESOURCES | BLOG | NEWS & EVENTS | ABOUT US

Researchers & engineers

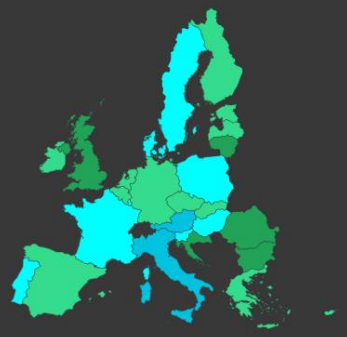
Specialists in this occupation conduct research, improve or develop concepts, theories and operational methods, or apply scientific knowledge relating to fields such as physics, astronomy, meteorology, chemistry, geophysics, geology, biology, ecology, medicine, mathematics, architecture, engineering, design and technology. Occupations in this group include, for example, physicists, astronomers, chemists, mathematicians, actuaries and statisticians, botanists, zoologists, civil engineers, and building architects.

Typically people in this occupation will have completed between three and six years of higher education. Read more about this occupation in our Analytical highlight.

FILTER OPTIONS | Researchers & engineers

Future employment growth (in %) of *researchers & engineers* across countries in 2015-2025

< 0.0%
0.0 - 15.6%
15.6 - 31.1%
31.1 - 46.7%
46.7 - 62.2%
> 62.2%



Key facts

SIZE OF EMPLOYMENT

In 2015, researchers & engineers accounted for 3.04% in the total employment in EU.

The total employment in this occupation reached 6,713,353.

RECENT HISTORY

During the period 2011-2015, the number of people employed as researchers & engineers in EU changed by 4.11%.

TOP PERFORMERS

In 2015, researchers & engineers were mostly employed in the following sectors in the EU:

Professional services (2,210,354)
Manufacturing (1,747,409)
Construction (565,231)
Public sector & defence (393,911)
ICT services (350,604)

TOP PERFORMERS

Countries with highest employment share of researchers & engineers in 2015:

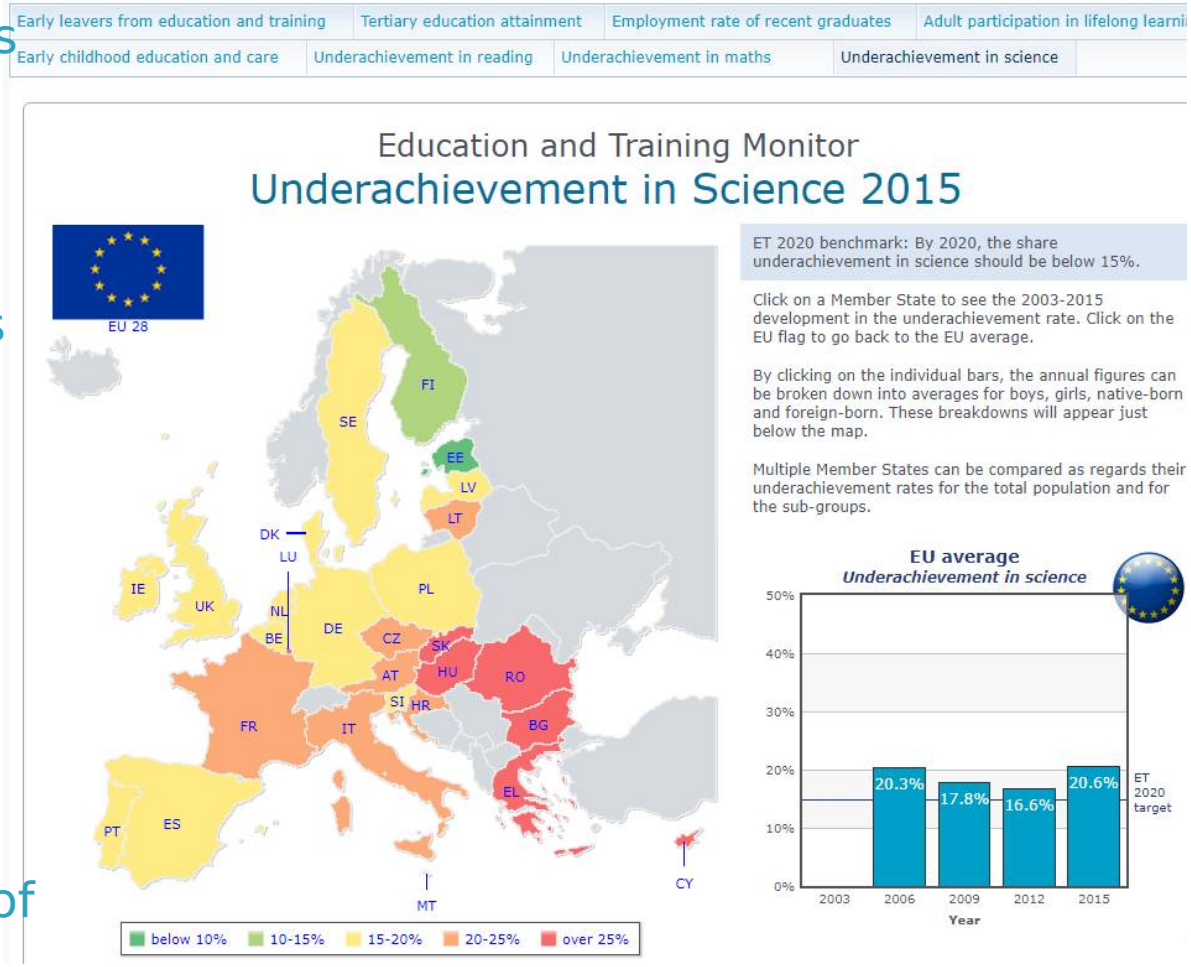
Finland (5.87%)
Luxembourg (4.06%)
Slovenia (3.90%)
United Kingdom (3.77%)
Sweden (3.53%)

LOOKING INTO THE FUTURE

In the period 2015-2025, employment for researchers & engineers in EU is projected to change by 12.51%.

Education and Training Monitor

1.reduce the early leavers from education and training below 10%
2.reach 40% tertiary educational attainment among 30 to 34-year-olds
3.reach the 95% participation in early childhood education and care
4.reduce the underachievement in reading, maths and science below 15%
5.reach the employment rate of recent graduates of 82%
6.reach 15% adult participation in learning



Overview

21st century challenges

Building the 'new' learning ecosystems

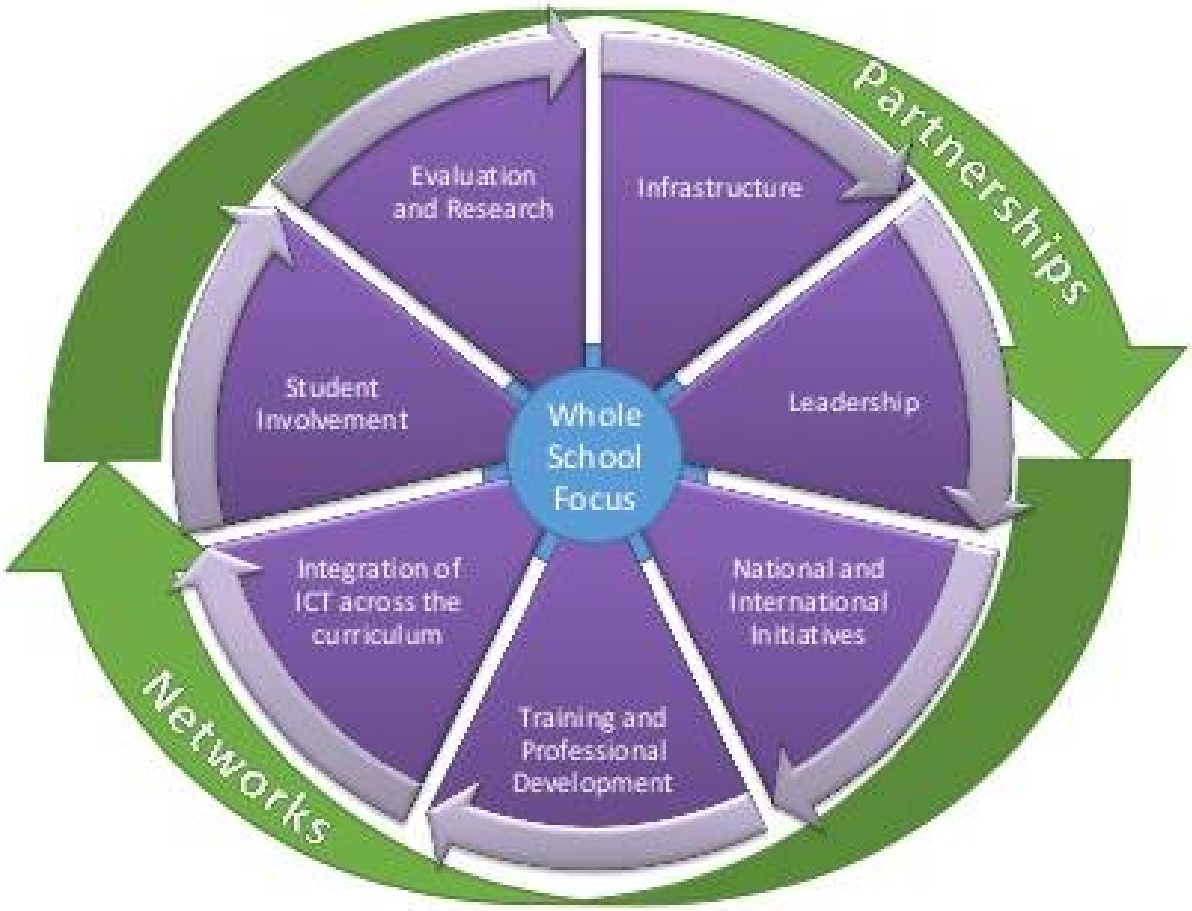
Europe's vision and strategic frameworks

European best practices for digital transformation

The EU K-12 education strategy:
School development and excellent teaching for a great start in life

Closing Remarks

The ‘Whole School Approach’



Living Schools Lab

Better, more inclusive schools

All young people must have the chance to develop the full range of key competences

(literacy, foreign languages, mathematics, science, digital and coding skills and civic and social competences, but also entrepreneurship competences and transversal skills such as creativity and critical thinking)

Linking learning with real life experience yields better results

(Project- and problem-based learning, on-the-job experiences or community service learning increase young people's motivation, put subject content into context, and offer opportunities for the development of competences)

Support of all learners and response to their specific needs
Whole School Approach

Cooperation helps schools to enrich learning experiences and outcomes

(within and beyond walls, cooperation with local services, community organisations, businesses and universities, but also cooperation within schools and families)

Engaging and stimulating curricula and effective teaching approaches

(Curricula addressing key competences, connect with real life and diversity in society, flexible and heterogeneous learner groupings, personalized forms of learning, opportunities for attractive and promising learning pathways)

Digital technologies enhance learning, support innovation, enrich learning experiences, support development beyond digital competence, support communication and cooperation in and between schools and enhance the participation of pupils and their families in school life.

Excellent teaching & learning

Changing nature of teaching in response to new knowledge about learning, increasing expectations about quality and equity
(teachers more accountable for outcomes than in the past, put morefocus on the lifelong development of key competences than on the acquisition of knowledge alone)

Review, adapt and innovate teaching and focus more on the needs individual learners
(Project- and problem-based learning, on-the-job experiences or community service learning increase young people's motivation, put subject content into context, and offer opportunities for the development of competences)

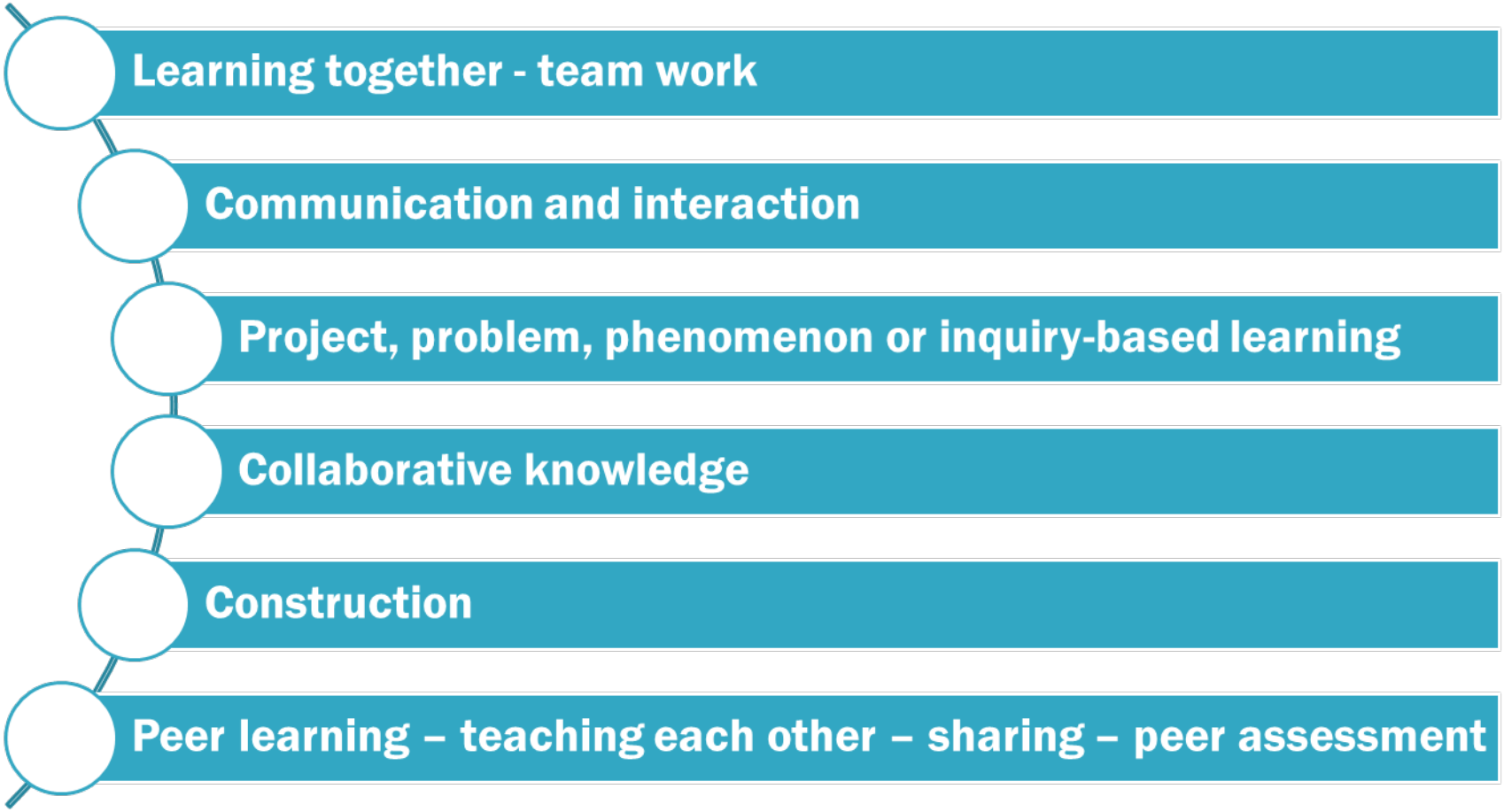
Support teachers and school leaders for excellent teaching and learning

Supporting teachers' career-long and collaborative learning
(update methods, keep developing competences, initial and continuing professional development, encourage self-directed learning, improve teaching practice through links to research, collaborative attitudes, networking with peers)

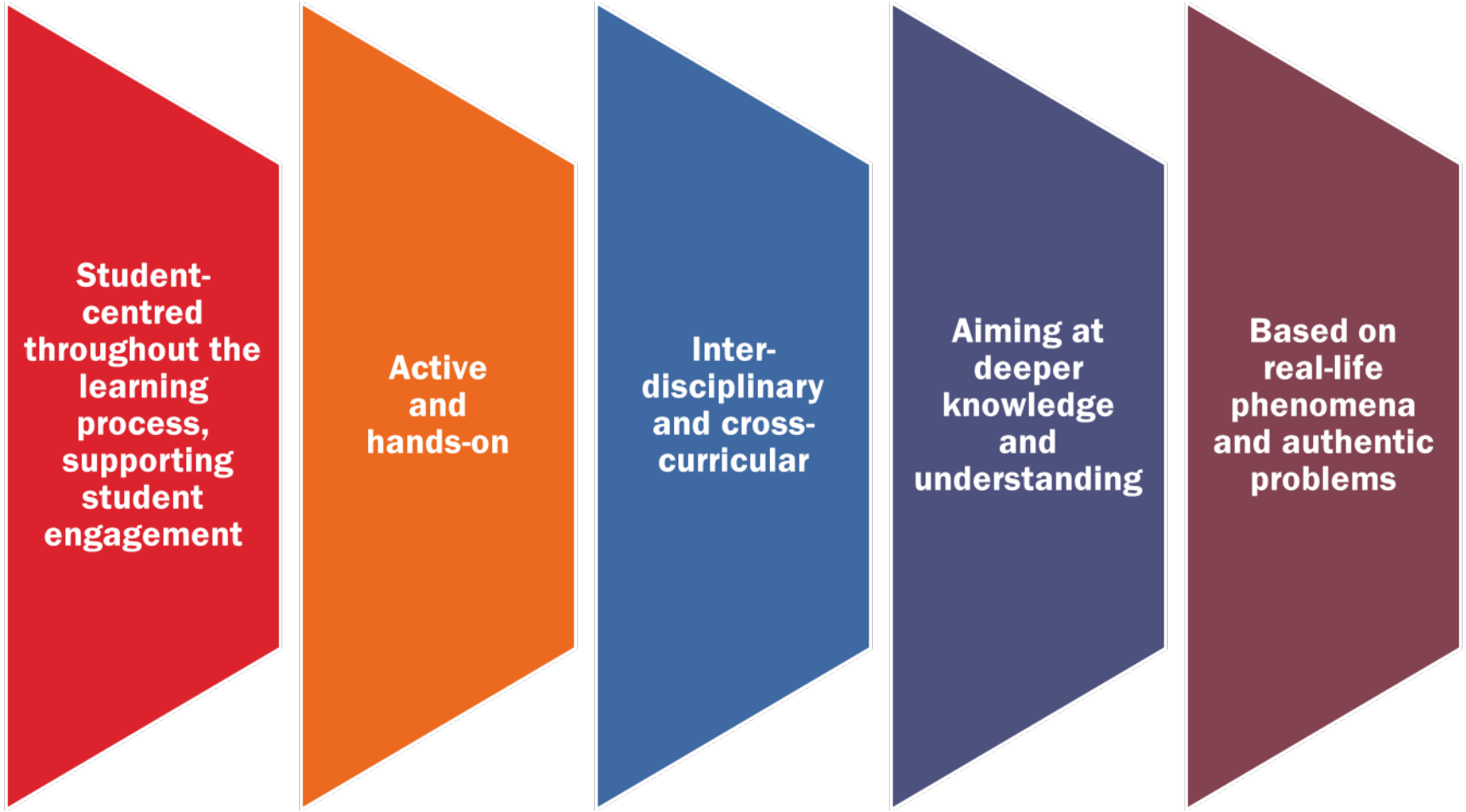
Supporting leadership and governance for innovation and quality
(shared attention to outcomes and quality, openness to new ideas, open communication with internal and external actors, generating-interpreting-using data, capacity to respond quickly to identified needs)

Collaborative environments and digital technologies can enhance teacher learning. Educational innovations such as collaborative peer networks, massive open online courses (MOOCs), and the sharing of open educational resources can complement traditional methods and help overcome barriers to participation.

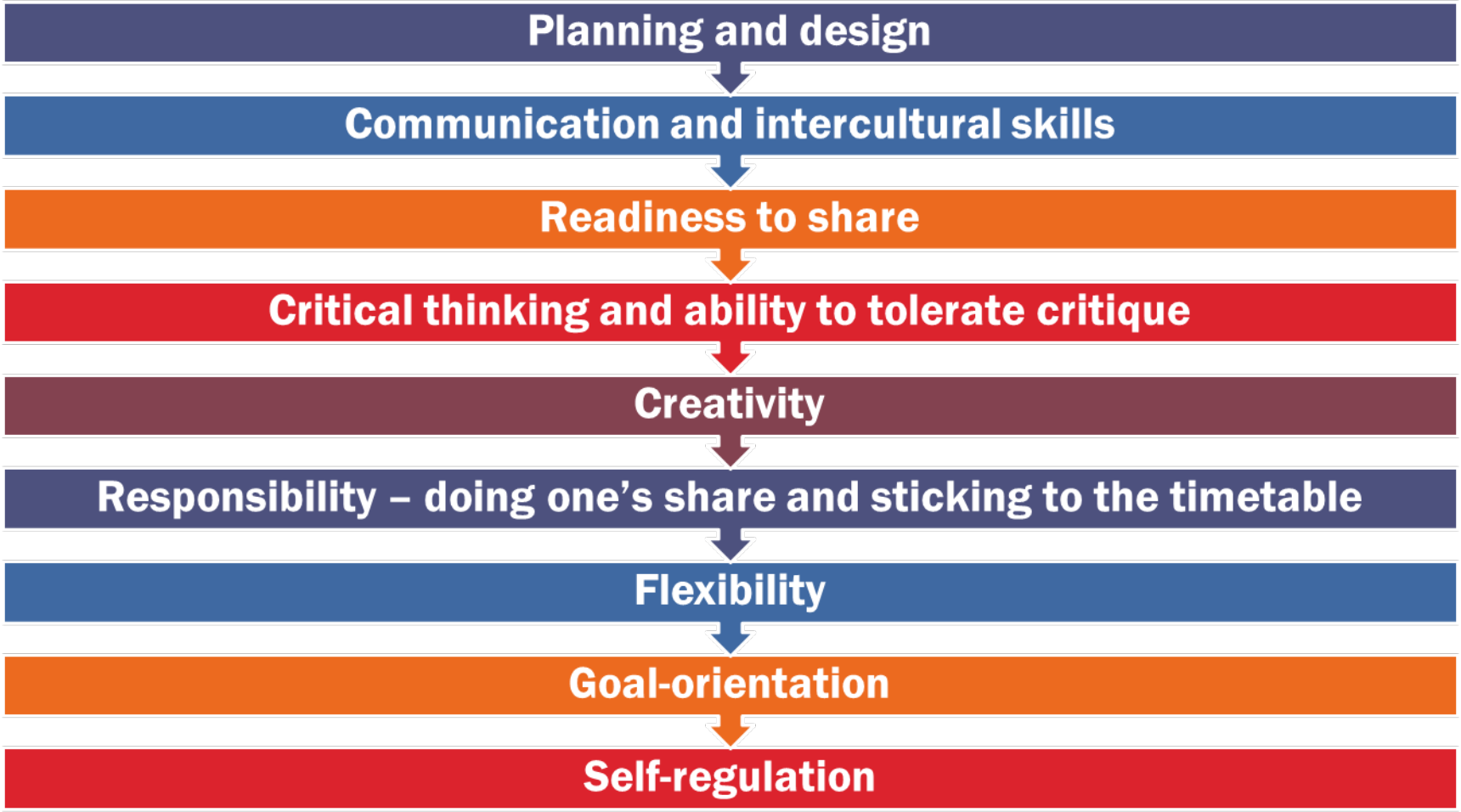
Collaborative learning



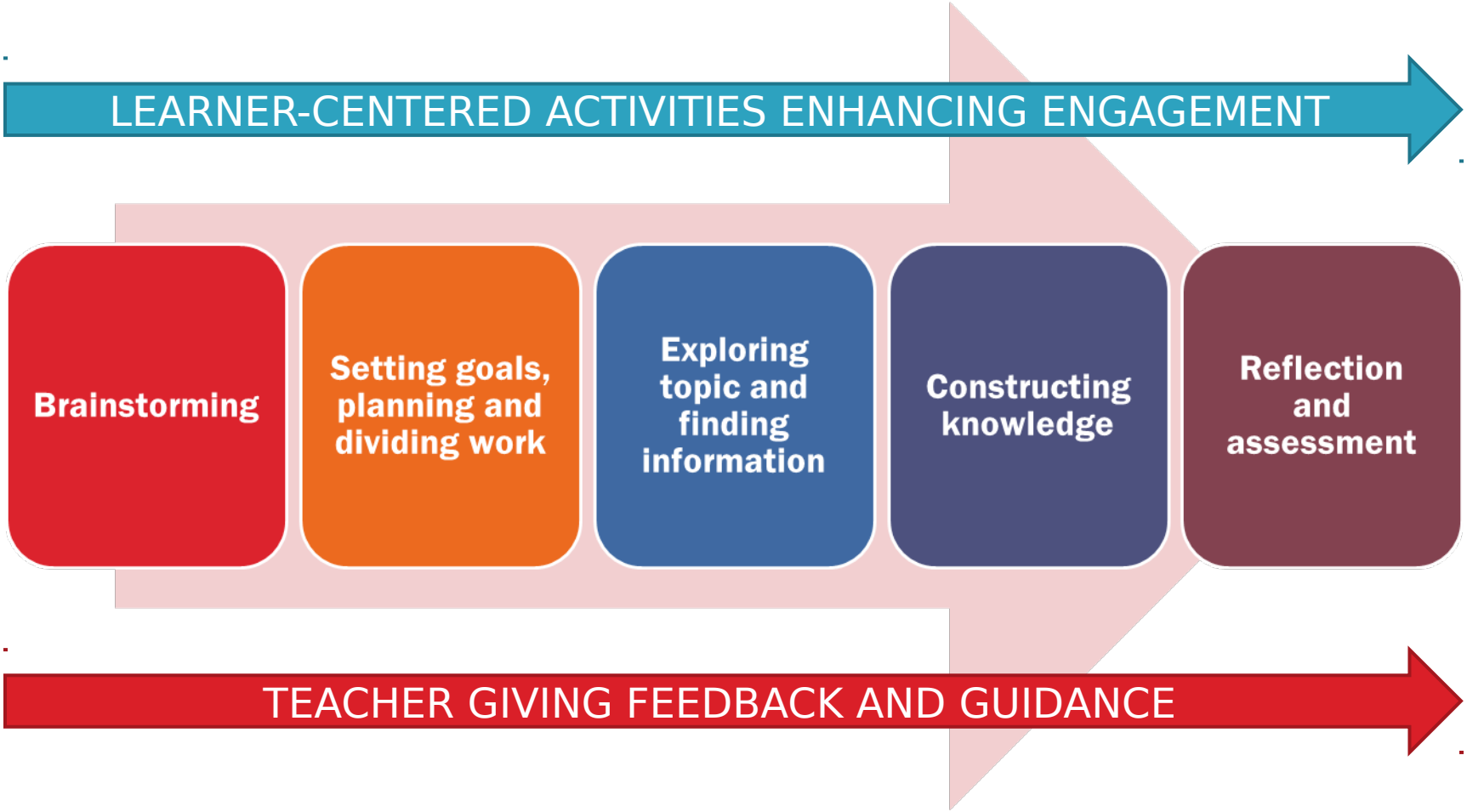
Learning projects based on collaboration are



Collaboration requires



Learning process



Funding and implementation

European Schoolnet
Transforming education in Europe

Network of 31 European Ministries of Education, based in Brussels.
Not-for-profit organization aiming to bring innovation in teaching and learning to key stakeholders:
Ministries of Education, **schools**, **teachers**, **researchers**, and **industry partners**

- Supporting schools and teachers in their teaching practices
- Developing and sustaining a network of schools engaged in innovative teaching and learning approaches
- Providing concrete evidence and data in the area of innovation in education on which to base

European Schoolnet
Transforming education in Europe

all you need is { C<3DE }
European Coding Initiative

I-LINC
INCLUSION + ICT + LEARNING

</DIS-C<3DE}

smile
Social Media in Learning & Education

the WEB WE WANT

Better Internet for Kids

eSKILLS FOR JOBS 2016

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acer European Schoolnet

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KODUKUP EUROPE

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Transforming education in Europe

CO-LAB
Collaborative Education Lab

ITELab

CPDLab
Continuing Professional Development *Lab*

FCL Regio

Living Schools Lab

iTEC
Designing the future classroom

SENnet

Creative Classrooms Lab

INDUCAS

School Education Gateway

TEACHUP

eTwinning

MENTEP
MENTORING TECHNOLOGY-ENHANCED PEDAGOGY

KEYCONET
Key Competence Network on School Education

nestt

LangOER

TasK


European Schoolnet
Transforming education in Europe
STEM School Label
Amgen | Teach
Engaging Science Educators
GO-LAB
Chemistry: All About You
Science: Where Can It Take You?
FuturEnergia
ENERGY IS OUR FUTURE
NANOPINION
NANO Channels
Xperimania
FROM MOLECULES TO MATERIALS
nextlab
SYSTEMIC
SAY YES TO STEM IN THE C
SPACE awareness
U4energy
The European school challenge
GLOBAL excursion
Extended Curriculum for Science Infrastructure Onlin
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RRI Tools
Fostering Responsible Research and Innovation
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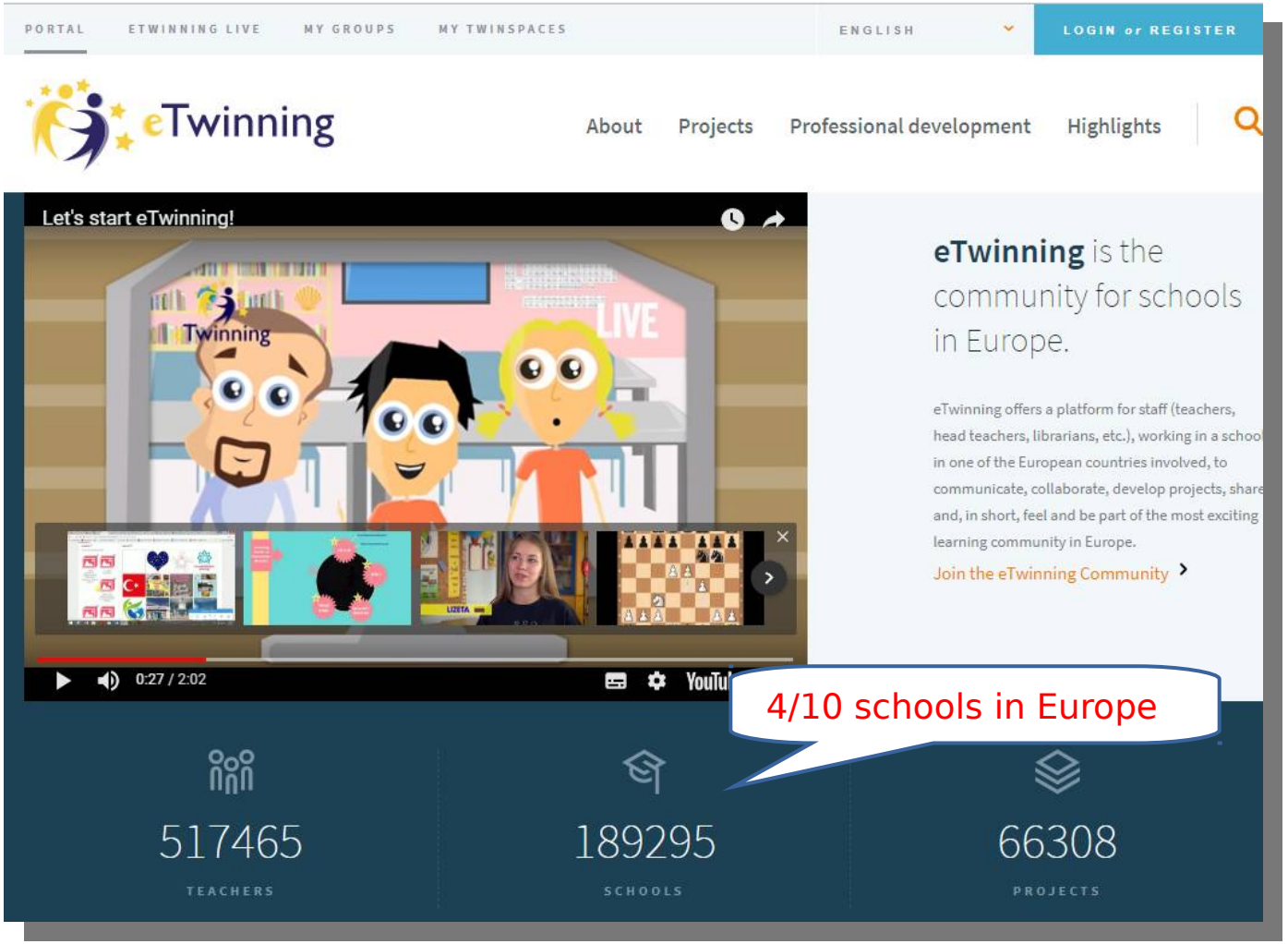
UniSchooLabS
DESIRE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Let's start eTwinning!
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About
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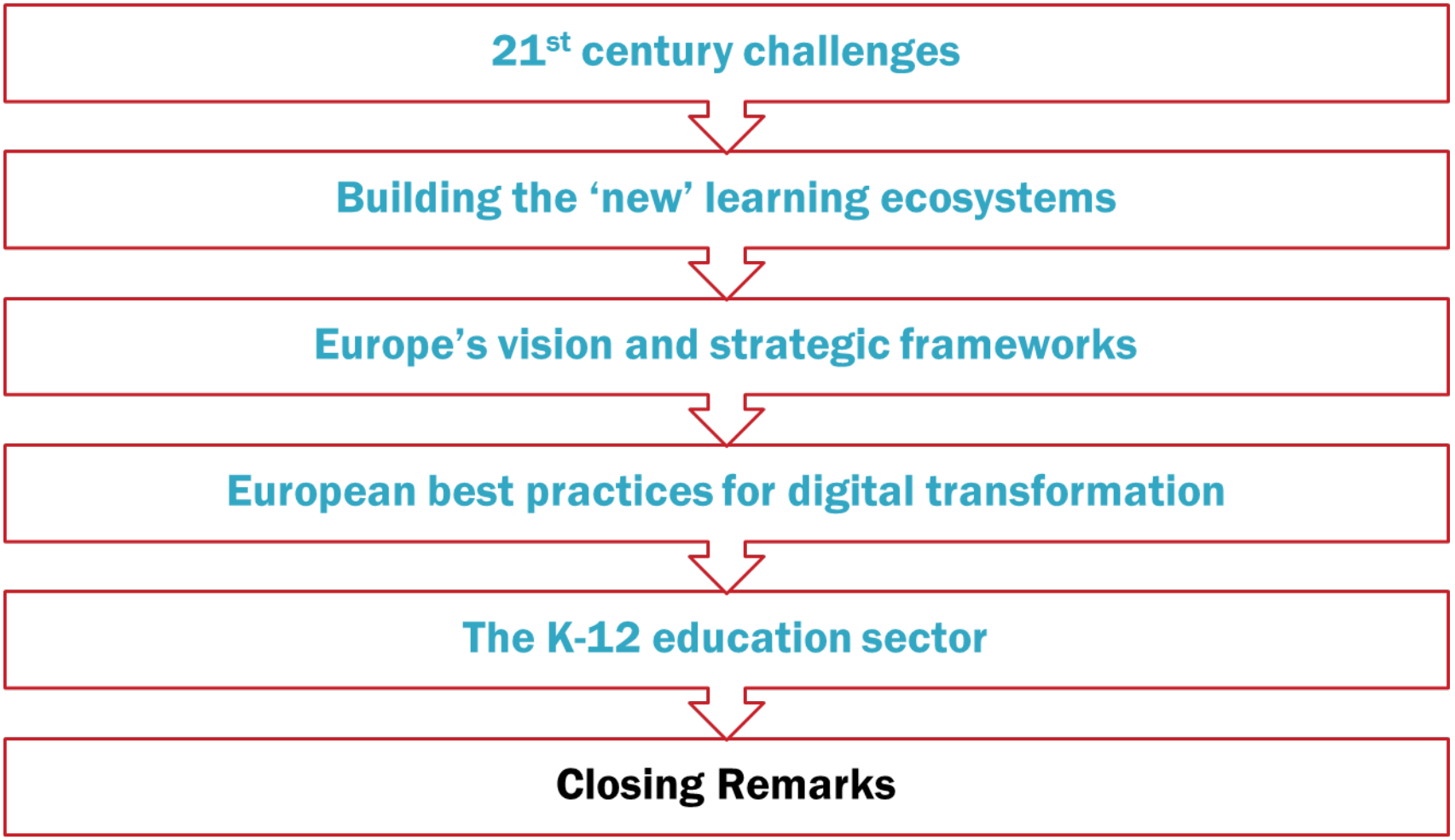
School Education Gateway

Overview


21st century challenges
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Europe's vision and strategic frameworks
European best practices for digital transformation
The K-12 education sector
Closing Remarks

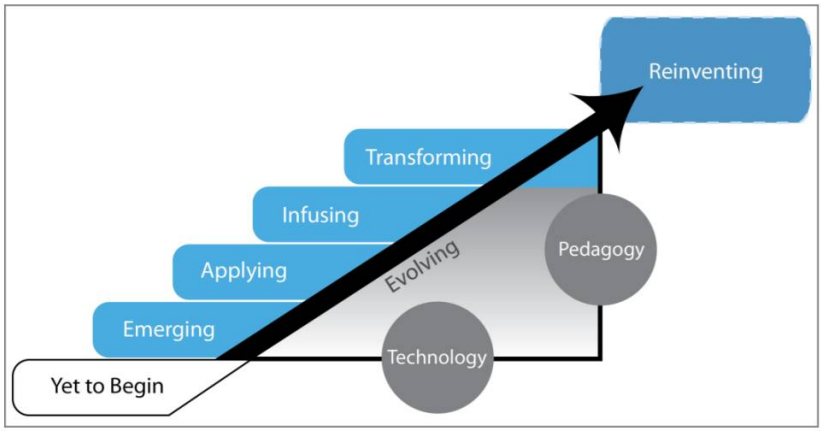
Transformation of Education

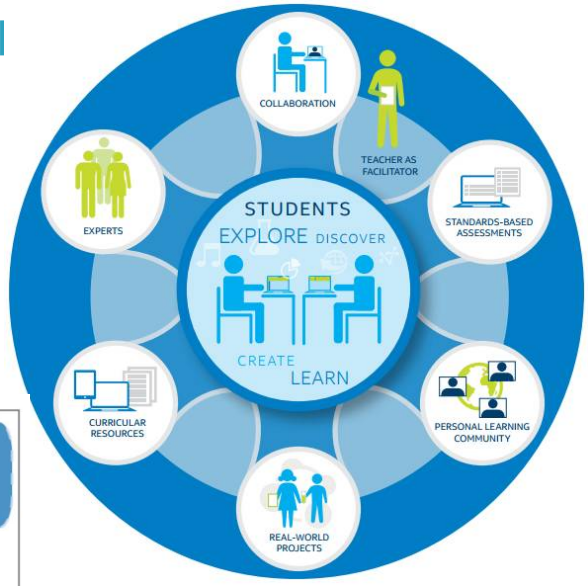
> Education drives development by transforming lives.

To continue achieving this, educatio
transformed!

Take the challenge and opportunity to reconsider, re-imagine, and re-invent learning environments able to prepare and excel each individual for effective life-l

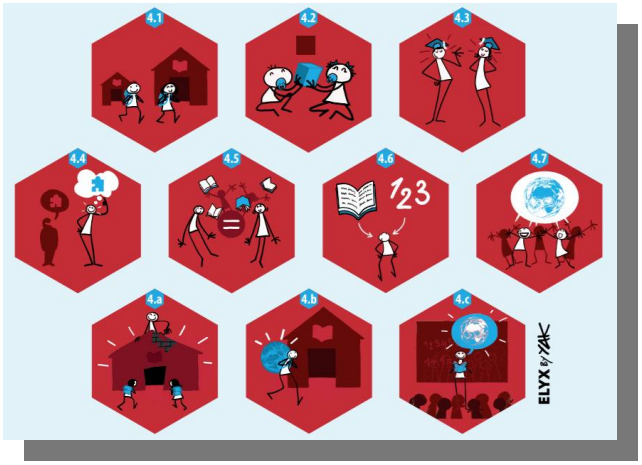
OECD project, Innovative Learning Environments





The way ahead

The goals are set.
Explore the means.
Plan the way.



Make it happen!

Open, inclusive and quality education for all!

Thank you!

CLEO SGOUROPOULOU
csgouro@teiath.gr