Education for the future

An international perspective

5th National STEM Summit
1 June 2017

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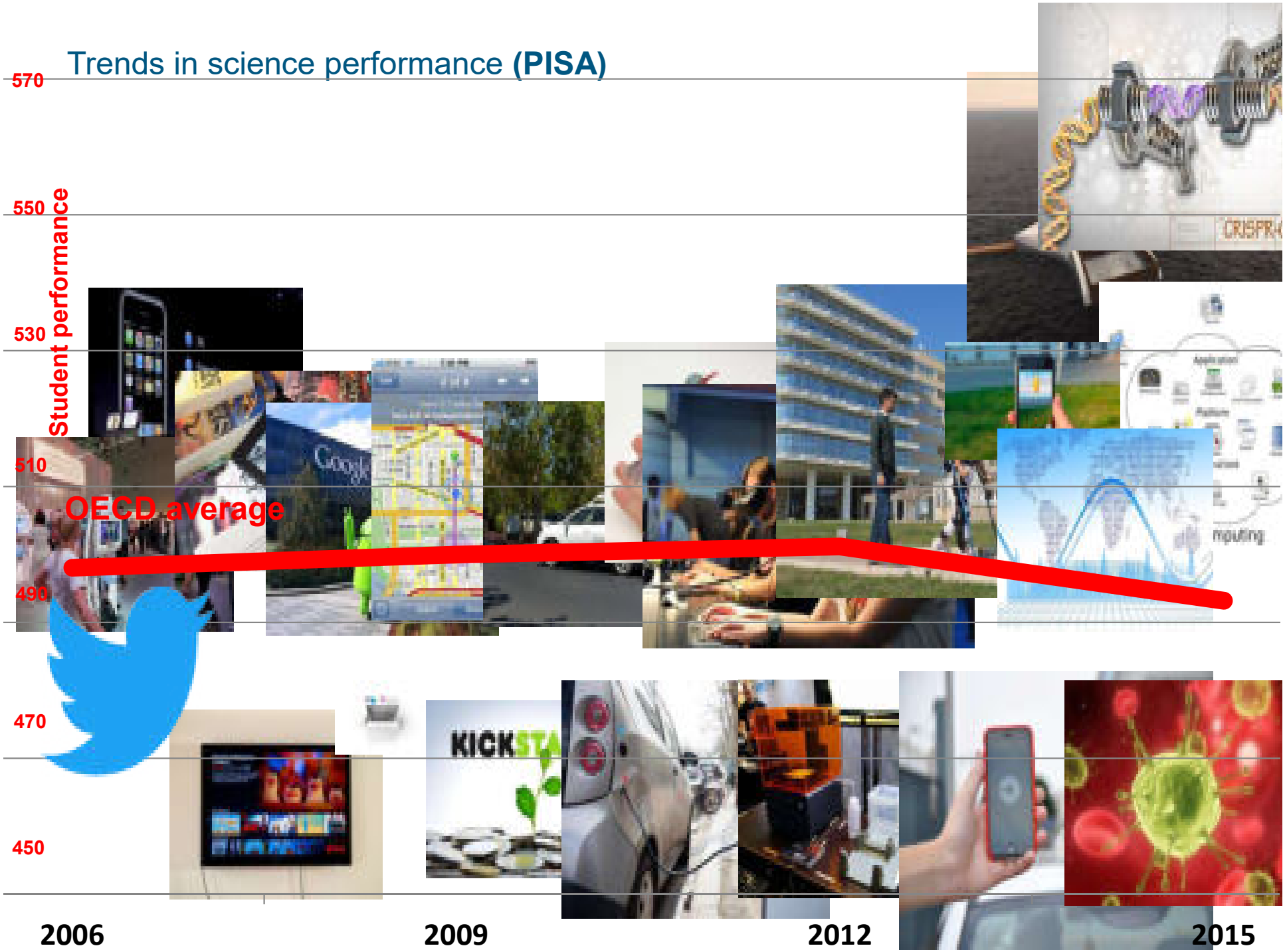
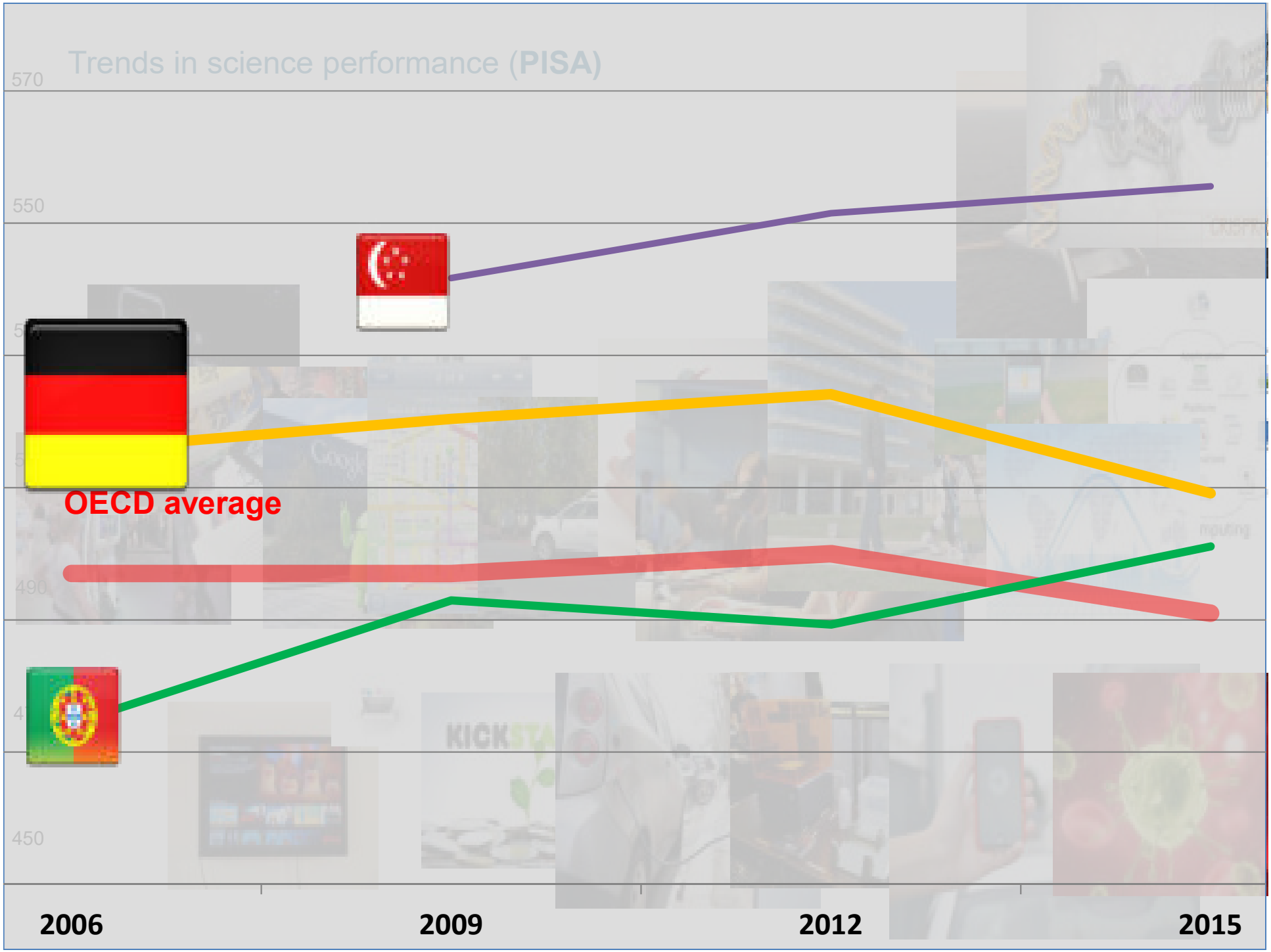
OECD

OECD
BETTER POLICIES FOR BETTER LIVES

Trends in science performance **(PISA)**




Trends in science performance (PISA)
570
550
490
450
OECD average
2006
2009
2012
2015

Poverty is not destiny - Science performance

Figure I.6.7

by international deciles of the PISA index of economic, social and cultural status (ESCS)

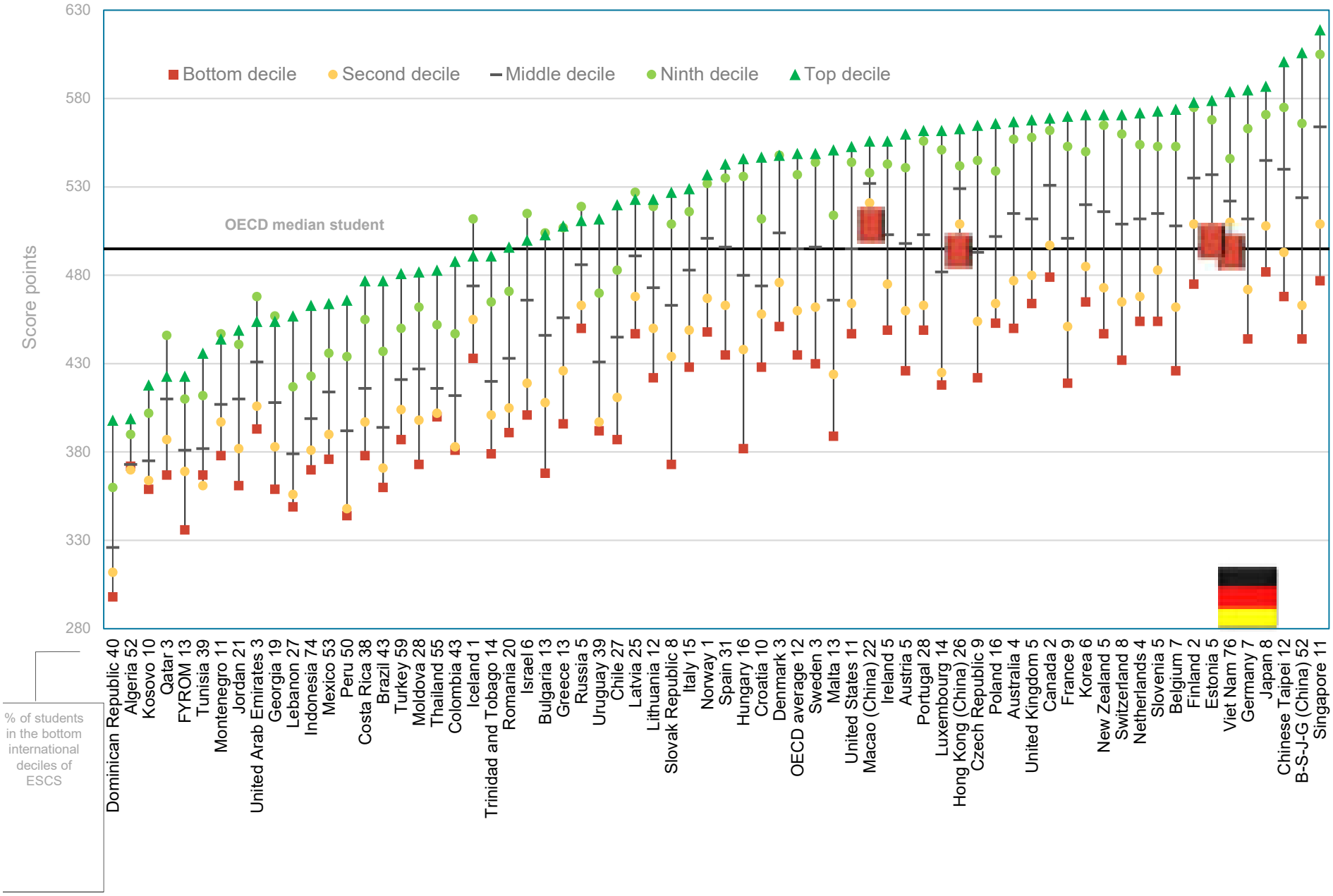


Figure I.3.2

Students expecting a career in science

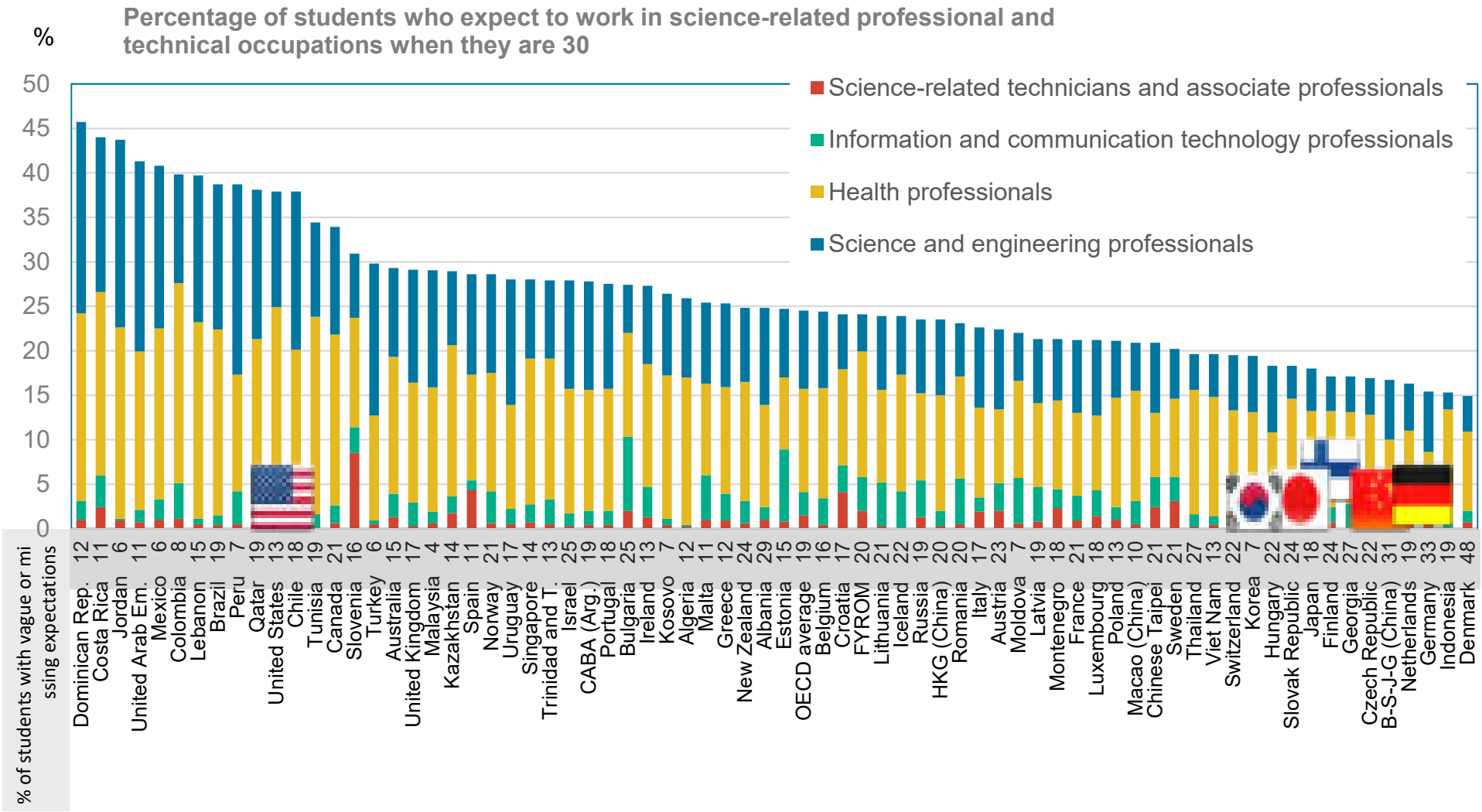
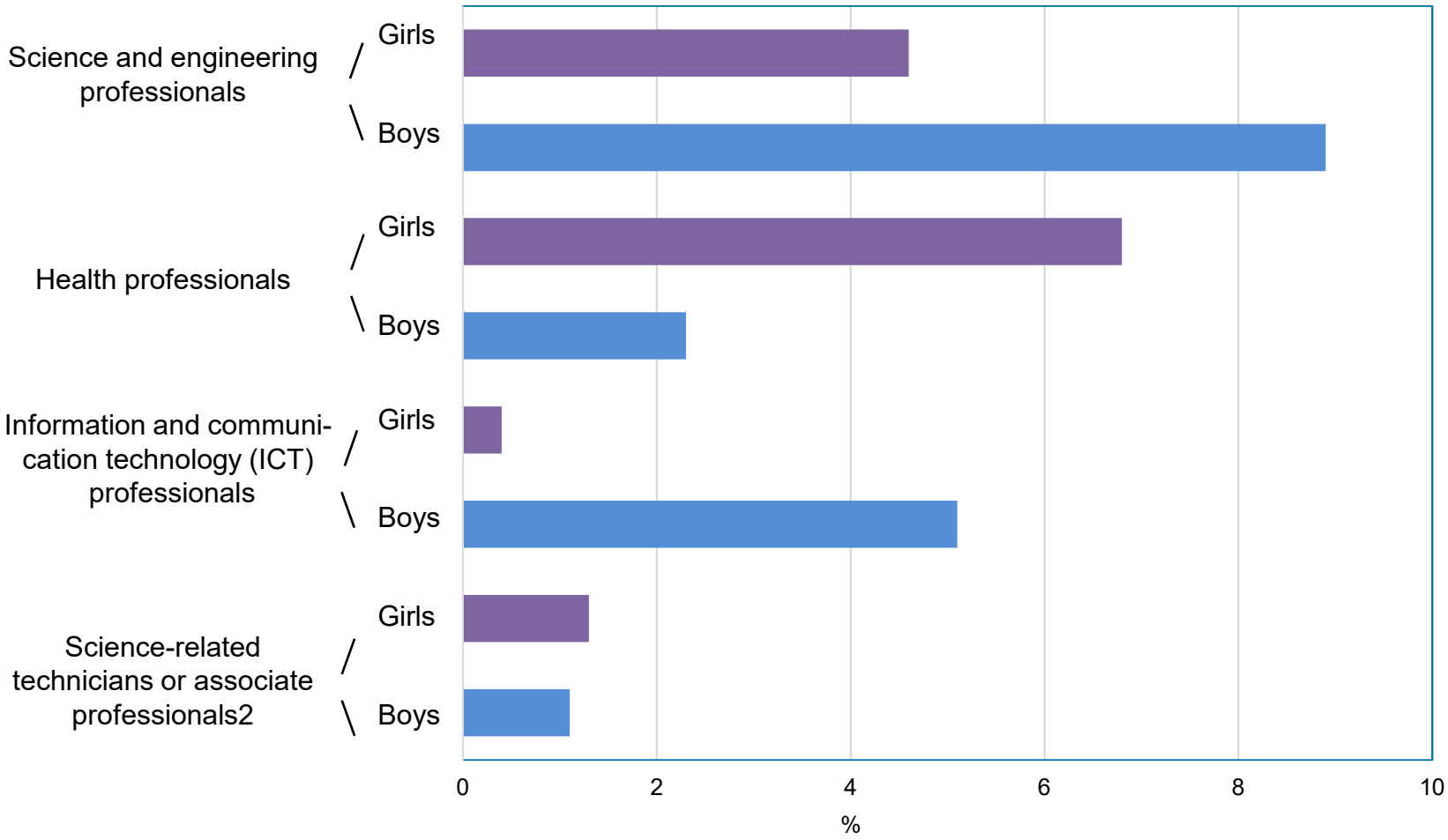


Figure I.3.5

Expectations of a science career

by gender



Multiple outcomes

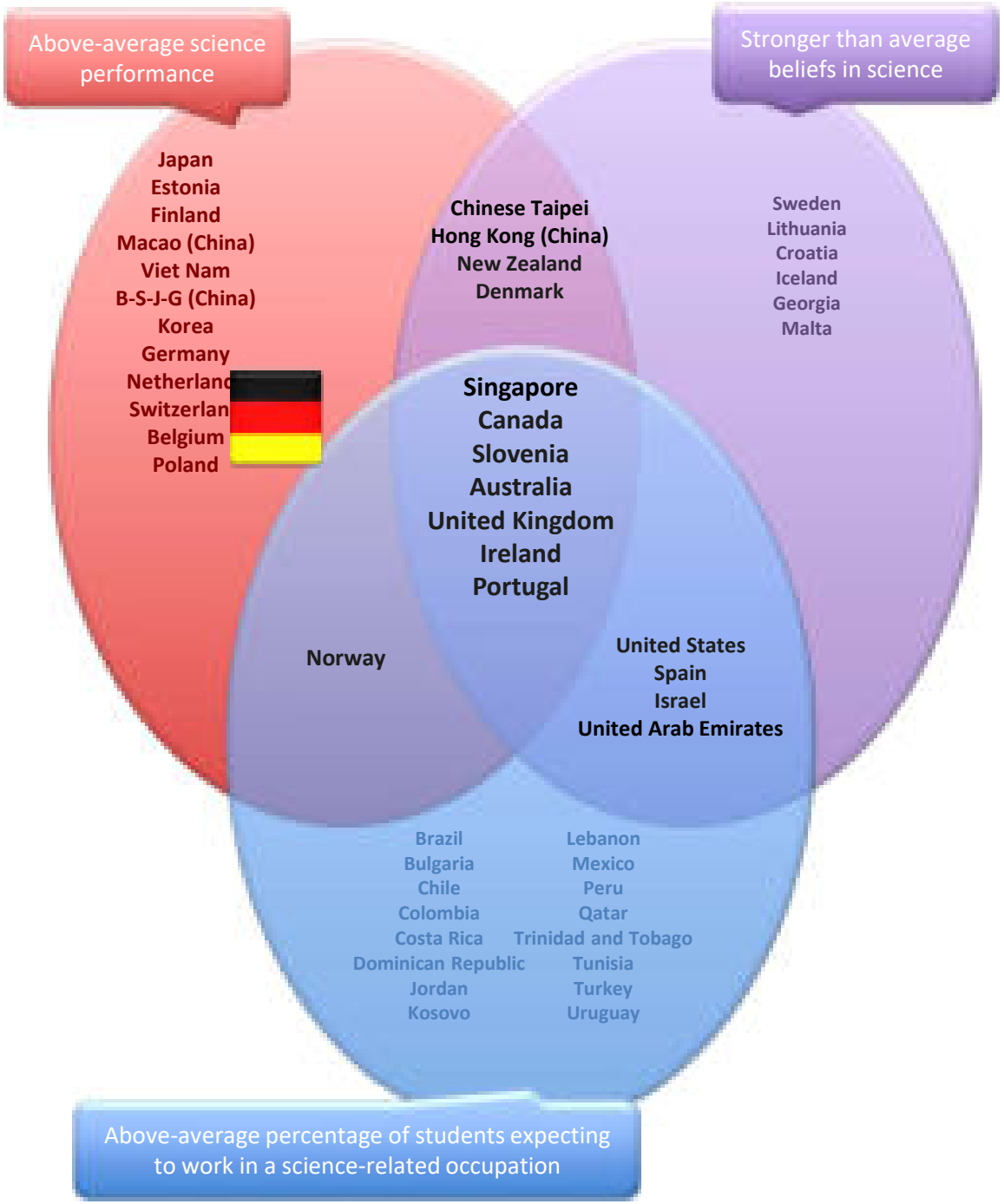


Figure I.3.17

Students expecting a career in science

by performance and enjoyment of learning

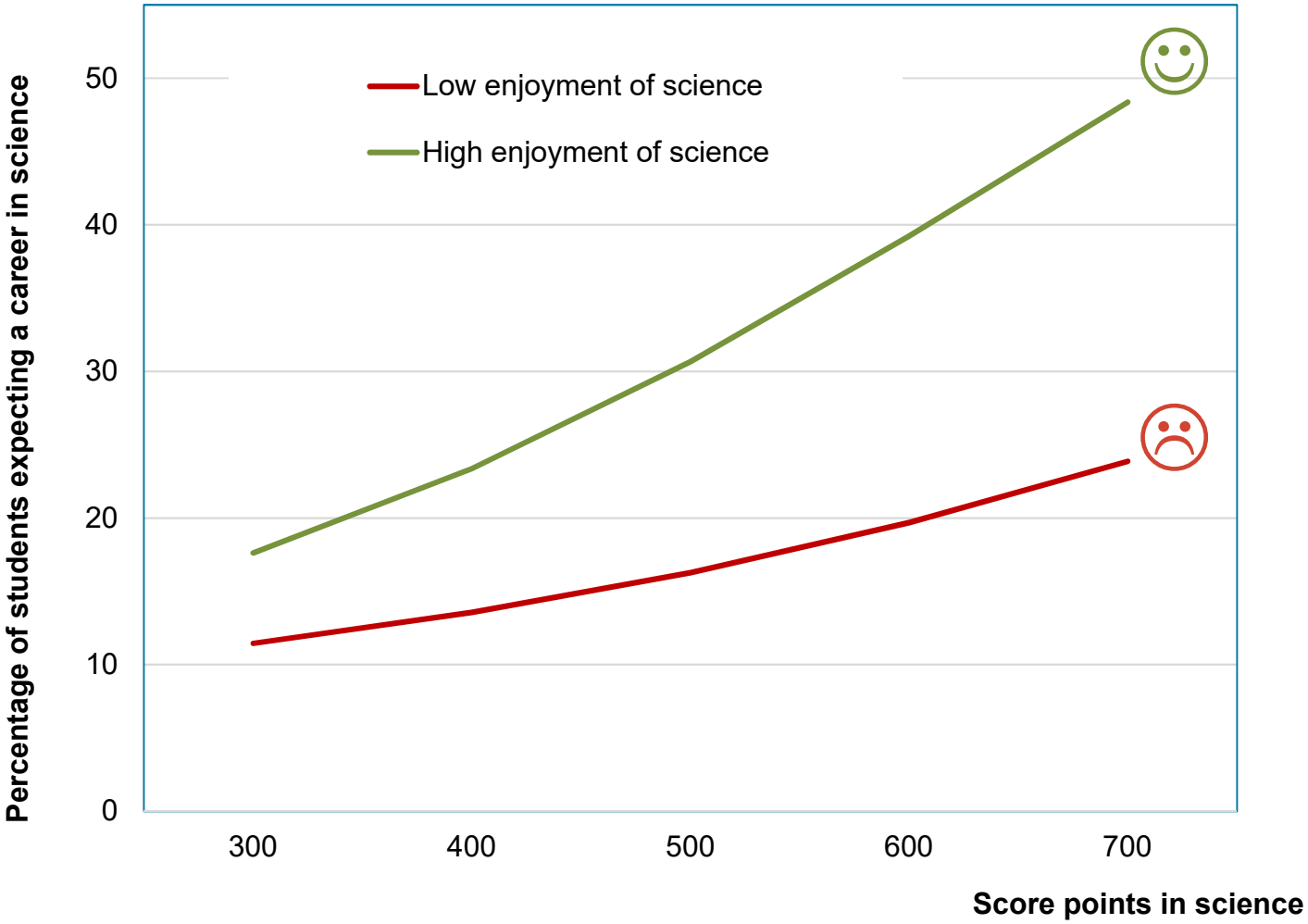
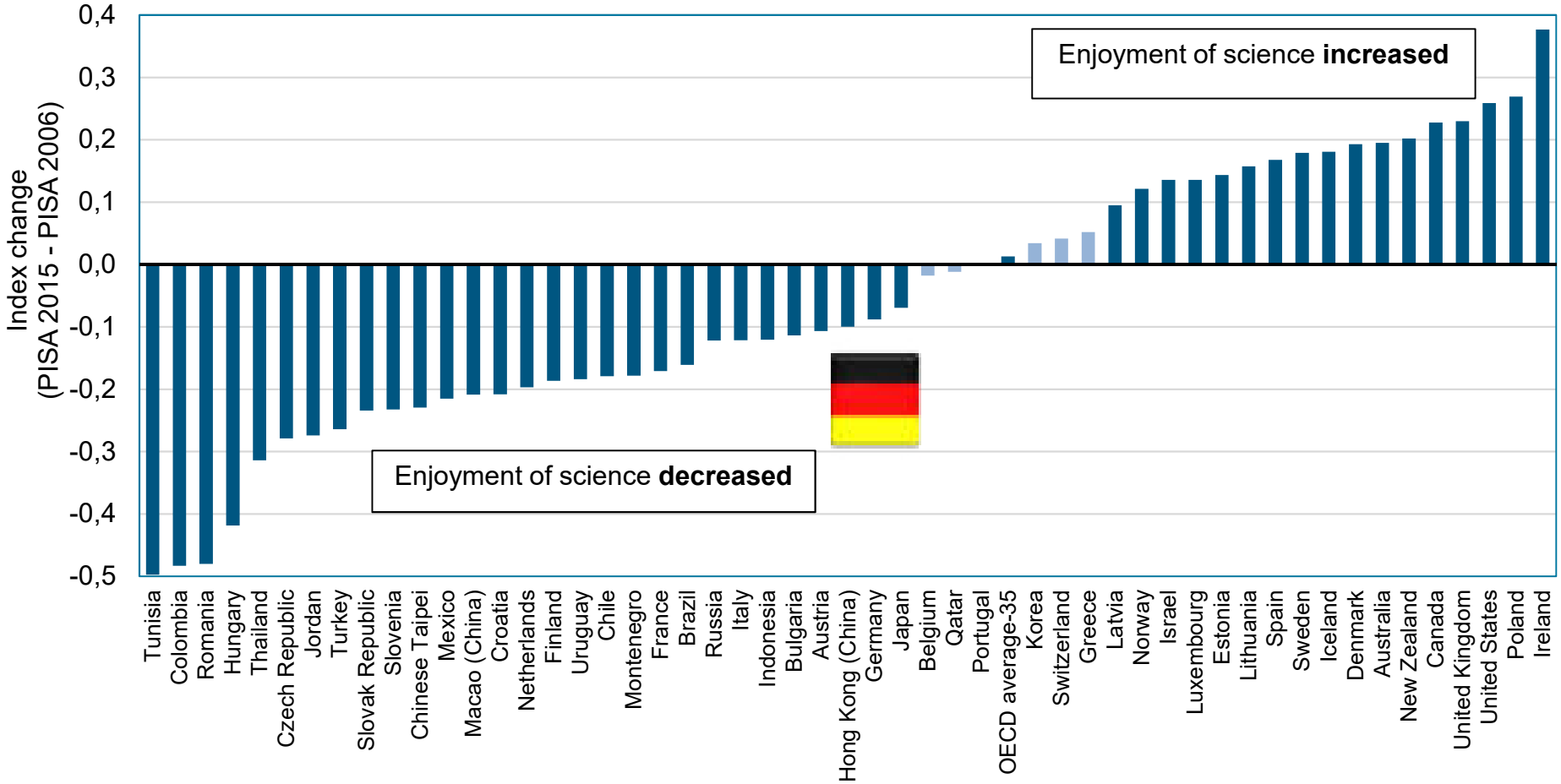


Figure I.3.10

Change between 2006 and 2015 in students' enjoyment of learning science



Challenges for tomorrow

Digitalisation

Systems thinking

Global competence

Design thinking

Digital literacy

Information literacy

Digitalisation

Democratizing

Homogenizing

Concentra

Empowering

Scale without mass

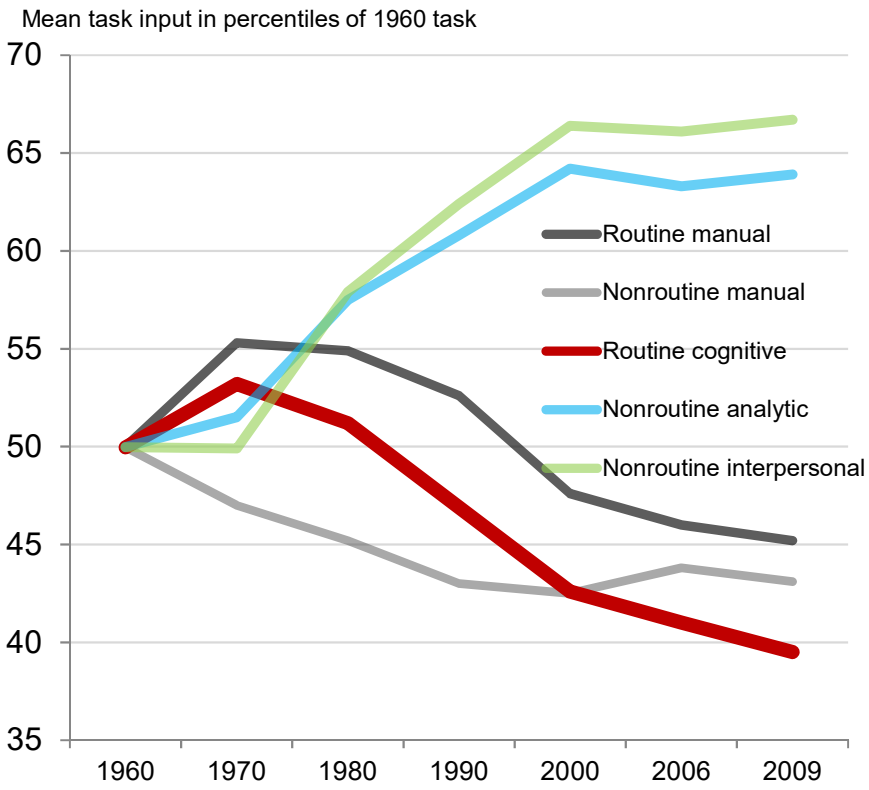
Google 1m $ / employee

120 k$ / employee

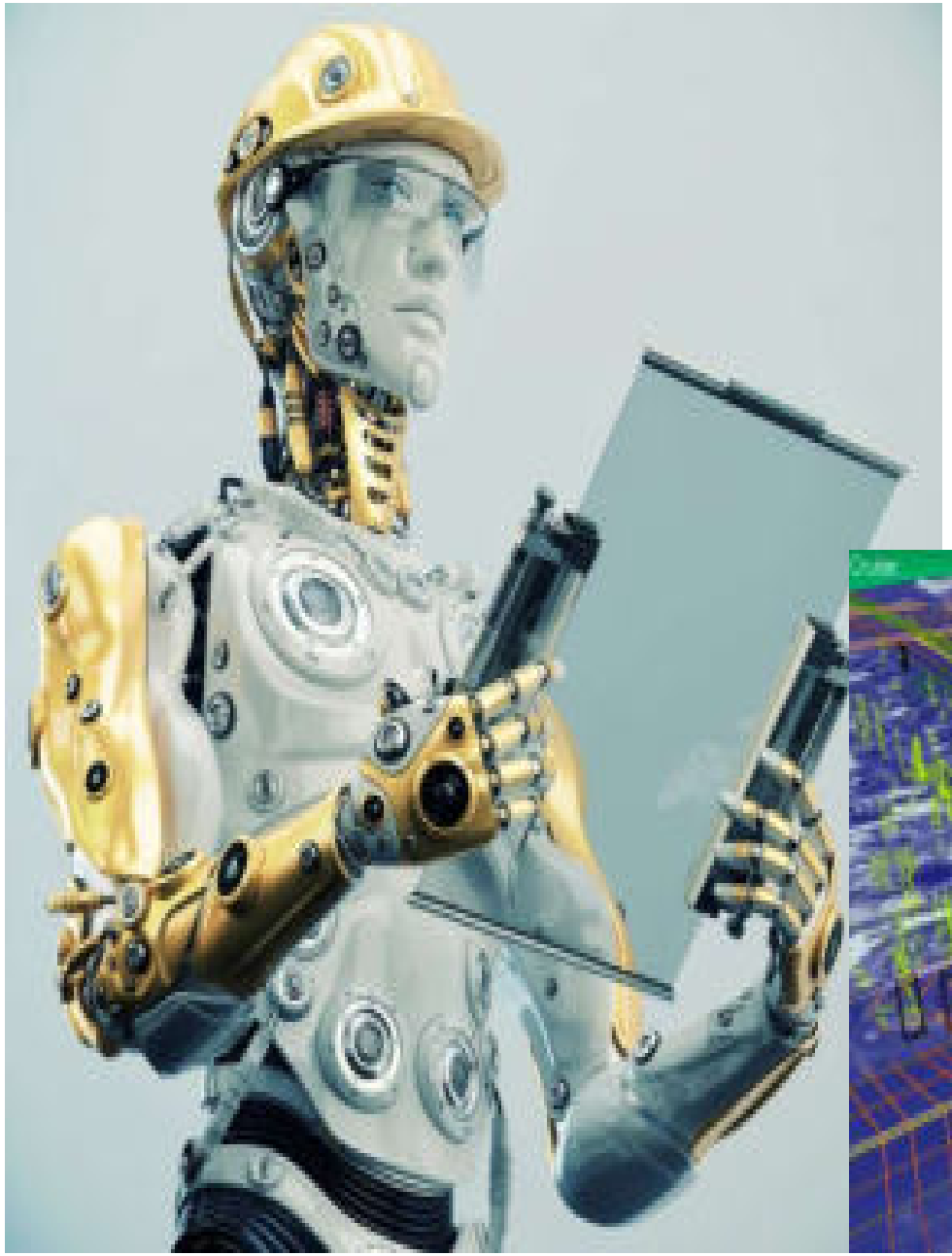
Particularizing

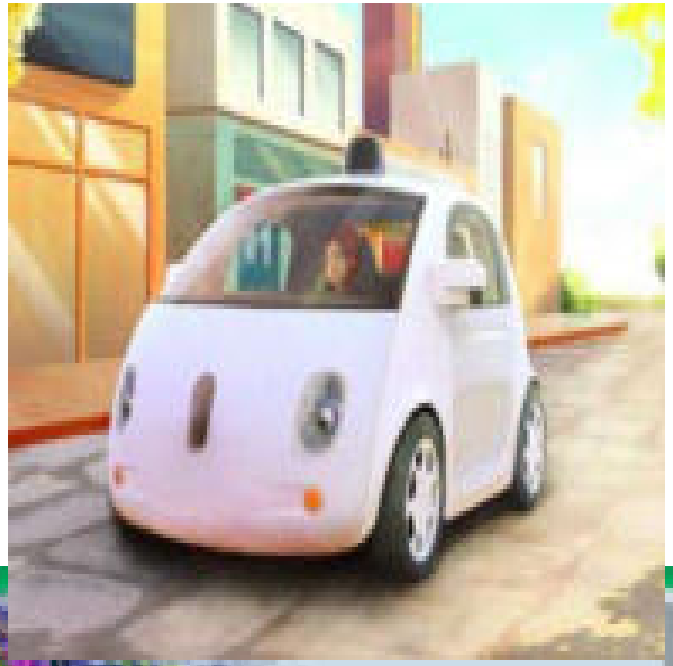
Disempowering

The kind of things that are easy to teach are now easy to automate, digitize or outsource



Robotics





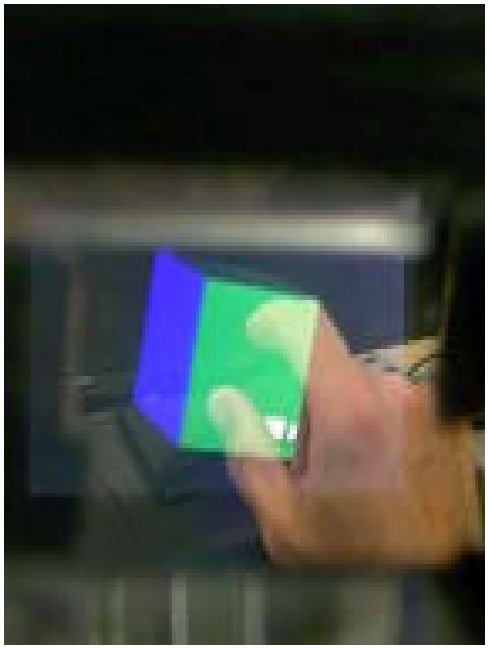
The Auto-auto

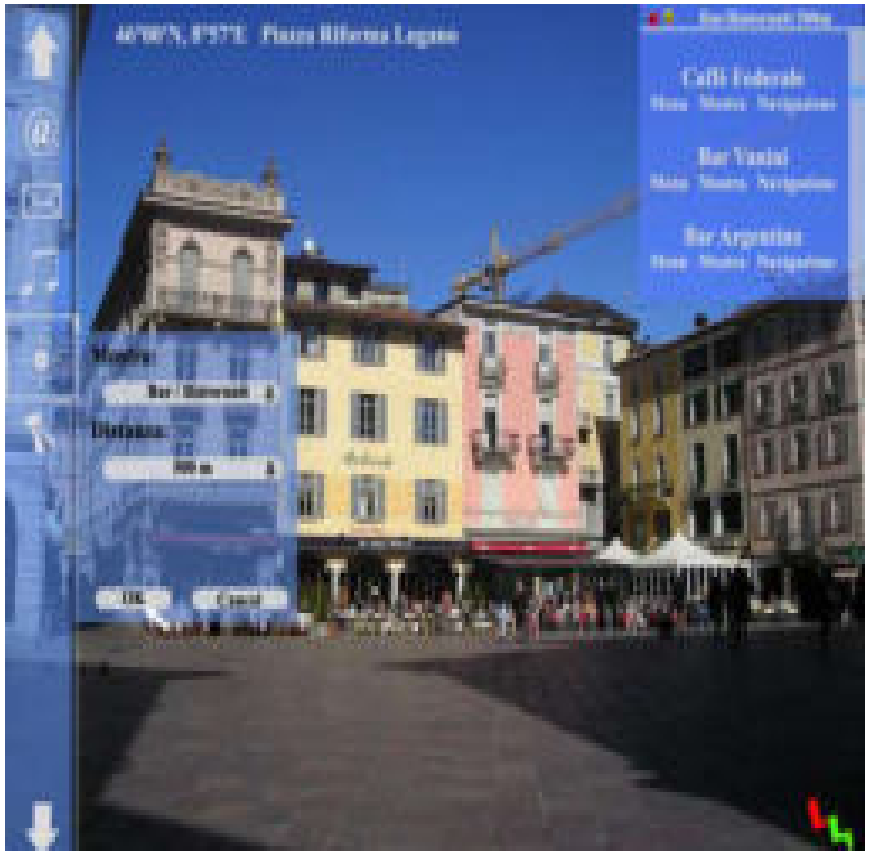
>1m km,

one minor accident,

occasional human intervention

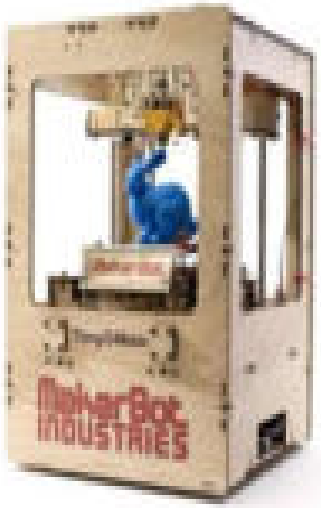
Augmented Reality

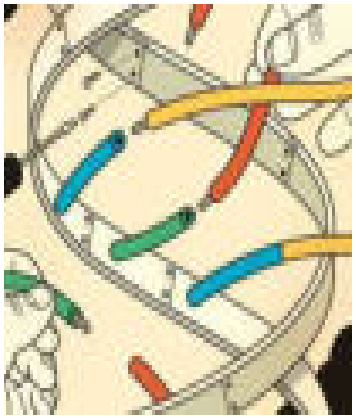


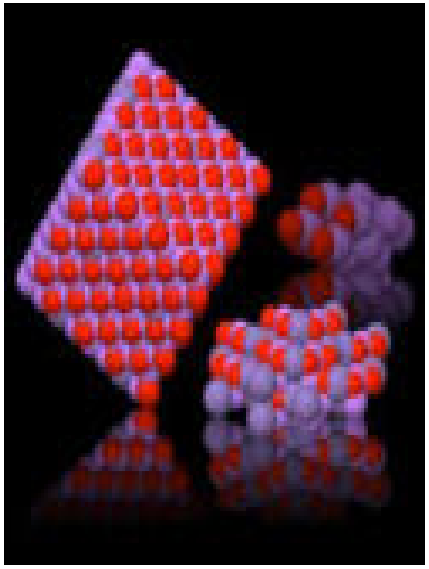


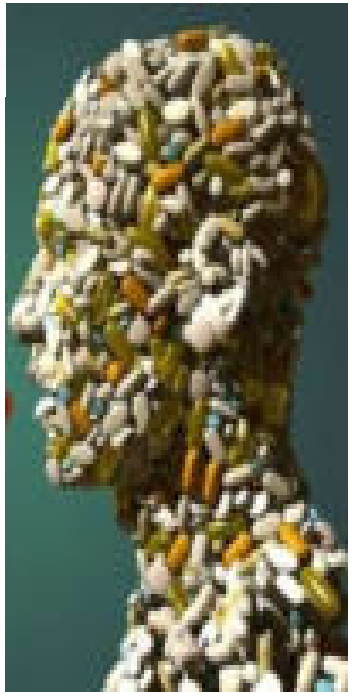
A lot more to come

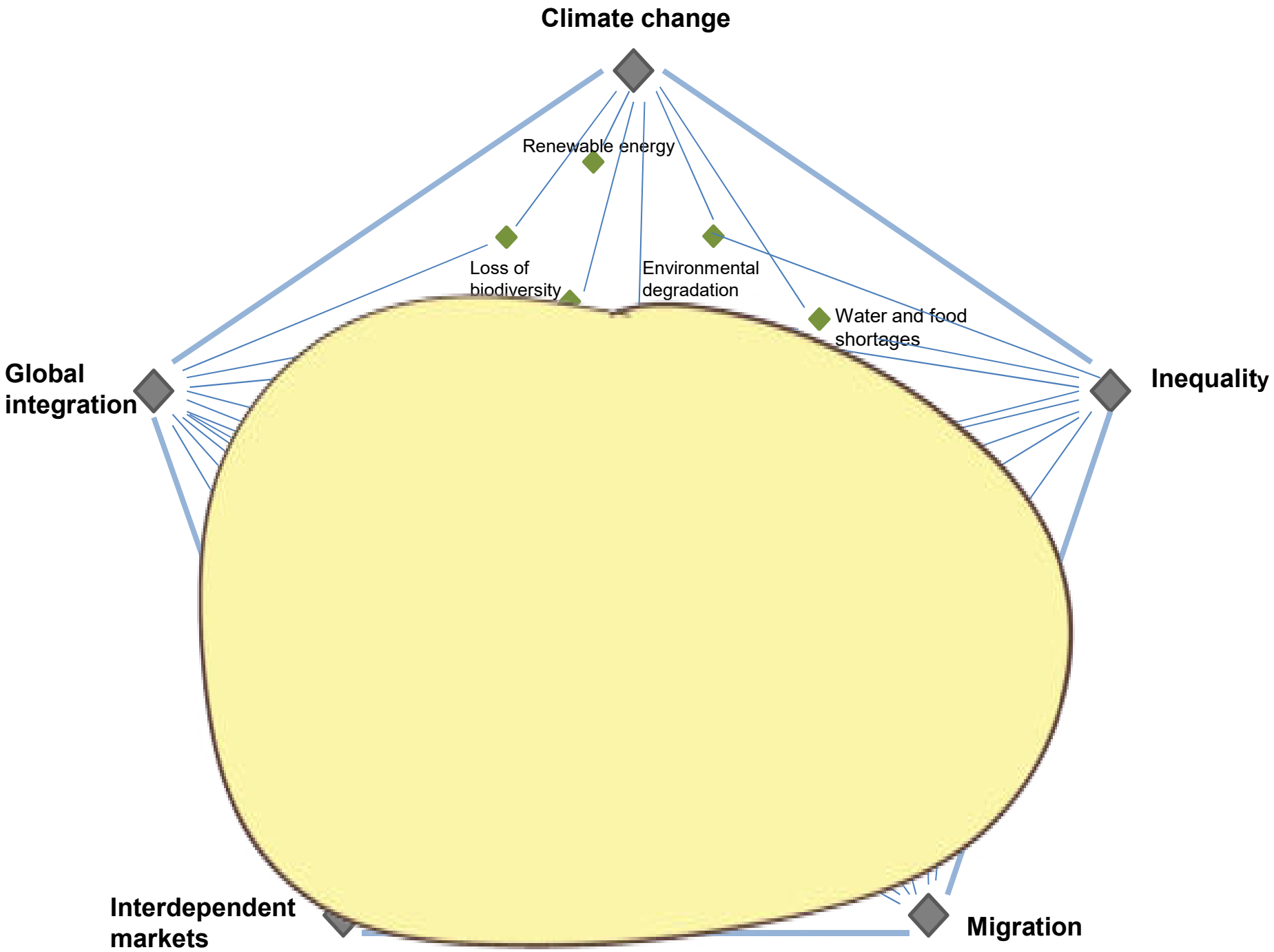
- 3D printing
- Synthetic biology
- Brain enhancements
- Nanomaterials
- Etc.



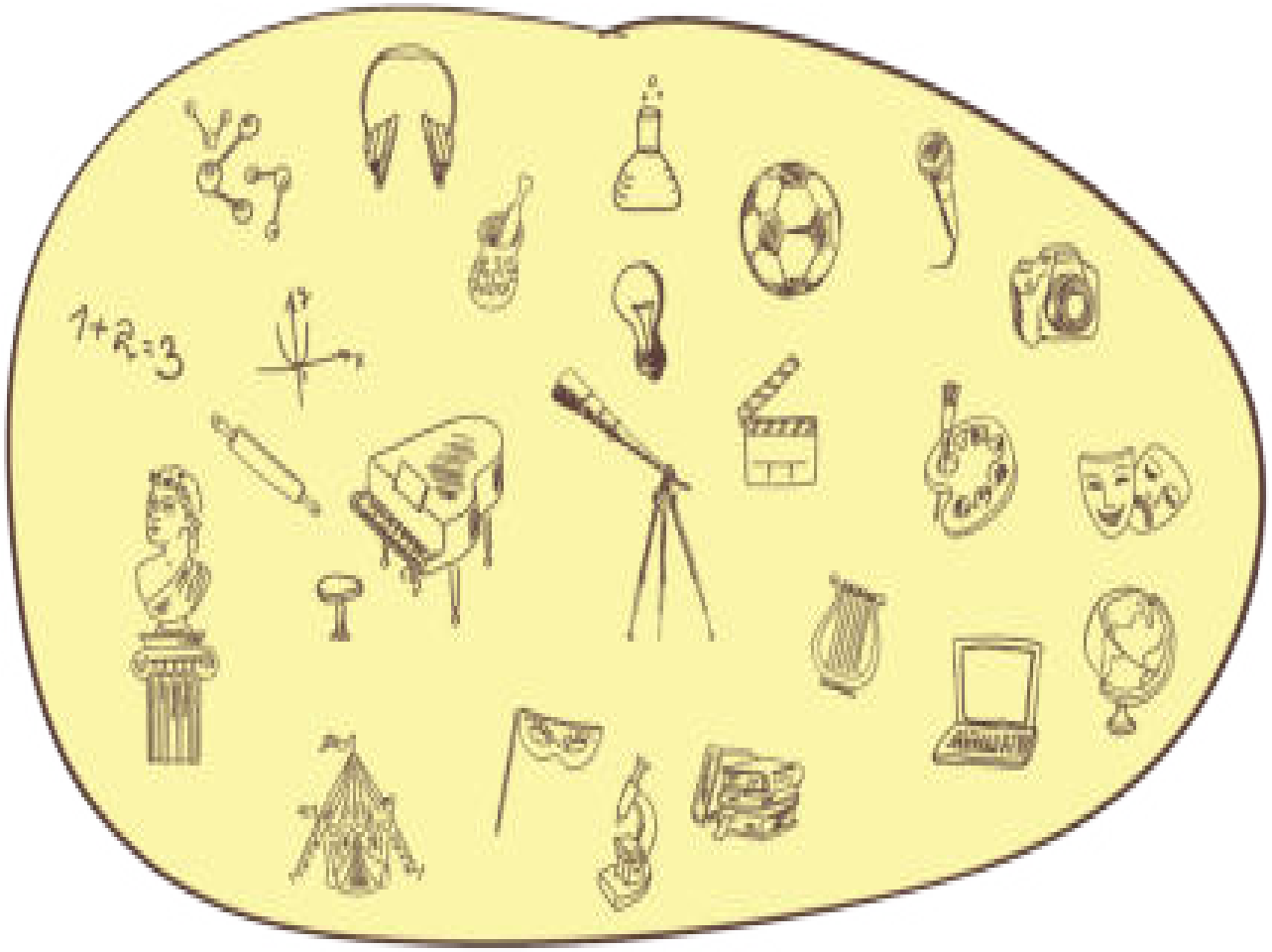




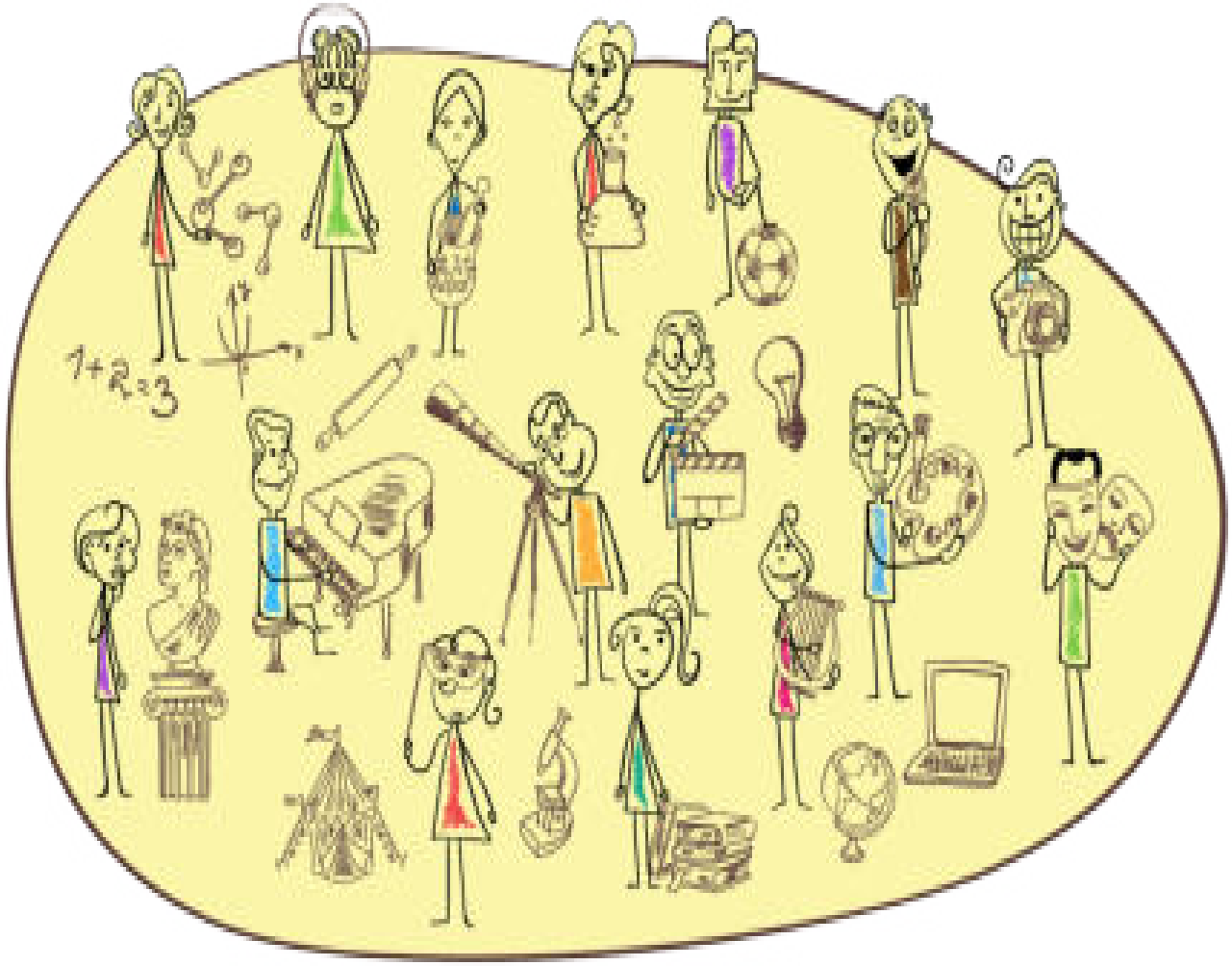



Climate change
Renewable energy
Loss of biodiversity
Environmental degradation
Water and food shortages
Global integration
Inequality
Interdependent markets
Migration

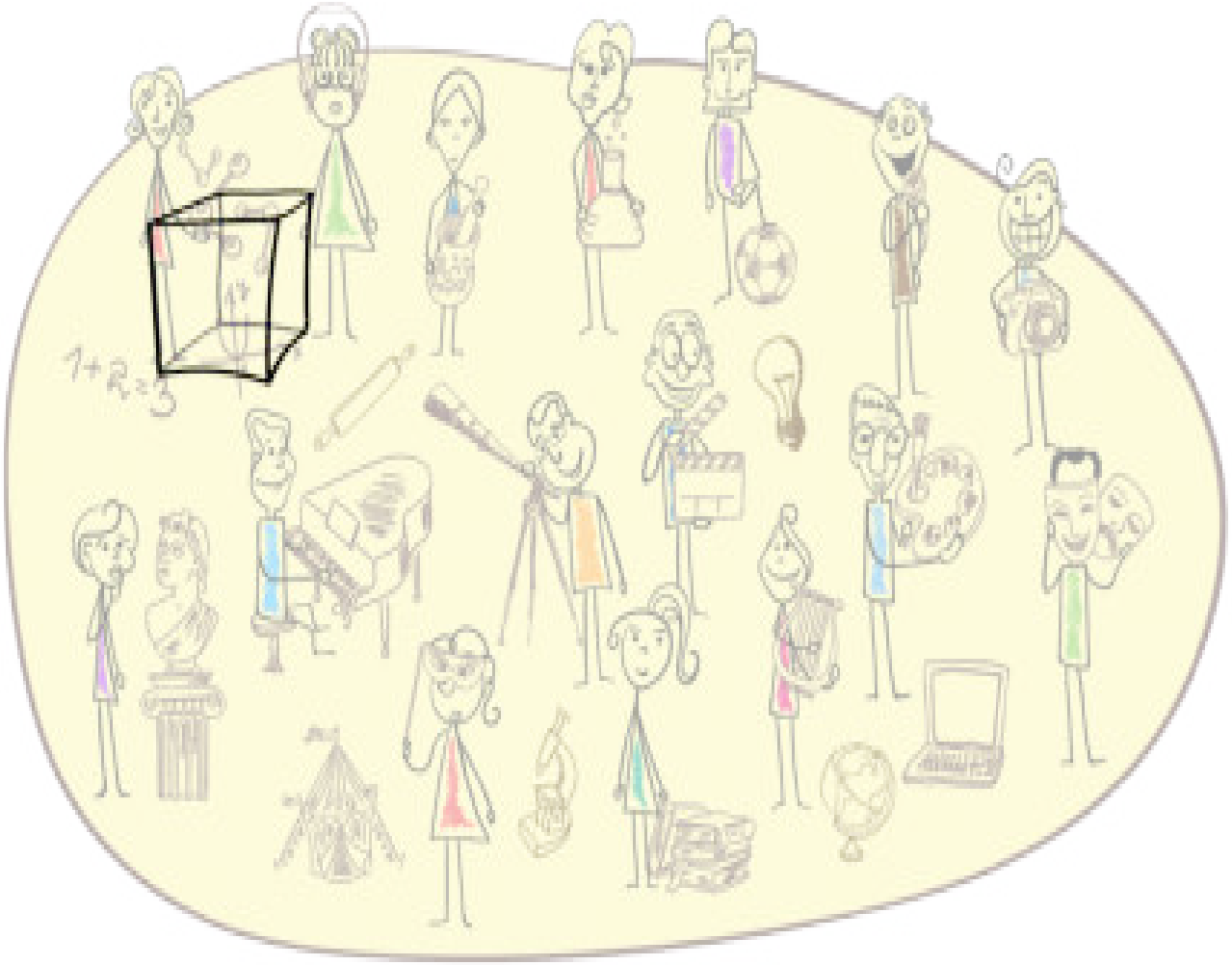
The multi-faceted world of knowledge



The human world of knowledge



The small world of the curriculum



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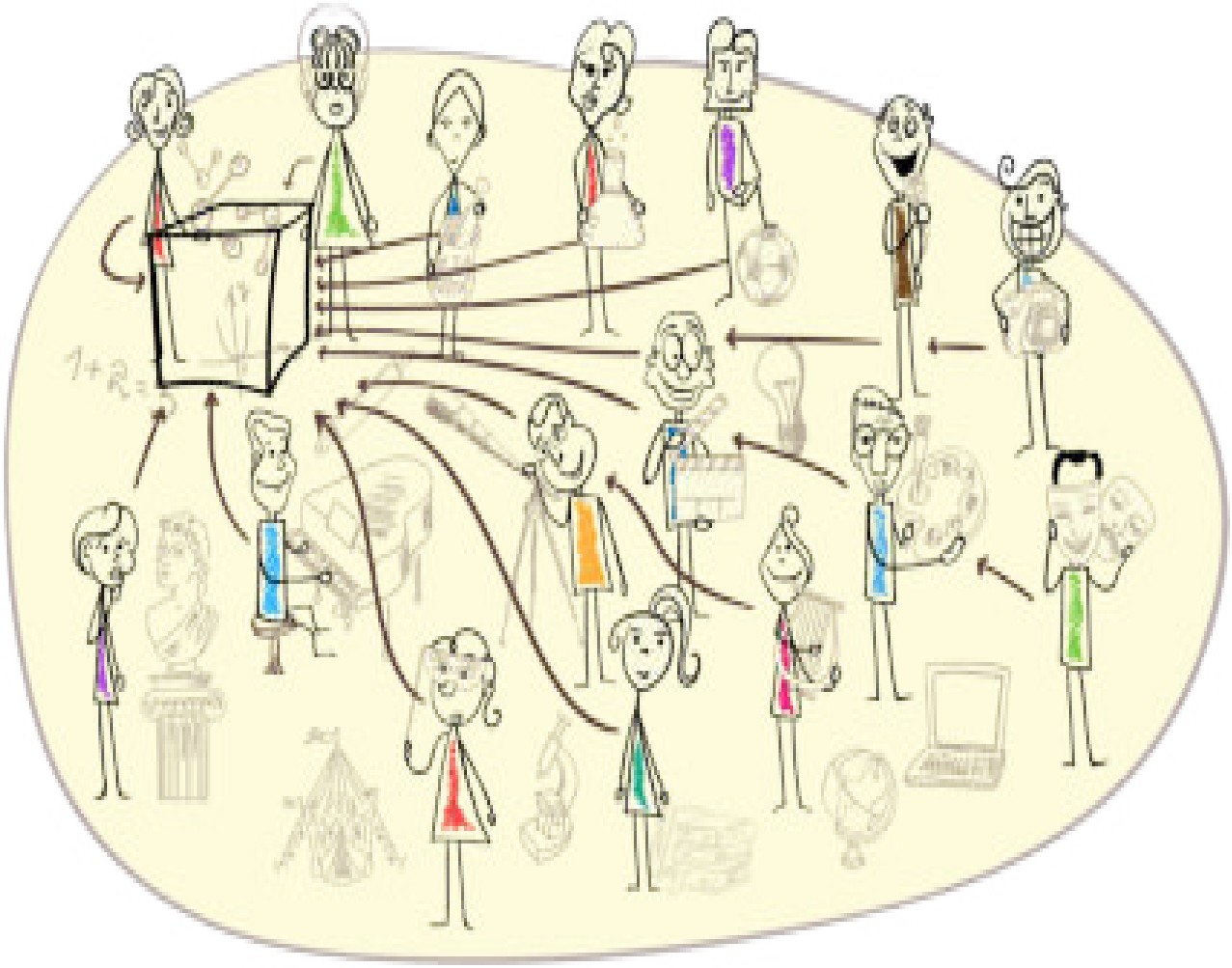

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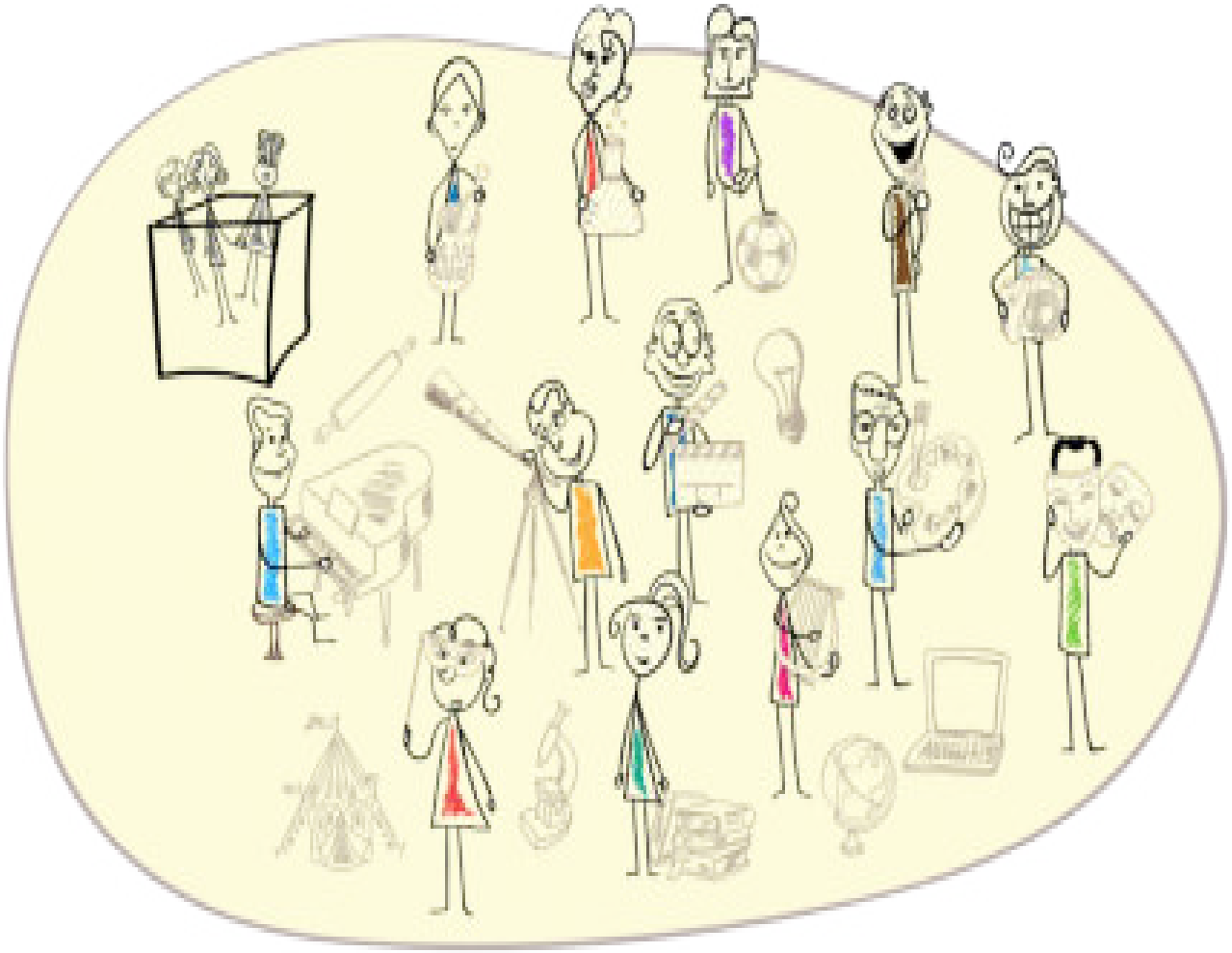

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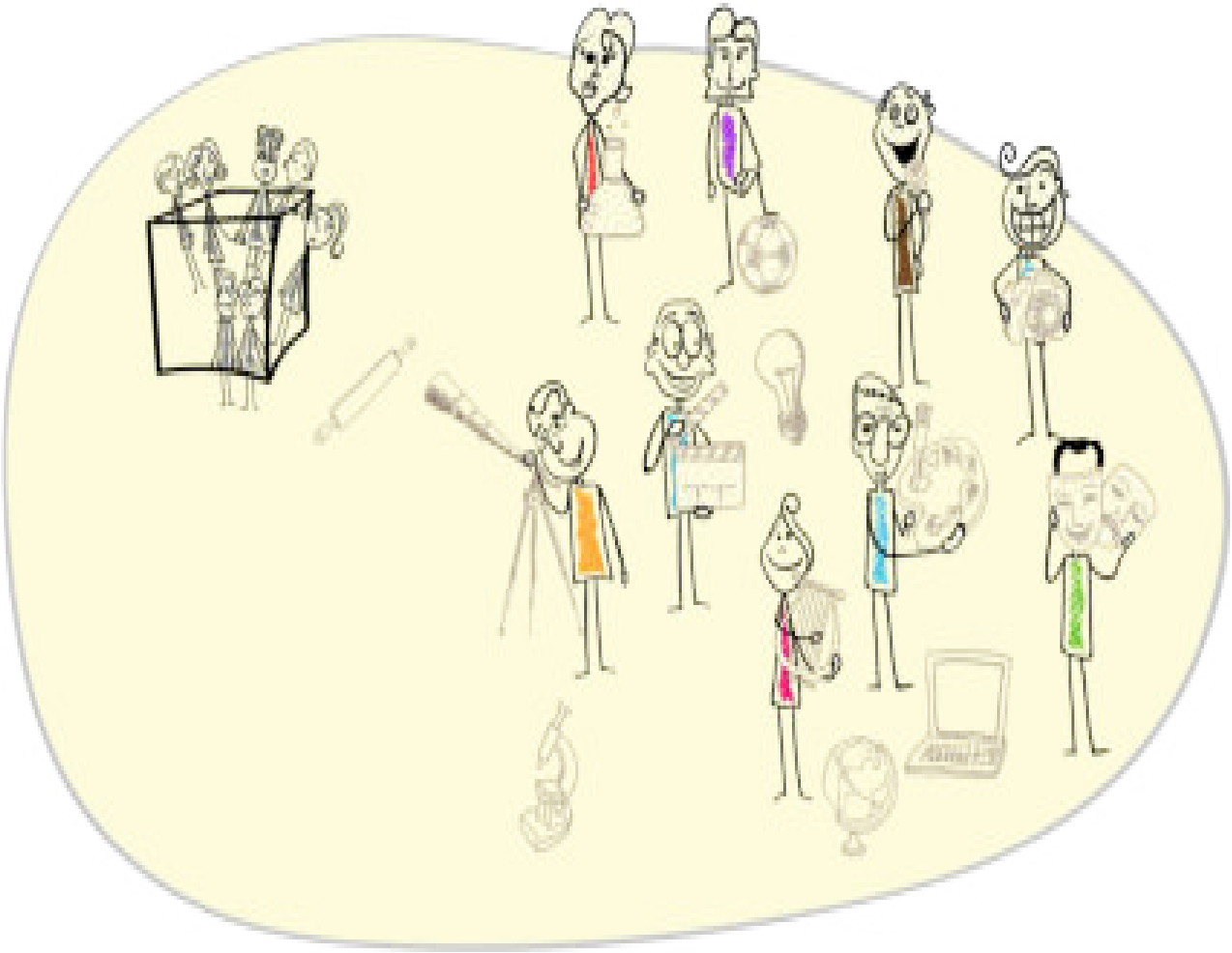

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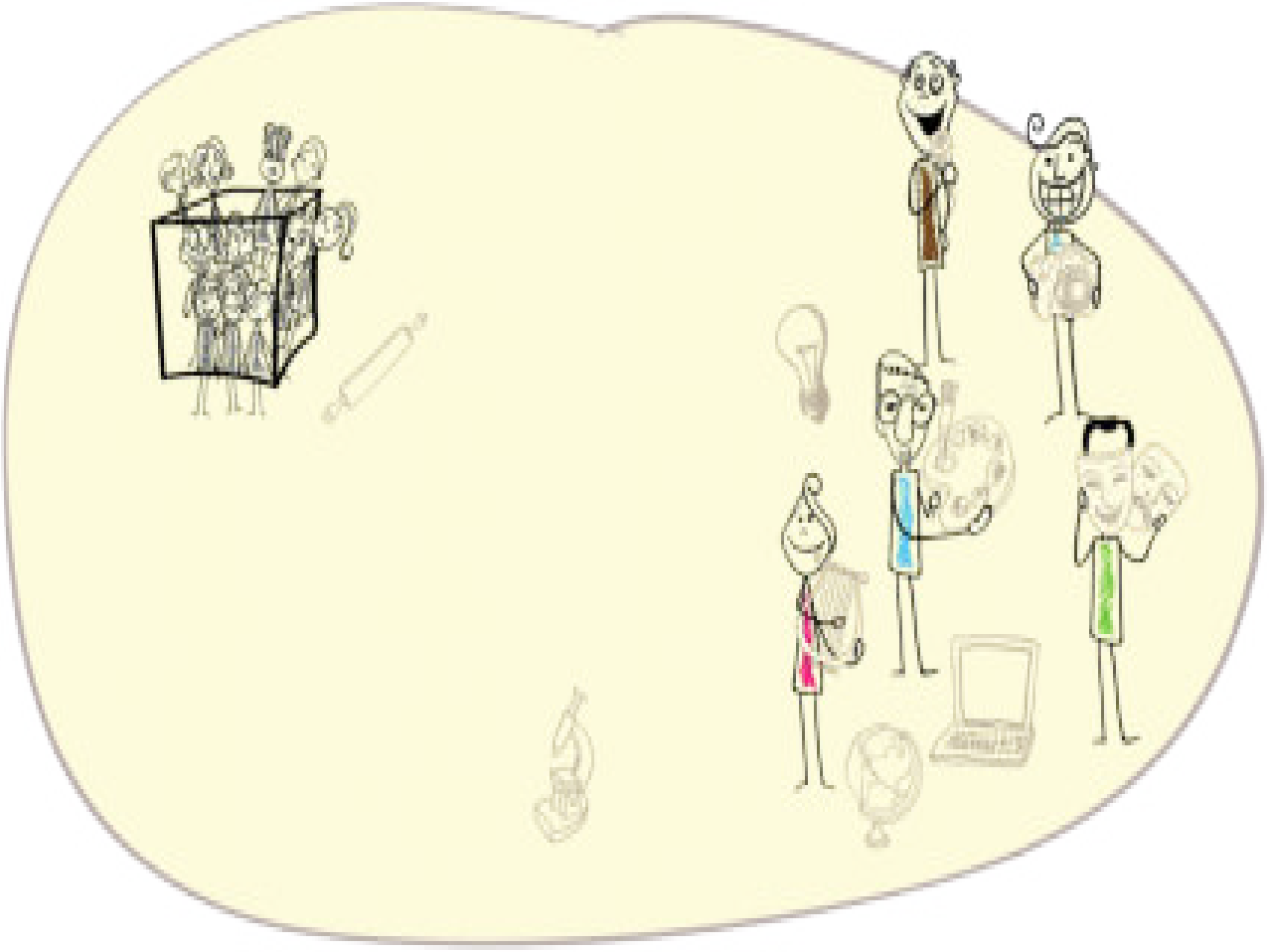

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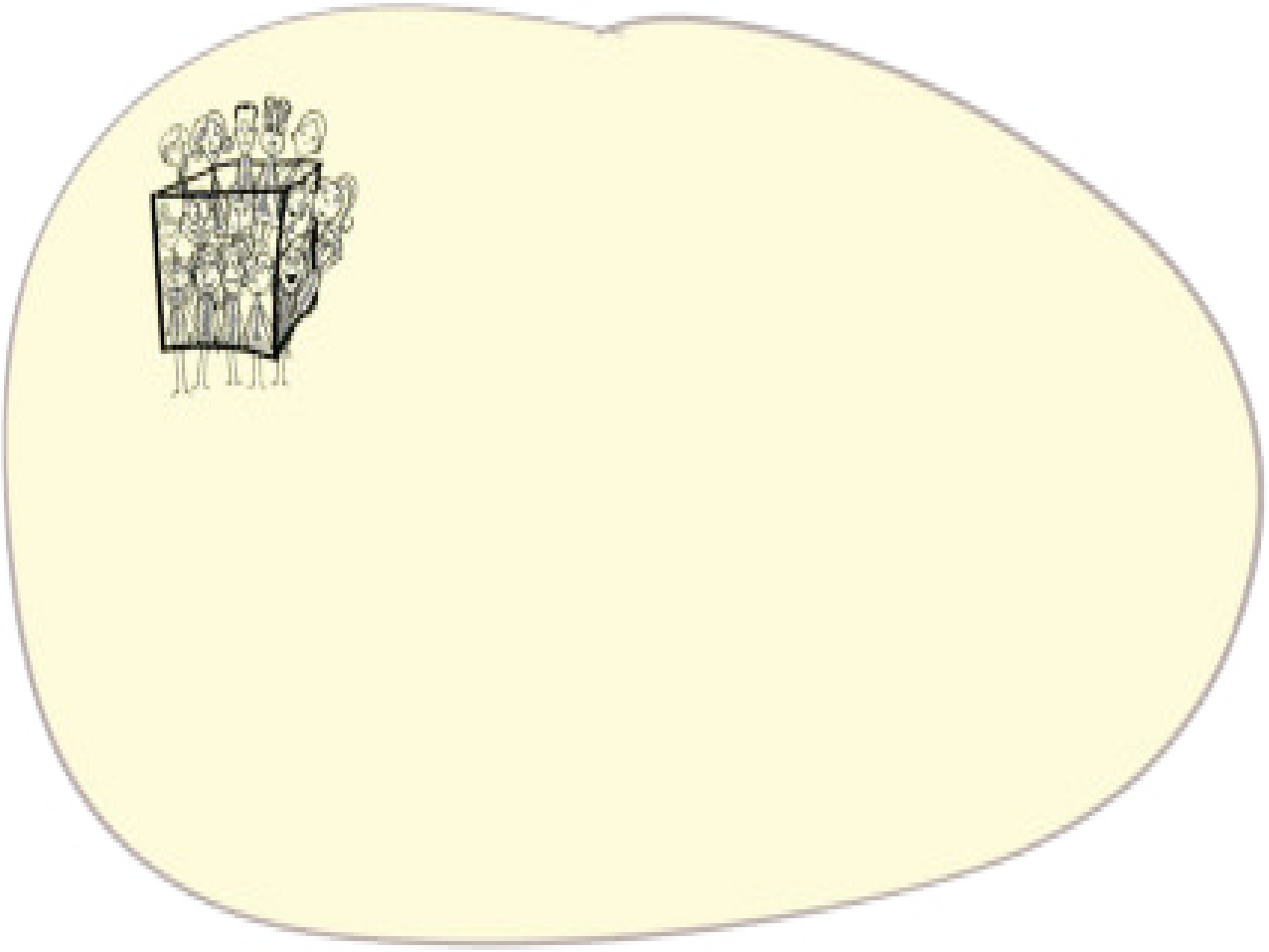
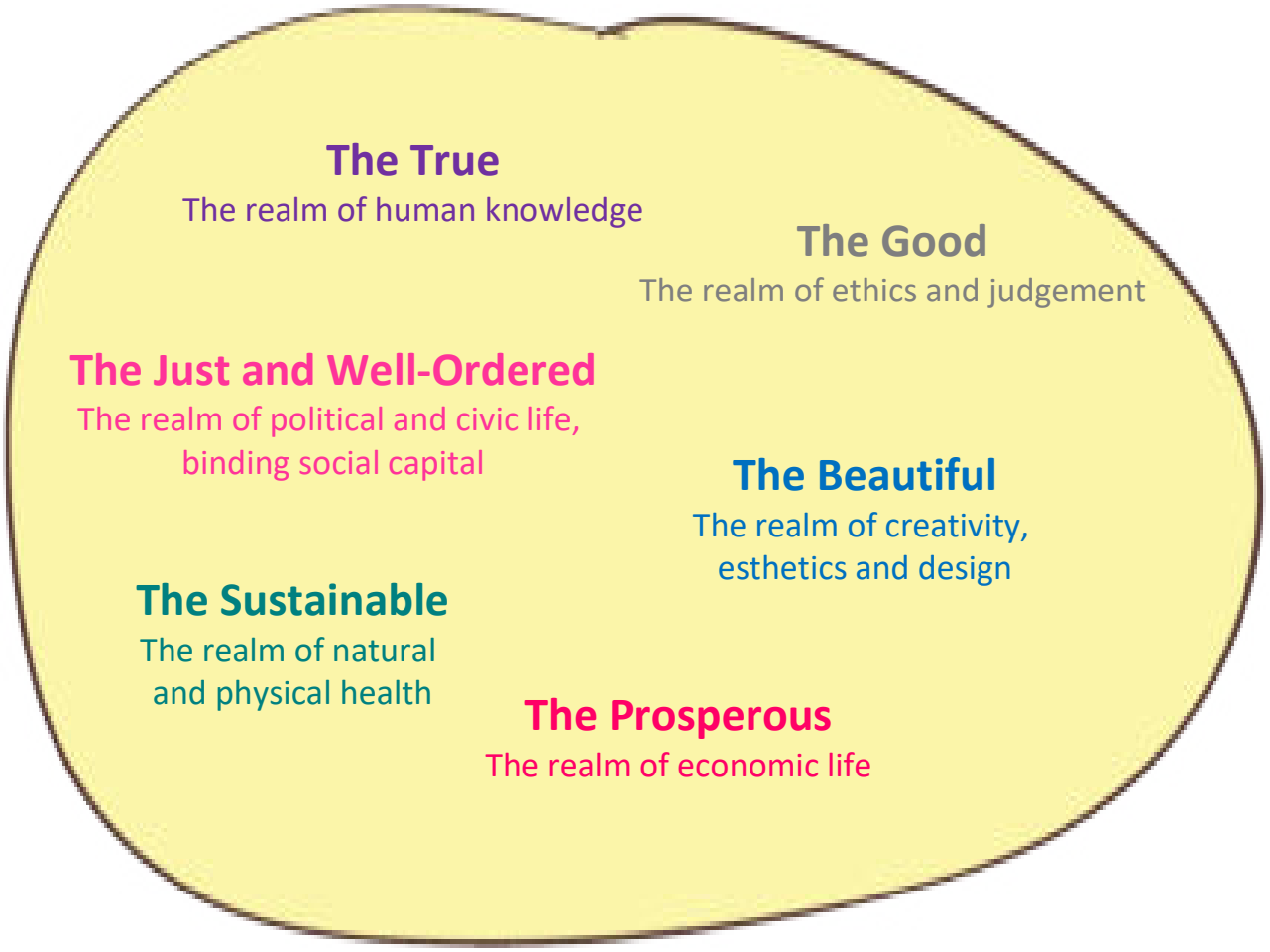


The big world of learning – Global citizenship



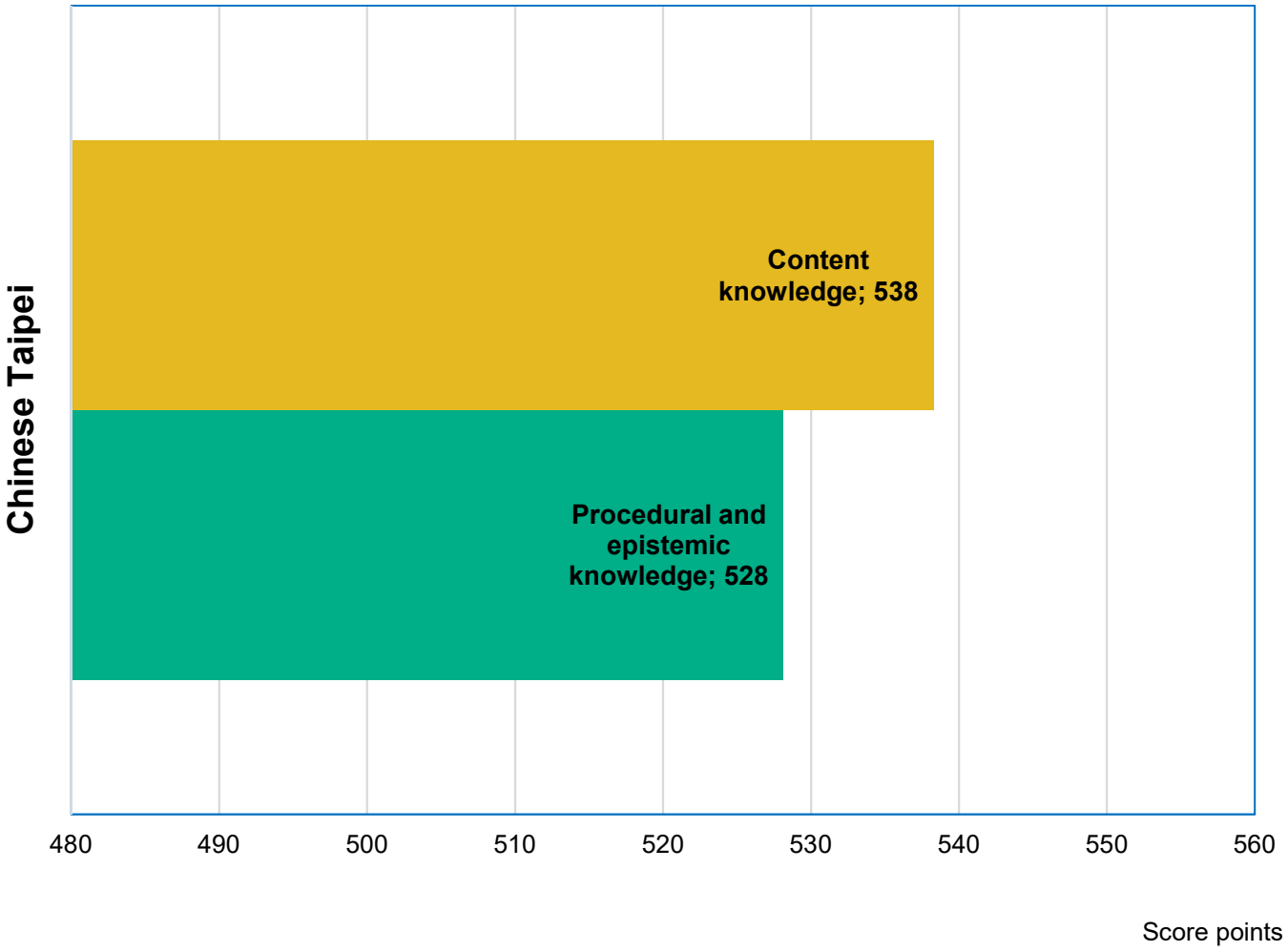
Good science teaching

A well-structured, clear and informative lesson on a topic including teachers' explanations, classroom debates and students' questions pays off, as does adaptive instruction

Inquiry-based science instruction (e.g. experimentation and hands-on activities) tends to relate negatively to performance but positively to student engagement and career expectations

Figure I.2.30

Comparing countries and economies on the different science knowledge subscales



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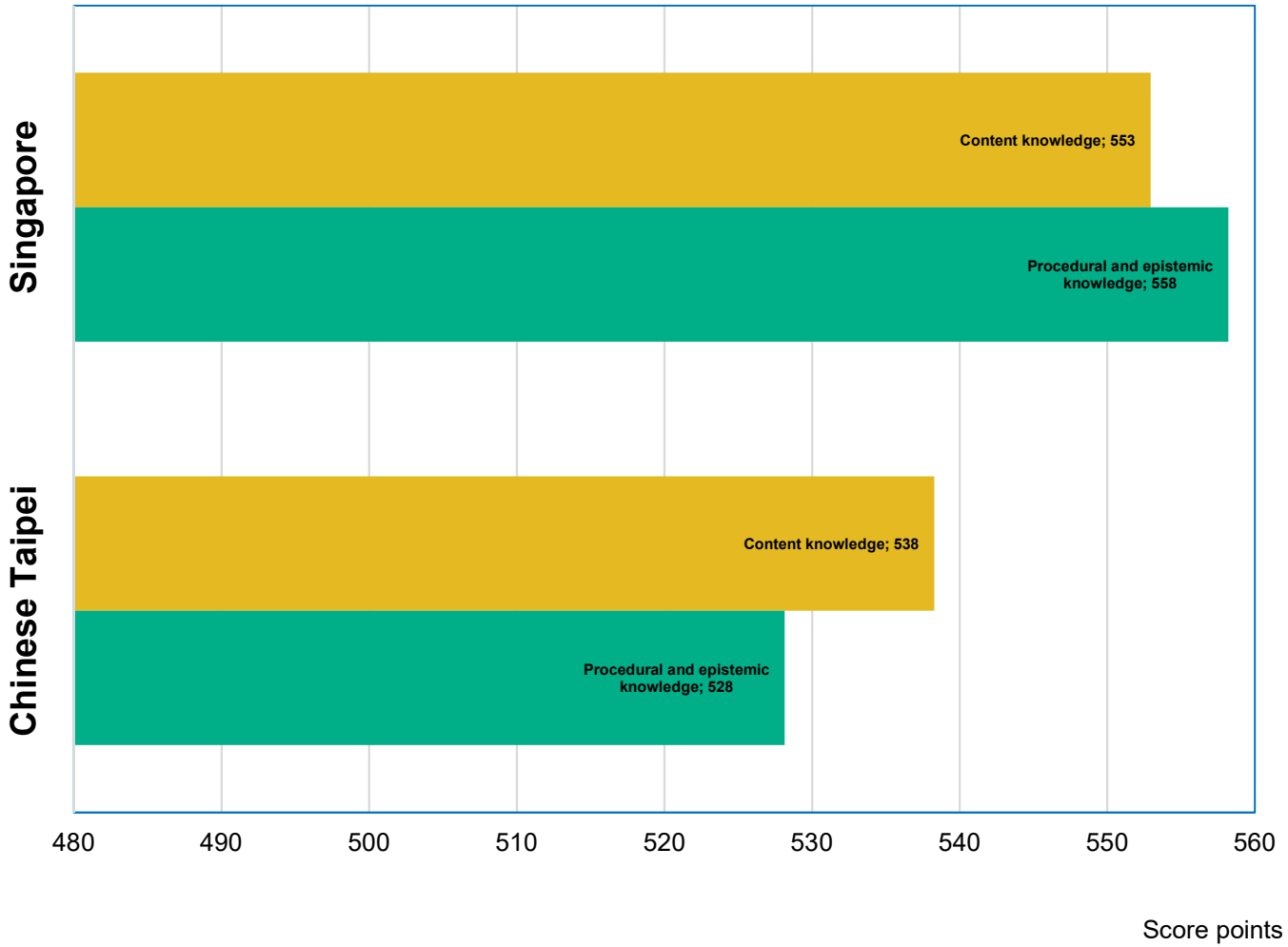

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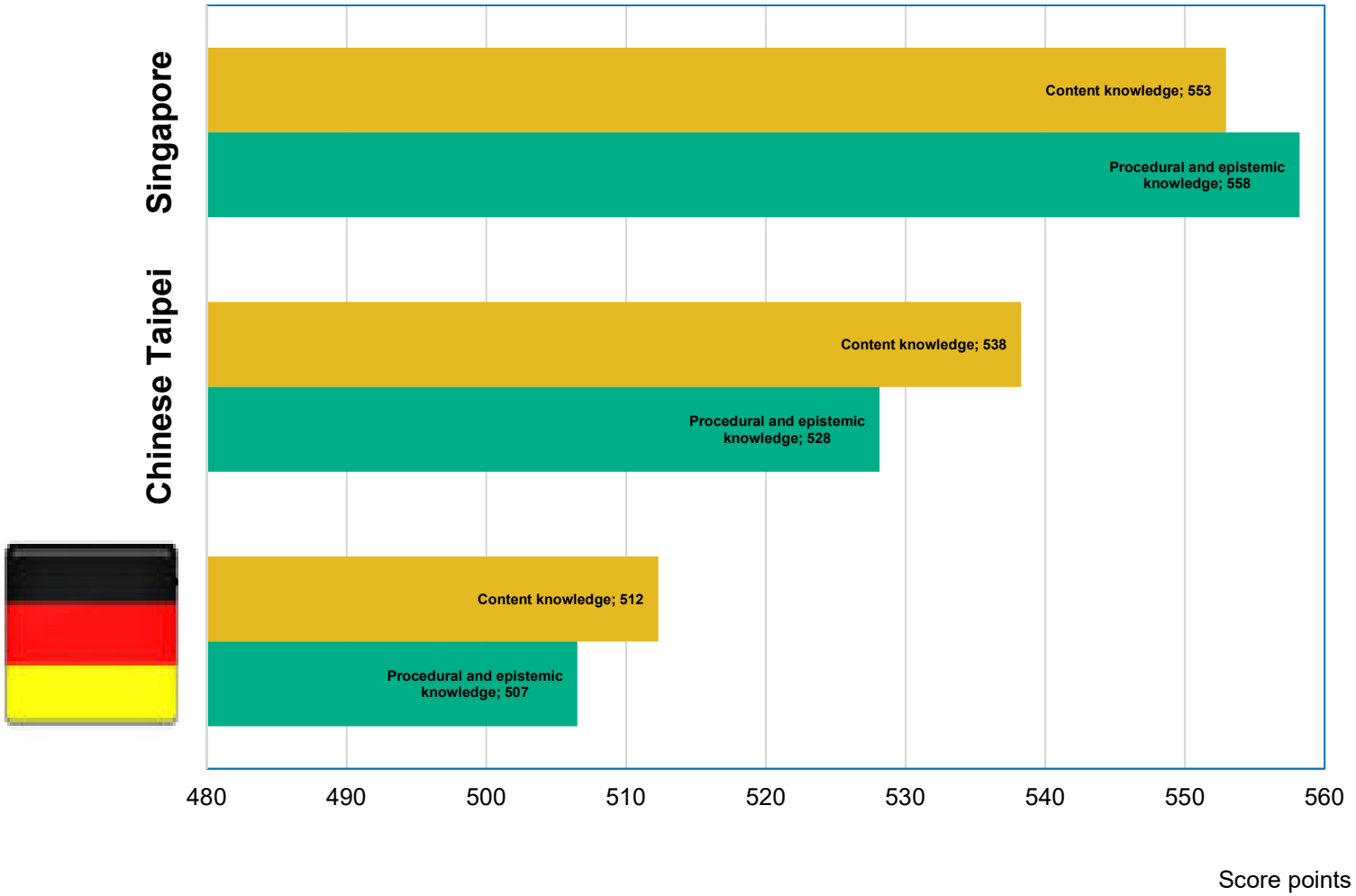
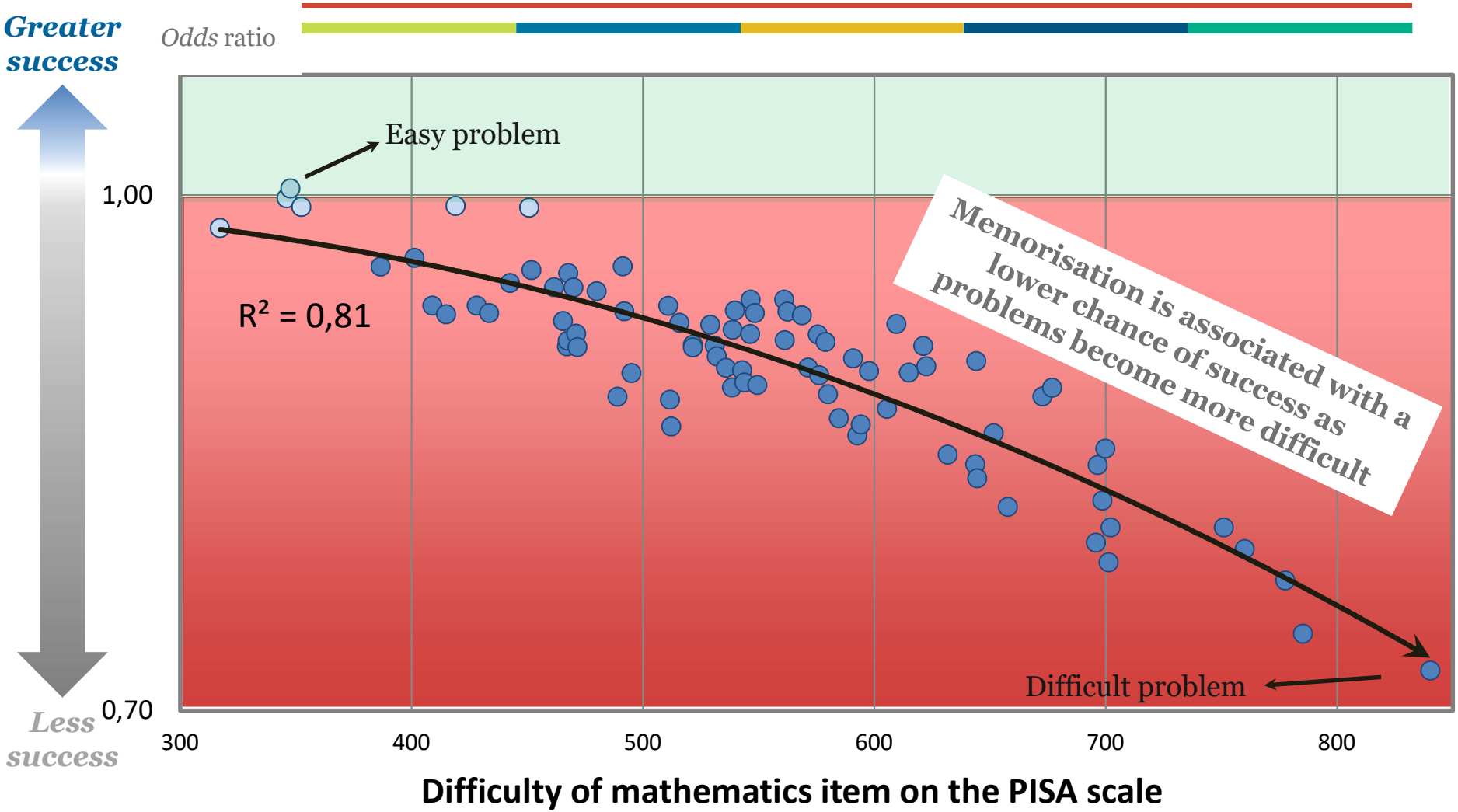
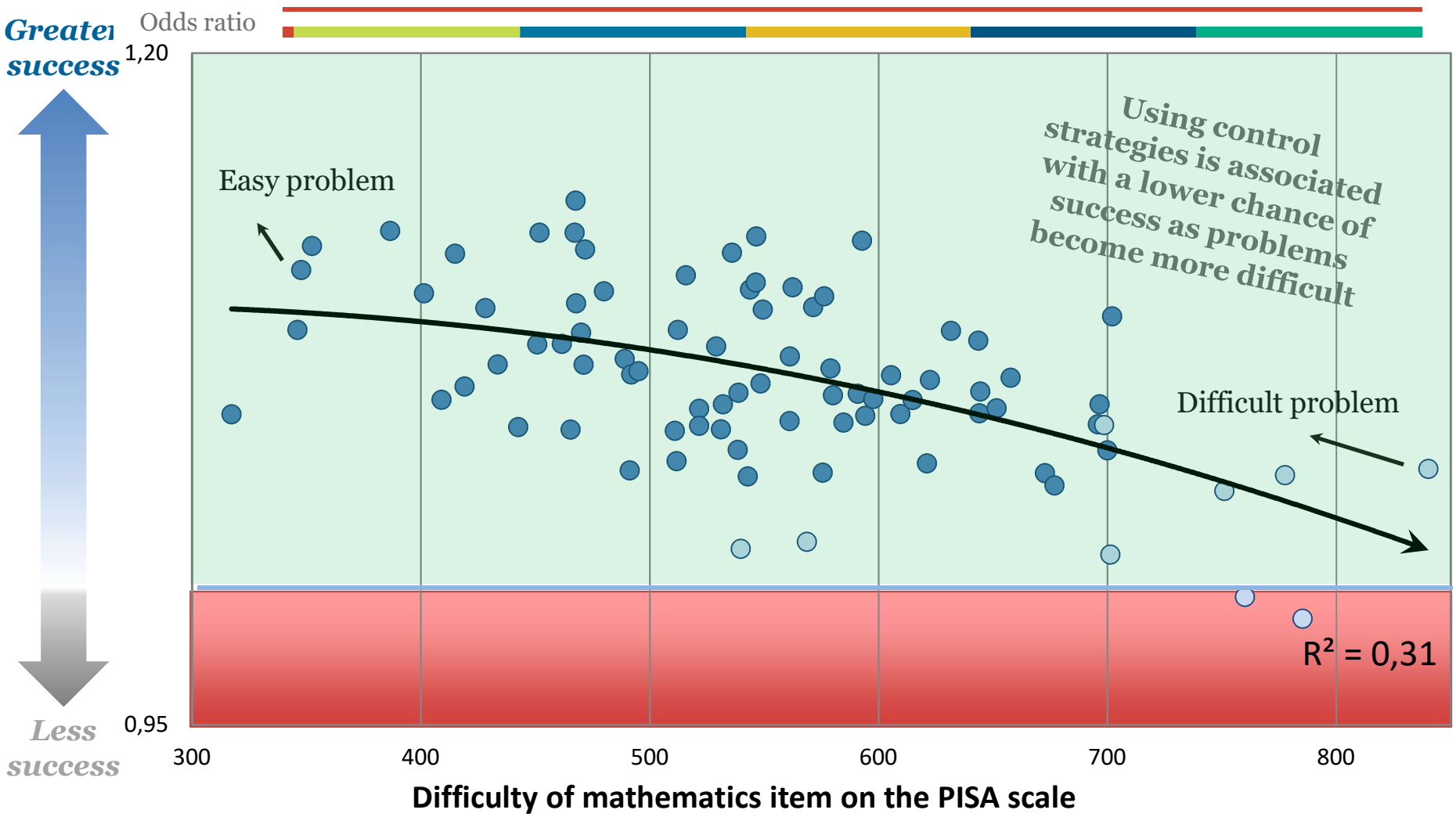


Memorisation is **less useful** as problems become **more difficult** *(OECD average)*



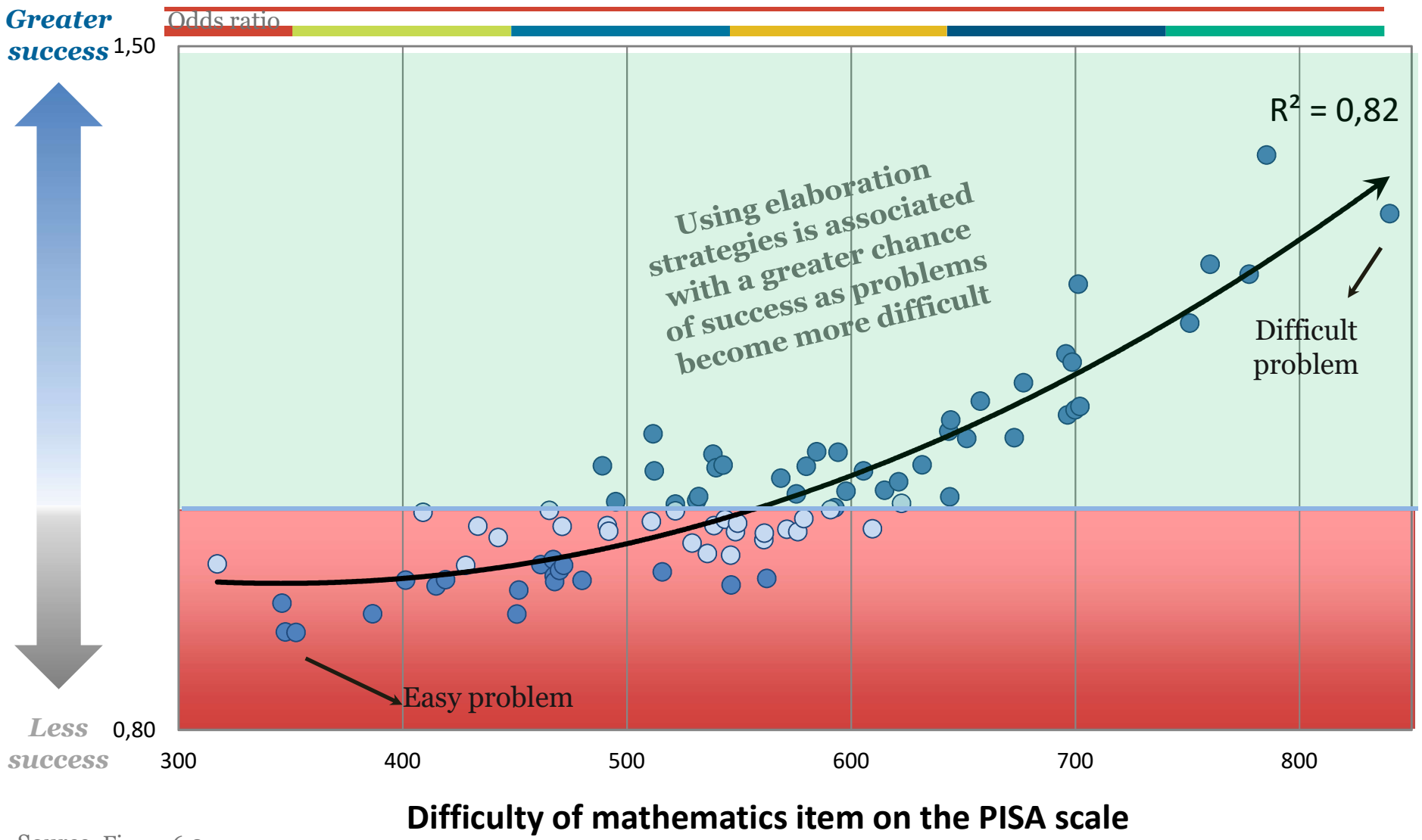
Source: Figure 4.3

Control strategies are **always helpful** but **less so** as problems become **more difficult** *(OECD average)*



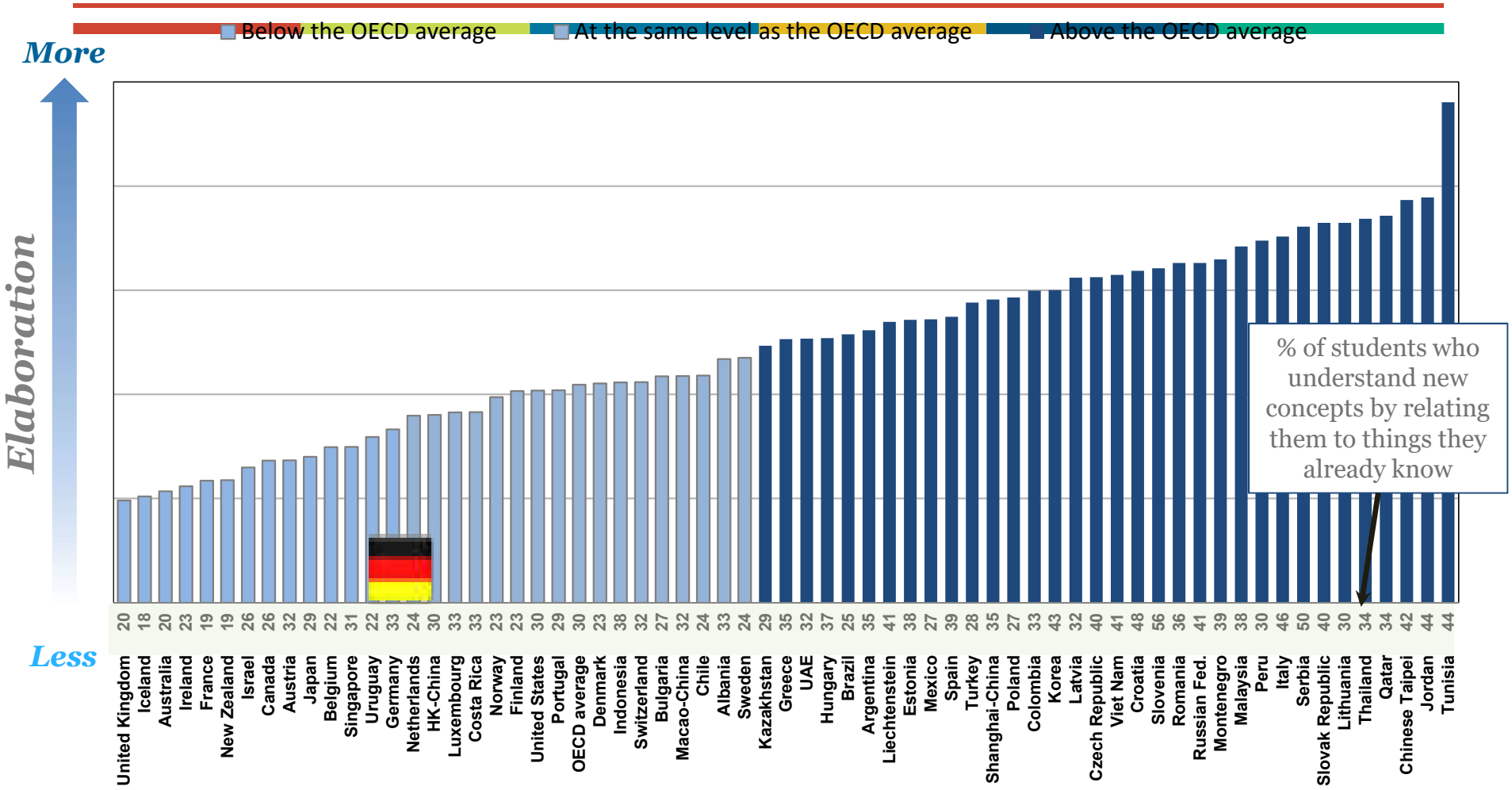
Source: Figure 5.2

Elaboration strategies are **more useful** as problems become **more difficult** *(OECD average)*



Source: Figure 6.2

Students' use of **elaboration strategies**



Source: Figure 6.1

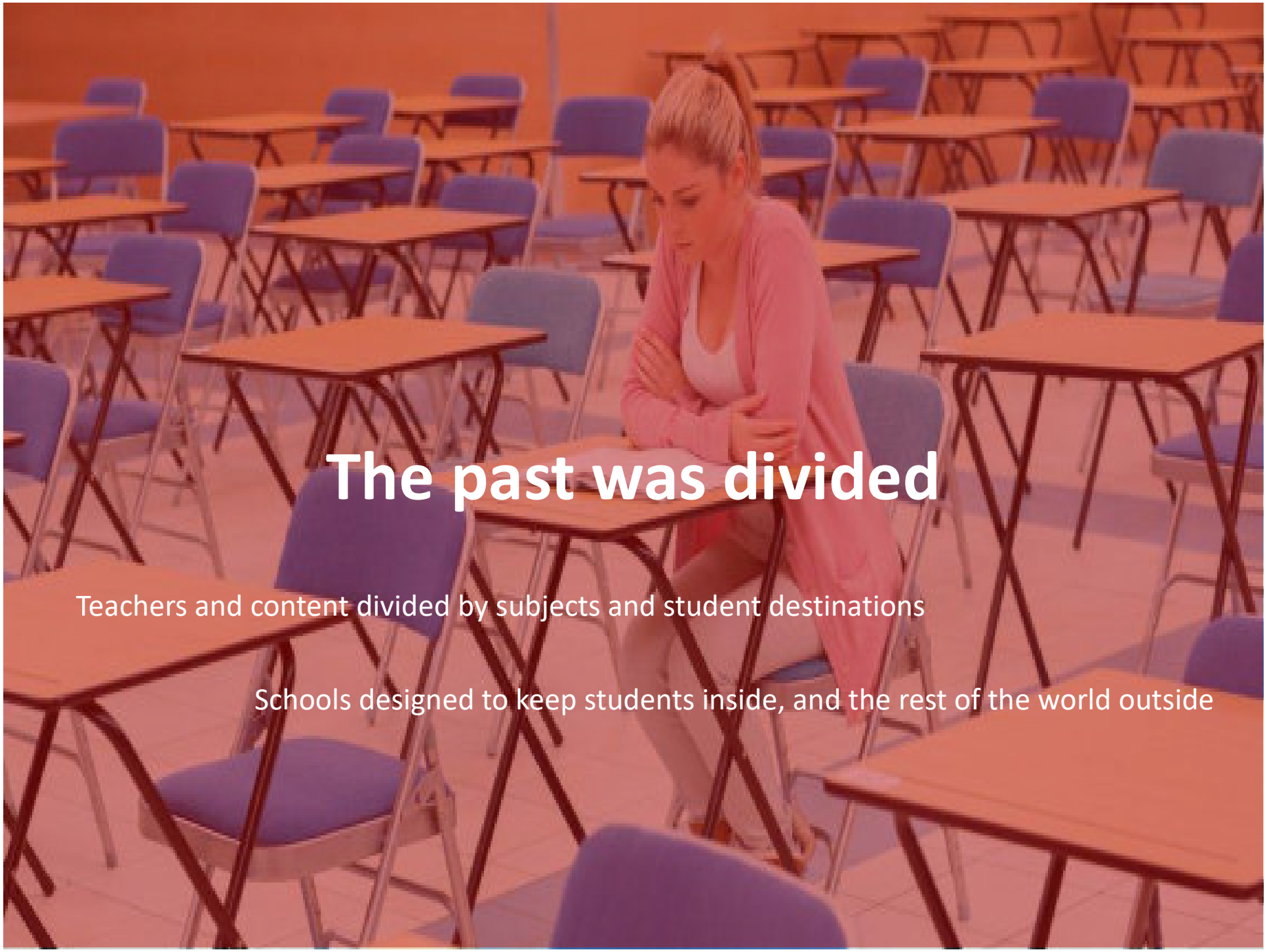

Some students learn at high levels


All students learn at high levels


Delivered wisdom

User-generated wisdom

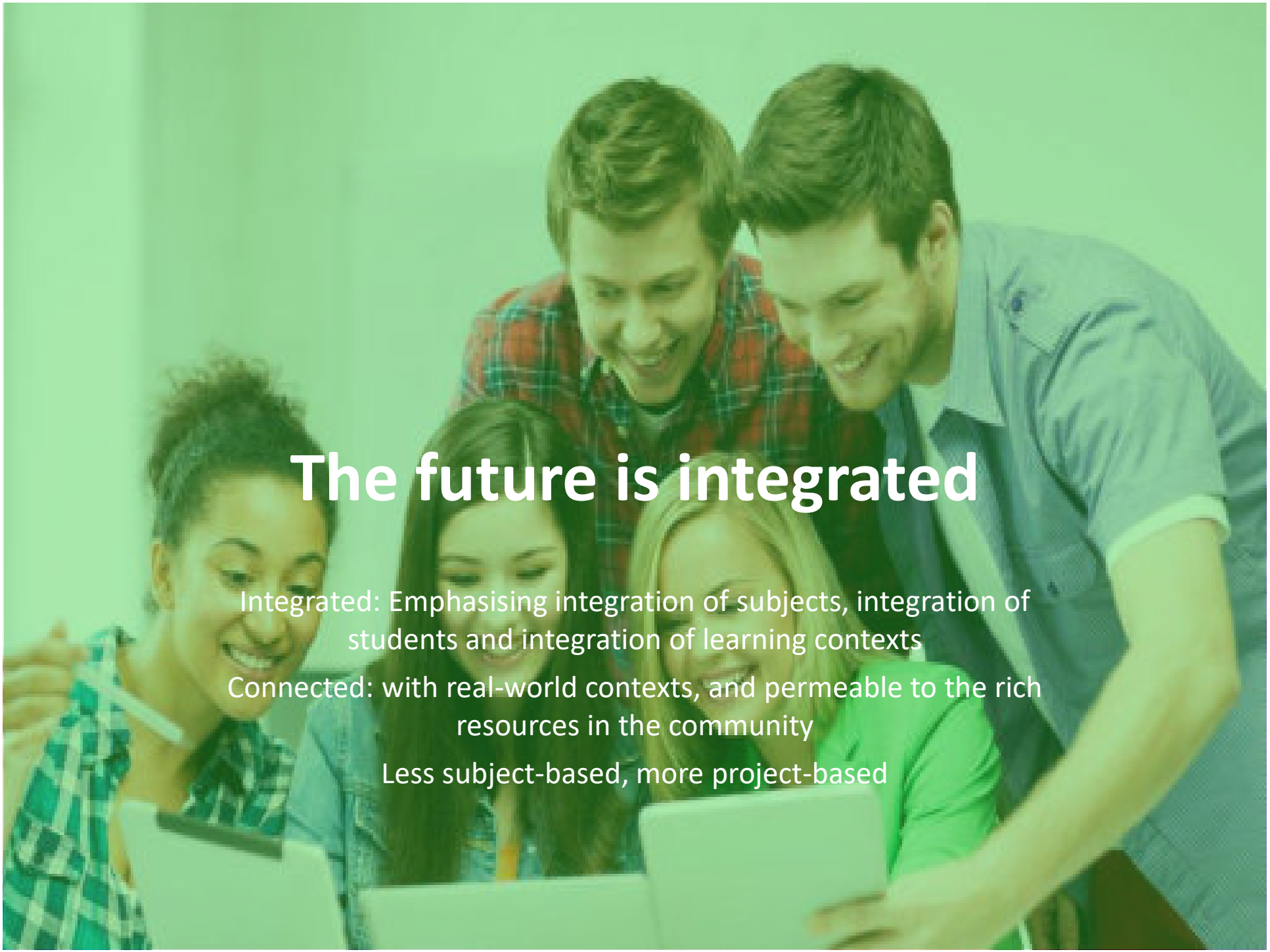
Recognising both students and adults as resources for the co-creation of communities, for the design of learning and for the success of students



The past was divided

Teachers and content divided by subjects and student destinations

Schools designed to keep students inside, and the rest of the world outside



The future is integrated

Integrated: Emphasising integration of subjects, integration of students and integration of learning contexts

Connected: with real-world contexts, and permeable to the rich resources in the community

Less subject-based, more project-based


Uniformity

Diversity

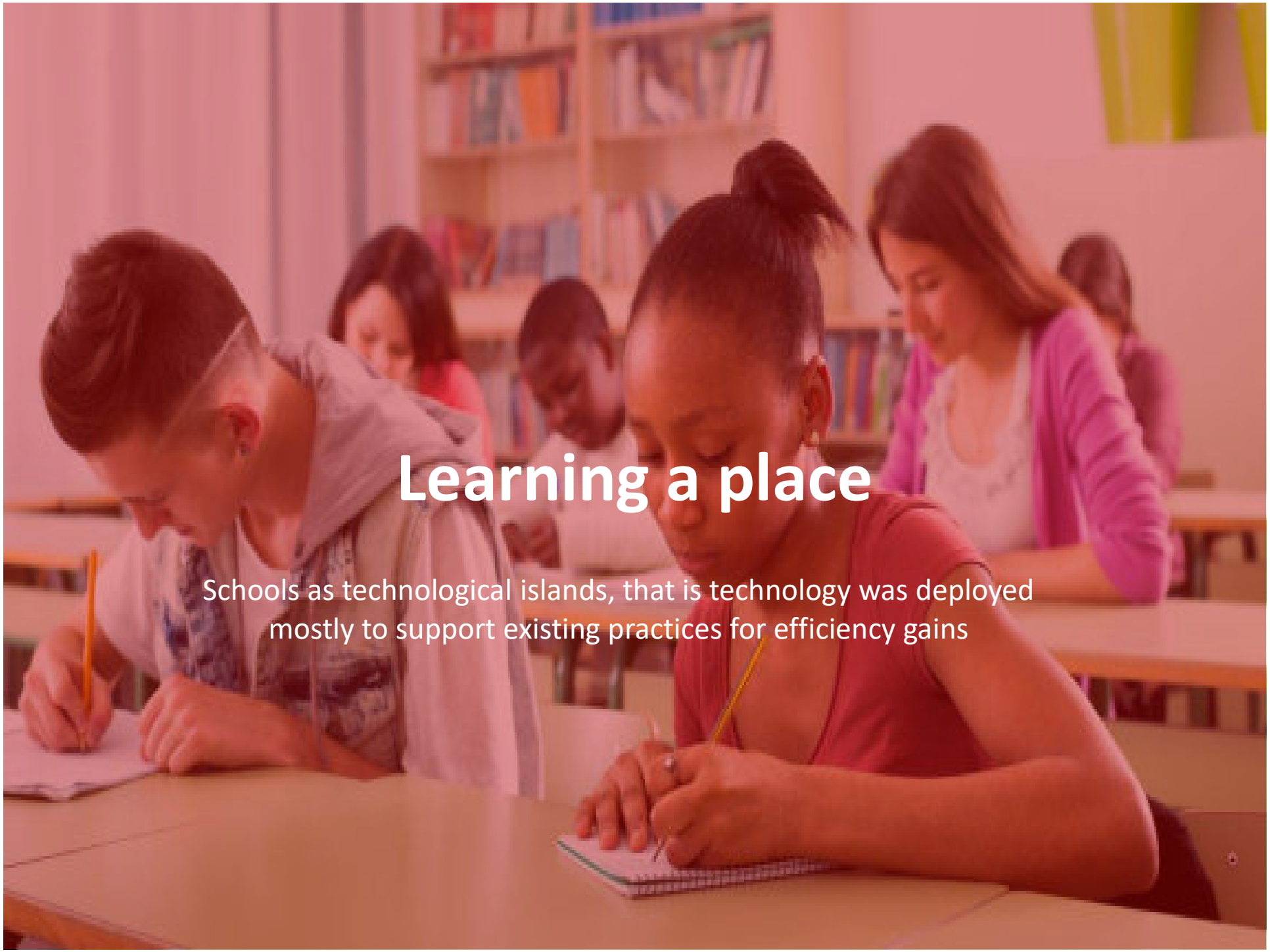
Embracing diversity with differentiated pedagogical practices

Standardisation and Conformity

Standardisation and compliance lead students to be educated in batches of age, following the same standard curriculum, all assessed at the same time.

Ingenious

Building instruction from student passions and capacities, helping students personalise their learning and assessment in ways that foster engagement and talents.



Learning a place

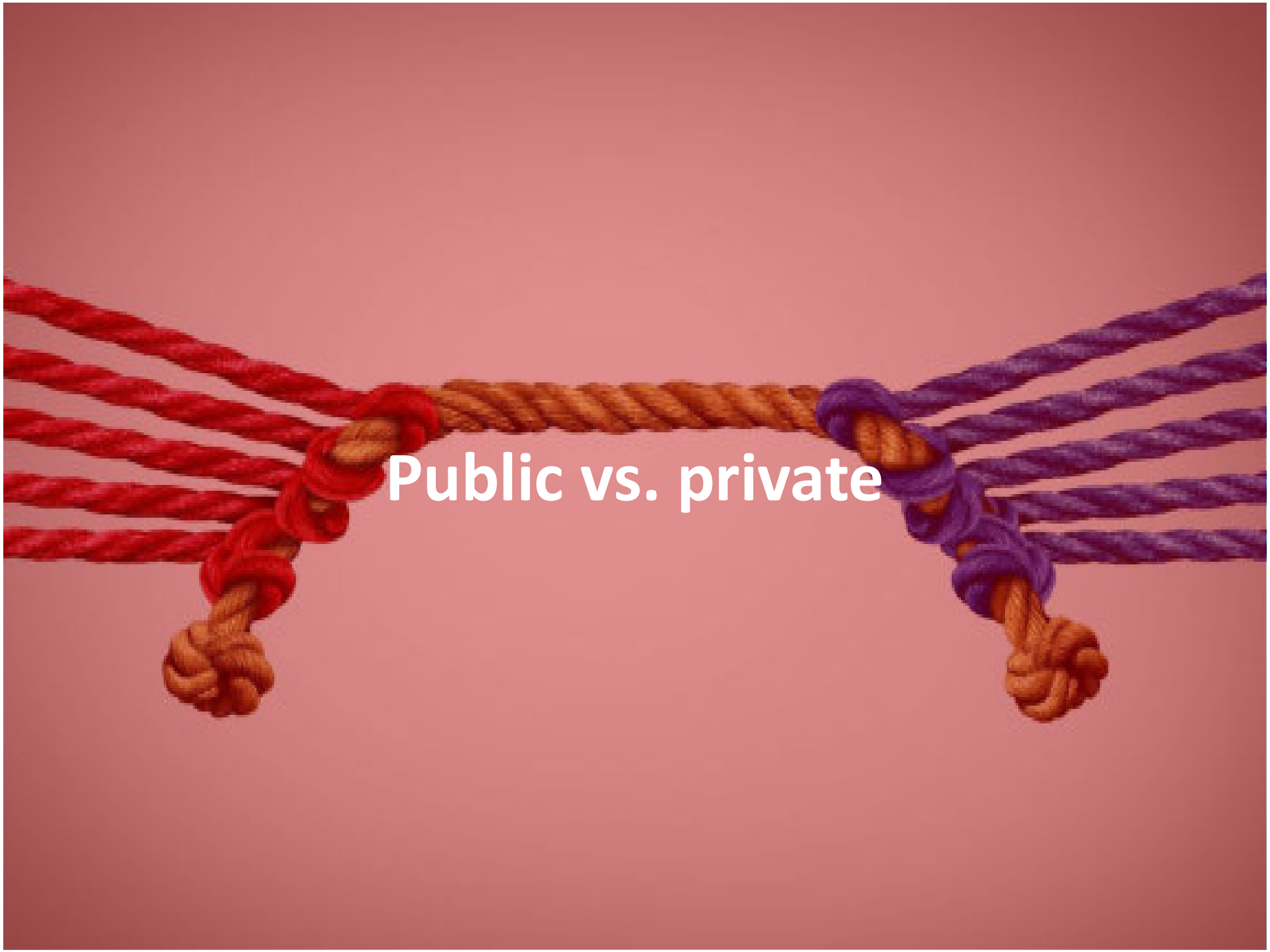
Schools as technological islands, that is technology was deployed mostly to support existing practices for efficiency gains

Learning an activity

Technologies liberating learning from past conventions and connect learners in new and powerful ways. The past was interactive, the future is participative

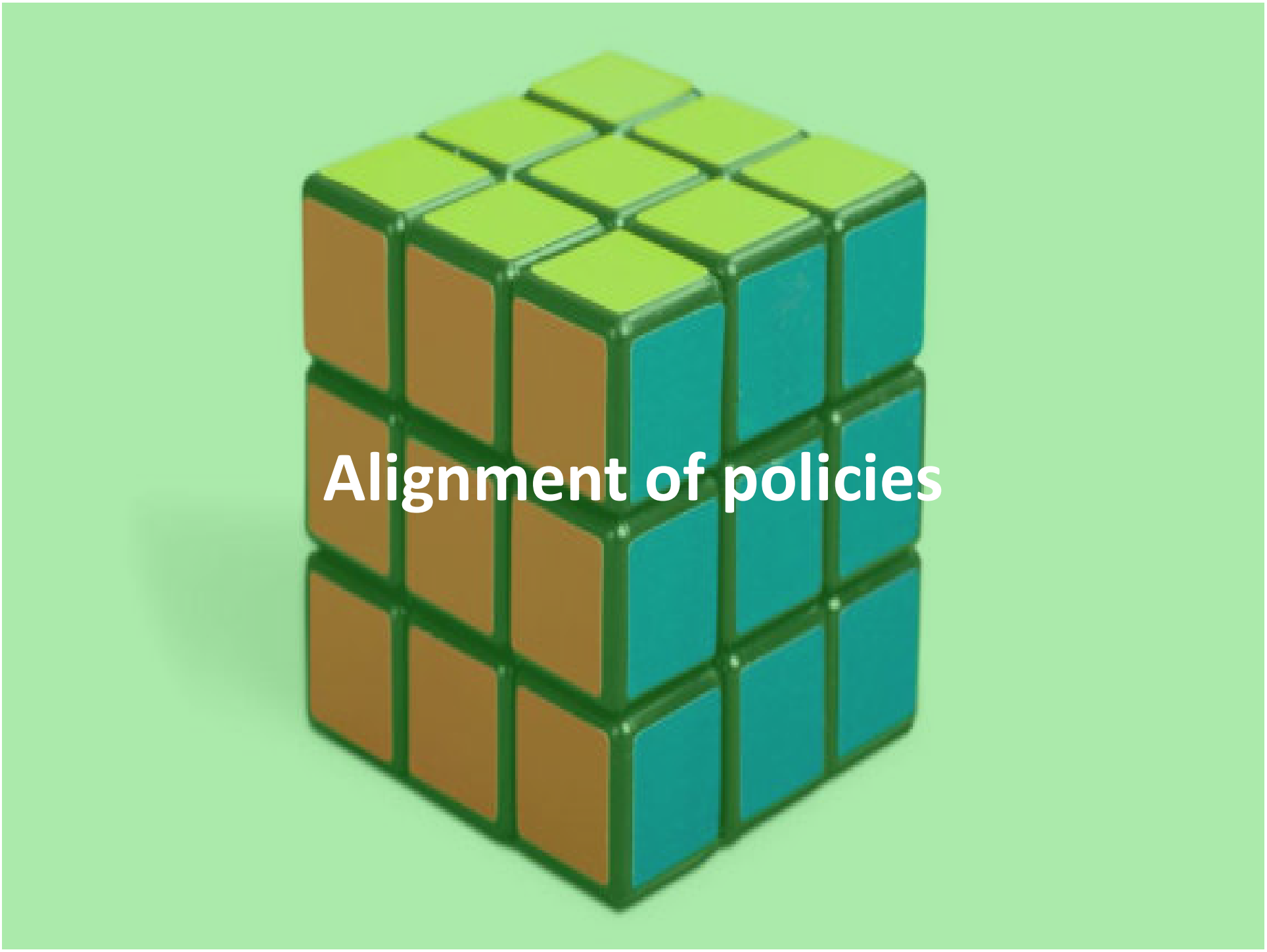
Administrative control and accountability

Professional forms of work organisation


Public vs. private


Public with private

Idiosyncratic policies


Alignment of policies

Thank you

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- The complete micro-level database

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Twitter: SchleicherEDU

and remember:

Without data, you are just another person with an opinion