

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



DR. CLEO SGOUROPOULOU

Educational Technology and eLearning Systems (EduTEL) Lab

1<sup>st</sup> PanHellenic **MoodleMoot** Conference  
TEI of Athens, 01.12.2017

# About the speaker

## Dr. Cleo Sgouropoulou



- Prof. of Learning Technology Systems  
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

**21<sup>st</sup> century challenges**

**Building the ‘new’ learning ecosystems**

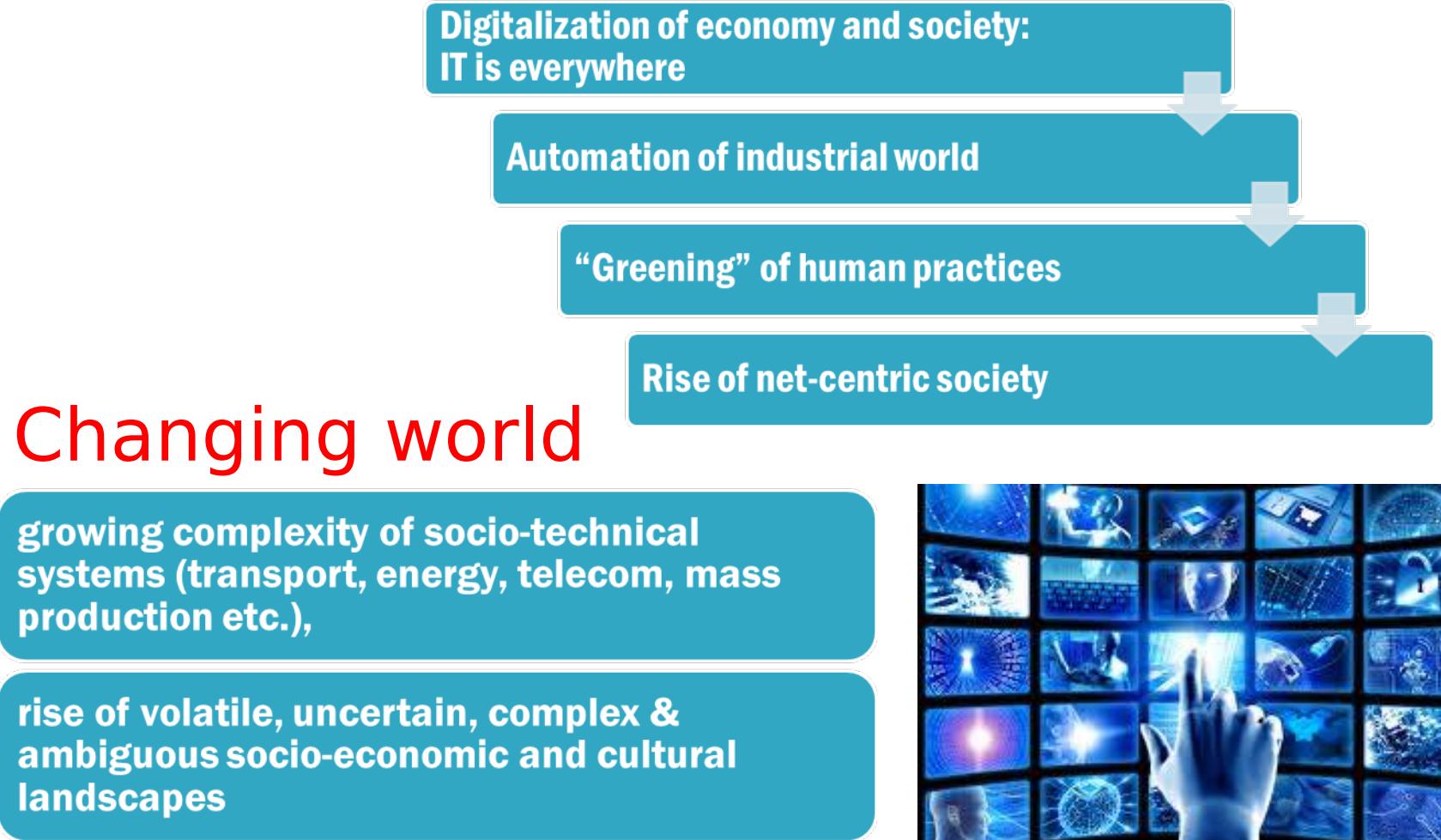
**Europe’s vision and strategic frameworks**

**European best practices for digital transformation**

**The EU K-12 education strategy**

**Closing Remarks**

# 21<sup>st</sup> century challenges



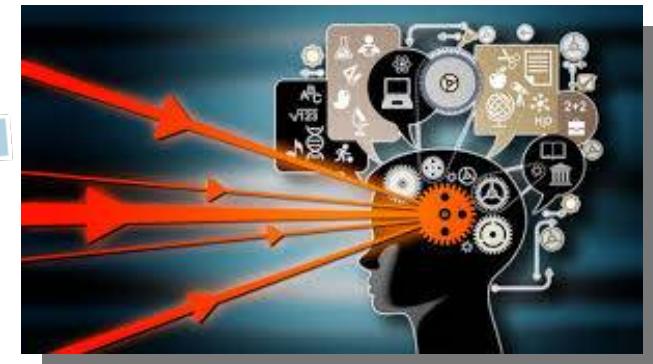
# New skills and knowledge

## 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?**

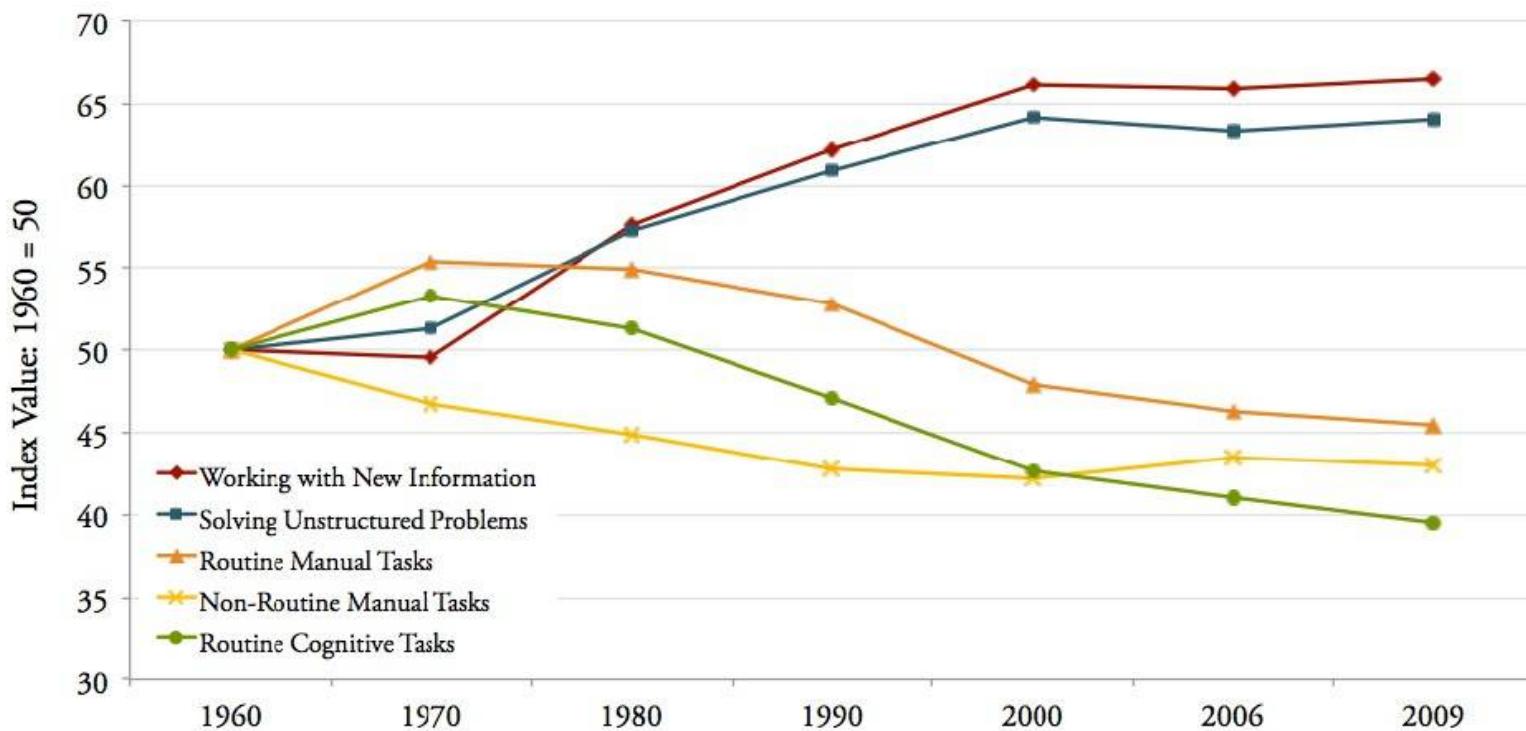


# Transformation of economies

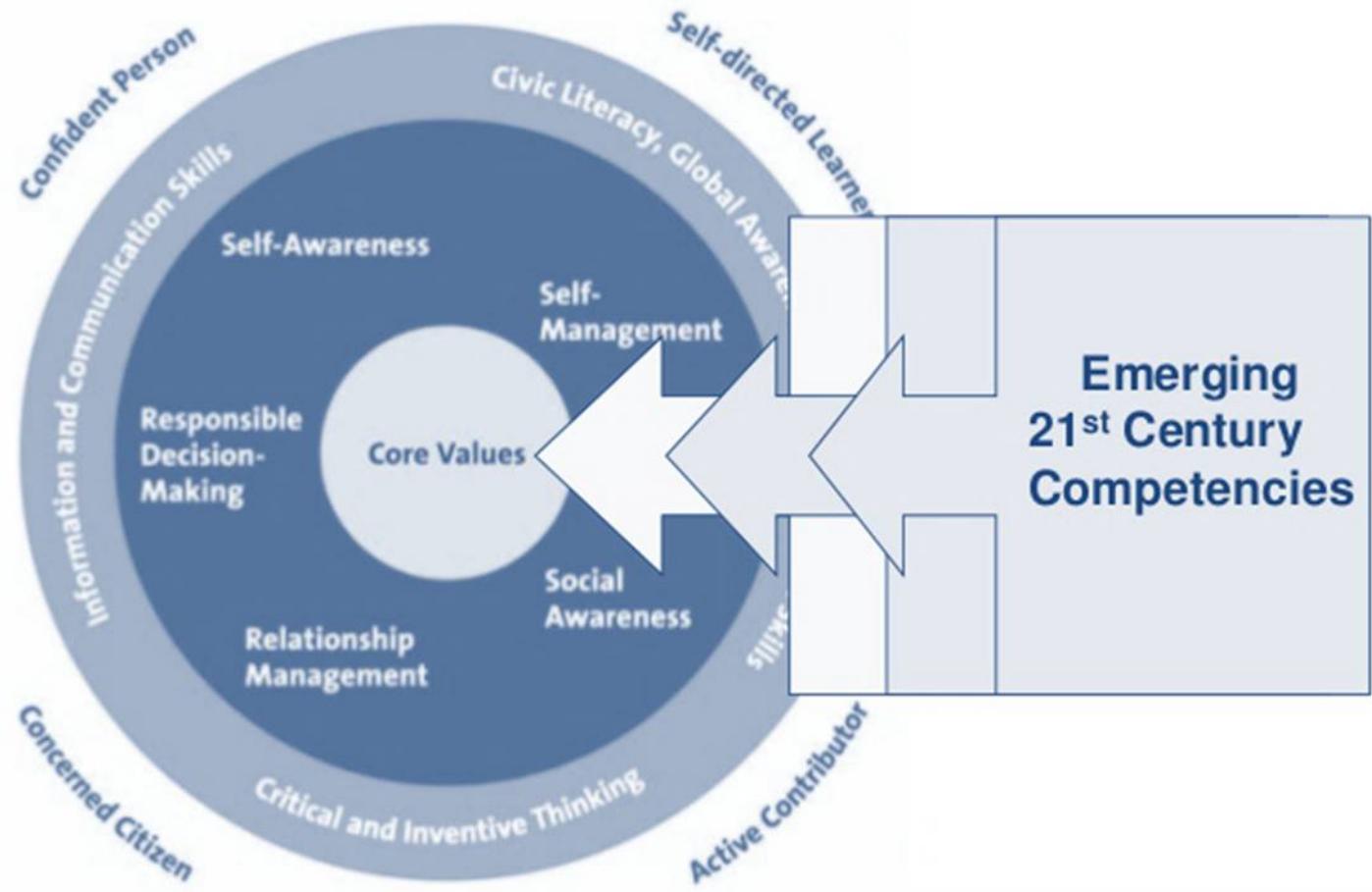


# Changed nature of working tasks

Figure 3: Index of Changing Work Tasks in the U.S. Economy 1960-2009<sup>21</sup>



# Emerging 21<sup>st</sup> century skills

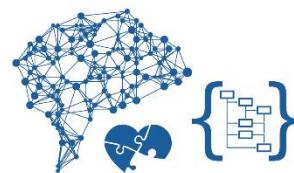


# WEF top 2020 skills



## in 2020

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



## in 2015

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



Source: Future of Jobs Report, World Economic Forum

# Education for 21<sup>st</sup> century challenges

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

Advances in learning sciences  
and proliferation of educational  
technologies

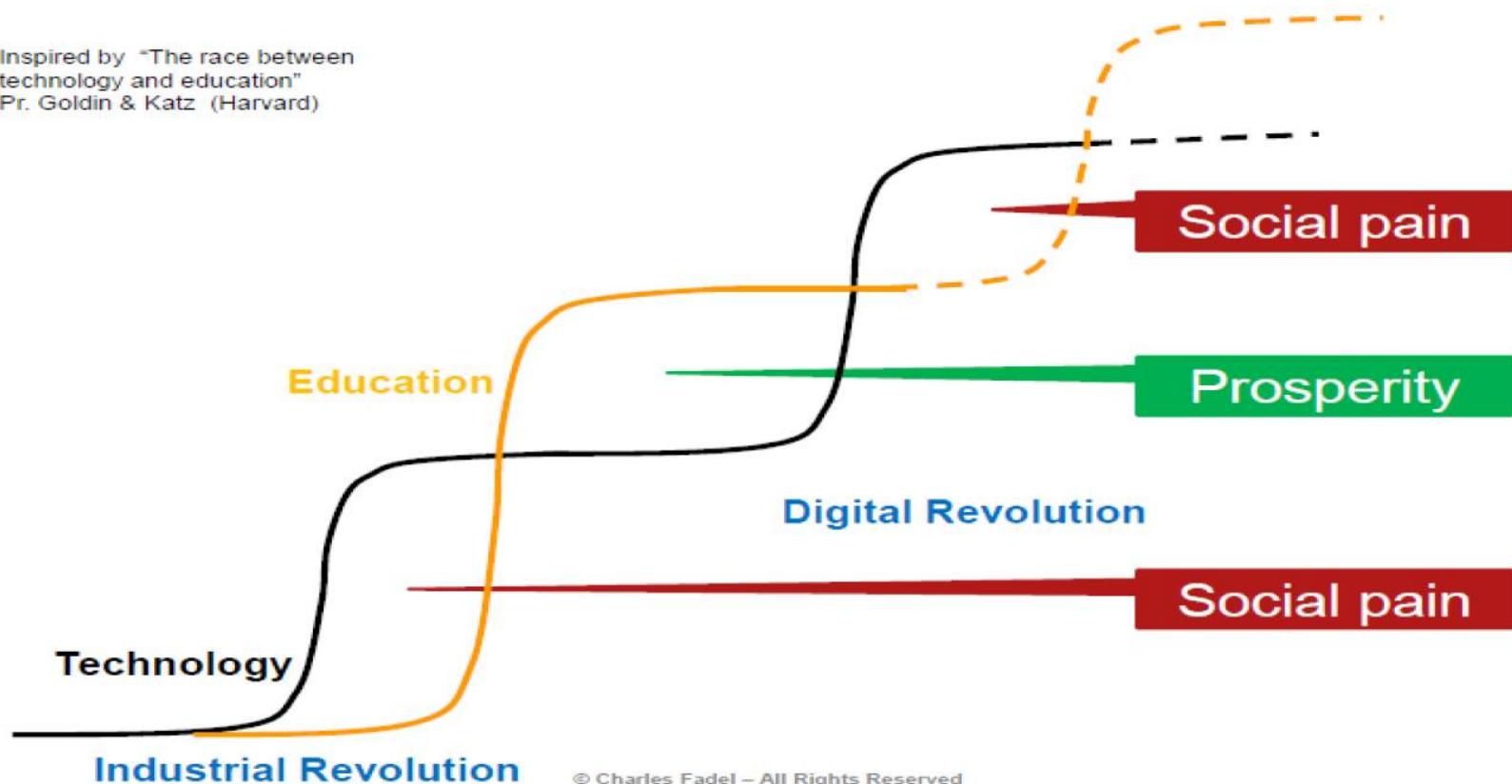
“ **WHY HAS EDUCATION NOT YET  
BENEFITTED FROM THE  
PRODUCTIVITY AND EFFICIENCY  
GAINS THAT ICT HAVE  
PROVOKED IN OTHER SYSTEMS?**

*However,*

OECD project,  
Innovative Learning Environments

# The Race between Technology and Education

Inspired by "The race between technology and education"  
Pr. Goldin & Katz (Harvard)



© Charles Fadel – All Rights Reserved

# 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

**21<sup>st</sup> 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**

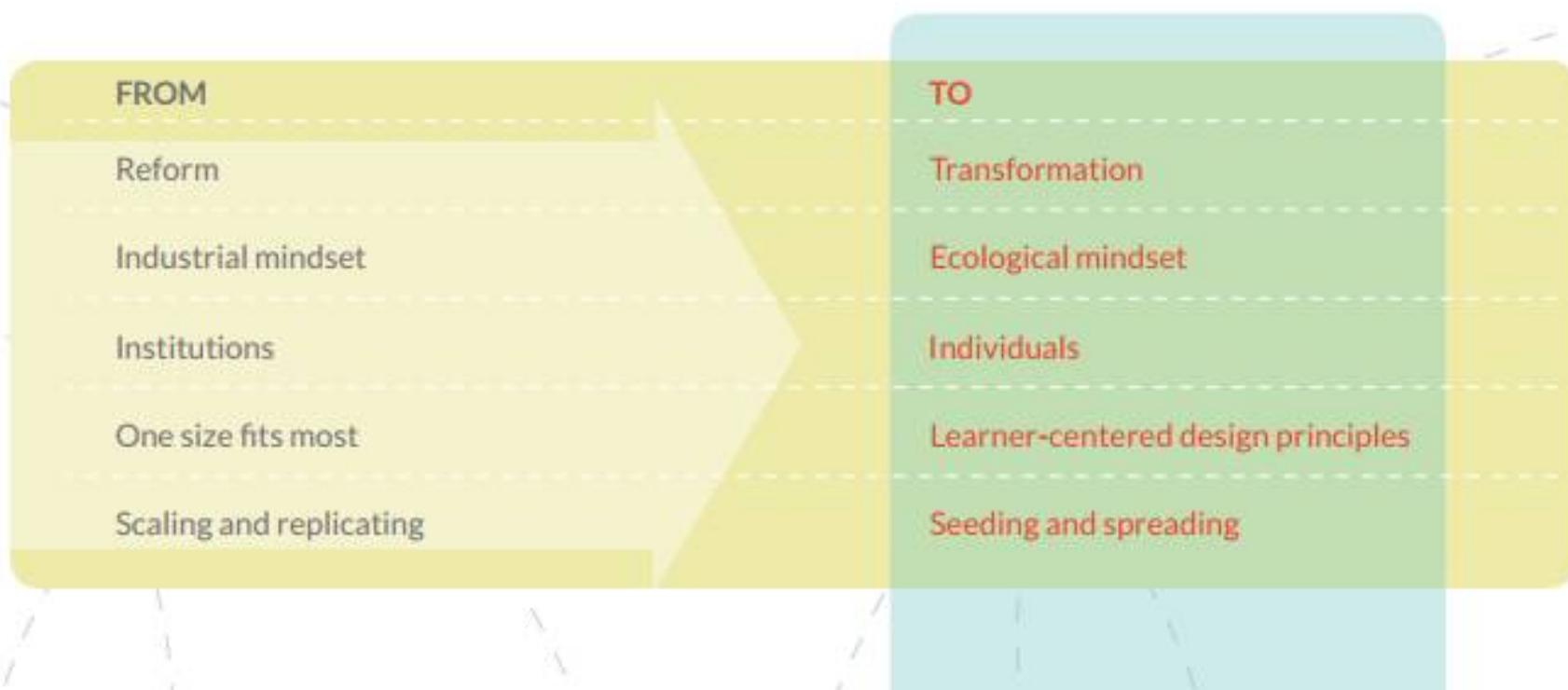
# Learn for life, Learn to learn!

"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

**learning systems require a co-design of social and technical systems**

**use models and concepts not only focusing on the artifacts but exploiting the social context in which they will be used**

**design use cases for real world application**

**include a focus on human qualities**

**support lifelong learning**

**smart integration of technological innovations to enable the creation of many novel ways of individual and collective learning**

# 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

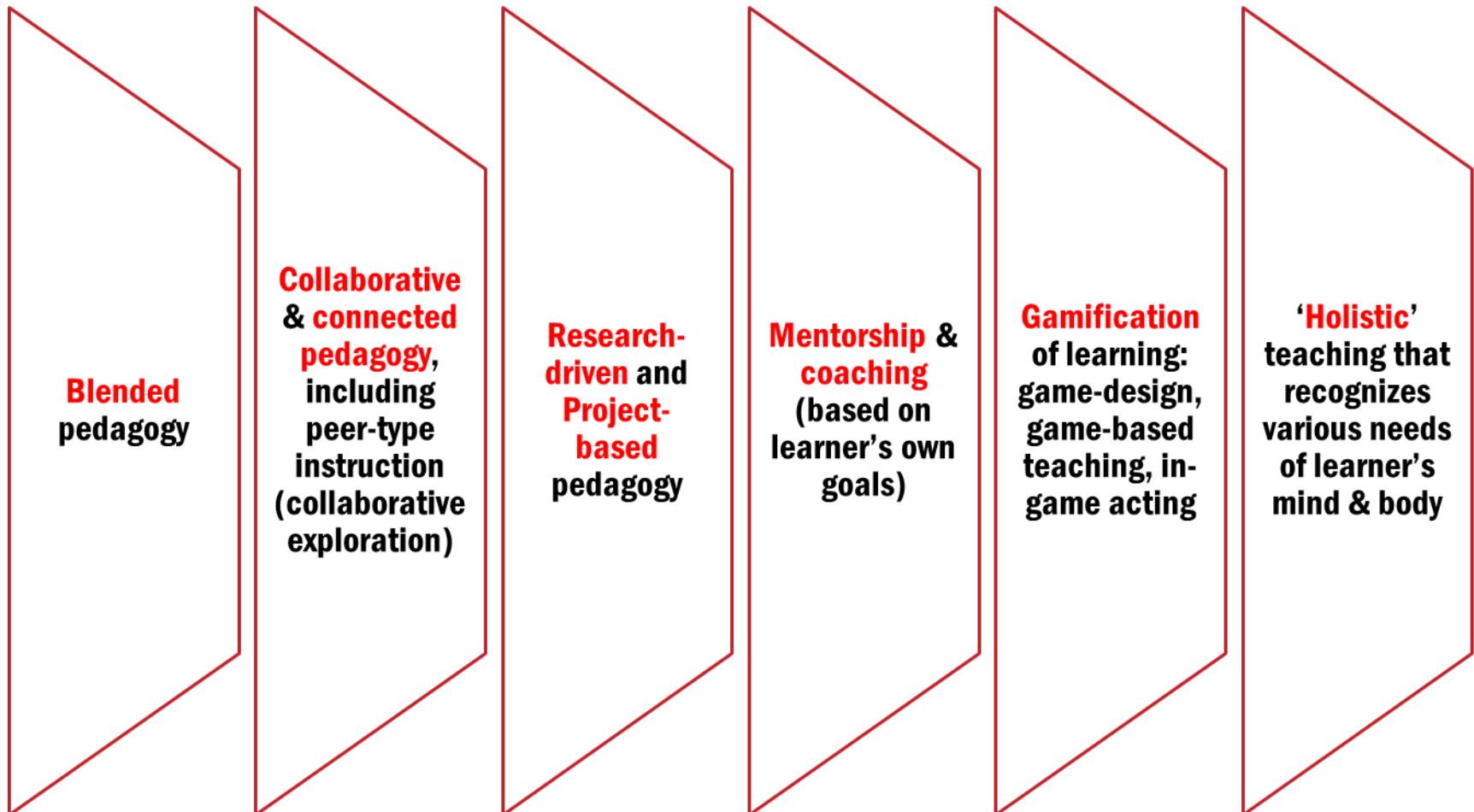
- Learning in virtual environments (online courses, virtual reality lectures, social & AR simulators etc.)
- Practice-based learning in real-life settings
- Peer-based learning (F2F & online) with mentors & community

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

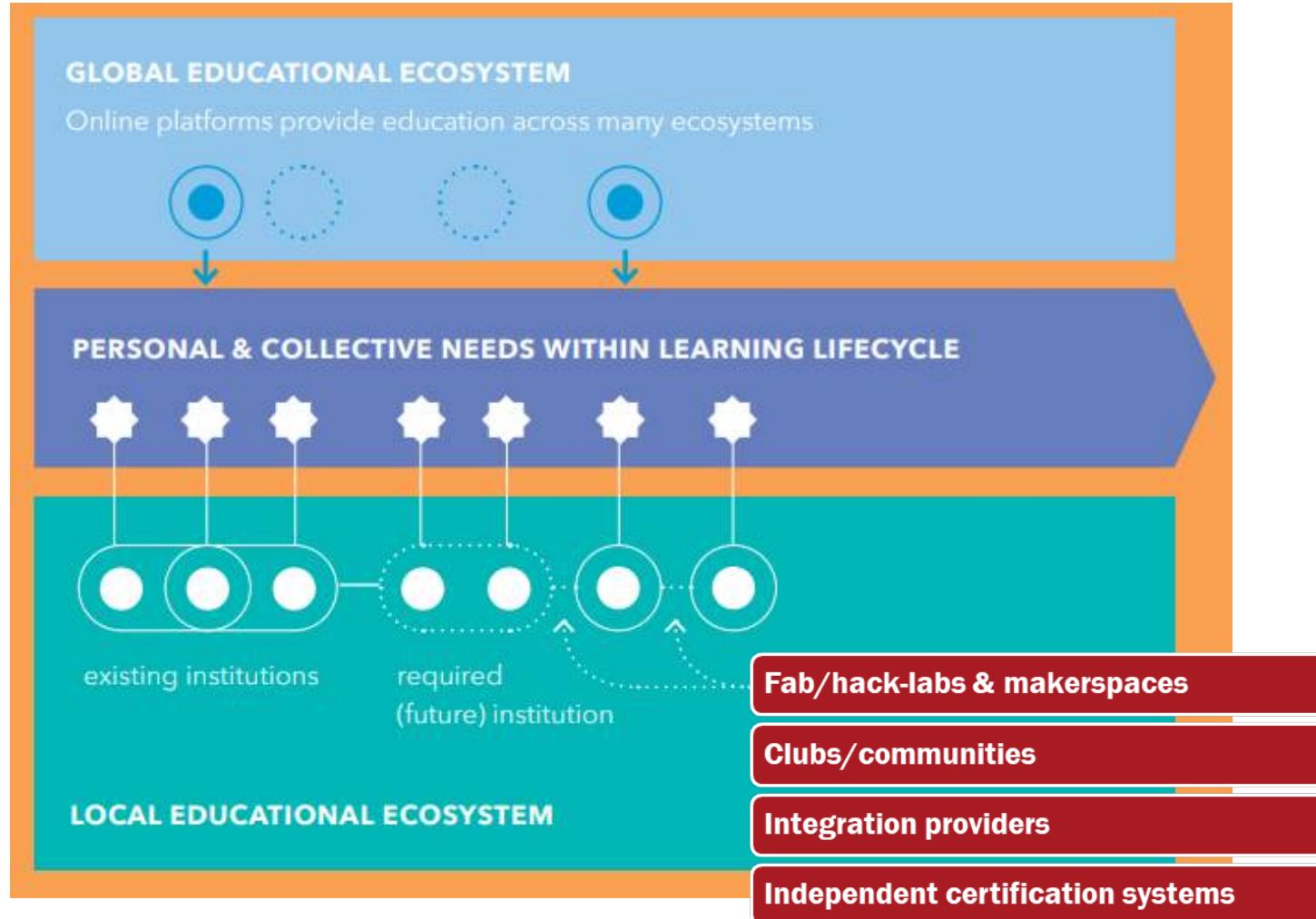
**Environment for physical exercises & interaction, emotional / artistic interaction etc.**

# Key areas of change in education

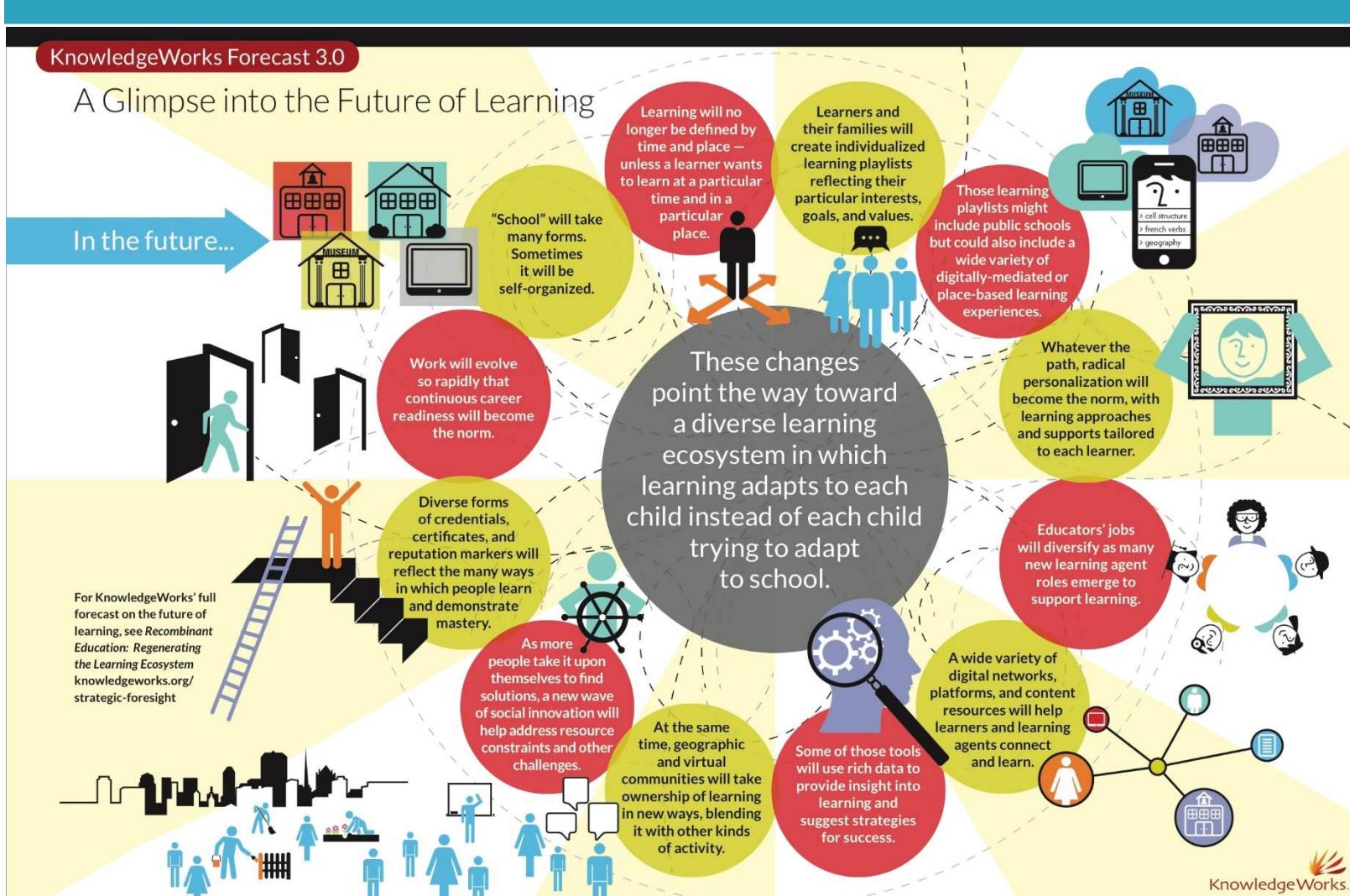
## Teacher skills



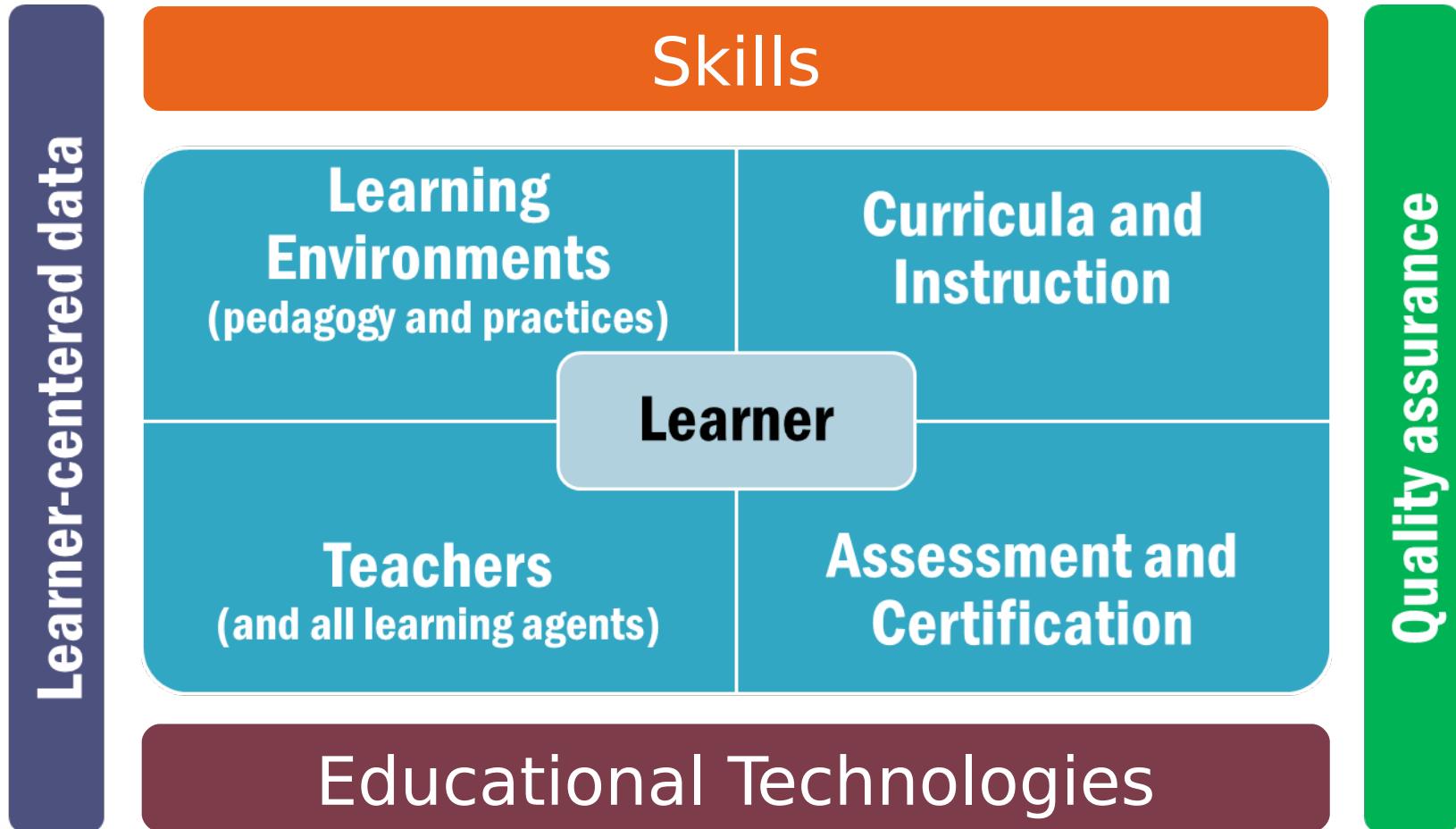
# A new 'educational ecosystems' model



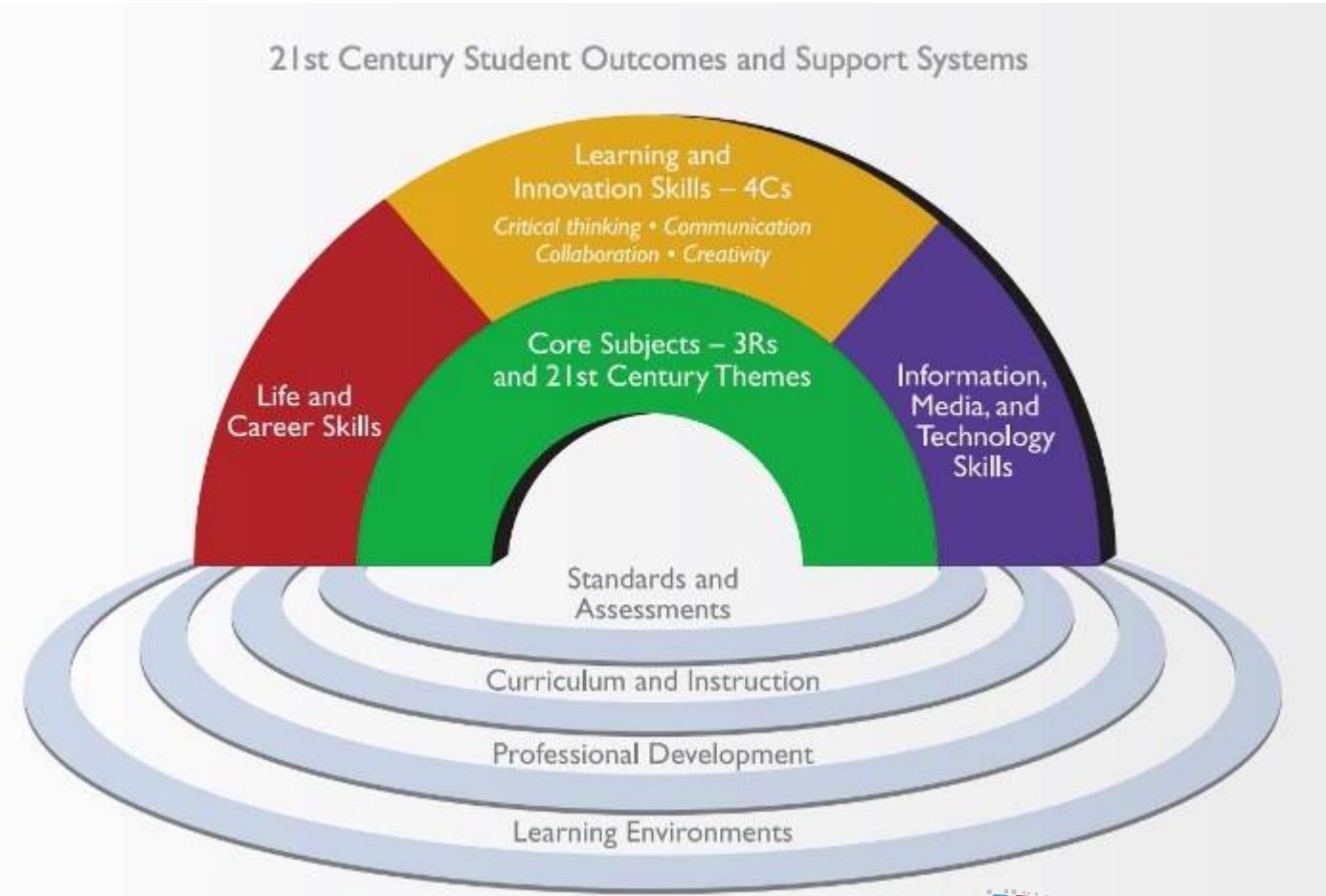
# The future of learning



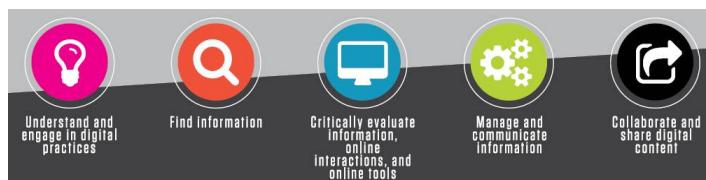
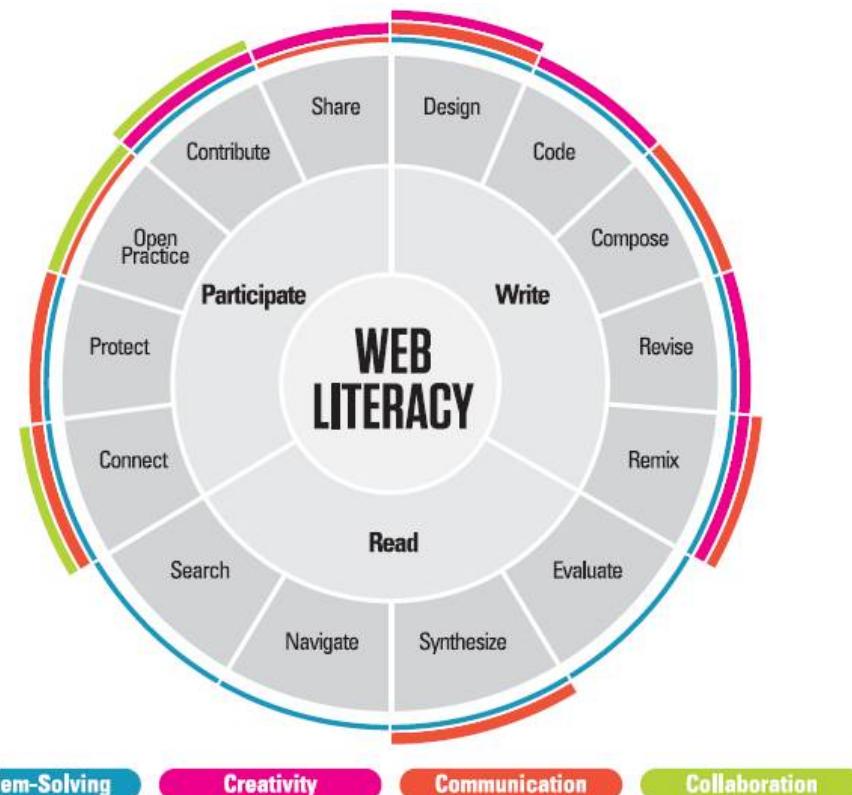
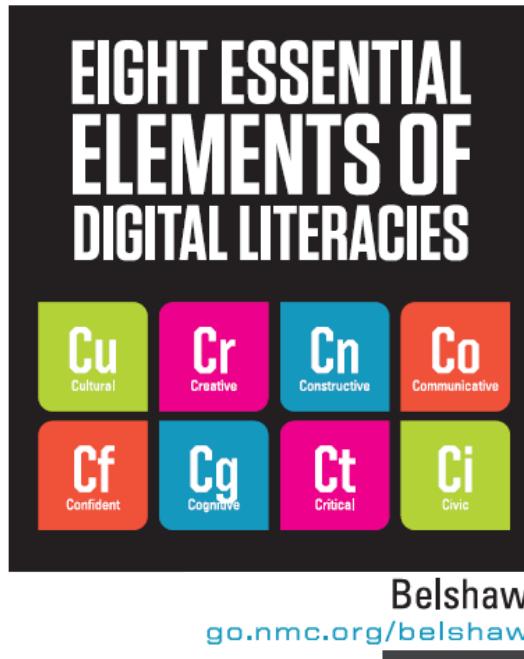
# The 'big picture' themes & challenges



# Students 21<sup>st</sup> Century Skills



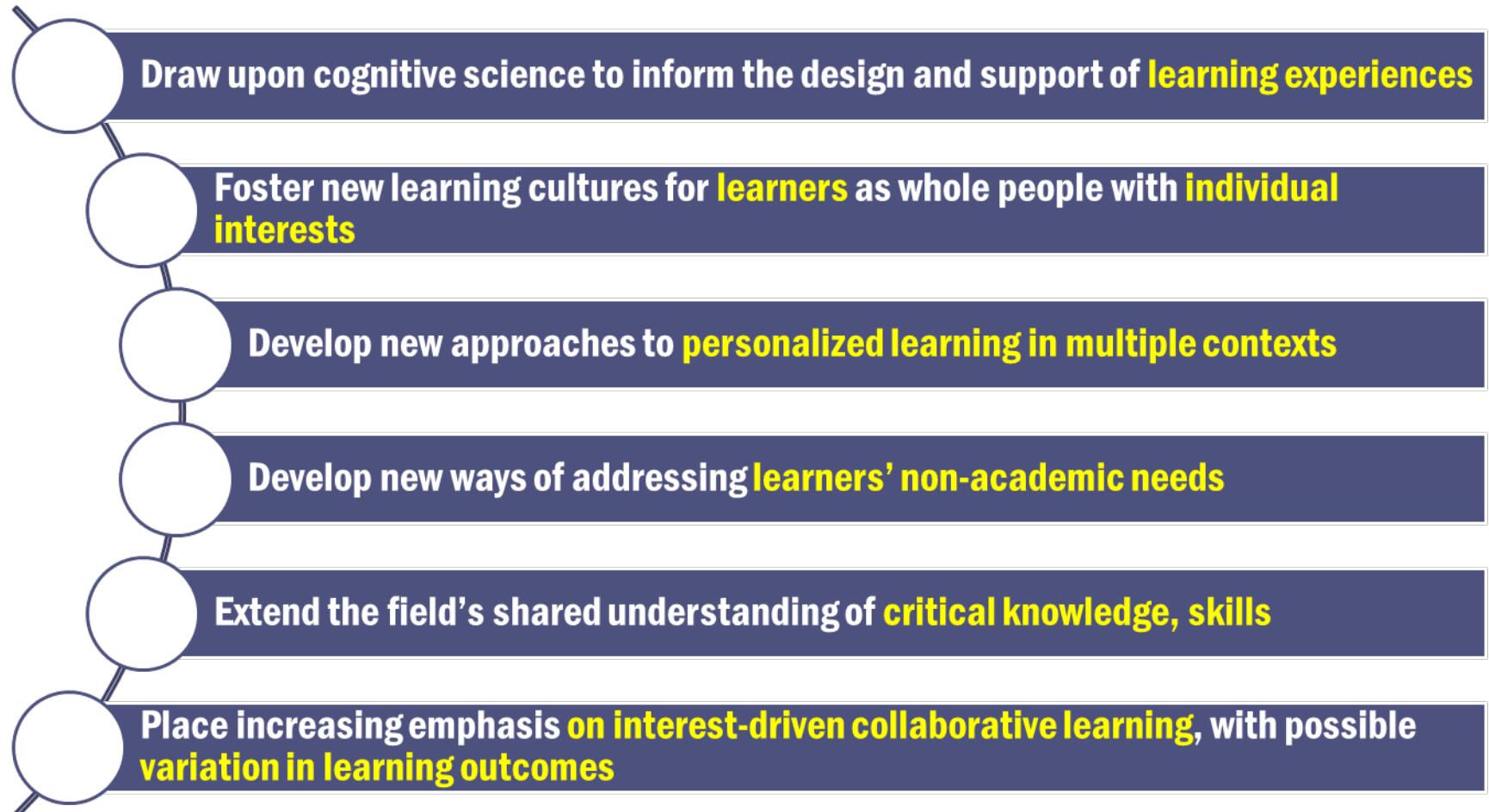
# Digital transformation essential for 21<sup>st</sup> century skills



Open University  
[go.nmc.org/oudigilit](http://go.nmc.org/oudigilit)

**MOZILLA WEB LITERACY**  
Mozilla Foundation  
[go.nmc.org/mozweb](http://go.nmc.org/mozweb)

# Learning environments: pedagogy



# Learning environments: practices



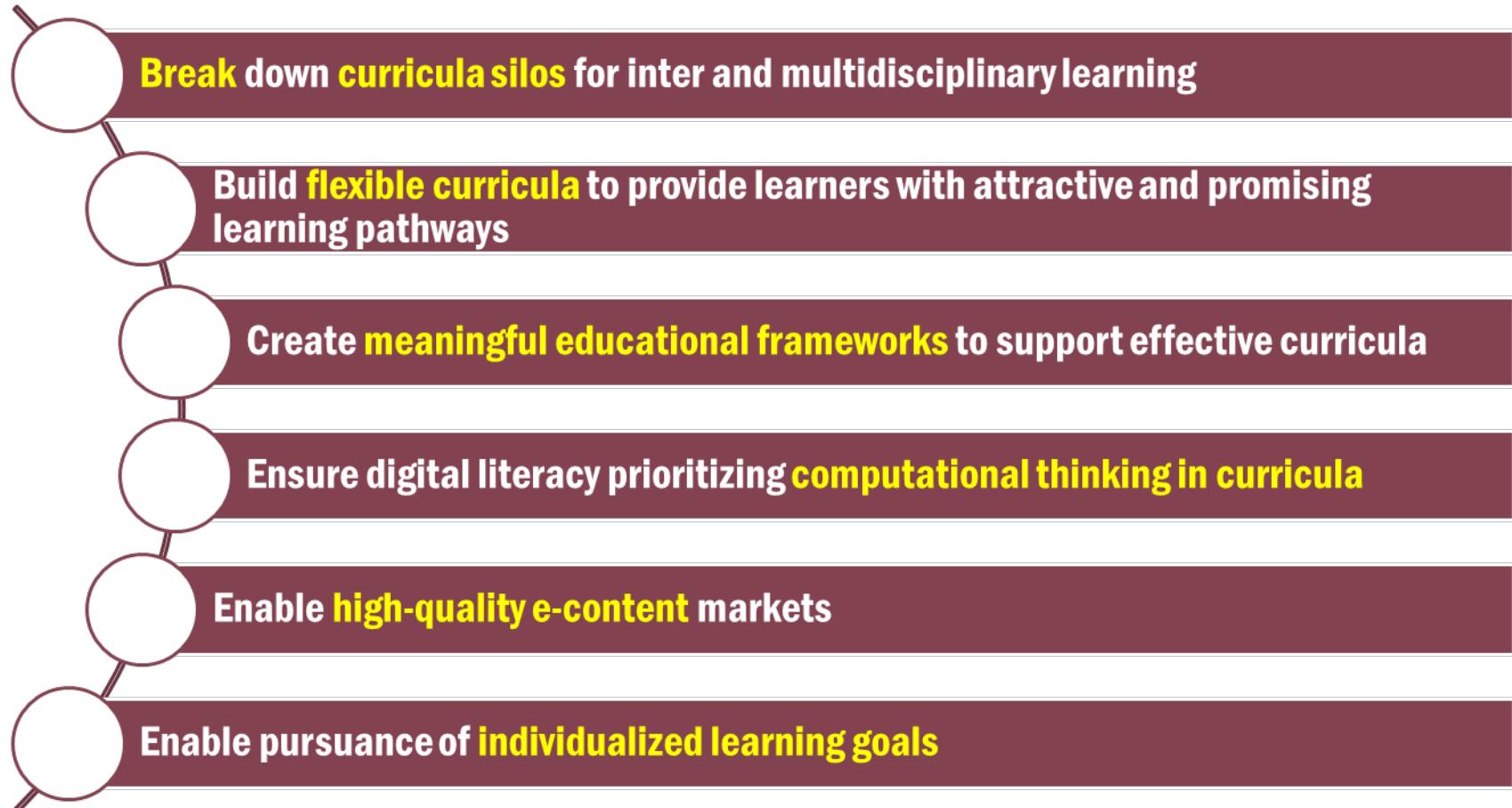
- Enable learners to begin **customizing their learning journeys**
- Develop and extend **new learning platforms**
- Produce **high-quality learning resources** for use in many settings
- Create **robust learning experiences** in **new and non-traditional settings**
- Create synergies of **traditional schools & other established providers**
- Create new connections across learning providers and platforms
- Develop **new forms of infrastructure** for learners to move **across learning structures**

# Teachers and learning agents



- Differentiate roles within the current education system**
- Expand roles in other kinds of learning environments (museums, libraries, ...)**
- Develop new learning agent roles appropriate to many learning environments**
- Support learning agents to collaborate across learning environments and specialties**
- Create appropriate teacher preparation and development systems**
- Establish teacher certification and compensation systems to reflect the full range of their roles and responsibilities**

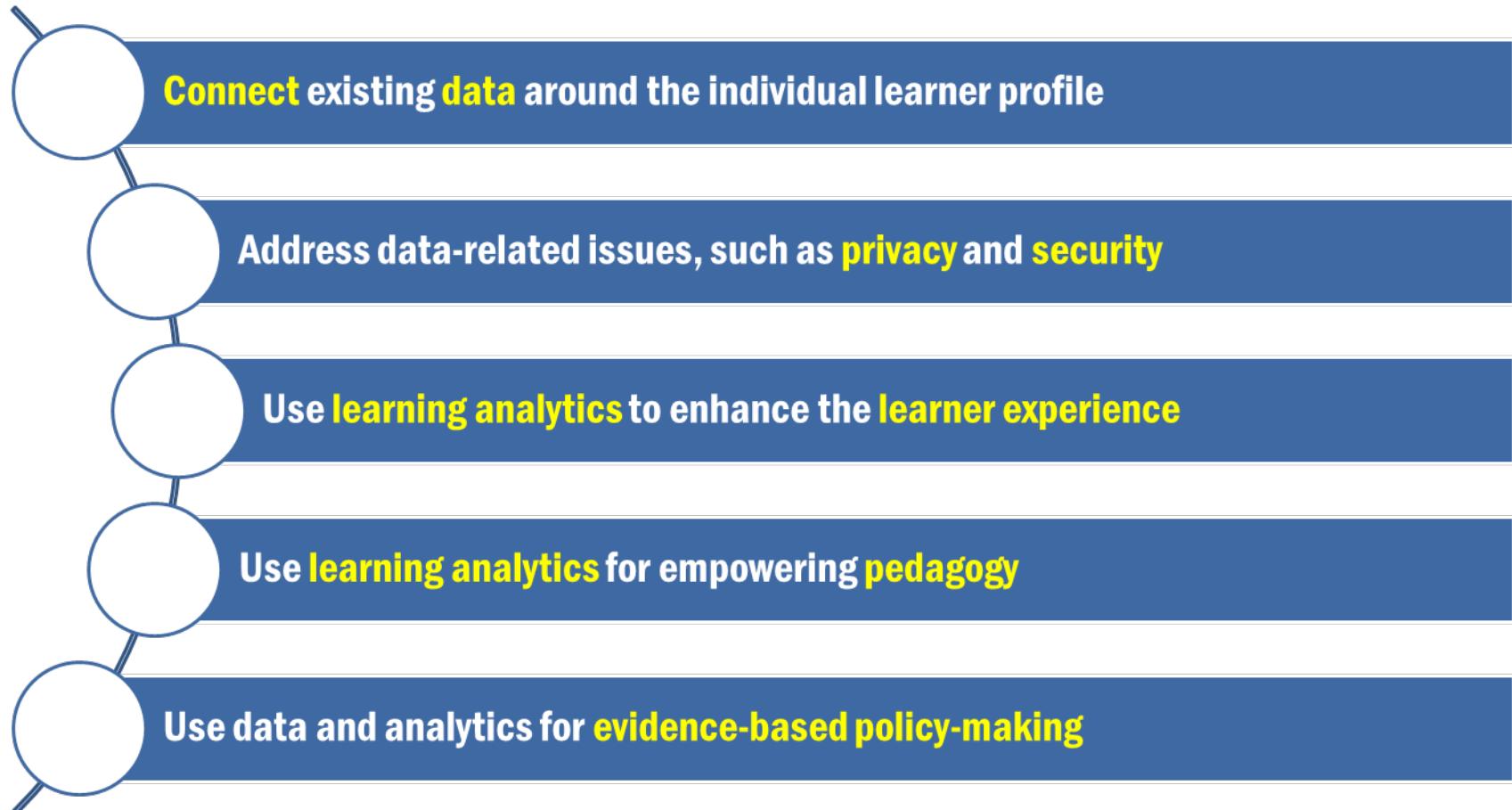
# Curricula and instruction



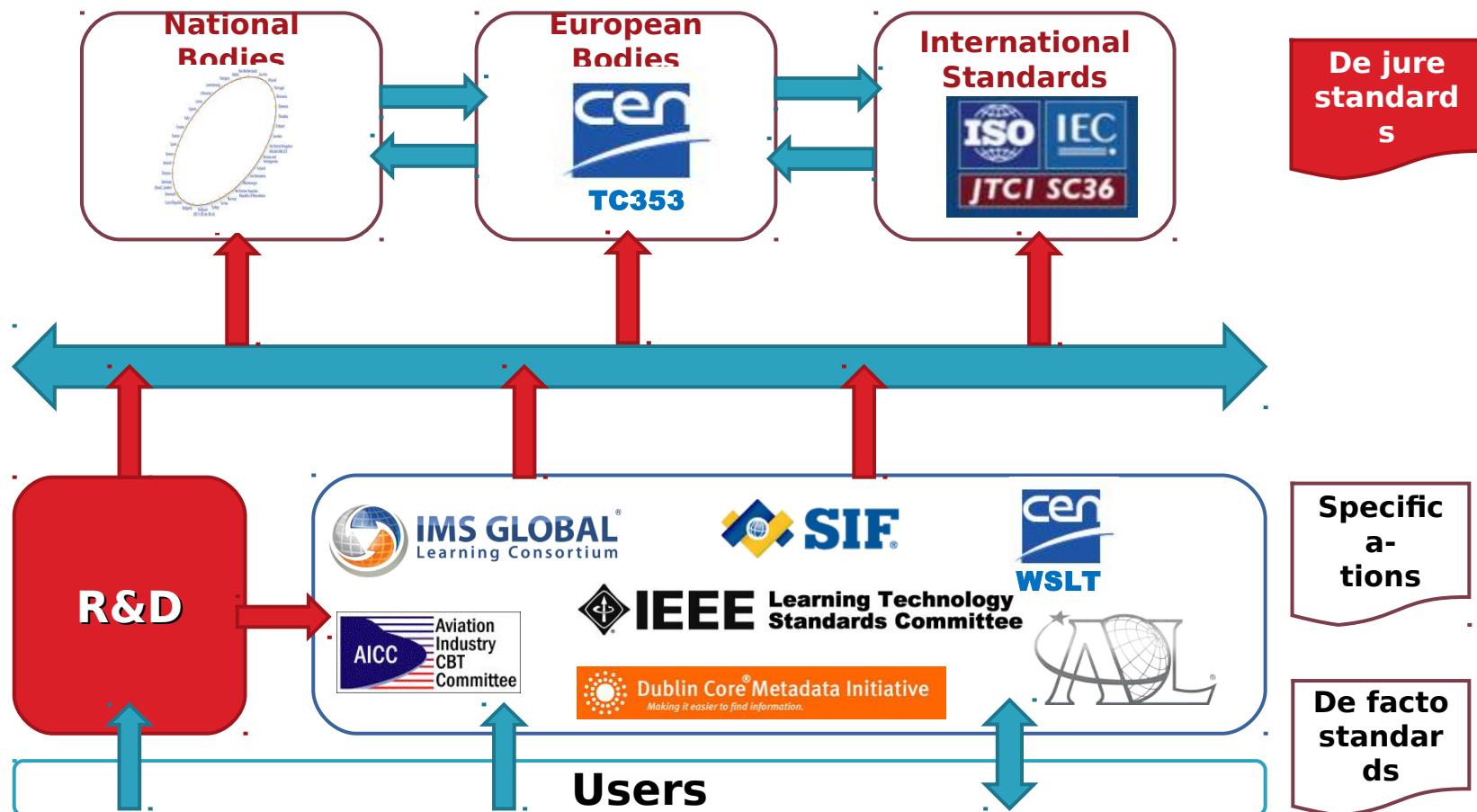
# Assessment and Certification



# Learner-centered data



# International Standards Development



# Learning Object Repositories



**OER Commons, us**

The OER Commons website features a header with "Learning is Sharing" and "Find Free-to-Use Teaching and Learning Content from around the World. Organize K-12 Lessons, College Courses, and more". The main content area includes sections for "OER Materials", "Recommended Resources", "Open Textbooks", "Career and Technical Education", and "OER Materials". A sidebar on the right shows a "Community News" post from May 27, 2011, and a "Browse Collection" sidebar with categories like Arts, Business, Education, Humanities, Mathematics and Statistics, Sciences and Technology, Social Sciences, and more.

**Le@rning Federation, au**

The Le@rning Federation website has a header with "The Learning Federation Schools Online Curriculum Content Initiative". The main content area includes sections for "For jurisdictions", "For teachers", "For developers, partners & publishers", and "Hot topic". A sidebar on the right shows a "Hot topic" section with a "Digital Content" button.



**MERLOT, us**

The MERLOT website features a header with "Welcome to MERLOT" and "Putting Educational Innovations into Practice". The main content area includes sections for "Communities", "Learning Materials", "Member Directory", "My Profile", and "About Us". A sidebar on the left shows a "Browse Collection" sidebar with categories like Arts, Business, Education, Humanities, Mathematics and Statistics, Sciences and Technology, Social Sciences, and more. A sidebar on the right shows a "Log In" form and a "Not a Member? Register Now!" button.

**Jorum, uk**

The Jorum website features a header with "Jorum Learning to Share". The main content area includes sections for "Featured Resources", "Learning to share", and "Welcome". A sidebar on the left shows a "Hot topic" section with a "Digital Content" button.



**Learning Resource Exchange, eu**

The Learning Resource Exchange website features a header with "Home", "News", "About", "Using the portal", and "For content providers". The main content area includes sections for "Find resources", "Integrated resources", and "Find by tags". A sidebar on the right shows a "Log In" form and a "Not a Member? Register Now!" button.

**e-yliko, gr**

The e-yliko.gr website features a header with "Ε-YLIKΟ. GR" and "ΕΛΛΗΝΙΚΟ ΙΝΣΤΙΤΟΥΤΟ ΕΠΙΧΕΙΡΗΣΗΣ ΚΑΙ ΛΕΙΤΟΥΡΓΙΑΣ ΣΧΟΛΙΚΗΣ ΚΑΙ ΚΑΙΡΙΟΥ ΣΧΕΔΙΟΥ". The main content area includes sections for "Επίκαια Ανανεώσιμη Ανάπτυξη", "ΕΠΙΧΕΙΡΗΣΗ ΤΕΧΝΗΣΑ Τ.Ε.Ι.Ε.", and "ΕΠΙΧΕΙΡΗΣΗ ΤΕΧΝΗΣΑ Τ.Ε.Ι.Ε.". A sidebar on the right shows a "Digital Content" button.

# 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				
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	Level 4	Level 5
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.					
<p>Influences and prepares the final Service Level Agreement (SLA) and accounts for the final content.</p> <p>Provides leadership to amend the enterprise strategy with respect to Service Level Agreements (SLA) in order to achieve forecasted results.</p>					—
Dimension 4					
Knowledge examples	<p>Knows/ Aware of/ Familiar with:</p> <p>K1 service level agreement documentation</p> <p>K2 how to compare and interpret management data</p> <p>K3 the elements forming the metrics of service level agreements</p> <p>K4 how service delivery infrastructures work</p> <p>K5 impact of service level non-compliance on business performance</p>				
Skills examples	<p>Able to:</p> <p>S1 analyse service provision records</p> <p>S2 evaluate service provision against service level agreement</p> <p>S3 negotiate realistic service level targets</p> <p>S4 use relevant quality management techniques</p> <p>S5 anticipate and mitigate against potential service disruptions</p>				

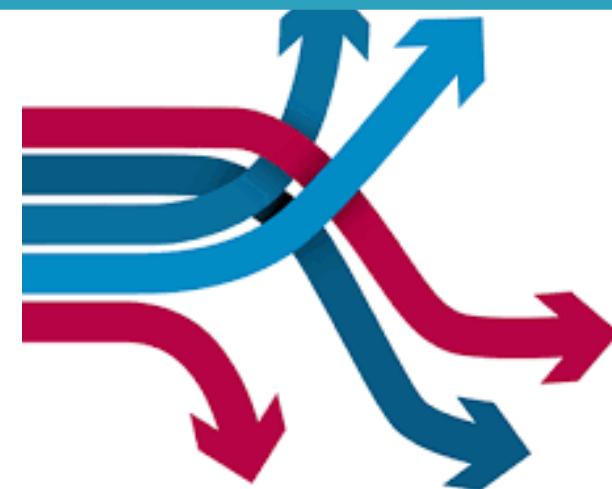
Everything outlined  
in red – everything  
that could possibly  
be separately  
assessed or  
evidenced –  
is a separate  
LOC definition.

# Learning opportunity pathways

Composing Lifelong Learning Opportunity **Pathways** through Standards-based **Services**



Unlocking Pathways to Learning



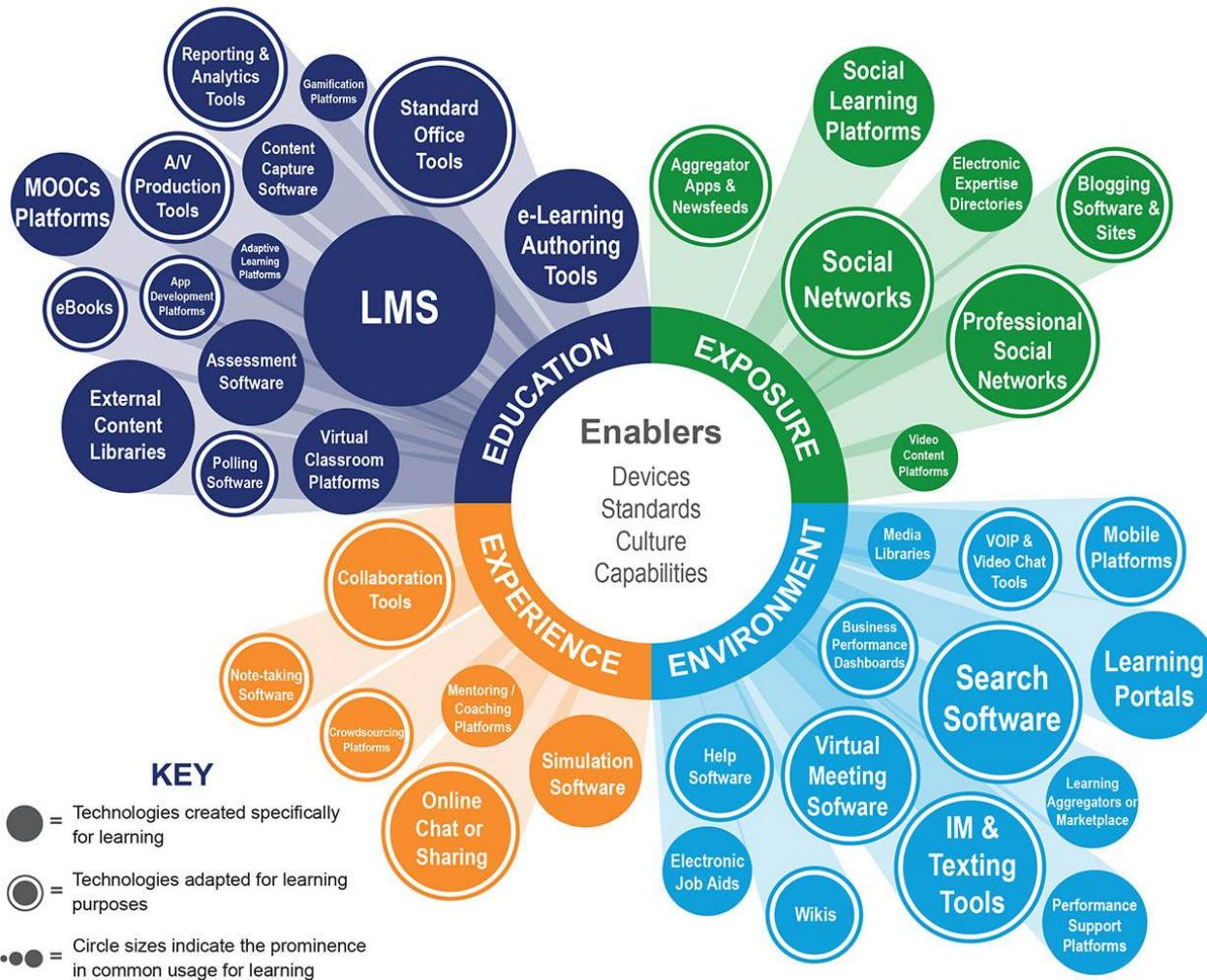
LEARNING  
COMPASS

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

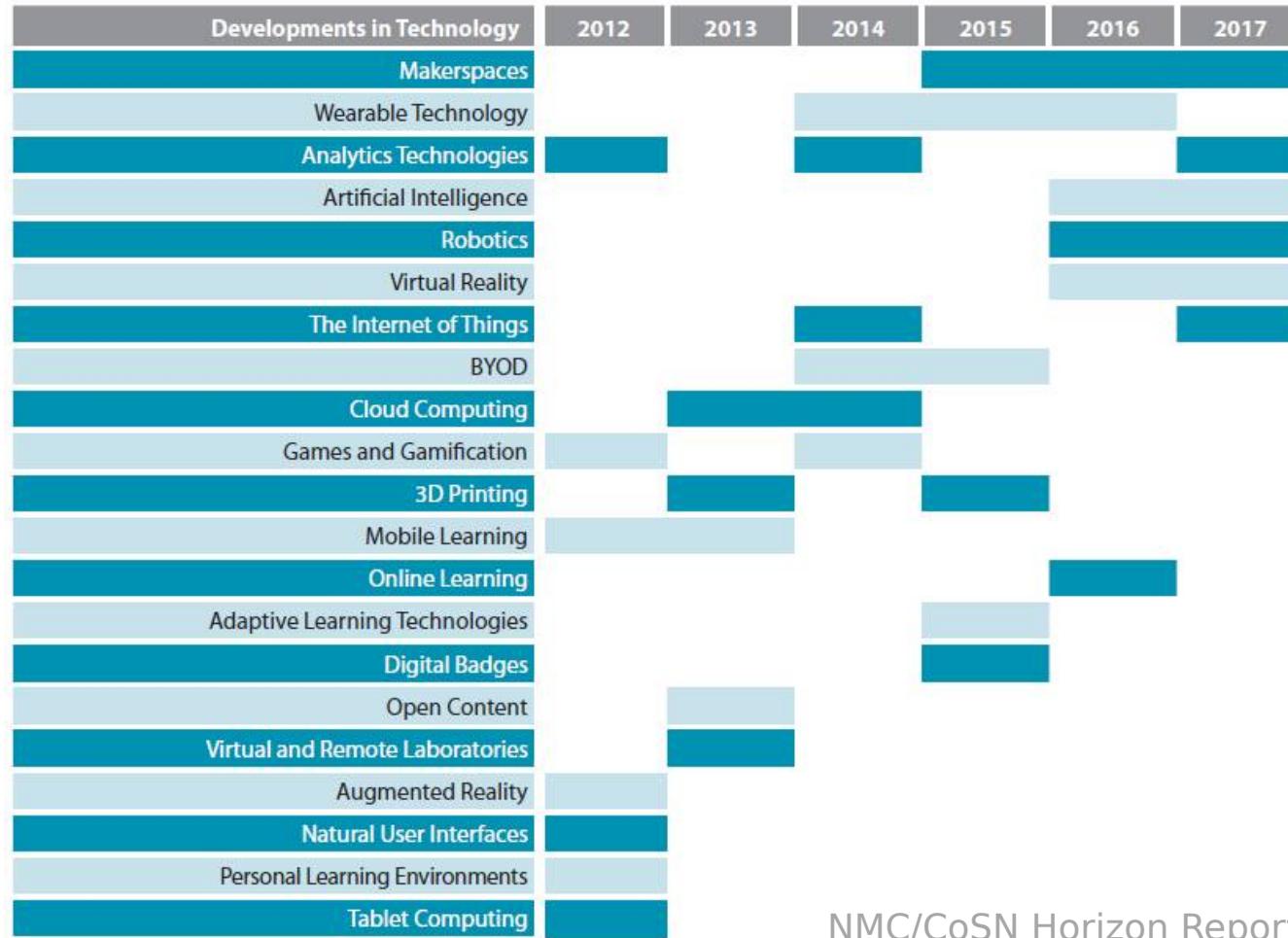
# Learning to employment pathways



# Educational technologies



# New technology developments



NMC/CoSN Horizon Report > 2017 K-12 Edition

# Digital transformation of the learning ecosystem

Personalized learning with adaptive eTextbooks	Digital classroom white boards and display iBeacons			Complete coverage with high performance Wi-Fi
Video recorders for lecture capture			Wearables for athletics and attendance tracking	
International Collaboration and social exchange	Online testing			Supplies and inventory tracking by sensor with auto-reorder
Student devices & eTextbooks <ul style="list-style-type: none"><li>• Notebooks</li><li>• Tablets</li><li>• Smartphones</li></ul>				Makerspaces with 3D printers and laser trimmers
File and program storage, local or cloud-based <ul style="list-style-type: none"><li>• Demographics, academics, behavior, interests</li><li>• LMS, CMS, SIS</li><li>• Educational programs and applications</li><li>• Video files: lectures and recorded lab experiments</li></ul>				Internet of Things-based HVAC
	Robotics for STEM and remote presence			Monitor and display of air quality throughout school
Network application analytics to monitor devices and network behavior		Surveillance security cameras		Sensors track buses and verify student passengers
		Wi-Fi sensors and locks <ul style="list-style-type: none"><li>• Entrances and exits</li><li>• Classroom doors</li></ul>		Sensors in parking lot and driveways

### Global Education Platforms

Global learning platforms will serve millions of people across the world, acquiring new knowledge and skills for their personal and professional development. Some of these platforms will become open online universities, while others will be integrated into popular social networks and online communities. Learning will be highly personalized and adapted to students' personal needs, their learning style and abilities, and even their current mood and body condition. Students will be able to learn individually and in teams, using a variety of learning resources and technologies. Teachers & mentors, in their turn, will be able to facilitate students with learners from many regions, breaking beyond the limitations set upon them by cultural restrictions.

### Personalized Education

Personalized education trajectories will support individual learners from the cradle until the great age. These trajectories will involve education, work, leisure, health, volunteering and hobbies, leisure, entertainment, and community life. Personalized education will be guided by life models, which will be used to support learners in their personal development, conduct new projects and create new art & craft objects. Personal trajectories will connect people with communities where they can learn, work, socialize, and play. Financial institutions will support personalized learning to open opportunities for new types of investment such as direct talent investments and educational insurance.



## FUTURE EDUCATION MAP

### Cities & Urban Communities

Urban environments across the world will grow into connected human-friendly communities, where learning, socializing, working and playing will become interconnected activities with support of mobile technologies, the Internet of Things, and sensors. Local governments will help citizens learn and share with their neighborhood communities. People will be involved into long games where daily routines will be combined with online playing and educational tasks. They will be able to learn from their neighbors, their local government, and will work together to raise their cities. Cities through various forms of do-it-yourself – community gardens, fab labs, fabify / new-track labs, and more. Urban learners will get support from family universities, where they will collectively learn how to care better about their families, their children and minors, and their peers.

### Knowledge Creation Communities

Moving into a knowledge-based economy will mean moving from a knowledge worker knowledgebase will need rapidly through digitization, raising our preference for digitized knowledge – in form of data, models, and algorithms. We will need digital models and objects, whose knowledge is derived from large amounts of data. We will need better knowledge organization that will be accompanied with the support of high-level artificial intelligence (AI). As a result, knowledge creation communities will be the hubs of practices and working groups, training and organizing knowledge as it is living created – and immediately translating it into 'use' – textbooks and learning materials if necessary. Due to use of many forms of knowledge creation, standards for intellectual property rights will be significantly challenged and accurately defined.

# Overview

**21<sup>st</sup> 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**

# European Requirements 2000



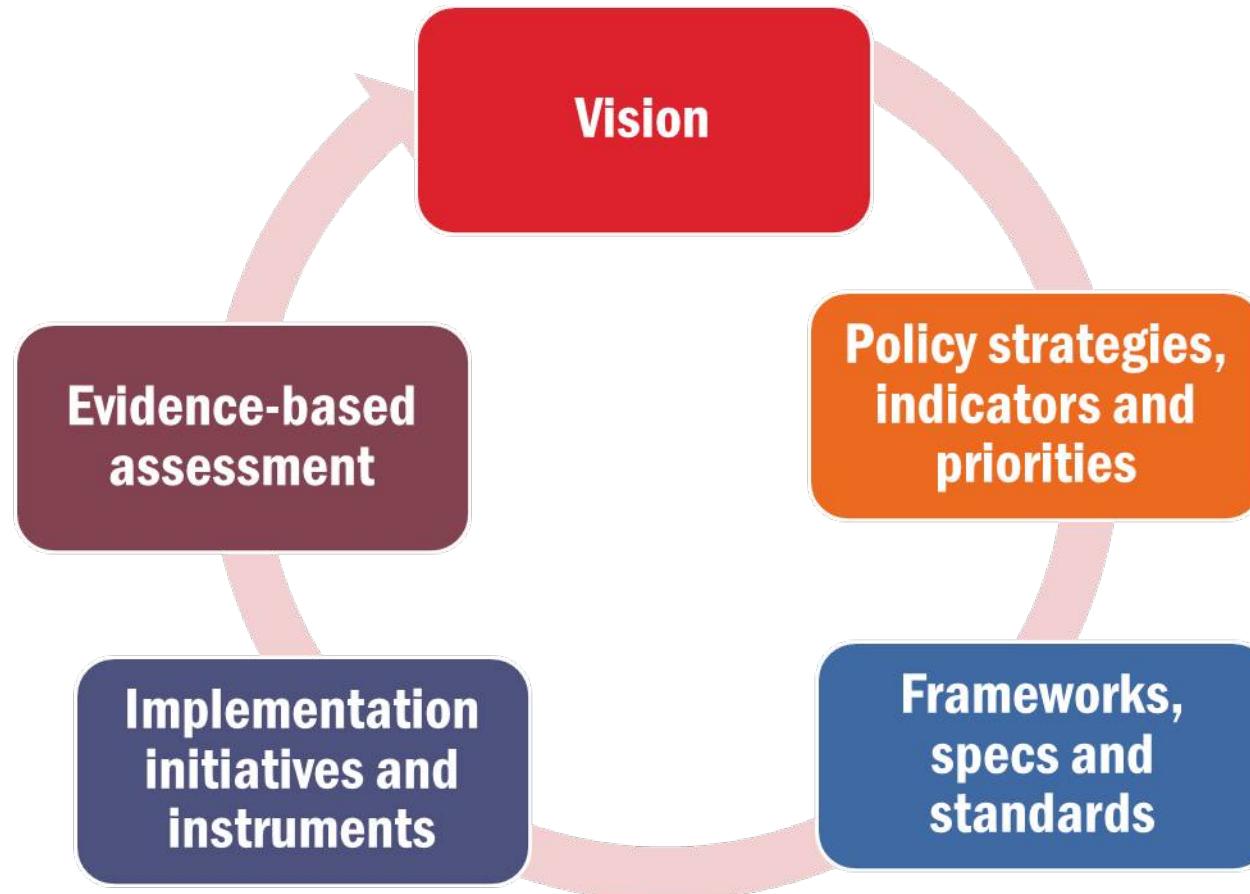
The EU should become “the most **competitive** and **dynamic knowledge-based economy** in the world capable of sustainable economic growth with more and better jobs and greater social cohesion”.

The achievement of this ambitious goal involves “not only a radical transformation of the European economy, but also a **challenging programme** for the **modernization** of social welfare and **education systems**”.



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

# 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

Implementation of  
ET 2020 LLL  
principles  
**flexible learning  
pathways,**  
**attractiveness of  
VET**

Ensure that  
**competences are  
acquired and  
recognised**  
throughout all  
levels and forms of  
learning

Improvement of  
**skills needs  
forecasting**

**Partnerships and  
common language**  
between the worlds  
**of business,  
employment,  
education &  
training**

# 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 sustainability and social cohesion in a knowledge 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**



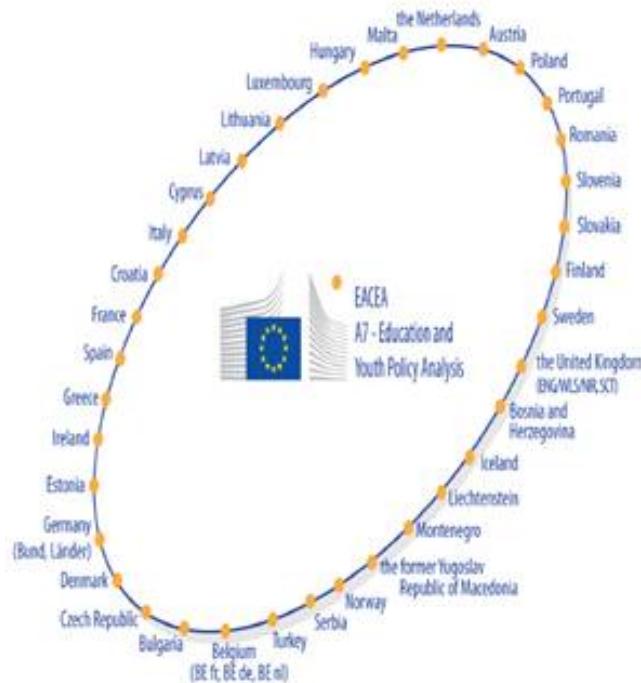
**Transparency and recognition of skills and qualifications to facilitate learning and labour mobility**



**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)



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

# Overview

**21<sup>st</sup> 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**

# Shift to Learning Outcomes

## Learning outcomes

**“what a learner knows, understands or is able to do at the end of a learning process”**

**Emphasis on ability to do irrespective of routes of acquisition**

**Associated with a learner-centered approach**

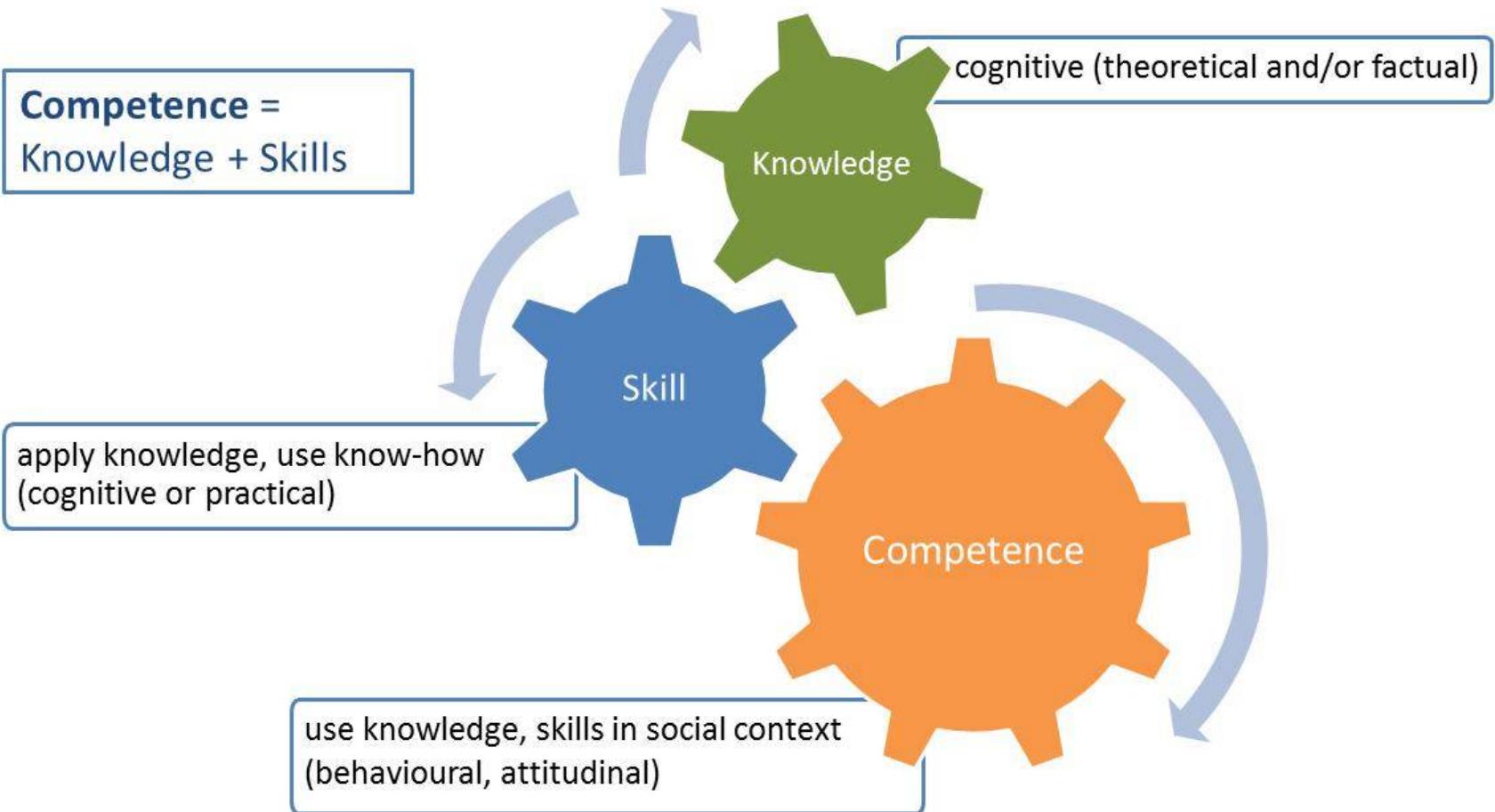
**Facilitates validation of non-formal and informal learning**

**Supports better matching between education and training provisions and labour market needs**

**Increases transparency of qualifications**

**Promotes mobility, employability, adaptability**

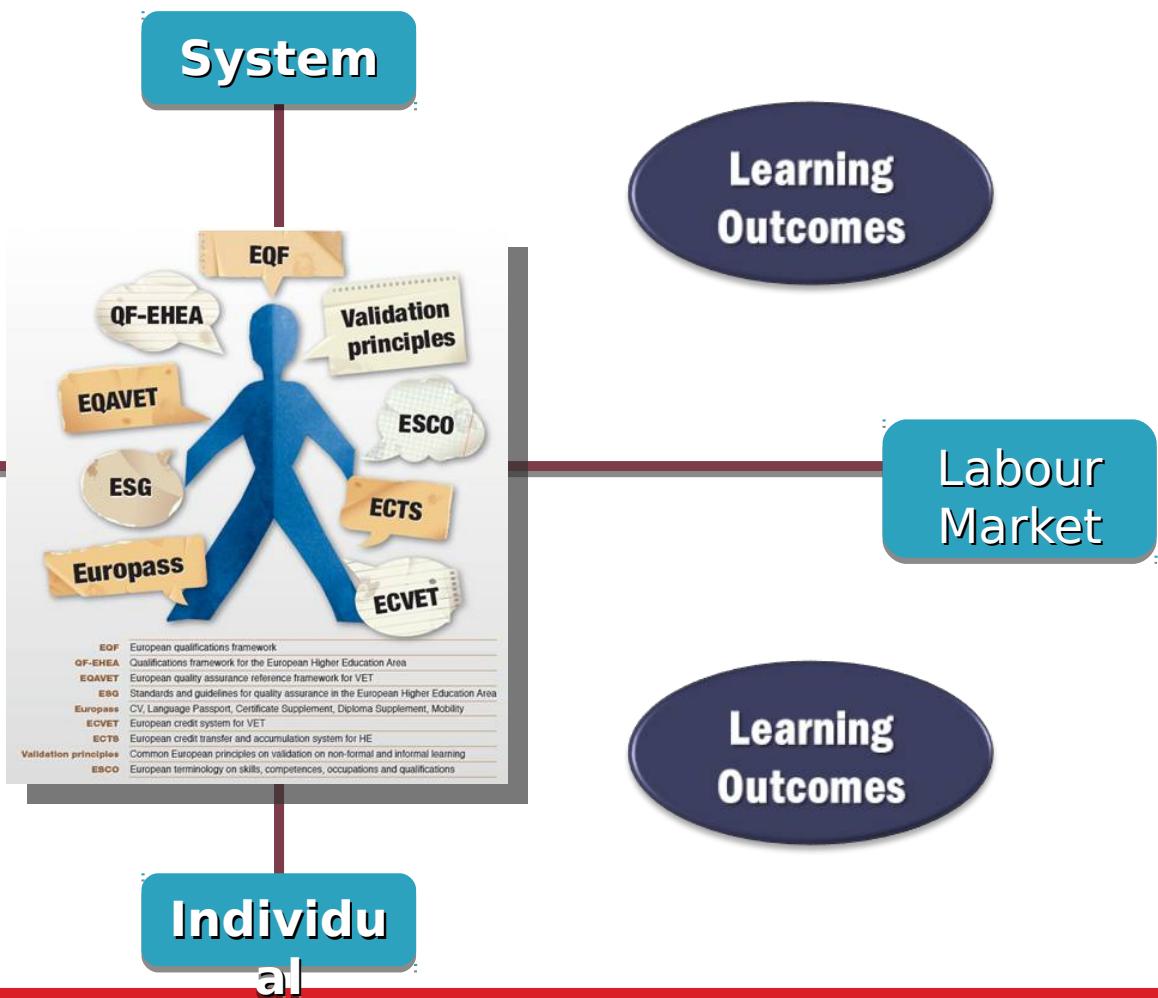
# Typology of Learning Outcomes



# EU Competence frameworks



# Skills and qualifications transparency instruments



# European Qualifications Framework

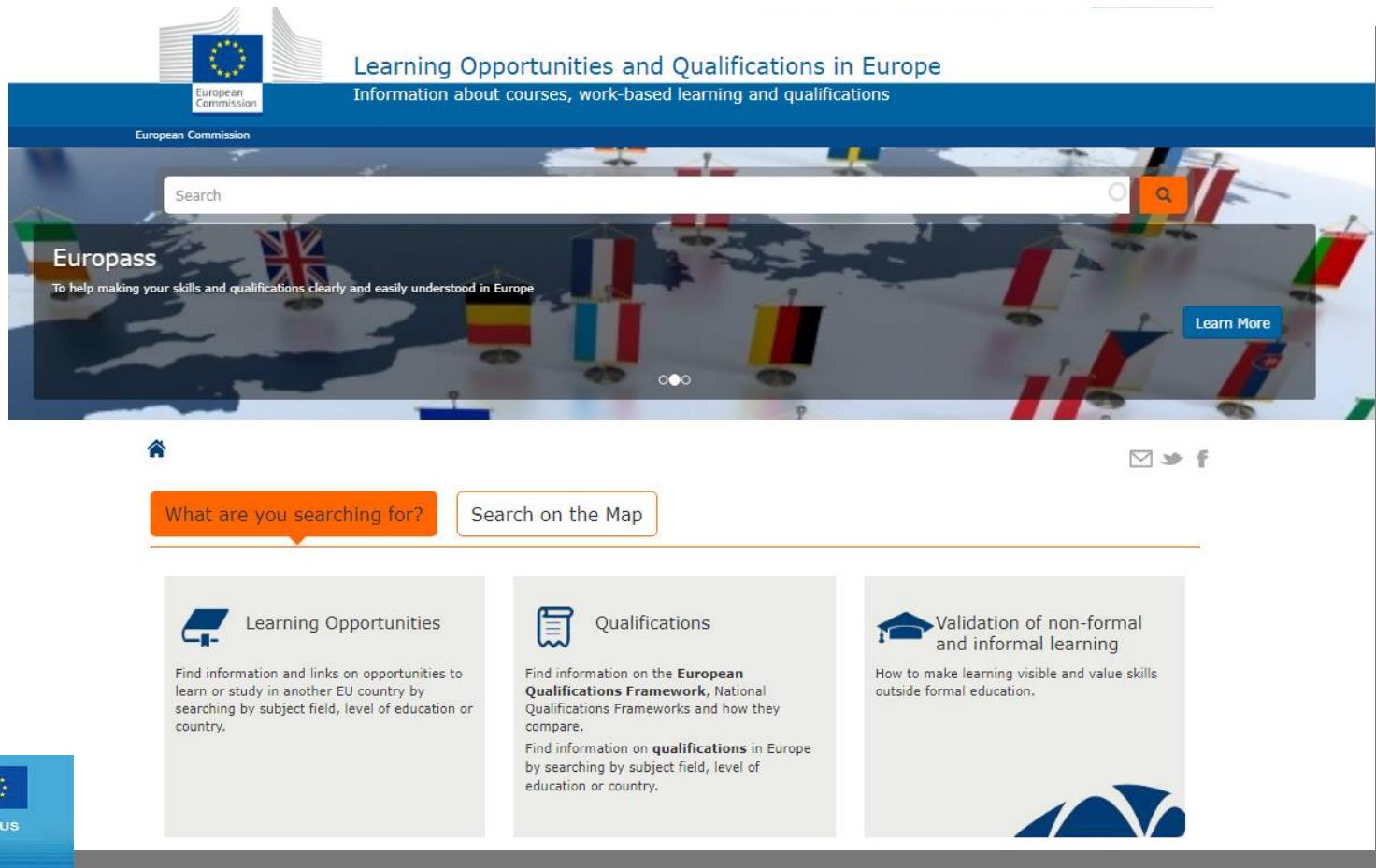
<b>KNOWLEDGE</b>			
<b>SKILLS</b>			
<b>COMPETENCE</b>			
Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.	In the context of EQF, knowledge is described as theoretical and/or factual.	In 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.
<b>LEVEL 1</b> The learning outcomes relevant to <u>Level 1</u> are	<ul style="list-style-type: none"><li>basic general knowledge</li></ul>	<ul style="list-style-type: none"><li>basic skills required to carry out simple tasks</li></ul>	<ul style="list-style-type: none"><li>work or study under direct supervision in a structured context</li></ul>
<b>LEVEL 2</b> The learning outcomes relevant to <u>Level 2</u> are	<ul style="list-style-type: none"><li>basic factual knowledge of a field of work or study</li></ul>	<ul style="list-style-type: none"><li>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</li></ul>	<ul style="list-style-type: none"><li>work or study under supervision with some autonomy</li></ul>
<b>LEVEL 3</b> The learning outcomes relevant to <u>Level 3</u> are	<ul style="list-style-type: none"><li>knowledge of facts, principles, processes and general concepts, in a field of work or study</li></ul>	<ul style="list-style-type: none"><li>a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information</li></ul>	<ul style="list-style-type: none"><li>take responsibility for tasks in work or study</li><li>adapt own behaviour in accordance with circumstances in solving problems</li></ul>
<b>LEVEL 4</b> The learning outcomes relevant to <u>Level 4</u> are	<ul style="list-style-type: none"><li>factual and theoretical knowledge in broad contexts within a field of work or study</li></ul>	<ul style="list-style-type: none"><li>a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study</li></ul>	<ul style="list-style-type: none"><li>exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change</li><li>supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities</li></ul>



# EUROPASS Service

The screenshot shows the Europass Service homepage. At the top left is the Europass logo with a yellow star and the text '100 million CVs online 2005-2017'. To its right is the tagline 'Opening doors to learning and working in Europe'. The top right features links for 'Visually impaired', 'Frequently asked questions', 'Glossary', 'Interoperability', a search icon, and a language dropdown set to 'English - (en)'. The main navigation menu includes 'Home', 'About Europass', 'Europass documents', 'Europass and you', 'Learning and working in Europe', and 'Resources'. The central content area is titled 'Curriculum Vitae' and 'European skills passport'. It lists 'Language passport', 'Europass Mobility', 'Diploma Supplement', and 'Certificate Supplement'. Below these are three buttons: 'Create your CV (+ cover letter) online', 'Update your CV (PDF+XML) online', and 'Download the CV template and instructions'. A 'Examples' button is also present. A 'LEARN MORE' button with a right-pointing arrow is located at the bottom of this section. To the right, a large blue sidebar contains a yellow question mark icon and a list of frequently asked questions: 'What is Europass?', 'How to complete a Europass CV?', 'How to become interoperable with Europass?', 'I am not a European citizen. Can I use the Europass CV?', and 'Which Europass documents do I need?'. Below this is a 'FREQUENTLY ASKED QUESTIONS' link with a right-pointing arrow. At the bottom right of the sidebar is a 'SEARCH' button with a magnifying glass icon. A small image of a Europass CV template is visible at the bottom left of the main content area.

# European PLOTEUS Service



The screenshot shows the homepage of the European PLOTEUS Service. At the top, the European Commission logo is displayed next to the text "Learning Opportunities and Qualifications in Europe" and "Information about courses, work-based learning and qualifications". Below this, a banner for "Europass" is shown, featuring a map of Europe and various national flags, with the text "To help making your skills and qualifications clearly and easily understood in Europe" and a "Learn More" button. The main navigation bar includes links for "Home", "What are you searching for?", and "Search on the Map". Below the navigation, three main service sections are presented: "Learning Opportunities" (with a 4 icon), "Qualifications" (with a book icon), and "Validation of non-formal and informal learning" (with a graduation cap icon). Each section includes a brief description and a "Read More" button. The bottom left corner features a logo for "PLOTEUS" with a paper boat icon on a blue background.

Learning Opportunities and Qualifications in Europe  
Information about courses, work-based learning and qualifications

Europass

To help making your skills and qualifications clearly and easily understood in Europe

Learn More

What are you searching for? Search on the Map

Learning Opportunities

Find information and links on opportunities to learn or study in another EU country by searching by subject field, level of education or country.

Qualifications

Find information on the **European Qualifications Framework**, National Qualifications Frameworks and how they compare.

Find information on **qualifications** in Europe by searching by subject field, level of education or country.

Validation of non-formal and informal learning

How to make learning visible and value skills outside formal education.

PLOTEUS

# 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



- **freely accessible, openly licensed educational material**

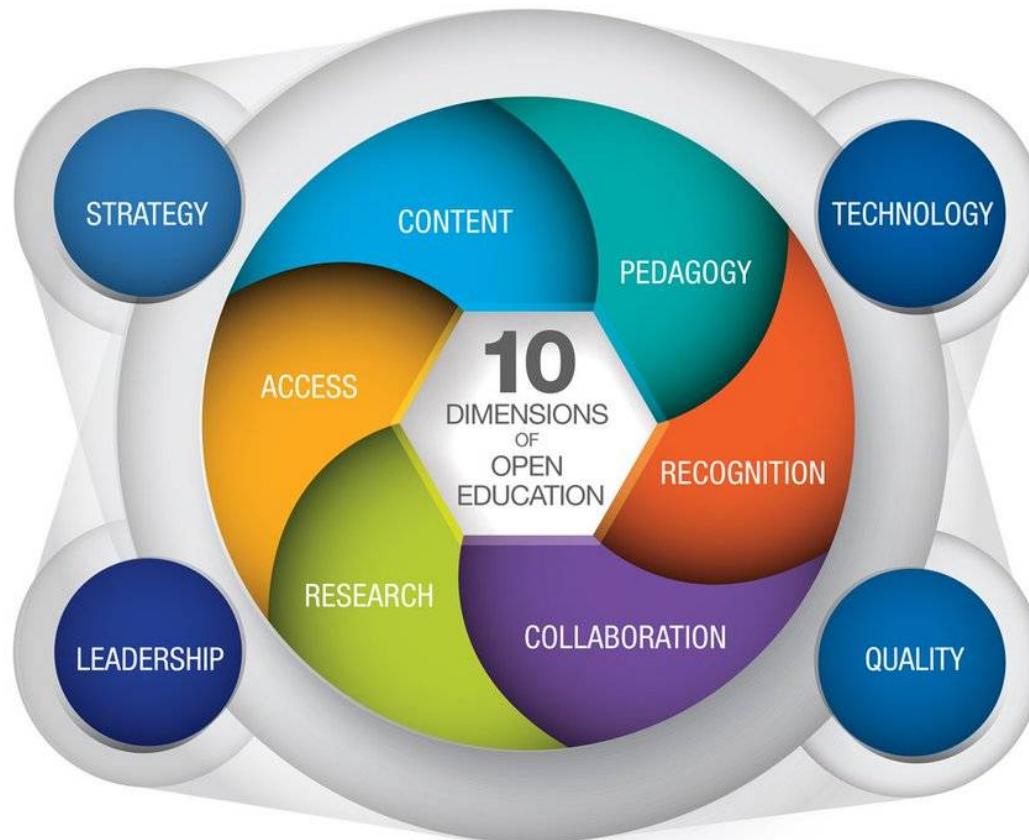


- **draw upon open technologies and high-quality open educational resources in order to facilitate collaborative and flexible learning**

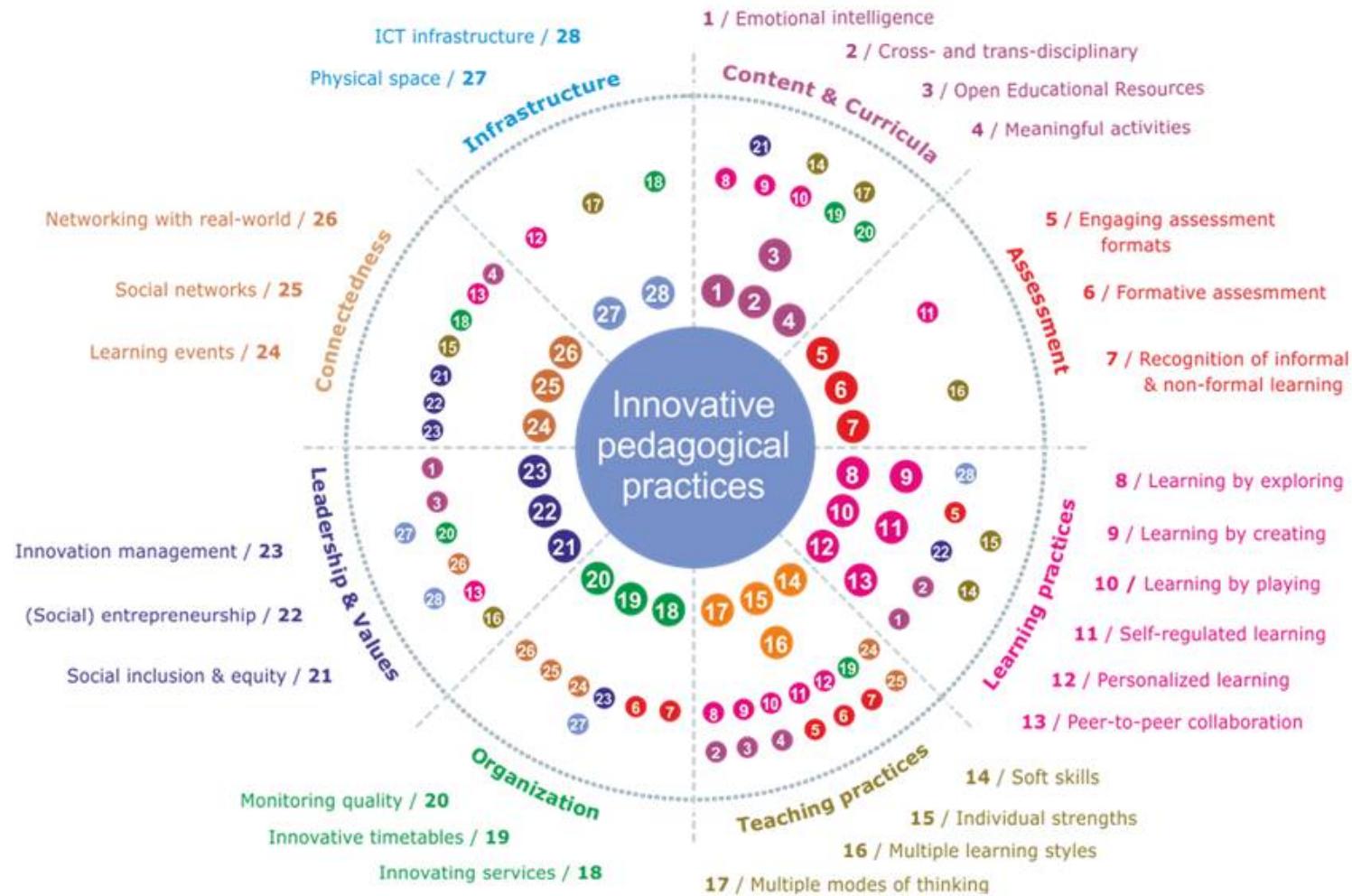


- **Learners are involved in establishing the context and activities. They determine what, when and how learning will occur. Learning is a social negotiation.**

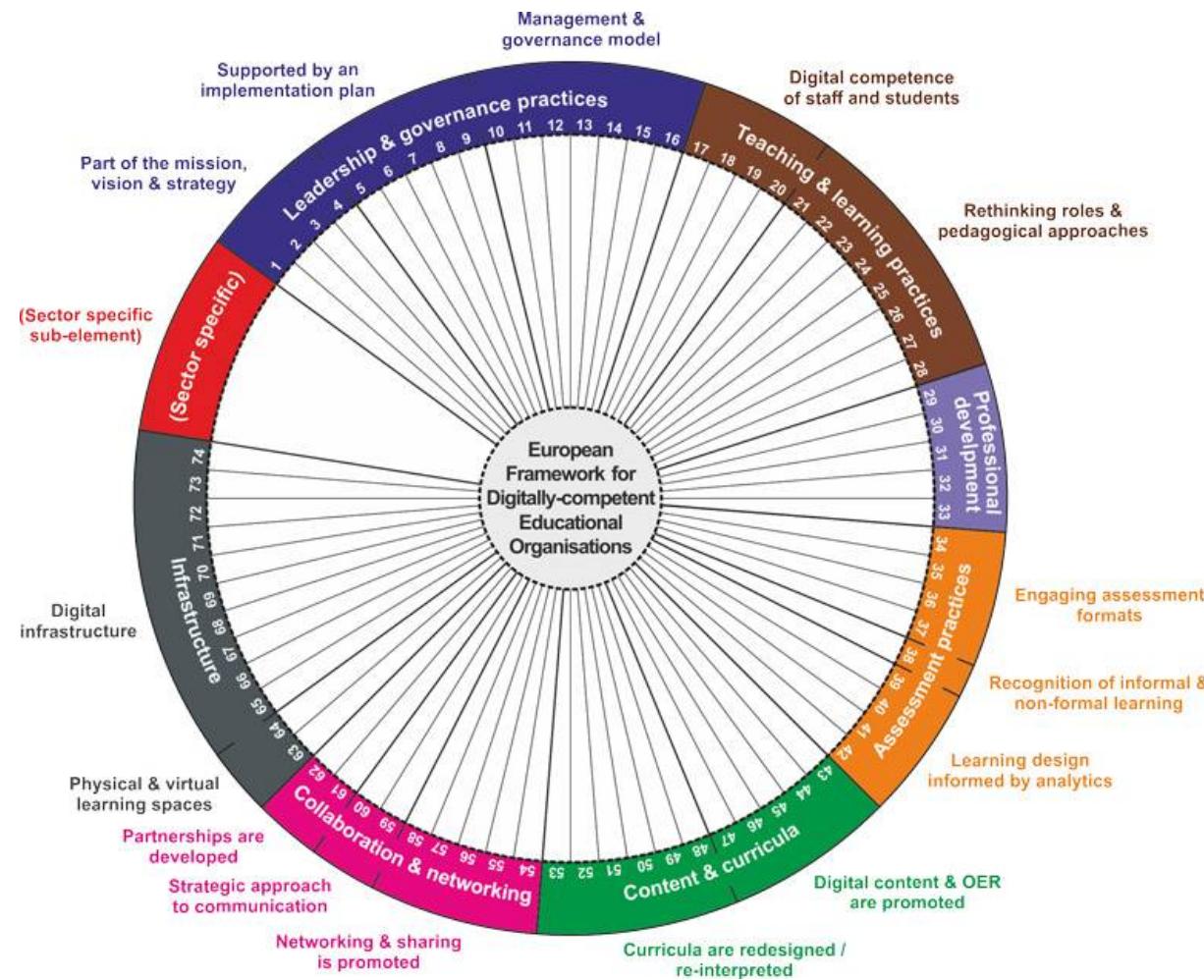
# The European Open Education framework



# Innovative pedagogical practices



# 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 the **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**:

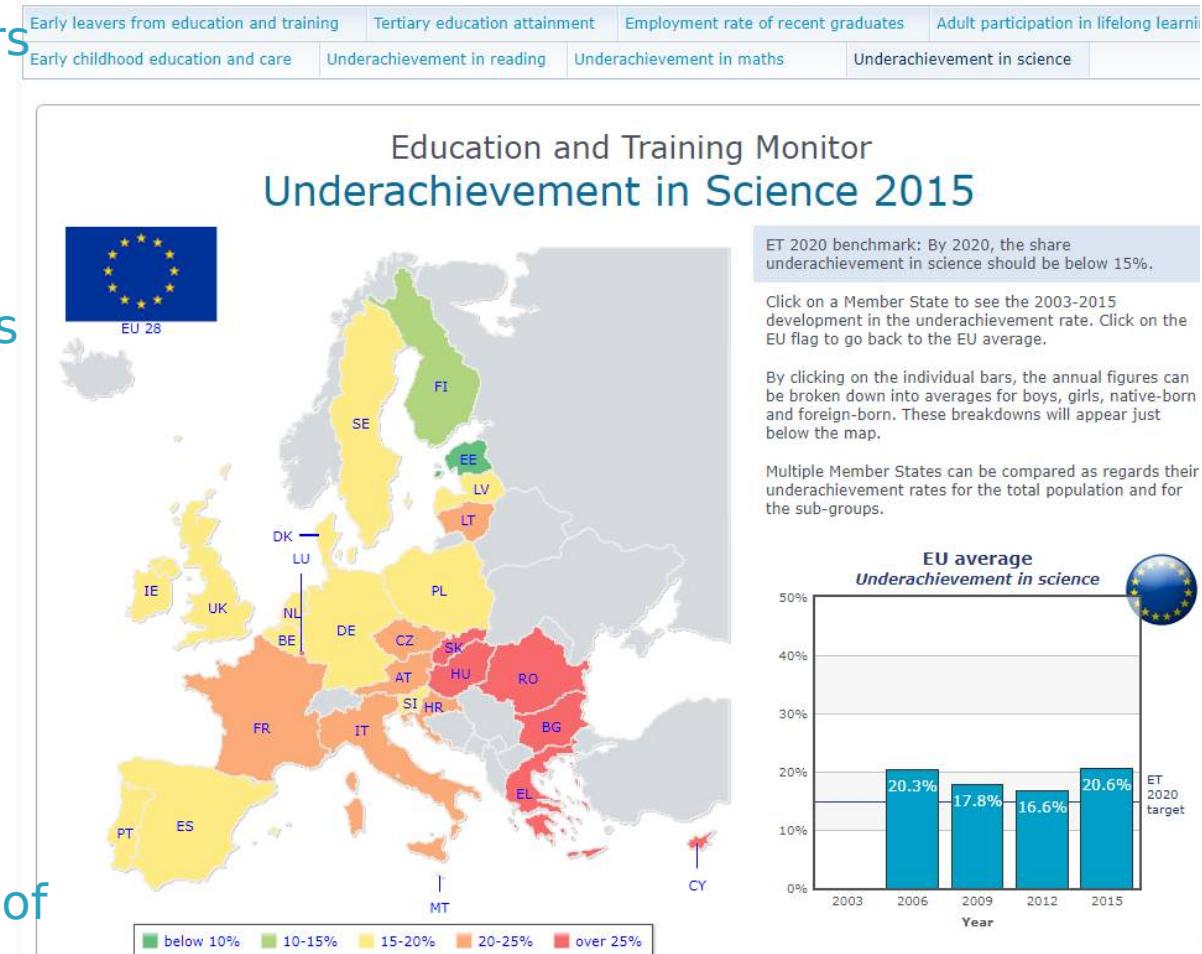
Finland (5.87%)  
Luxembourg (4.06%)  
Slovenia (3.90%)  
United Kingdom (3.77%)  
Sweden (3.53%)

#### 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

**21<sup>st</sup> century challenges**

**Building the ‘new’ learning ecosystems**

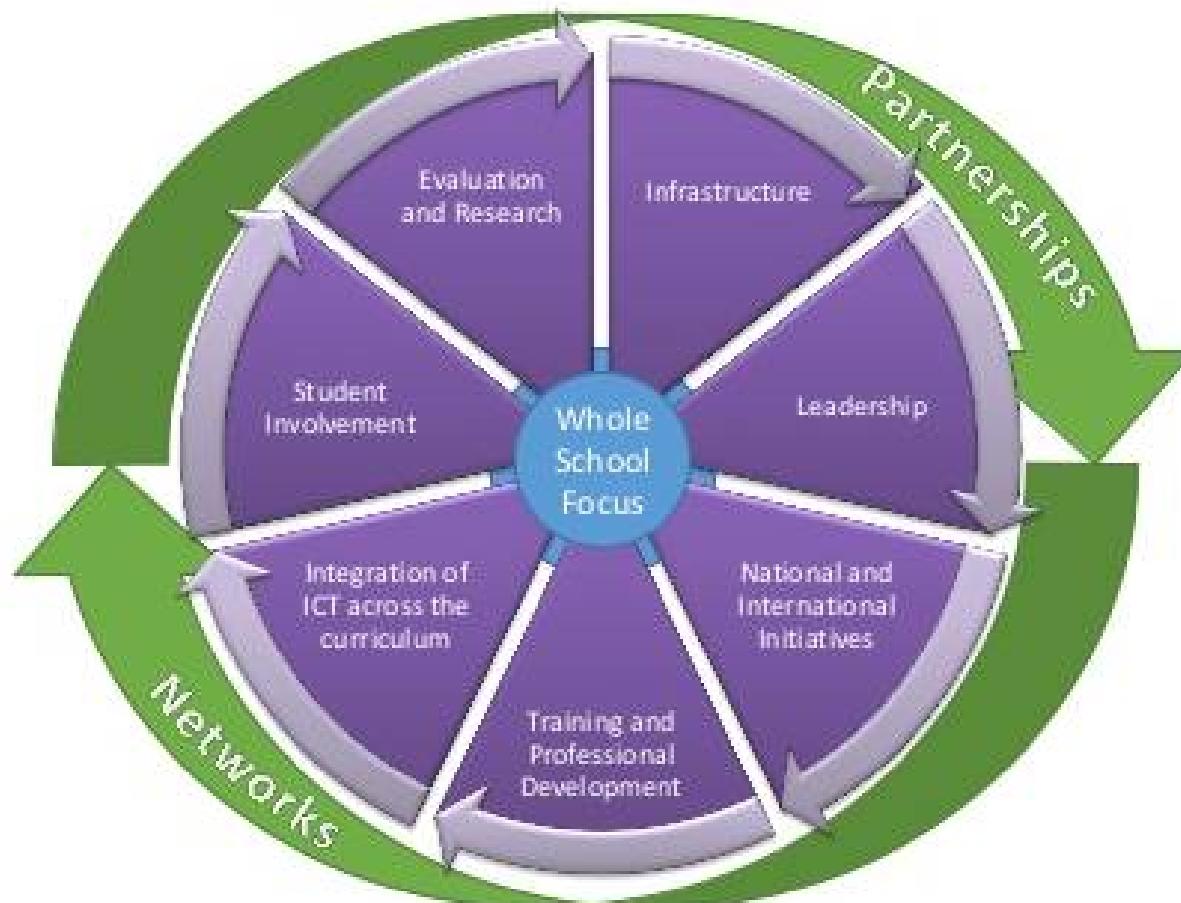
**Europe’s vision and strategic frameworks**

**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’



# 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 more focus 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 of 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)

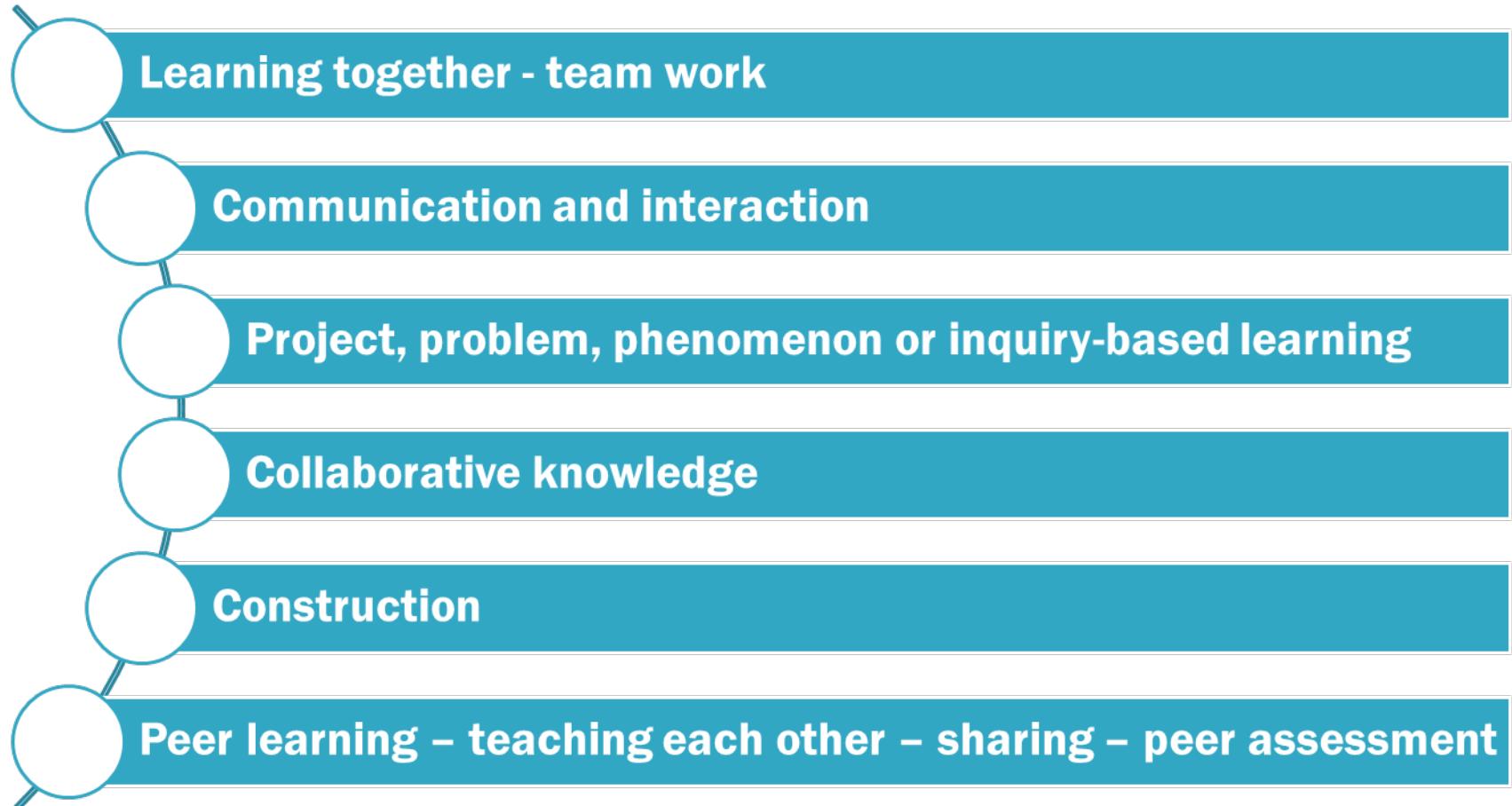
## Support teachers and school leaders for excellent teaching and learning

**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

**Student-centred throughout the learning process, supporting student engagement**

**Active and hands-on**

**Inter-disciplinary and cross-curricular**

**Aiming at deeper knowledge and understanding**

**Based on real-life phenomena and authentic problems**

# Collaboration requires

Planning and design

Communication and intercultural skills

Readiness to share

Critical thinking and ability to tolerate critique

Creativity

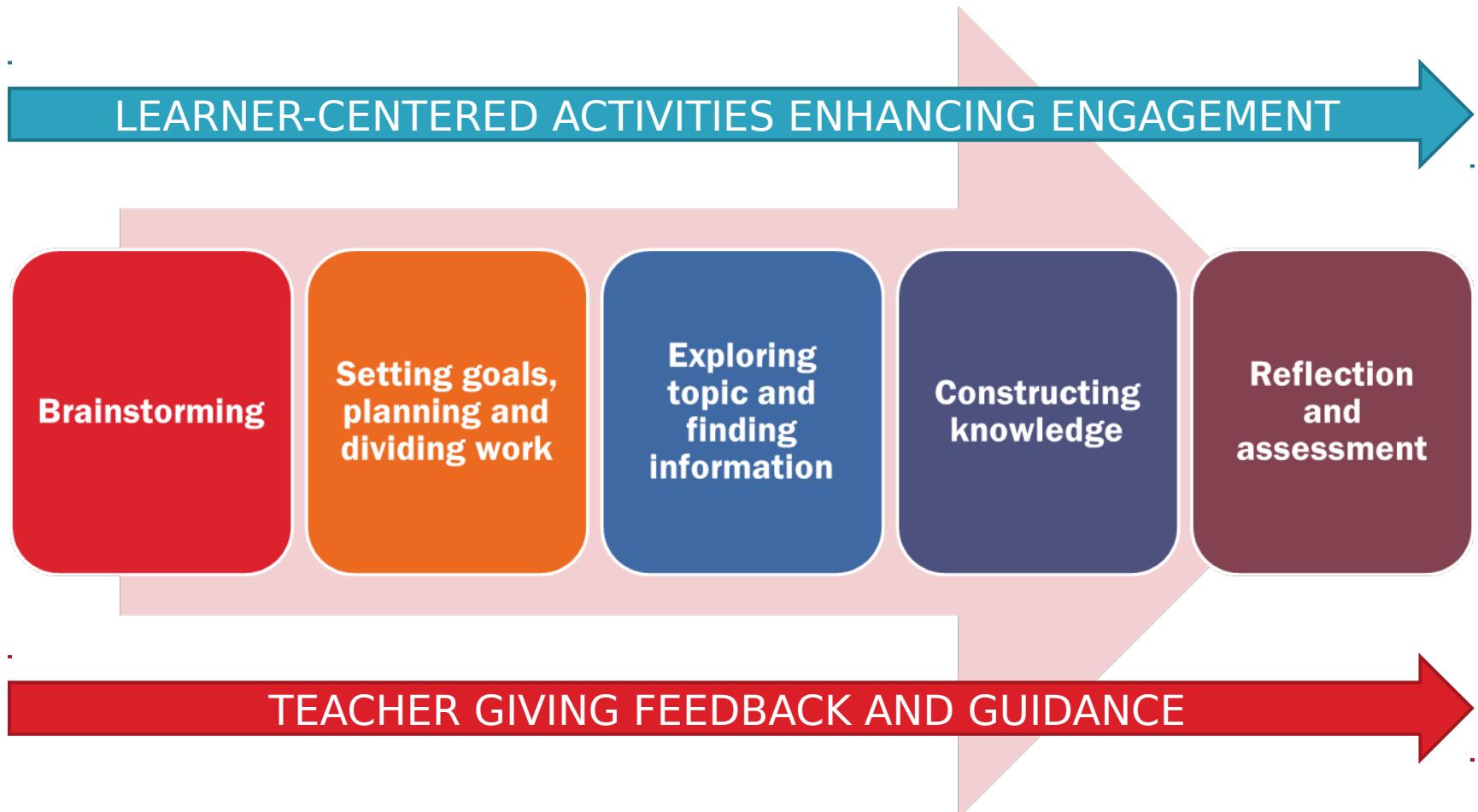
Responsibility – doing one's share and sticking to the timetable

Flexibility

Goal-orientation

Self-regulation

# Learning process



# Funding and implementation



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**



DIGITAL CITIZENSHIP



INNOVATION



STEM

- 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



Transforming education in Europe

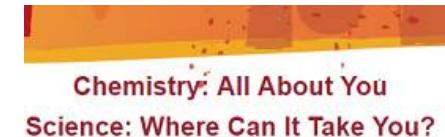


Better  
Internet for  
Kids

COMPUTHINK







PORTAL   ETWINNING LIVE   MY GROUPS   MY TWINSPLANES   ENGLISH   [LOGIN or REGISTER](#)

 [eTwinning](#)   [About](#)   [Projects](#)   [Professional development](#)   [Highlights](#)   

Let's start eTwinning!



**eTwinning** is the community for schools in Europe.

eTwinning offers a platform for staff (teachers, head teachers, librarians, etc.), working in a school in one of the European countries involved, to communicate, collaborate, develop projects, share and, in short, feel and be part of the most exciting learning community in Europe.

[Join the eTwinning Community](#) >

4/10 schools in Europe

 517465 TEACHERS	 189295 SCHOOLS	 66308 PROJECTS
---	--	--

[f](#) [t](#) [You Tube](#) [✉](#) [#EdGateway](#)

 European Commission | [About](#) | [English](#) | [Log in / Register](#)

## School Education Gateway

Europe's online platform for school education

[Home](#) | [LATEST](#) | [VIEWPOINTS](#) | [RESOURCES](#) | [ERASMUS+ OPPORTUNITIES](#) | [TEACHER ACADEMY](#) 

[Home](#) > [About](#)

## About

Presented in 23 European languages, the School Education Gateway is a single point of entry for teachers, school leaders, policy makers, experts and other professionals in the school education field. Join today and stay informed about European policy and action for schools!



The illustration shows a diverse group of seven school professionals standing together. From left to right: a young boy in a plaid shirt, a woman in a dark blazer, a man in a red vest, a man in a grey suit with a play button icon on his forehead, a woman in a red dress, a man in a dark suit, and a woman in a white lab coat with glasses. They are standing in front of a green circular background that suggests a globe or a window.

# Overview

**21<sup>st</sup> century challenges**

**Building the ‘new’ learning ecosystems**

**Europe’s vision and strategic frameworks**

**European best practices for digital transformation**

**The K-12 education sector**

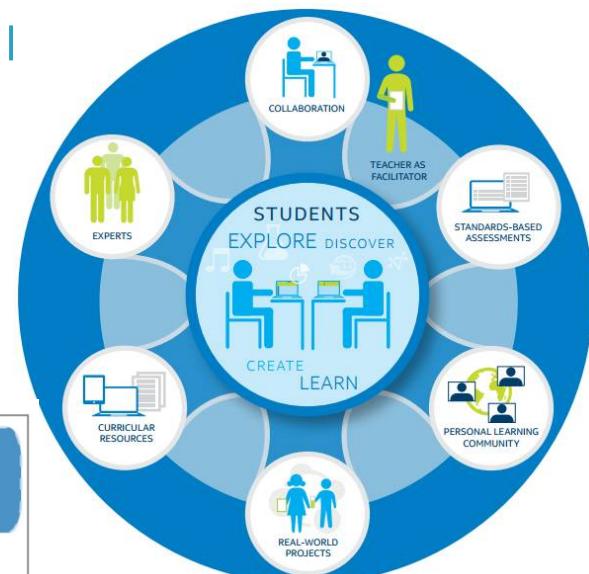
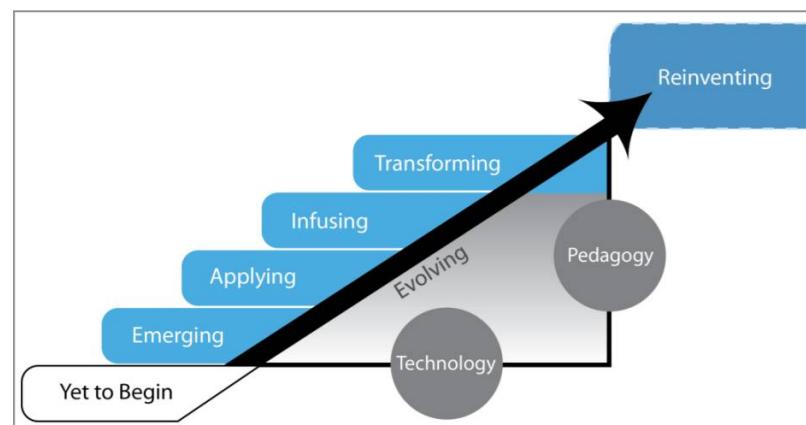
**Closing Remarks**

# Transformation of Education

“ Education drives development by transforming lives.

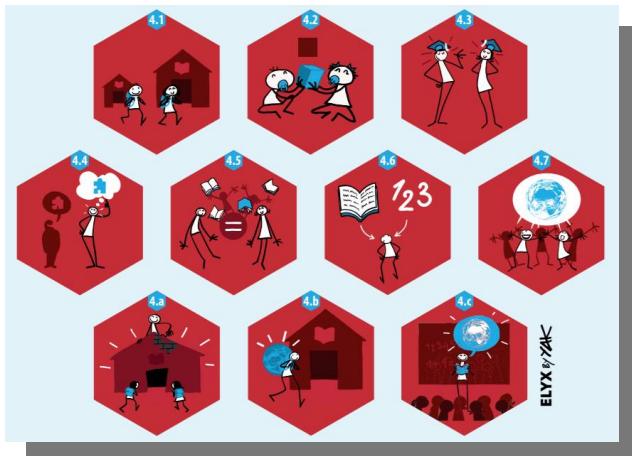
To continue achieving this, education must take the challenge and transformed! opportunity to reconsider, re-imagine, and re-invent learning environments able to prepare and excel each individual for effective life-long learning.

OECD project,  
Innovative  
Learning Environments



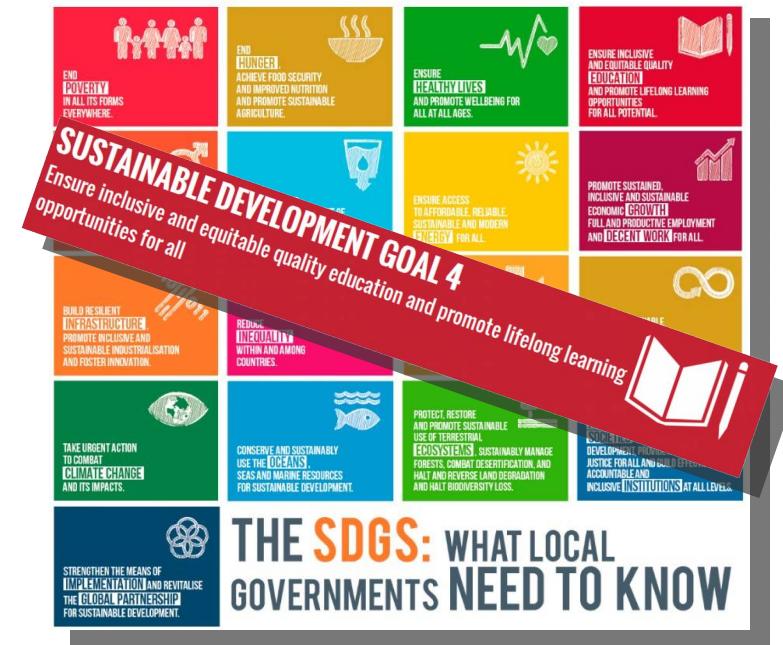
# The way ahead

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](mailto:csgouro@teiath.gr)