Innovation is a new imperative for education policy

Innovation is a driver of growth and well-being in the economy and society. In education, innovation has also become an imperative to bring about qualitative changes alongside the expansion of education systems. Innovation should lead to more efficiency and improved outcomes in quality and equity of learning opportunities.

To reap the gains of innovation, education and training policies have to empower people to both innovate and adapt to innovations. In this endeavour, OECD countries need to share knowledge and experiences on the design and implementation of effective and evidence-based policies to encourage, facilitate and measure innovation in education.

CERI Innovation Strategy for Education and Training: two complementary strands of work

The CERI Innovation Strategy for Education and Training explores new approaches to support radical and incremental innovation and continuous improvement in education systems, and to equip people with the skills required for innovation. The project has developed two main and complementary strands of work:

1. **Innovation in education.** This explores how different forms of innovation can be fostered and measured in the education sector, and how they can bring improved outcomes.

2. **Skills and education for innovation.** This explores the set of skills that are needed in innovative societies, and how they can be developed in education. It notably focuses on how to teach, learn and assess students’ creativity and critical thinking.

The project has produced a number of reports, articles and conferences to inform policy makers on these topics. In addition, the project has contributed to the OECD Innovation Strategy, the OECD Skills Strategy, the OECD Development Strategy, and contributes to the OECD “Going Digital” horizontal project.

Find all our publications and additional information at [www.oecd.org/edu/innovation](http://www.oecd.org/edu/innovation)
Strand 1: Innovation in education

**Pillars of innovation in education**

This strand of the project explores the role and interaction of multiple **levers of innovation policy** in the education sector and how they can be governed to become more effective. It examines a range of innovation **policy instruments** to identify how countries do or could promote an innovation ecosystem that accommodates incremental and radical experimentation and facilitates self-sustained improvement.

**System organisation**

*Regulatory frameworks* provide incentives and opportunities for innovation in the education system.

- Does the rate of innovation increase when educators are spurred on by competitive incentives? How much room for innovation leave central and school-based approaches to curriculum decision making?

**Technology**

A systemic and evidence-informed approach is needed for **technology-based innovations in education**.

- How to best enhance teaching and learning with technology?
- How could **longitudinal information systems** lead to a more efficient use of the “big data” collected by education systems in support of innovation and improvement?

**School organisation**

Forms of **work organisation in schools** can spur organisational learning and educational outcomes.

- How do professional interactions within schools – as well as individual and organisational learning and training – effectively promote innovation?

**Educational R&D**

Public and private investments are required to promote R&D on existing and new **educational products and services**.

- Can the education industry developing innovative tools grow to match the rate of innovation seen in other sectors?
- How is educational R&D structured and supported within countries?

**Measuring innovation in education**

The ability to **measure innovation** is essential to an improvement strategy in education. Knowing **whether and how much practices are changing** within classrooms and educational organisations, and to what extent change is linked to improvements, strengthens the **education knowledge base** which informs policy making.

- New information about innovation in education compared to other sectors.
- Over 200 measures of innovation in education using international data.

**Main publications on innovation in education**

Strand 2: Skills and education for innovation

Developing skills for innovation

This strand of the project explores the role of the education and training system in fostering the dispositions and skills that are conducive to innovation. In innovation-driven societies, education and training systems must empower people to innovate and to quickly respond to new skills needs generated by technological and organisational change. This work identifies the skills required for innovative societies and analyses how different teaching and organisational practices help foster them.

Innovation goes beyond content and procedural knowledge in a particular domain. People need to think critically, to challenge assumptions and conventions, and to be able to come up with new ideas and make connections. Innovation is also aided by behavioural and social skills that help people acquire technical skills, apply their creativity and critical thinking, and put their ideas into action. While innovation skills empower people for innovation and give access to better jobs, they are also a driver of personal satisfaction and wellbeing.

Policy strategies

The Innovation Strategy for Education and Training explores a number of policy issues to help OECD countries to scale up and mainstream effective approaches for the promotion of skills for innovation:

- How education and training systems must adjust to the evolving skill needs of highly innovative societies.
- The pedagogies and teaching models, such as problem-based learning or metacognitive strategies, that may be more conducive to develop skills for innovation.
- The models of workplace organisation, including professional development, that are most effective in encouraging and further developing skills for innovation.

Main publications on skills and education for innovation

Fostering creativity and critical thinking skills

Teaching, learning and assessing creative and critical thinking skills

How to foster and assess creative and critical skills in formal education? Working with schools, higher education institutions and experts within countries, the project develops a vision and language on what it means and takes to develop creativity and critical thinking. This vision is embodied in a rubric, a bank of pedagogical resources, in professional development plans, and in examples of student work that give concrete examples and scaffolding to teach and learn these skills.

The pilot phase of the project (2015-18) has engaged school and teacher networks in 11 countries, reaching over 17,000 students, 650 teachers and 325 schools. Teachers have adapted their teaching practice and implemented pedagogical interventions aimed at fostering creative and critical thinking skills in their curricular domain. This has provided a proof of concept for a teacher-friendly language that is understandable and usable internationally.

Using a quasi-experimental research design, the project aims to evaluate whether the pedagogical interventions have the expected effects on a variety of factors, from test scores through to attitudes, understanding of creativity and critical thinking, and pedagogical practices. The monitoring also helps identify the conditions for the successful development of these skills in formal education. The rigorous monitoring and evaluation of innovative practices is key to the design of validation and scale up strategies and to their adjustments to different contexts.

Looking forward

The project has paved the way for creative thinking to be the innovative domain for PISA 2021 and is informing the design of the standardised assessment. In 2018, the project will start similar work in higher education and teacher training. A validation phase of the project at the school level is envisaged from 2019 onwards: it will implement the pedagogical intervention at a larger scale and evaluate its effects in a rigorous way. Working at primary, secondary and tertiary education levels, the projects aims to trigger systemic change.

The team

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OECD rubric on creativity and critical thinking

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<tr>
<th>CREATIVITY</th>
<th>CRITICAL THINKING</th>
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<tbody>
<tr>
<td>Coming up with new ideas and solutions</td>
<td>Questioning and evaluating ideas and solutions</td>
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<tr>
<td>INQUIRING</td>
<td>Make connections</td>
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<tr>
<td>IMAGINING</td>
<td>Challenge assumptions</td>
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<tr>
<td>DOING</td>
<td>Generate ideas and play with unusual and novel ideas</td>
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<tr>
<td>REFLECTING</td>
<td>Find several perspectives on the problem</td>
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<td>Evaluate solution justified on logical, ethical or aesthetic criteria</td>
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<td>Assess the novelty of a solution and of possible consequences</td>
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<td></td>
<td>Reflect on uncertainty/limits of chosen solution/position</td>
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Quasi-experimental monitoring framework

- Subject-based assessment
- Creativity assessment
- Survey questionnaires
- Interviews and focus groups
- Standardised assessment of academic achievement (Maths and Science; Visual arts and Music)
- Standardised test for creativity (EPoC)
- School principals
- Teachers
- Students