



# Towards a New Generation of Engaged Universities: *The Need to Act, Adapt and Transform*

16<sup>th</sup>– 18<sup>th</sup> April, 2024 | Kempinski Central Avenue  
(Formerly the Address Dubai Mall), Dubai, UAE

## Higher Education in the Green and Digital Transitions *Challenges, Trends and Opportunities*

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Thinking about higher education's **contribution** to the green and digital transitions...

1. How will the “**green transition**” affect demand for advanced skills?
2. How might **artificial intelligence** influence future demand for higher education graduates?
3. How is **higher education responding** in terms of updating traditional programmes and creating opportunities for upskilling and reskilling?
4. Questions for higher education leaders going forward





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Two global trends will have greatest impact on demand for advanced skills

Green  
transition

- **Decarbonisation** of the economy, altering sectors of activity and occupations

Digital  
transition

- Deployment of digital technologies, including artificial intelligence, increasing **automation**

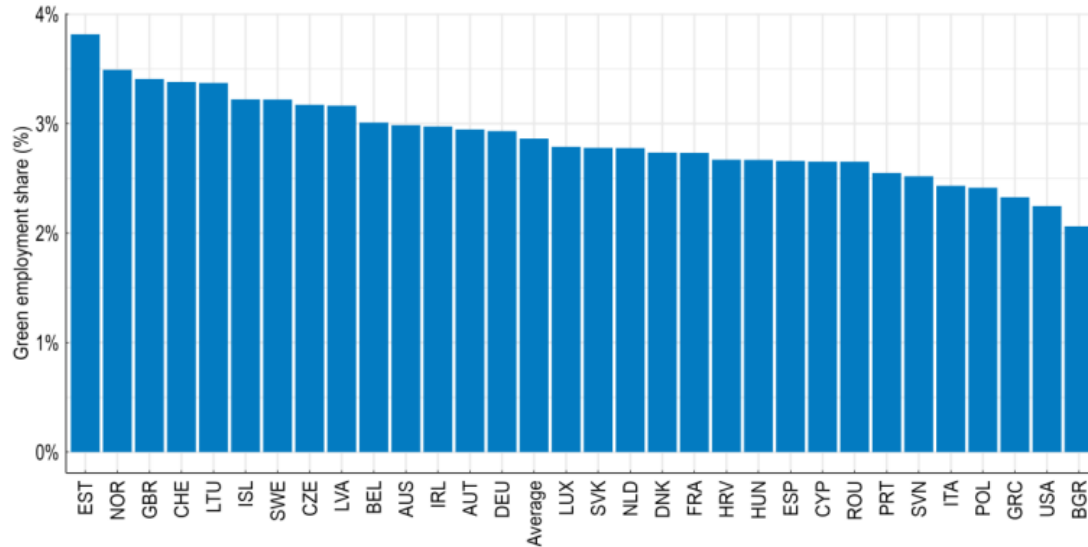




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## The green transition: emerging clarity about likely impact on demand for advanced skills



- O\*NET = Occupational Information Network in US
- “Green” tasks = linked to environmental activities, including decarbonisation of economy
- “Green occupations” = at least 10% green tasks
- “Brown” occupations = large share of employment in high-emission sectors
- Green occupations = 2%-3.5% of employment
- Brown occupations = 3%-10% of employment



Tyros, S., D. Andrews and A. de Serres (2023), "Doing green things: skills, reallocation, and the green transition", OECD Economics Department Working Papers, No. 1763, OECD Publishing, Paris, <https://doi.org/10.1787/286a5007-en>.





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## The green transition: many of the same skills are needed for “green” and “brown” jobs

<b>Engineering and Technical:</b>	
2C3b	Engineering and Technology
2C3c	Design
2C3d	Building and Construction
2C3e	Mechanical
4A3b2	Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment
4A1b3	Estimating the Quantifiable Characteristics of Products, Events, or Information
<b>Operation management:</b>	
2B4g	Systems Analysis
2B4h	Systems Evaluation
4A2b3	Updating and Using Relevant Knowledge
4A4b6	Provide Consultation and Advice to Others
<b>Monitoring:</b>	
2C8b	Law and Government
4A2a3	Evaluating Information to Determine Compliance
<b>Science:</b>	
2C4b	Physics
2C4d	Biology

- Most important skills associated with “green occupations” are often **transferable** – found in many other jobs, including “brown” jobs
- Overall: the green transition will likely generate **fewer changes** in skills demand than sometimes thought
- Main exception: **lower-skill** “brown occupations” – limited transferability of skills to other occupations
- Does **not** reduce need for **updating curricula** and **upskilling and reskilling** in higher education for sustainability



Tyros, S., D. Andrews and A. de Serres (2023), "Doing green things: skills, reallocation, and the green transition", OECD Economics Department Working Papers, No. 1763, OECD Publishing, Paris, <https://doi.org/10.1787/286a5007-en>.



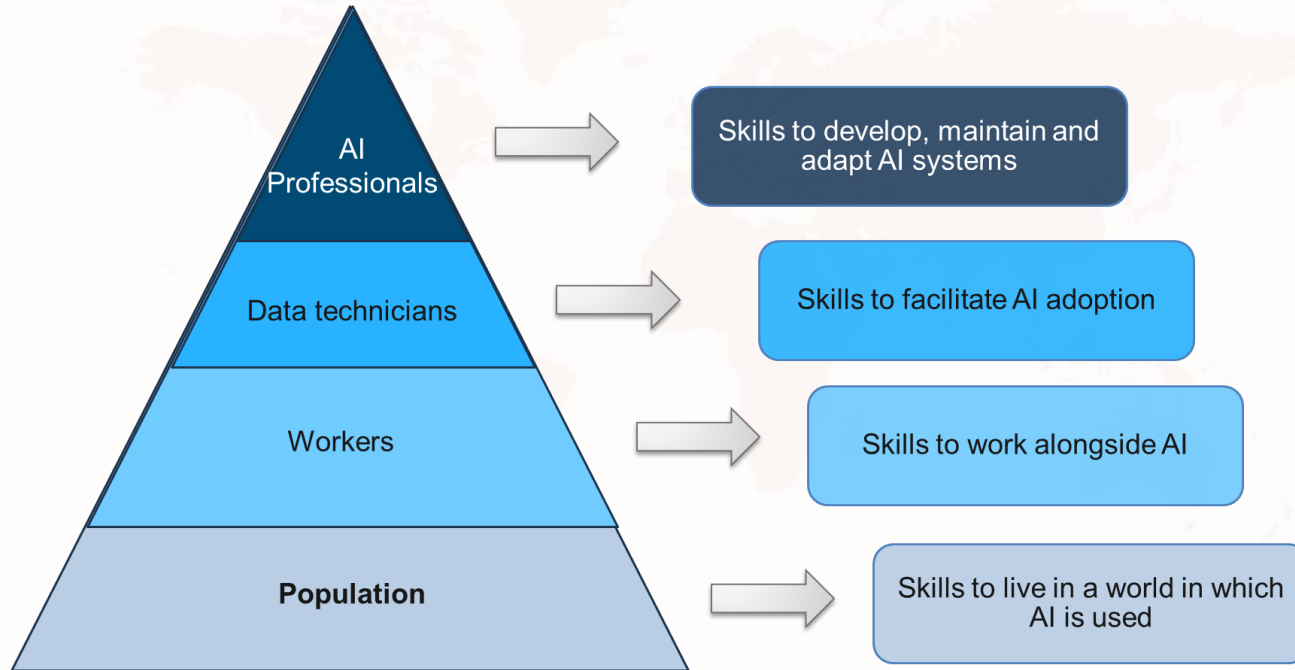




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**The digital transition:** artificial intelligence (AI) will increasingly drive changes in demand for (advanced) skills



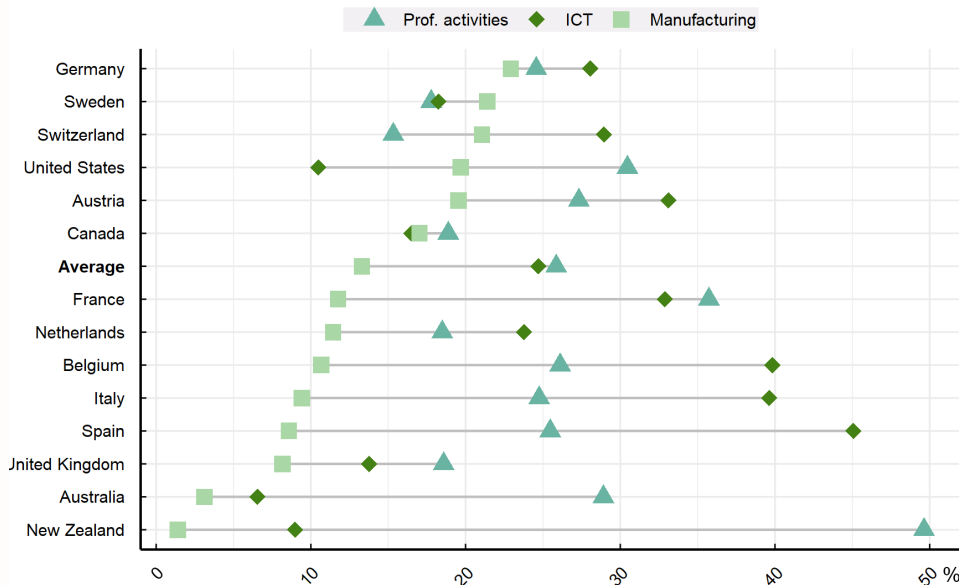


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## The digital transition: current demand specifically for AI skills is low, but growing

Percentage of AI vacancies in specific industries with higher demand for AI skills, averaged across 2019-22, by country



On average across **English-speaking** and **European countries**, the average share of positions requiring AI skills was:

- **25%** for **Professional Activities**
- **24%** for **ICT**
- **13%** for **Manufacturing**



Source: [Borgonovi et al. \(2023\)](#)



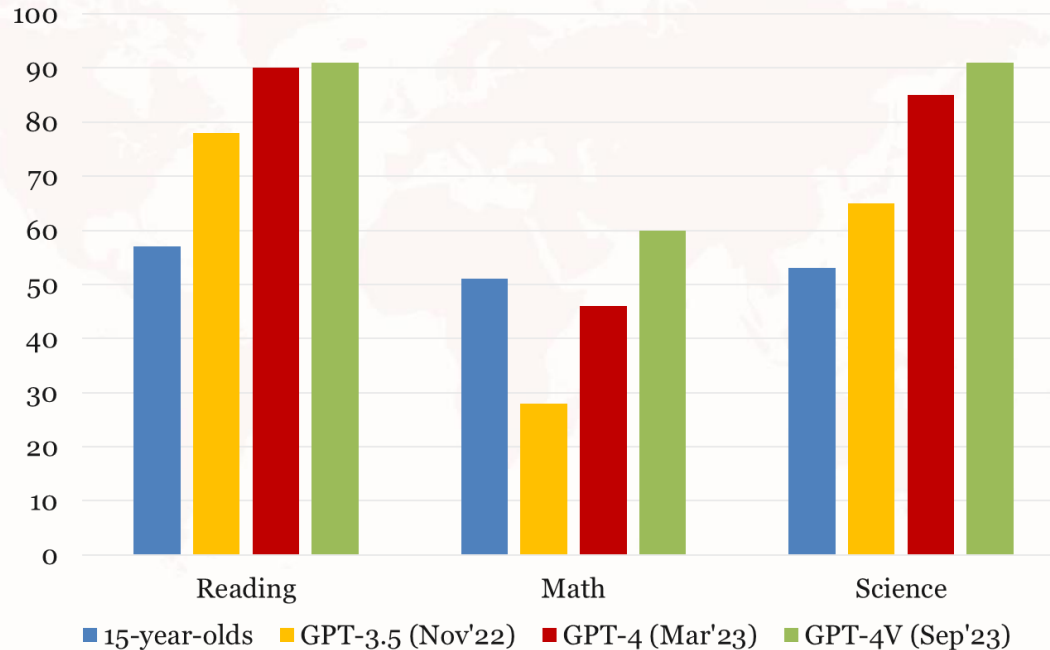


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**The digital transition:** the capabilities of generative AI are increasing very rapidly

ChatGTP taking PISA



Source: OECD: AI and the Future of Skills project



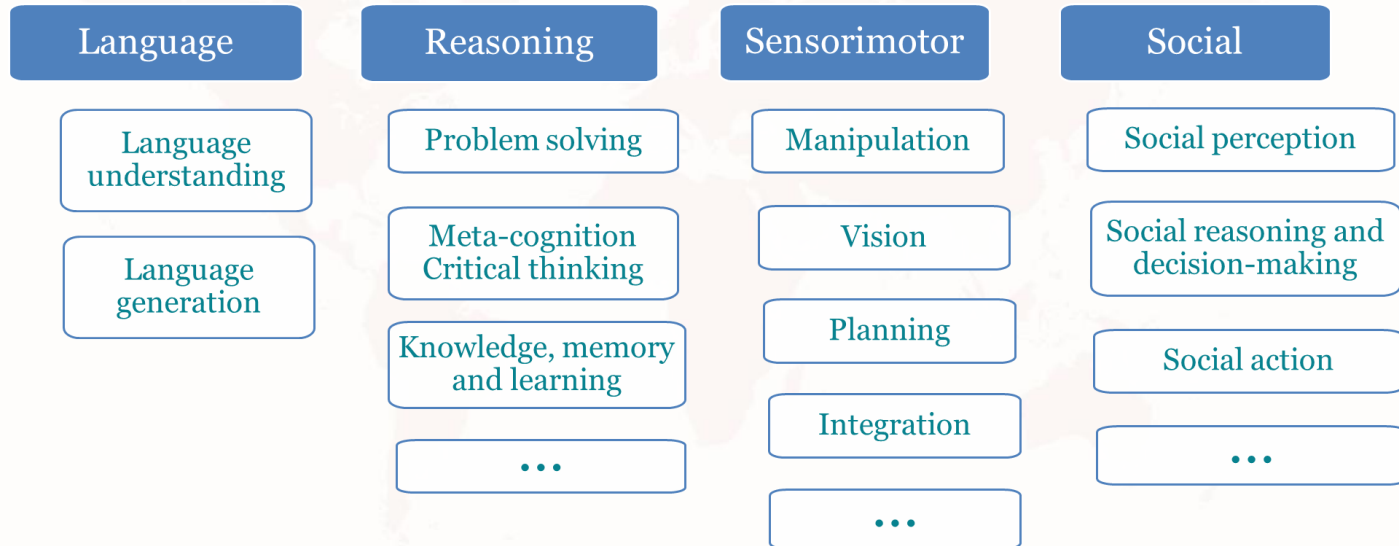




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**The digital transition:** current OECD work is analysing the capacity of generative AI





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**The digital transition:** AI will radically affect graduate jobs, but many uncertainties remain

AI will perform many cognitive tasks at near-human levels

Application will take time (~5 years?) but AI will be used

In most contexts we will perform cognitive tasks with AI help

AI will move more quickly on some job tasks than others

- Faster on language and reasoning tasks
- Slower on sensorimotor tasks
- Faster on social tasks using language
- Slower on social tasks using sensorimotor capabilities



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**Changing skills demand:** take aways for now...

## Impacts of the green transition

1. Many of the skills needed for the green transition are already embedded in high-quality higher education programmes
2. Radical changes may not always be needed in higher ed. – but scope to increase emphasis on sustainability and support upskilling and reskilling
3. Pressing need to support lower skilled workers in affected sectors

## Impacts of the digital transition

4. AI is disrupting established assumptions about “digital skills”
5. Graduates will need to be trained to work alongside AI – including understanding associated risks
6. Does this mean students don’t need to learn certain things they currently learn? That is where it becomes complicated...





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Higher education and development of skills for green and digital transitions...



## What we know

- Higher education attainment is associated with better labour market outcomes on average
- Higher education graduates tend to be more highly skilled
- Higher education graduates benefit from, and contribute to better social outcomes on average
- Higher education graduates are more likely to participate in innovative product and process development



## What we don't know

- To what extent does higher education “cause” these more positive outcomes and to what extent are they driven by initial conditions/selection effects?
- Why do skills assessments show dramatic variation in the skill levels of higher education graduates, within and across countries?
- Which specific factors and actions within higher education are most likely to build the competencies needed?



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## Education and Innovation Practice Community

Around **750 members** from more than **78 countries**, including policymakers, practitioners, learners and business sector representatives.



**Underlying question:** Which competencies support innovation for the green and digital transitions? [see above]



**Analysis:** How can higher education policy and practice help develop these competencies?



### Strand 1

Supporting competency development in schools



### Strand 2

Updating “traditional” higher education



### Strand 3

Developing upskilling and reskilling offers







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## Education and innovation for the digital and green transitions: How higher education can support effective curricula in schools

### The Education and Innovation Practice Community (EIPC)

This is the first in a series of four analytical reports prepared by the OECD Higher Education Policy Team on developing competencies in support of innovation for the digital and green transitions. These reports support knowledge exchange within an **Education and Innovation Practice Community (EIPC)**. The EIPC is an action of the European Commission (DG EAC), implemented with the OECD under the [New European Innovation Agenda](#), Flagship 4 "Fostering, attracting and retaining deep tech talent".

This analytical report examines how higher education institutions (HEIs) can support the integration of competencies for innovation into school curricula, drawing on research evidence and policy and practice examples from a wide range of education systems. It offers six options for consideration by education policy makers to strengthen HEIs' role in supporting effective curriculum development in schools:

1. Develop strategies to strengthen HEIs' involvement in **curriculum analysis and facilitating dialogue between teachers, pupils and policy makers** to inform school curricular reforms.
2. Support HEIs to develop **educational resources** for schools – specifically, resources on digital and climate change literacy – and provide their use through guidance, pedagogy and online platforms.
3. Mobilise the higher education sector to engage in collaborative and applied **educational research** on education for the digital and green transitions.
4. Explore the potential of **service learning** involving HEIs, schools and civil society to increase community-based learning to help secondary students develop competencies for innovation.
5. Support HEIs to engage in **science communication** with schools, to strengthen research-based teaching practices and raise students' motivation and interest in science, digital and innovation.
6. Examine the potential of **dual enrolment programmes** to establish structural collaboration between schools and HEIs for curriculum design and delivery in upper secondary education.

For more information, contact the OECD Higher Education Policy Team ([HigherEducation@oecd.org](mailto:HigherEducation@oecd.org)) or the European Commission ([EAC-UNITE-C1@ec.europa.eu](mailto:EAC-UNITE-C1@ec.europa.eu)), and [click here](#) to join the EIPC network.



November 2023



## Education and innovation for the digital and green transitions: How higher education can support teachers and school leaders

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This analytical report examines how higher education institutions (HEIs) can support teachers and school leaders in secondary education to help their students to develop competencies for innovation, drawing on research evidence and policy and practice examples from a wide range of education systems. It offers three options for consideration by education policy makers to strengthen HEIs' role in supporting schools to develop human capacity for innovation:

1. Develop and include **specific requirements on research, digital and green competencies** into teacher professional standards, and support their integration in pedagogical practice and research.
2. Support HEIs and schools to **establish structured partnerships** to jointly design, deliver and evaluate initial teacher education programmes that are anchored in pedagogical practice and research.
3. Support the **professional development of teacher educators** to enhance the quality and relevance of teaching and learning offered in initial teacher education.
4. Mobilise HEIs to develop diverse and flexible **upskilling and reskilling opportunities** on digital and climate change **education and innovative research engagement** among teachers.
5. Engage experts from higher education in **out-of-school self-evaluation and external quality assurance** to build the capacity of school leaders and teachers to develop competencies for innovation.

For more information, contact the OECD Higher Education Policy Team ([HigherEducation@oecd.org](mailto:HigherEducation@oecd.org)) or the European Commission ([EAC-UNITE-C1@ec.europa.eu](mailto:EAC-UNITE-C1@ec.europa.eu)), and [click here](#) to join the EIPC network.



## Cultivating the next generation of green and digital innovators – the role of higher education

This is the third in a series of four analytical reports prepared by the OECD Higher Education Policy Team on developing competencies in support of innovation for the digital and green transitions. These reports facilitate knowledge exchange within the **Education and Innovation Practice Community (EIPC)**. The EIPC is an action of the European Commission (DG EAC), implemented in collaboration with the OECD under the [New European Innovation Agenda](#), Flagship 4 "Fostering, attracting and retaining deep-tech talent".

This analytical report provides analysis and case studies related to Strand 2 of the EIPC project, which focuses on how traditional higher education degree programmes can best develop competencies important for green and digital innovation. Four key areas of action are discussed:

1. **Tracking and assessing competencies:** enhancing the capacity of higher education systems to track demand for and supply of competencies that support innovation, through improving anticipation and assessment methods.
2. **Curriculum development:** updating educational programmes and curricula to ensure they target the necessary knowledge and skills for green and digital innovation, encompassing relevant transversal and discipline-specific competencies.
3. **Student engagement:** increasing interest and motivation to develop competencies that contribute to innovation, which may involve improving incentives and greater attention to designing engaging learning experiences.
4. **Private sector partnerships:** strengthening partnerships with innovative businesses and industries to align higher education provision with their human capital needs.

For more information, contact the OECD Higher Education Policy Team ([HigherEducation@oecd.org](mailto:HigherEducation@oecd.org)) or the European Commission ([EAC-UNITE-C1@ec.europa.eu](mailto:EAC-UNITE-C1@ec.europa.eu)), and [click here](#) to join the EIPC network.



March 2024





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## Adapting “traditional” higher education content: main priorities for policy and practice

Cultivating competencies  
for green and digital  
innovation in higher  
education



### 1. Identify and track competencies

*Seek out signals about needed competencies and find ways to assess and monitor their presence in learners*



### 2. Review and update programme curricula

*Periodically review and iterate programme design and curricula to ensure they promote knowledge and skills relevant for green and digital innovation*



### 3. Engage and motivate learners

*Provide an environment and experiences that incentivise learners to participate in, and lead, green and digital innovation*



### 4. Collaborate with business and industry

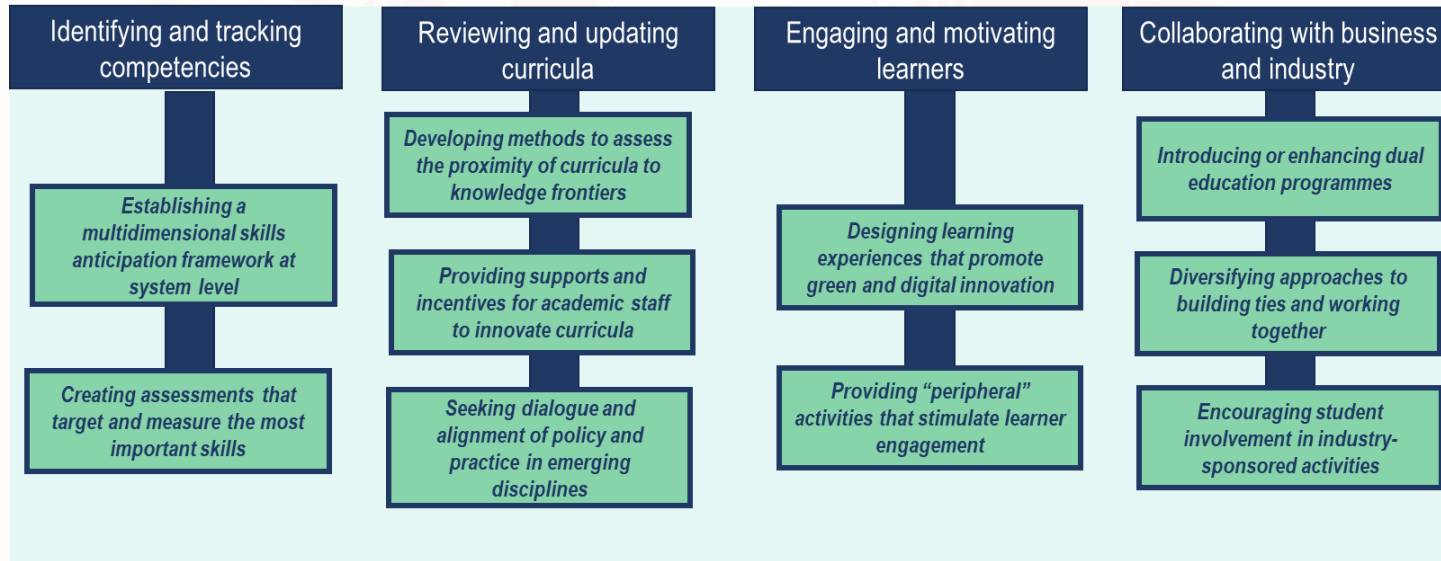
*Establish effective, mutually beneficial partnerships and ongoing dialogue with the most innovative businesses and industries*



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## Adapting “traditional” higher education content: main policy and practice levers





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## Upskilling and reskilling offerings: an imperative for higher education to contribute

Education systems need to deliver:

- Higher skills levels for more people in **initial education and training**
- Opportunities to **upskill and reskill** throughout life



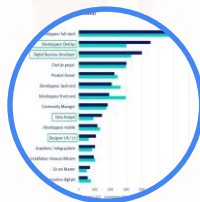
Front-loaded learning to lifelong learning



Multiple pathways



Responding to priority skills needs (as well as core competencies)



Combining work & study



Motivating & incentivising individuals







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## An increasing focus on more flexible learning: micro-credentials



Public policies for effective micro-credential learning



OECD



### What?

Compared to traditional degree programmes, micro-credentials are:

**Smaller** in volume (in study duration or load)

**More targeted** in terms of skills or study topics

**More flexible** in delivery

### Why?

Different offerings have distinct, but often overlapping purposes







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## Questions for higher education leaders

1. How well are your systems and institutions tracking **trends in skills demand and use**?
2. Do you have a strategy to respond to the **disruptive potential** of digitalisation and AI?
3. How **responsive** are “traditional” programmes and curricula to evolving skills needs?
4. To what extent are more **flexible, accessible forms of offering** available to allow advanced upskilling and reskilling?
5. How are your systems **supporting and engaging learners** of all ages to develop relevant competencies for the future?





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