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Crossing borders, blurring borders

The future of university-industry collaboration (at KU Leuven)

Luc Sels
Rector KU Leuven

Jobs supported and Gross Value Added generated by KU Leuven in 2017
(excl. Academic hospital)

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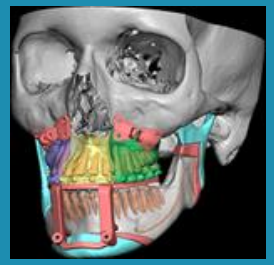
From science-as-resource to science-as-engine



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#1

Reuters Ranking of Most Innovative Universities in Europe (2019)

1. **KU Leuven**
2. University of Erlangen Nuremberg
3. Imperial College London
4. University of Cambridge
5. EPFL
6. University College London
7. Technical University of Munich
8. University of Manchester
9. University of Zürich
10. Swiss Federal Institute of Technology Zurich

#7

Reuters World Ranking of Most Innovative Universities (2018)

1. Stanford
2. MIT
3. Harvard
4. University of Pennsylvania
5. University of Washington
6. University of Texas System
7. **KU Leuven**
8. Imperial College London
9. University of North Carolina Chapel Hill
10. Vanderbilt University

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KU Leuven Research and Development (LRD)

ESTABLISHED IN 1972
ONE OF THE FIRST UNIVERSITY TECHNOLOGY TRANSFER OFFICES IN EUROPE

LRD advances the impact of research results on people's lives around the globe by means of:

- Contract research
- Managing intellectual property rights
- Founding spin-off companies
- Promoting entrepreneurship and innovation
- Supporting regional development

LRD in figures

- 2017: 3,106 new university-industry contracts concluded (€149 million contract research and valorisation activities)
- 2017: € 72 million revenue from intellectual property
- 2005-2017: € 927 million external capital investment in spin-off portfolio

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Crossing borders in education

An entrepreneurial university. However …

- Integration of experiential learning is limited
- Research-driven education “incompatible” with a practice-based approach
- Scaling up internships, service learning, business projects, etc. is a challenge
- Low mobility of academics/professionals between university/business
- Limited involvement of professionals in educational programmes
- Resistance to dual learning in university education
- Limited supply of lifelong learning
- Lifelong learning *for* the business world, not *with* the business world

Ways to cross the border

Students going out

- Student work placements
- Student internships
- Students conducting real life projects in firms

Academics going out

- Academics experience the work in firms
- University training for enterprises' order

Employer involvement

- Curriculum development
- Degree advisory board
- Student assessment
- Guest lectures
- Student mentoring
- Career fairs or events
- Sponsorships / scholarships
- Graduate recruitment

Universities and firms collaborate to deliver

- Work based learning degree programs/sandwich years
- Dual study programmes
- Extended universities in co-creation
- Research and development activities
- Practical projects either on university campus or in enterprises

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Crossing borders: six approaches

Crossing border: six models

1. The sabbatical leave model
2. The skills development model
3. The PIP model
4. The gap year model
5. The dual study programme model
6. The extensions model

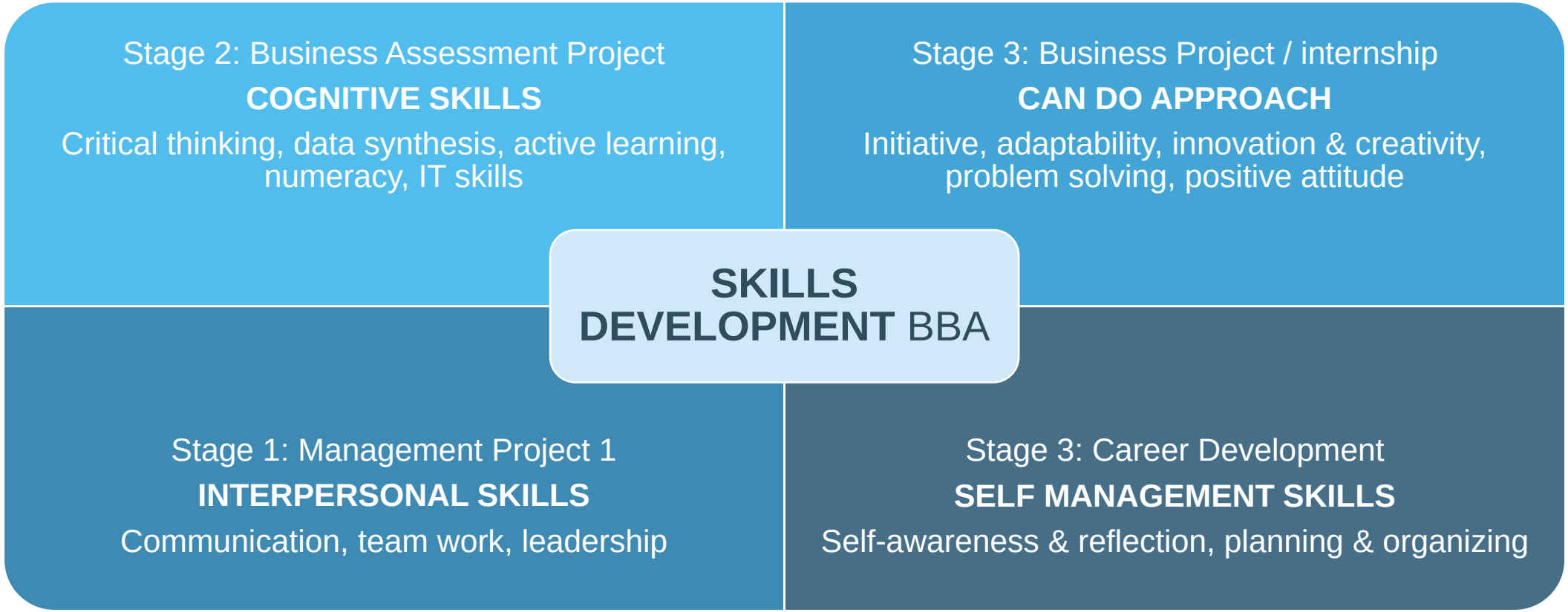
1. The sabbatical leave model

- Have tenured faculty engage in one-to-two semester leaves at an industry site
- Mixed model: half salary paid by the company, half paid by industry
- Potential effects
  - Learning new areas through observing and participating in teams and committees
  - Brings real-life relevance to research
  - Personal relationships with managers/engineers at host site lead to follow-on contracts
  - Develop more responsive teaching syllabi, enhancing experiential learning
  - Graduate students can become involved (masters or doctoral degree topics)
  - Encourages exploration of research territory that is of vital importance to industry
  - New methods/technology introduced by the faculty visitor
  - Introductions to other faculty members with specific expertise

2. The skills development model

Example: BBA programme @ KU Leuven

Focus on management and employability skills



3. The PIP model

Product Innovation Projects

- **Students** commit to a project for a full academic year. They work together in teams and are supported by various seminars. By doing this project, they can receive ECTS-credits.
- **Companies** provide a team with a challenge for which they can use an extra portion of resources or inspiration. They provide a budget and assist the team throughout their journey
- **The KU Leuven** is involved in facilitating the team, providing technical know how and allowing the students to valorize their project work as a part of their curriculum.
- Example
  - Tremtech
  - Project sponsor and challenge provider: RVO-Society
  - Challenge: “Develop a product that improves the daily lives of people with tremors”

4. The gap year model

EDHEC BUSINESS SCHOOL

E.g. Master in Management

- Year 1 – Foundation Year
- Year 2 – Gap Year
- Year 3 – Specialisation Year

TOP RECRUITERS—GAP-YEAR INTERNSHIPS

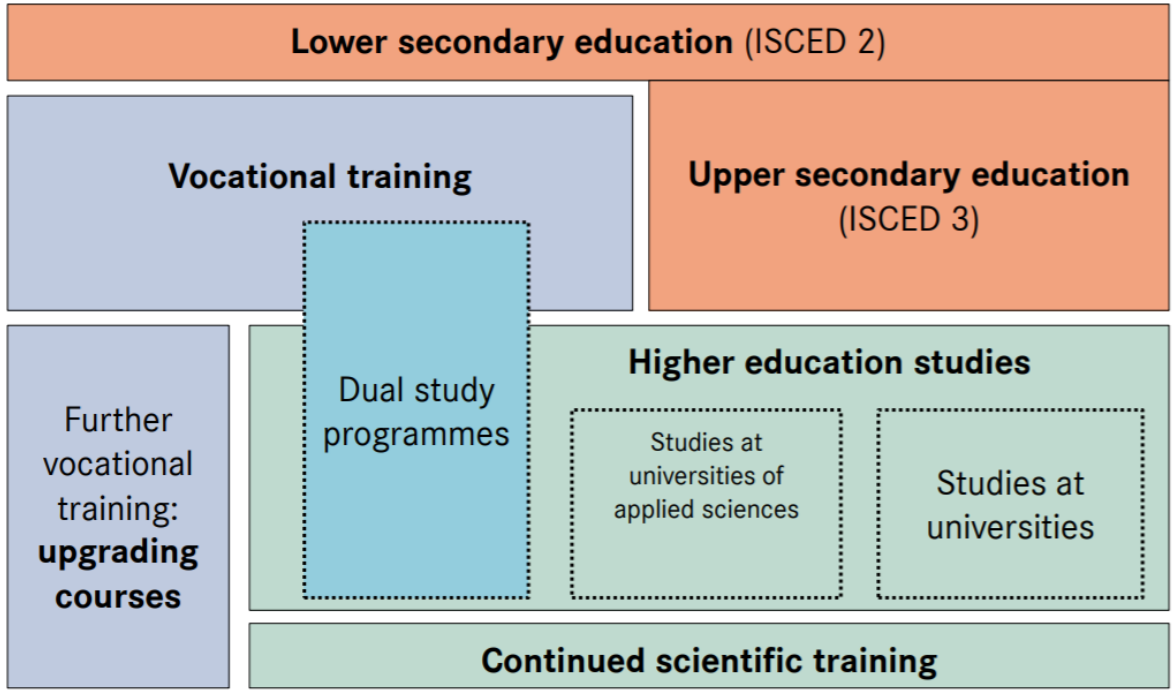
AIR LIQUIDE	COCA-COLA	LVMH
AIRBUS	CRÉDIT AGRICOLE	MICROSOFT
ALCATEL-LUCENT	DAILYMOTION	NESTLÉ
AMADEUS	DANONE	PROCTER & GAMBLE
ATOS	HENKEL	PwC
BARCLAYS	HERMÈS	SOCIÉTÉ GÉNÉRALE
BMW	IBM	SONY
BNP PARIBAS	KMPG	TOTAL
CARTIER	KRAFT FOODS	UBISOFT
CHRISTIAN DIOR	L'ORÉAL	UNILEVER
CHRISTIE'S	LOUIS VUITTON	

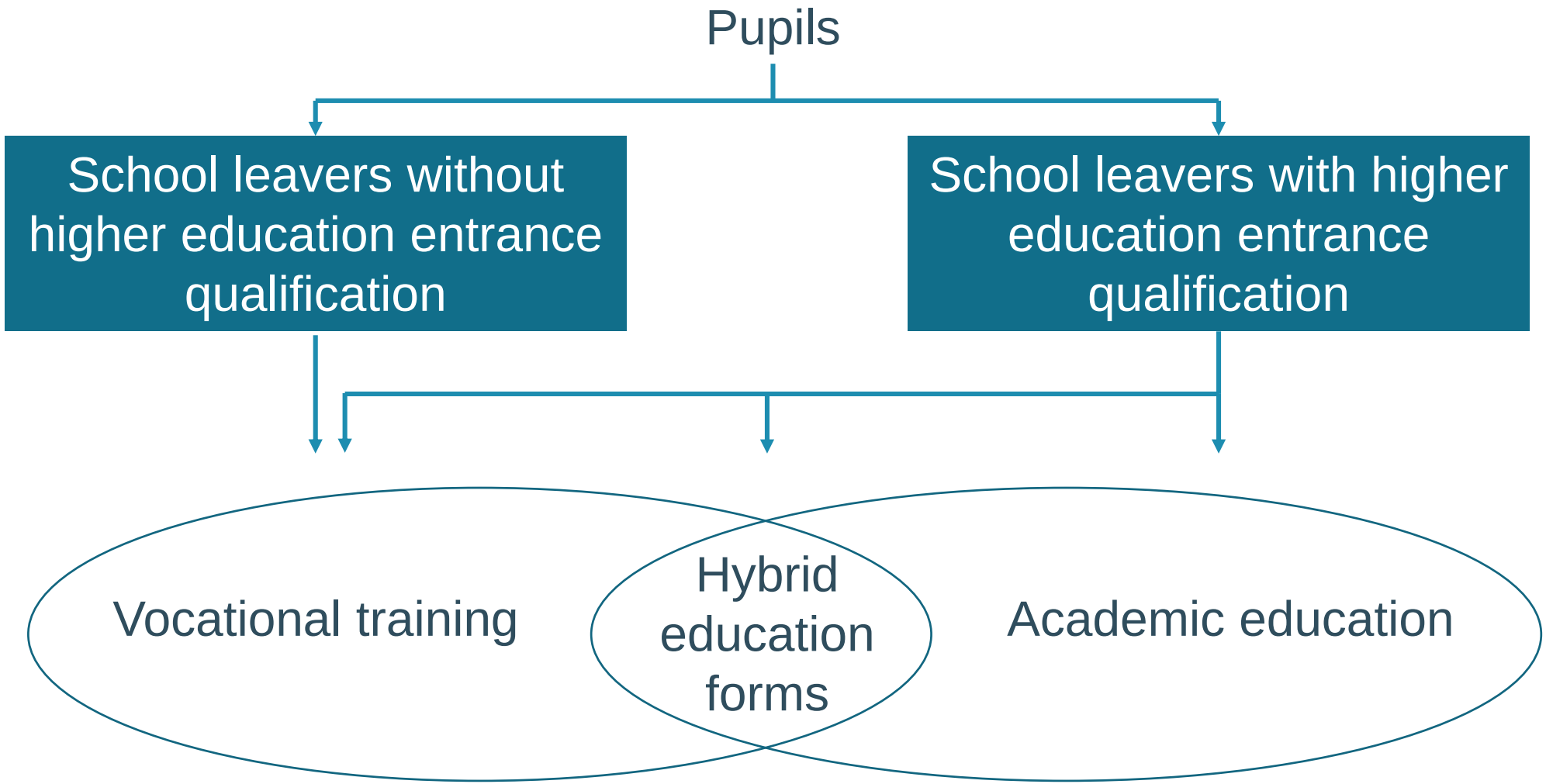
EDHEC has signed 117 partnership agreements with leading business schools and universities in 31 countries

Schulich School of Business York University · BI Norwegian School of Management · HKUST Business School · CBS Copenhagen Business School · UCD Michael Smurfit Graduate Business School · Tecnológico de Monterrey · Maastricht University · SMU Singapore Management University · 서울대학교 Seoul National University

5. The dual study programmes model

- An academic study programme combined with vocational/practical training in a company/institution
- Example: Studying Mechanical Engineering at a University while in parallel receiving practical training at a car manufacturer
- Two options, or a combination: a structured vocational training/degree besides the academic degree, or a practical training similar to internships besides the academic degree




Pupils
School leavers without higher education entrance qualification
School leavers with higher education entrance qualification
Vocational training
Hybrid education forms
Academic education

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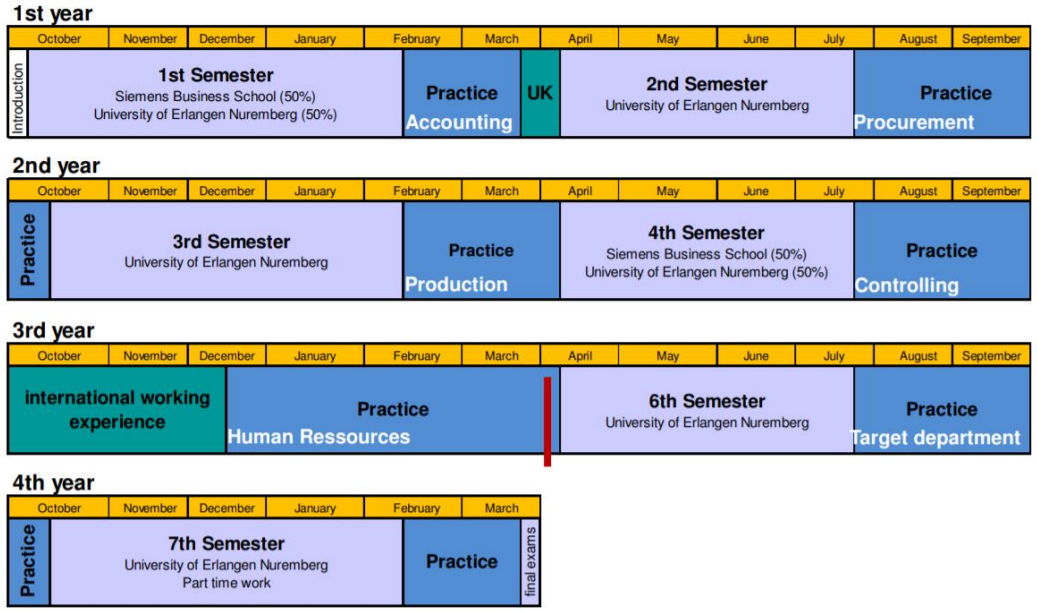
Flow chart of the Dual Study Programme



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What we do - Examples of our dual curricula

Apprenticeships and degree programs requiring university-entrance qualification

Electrical Engineering / Mechatronics	Information Technology	Mechanical Engineering	Business Management
B. of Eng. in Electrical Engineering and Information Technology Incl./excl. IHK B. of Eng. in Electrical Engineering B. of Eng. in Mechatronics incl./excl. IHK B.of Sc. in Electrical Engineering and Vocational Training incl. IHK Associate Engineer ▪ Automation ▪ Mechatronic Systems	B. of Eng. in Information Technology B.A. in Business Administration incl. Specialist Consulting B. of Sc. in Computer Science B.of Sc. in IT-Management incl. IHK Specialist Consultant in ▪ Software Engineering ▪ Integrated Systems ▪ Sales	B.of Eng. in Mechanical Engineering incl./excl. IHK Associate Engineer in Mechanical Systems Master of Eng. in Power Systems Engineering incl. Bachelor of Engineering incl. IHK	B.A. in Business Administration incl./excl. IHK B.A.in International Management incl. IHK B.A. in Business Administration Industry/ Service Management B. Of Sc. in Business Information Technology B.A. in Management with Engineering Office Management Assistant (2-year)

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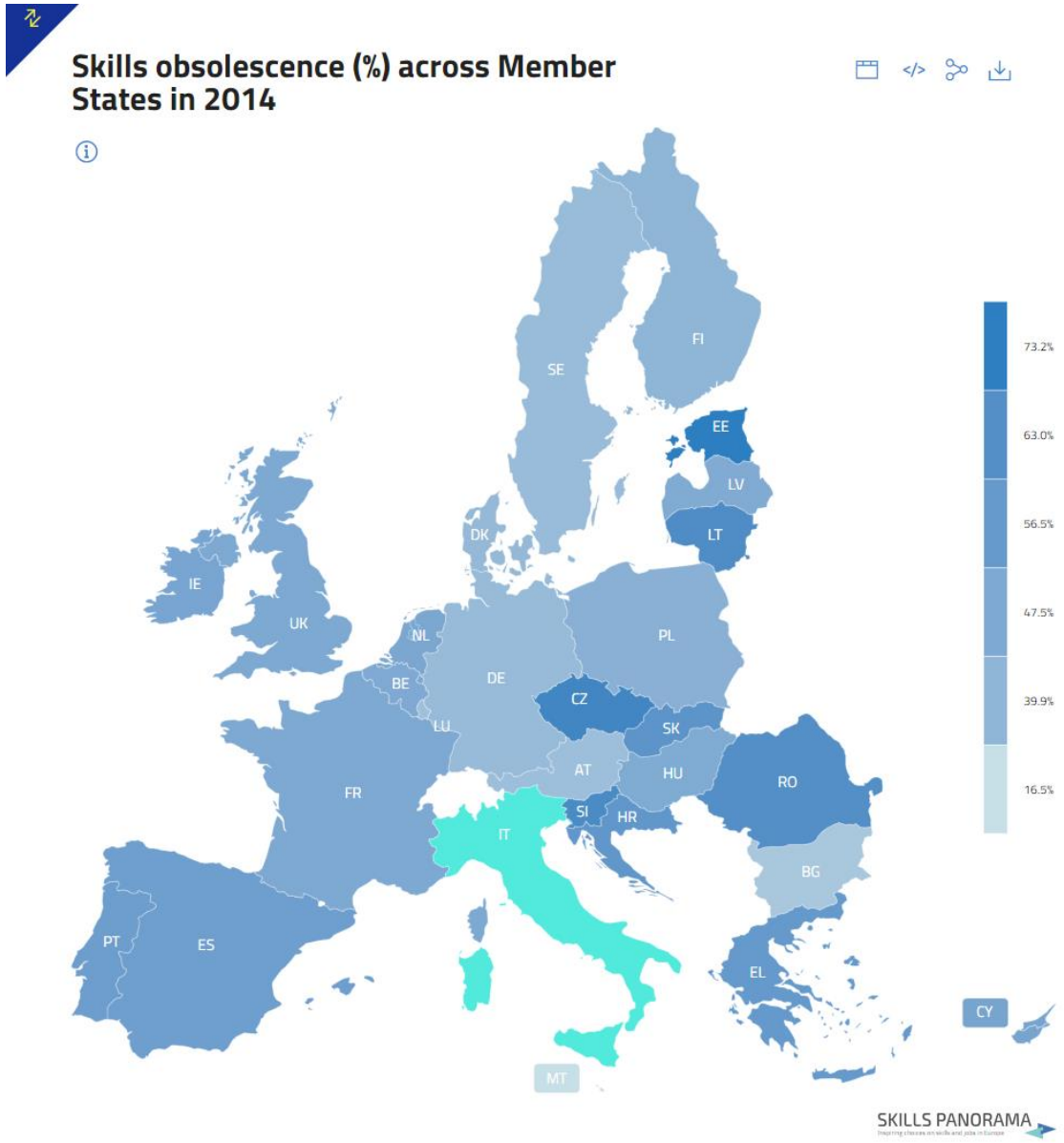
Quality assurance of dual study programmes

- Relation between different places of learning and training (minimum criteria: close connection of profession and field of study, stable cooperation between HEI and company)
- Academic standards (range of credits for academic teaching and learning, appropriate time frame, qualification of teaching personnel)
- Organization of vocational training (demands of supervision, learning goals and didactics)
- Transition to Master-level programmes (transition of dual BA-graduates into regular MA-programmes)

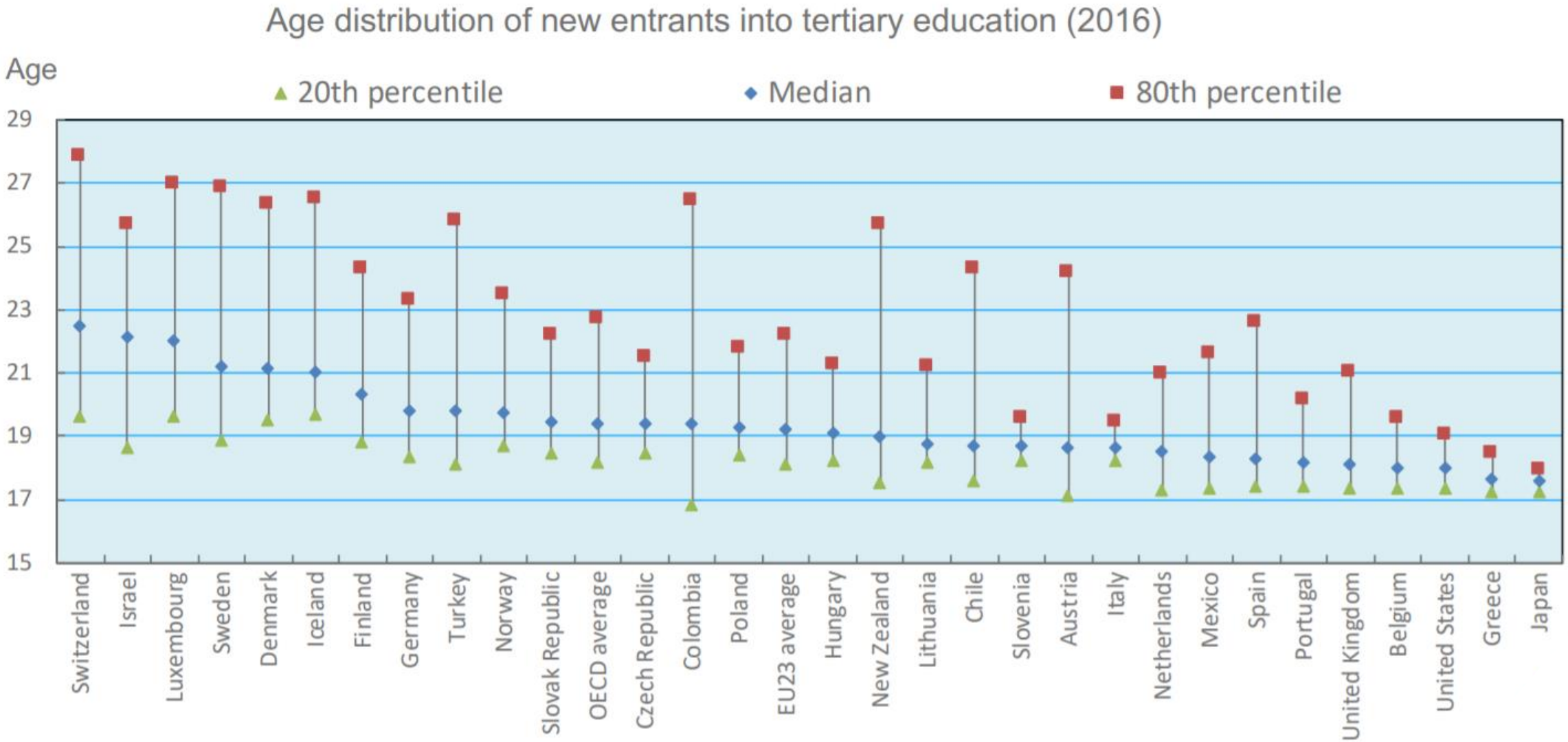
6. The extensions model

Lifelong employability

- Anyone who is 52 years old today, has started working at 22 and can retire at 67, still has one third of the working life in front of them
- Someone who starts the career at 25 and is expected to work up to 70 years of age is only just past half of the career at the age of 50
- Not attending training anymore is - already today - an early predictor of job loss



New learning biographies: are universities adapting to lifelong learning?



Excellence in Education

For over a century, UCLA Extension has helped prepare people to live better lives through the power of education.

As one of the nation's oldest, largest and most comprehensive continuing and professional studies providers, UCLA Extension gives you a wide range of options to advance in your career, switch careers, or achieve personal growth.

UCLA Extension offers:

- The excellence that comes with a UCLA-approved curriculum.
- Open enrollment – most courses require no admission decision.
- Evening, weekend, daytime and online courses.
- Locations throughout L.A.—Westwood, DTLA, and Woodland Hills
- Certificate Programs, Specializations, transferable undergraduate degree-credit, and continuing education credits.
- Custom programs and corporate education, available worldwide.
- Non-credit courses, workshops, and special events
- Courses specifically designed for working adults, college students, and lifelong learners.

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Concluding remarks

More research on impact of pedagogical methods needed

An integrated Teaching Model Framework Encompassing EE Impact and Underpinning Pedagogy

Pedagogical methods

- **Supply model** (e.g. reproduction methods such as lectures, reading, and so forth)
- **Demand model** (e.g. students working on collaborative projects, interactions with entrepreneurs, simulations, etc.)
- **Competence model** (e.g. students starting up businesses by consulting external experts, dealing with real-world problems in industry-engaged environments)
- **Hybrid model**

→

Impact indicators

- **Level 1:** current and on-going measures during the program (e.g. interest and awareness)
- **Level 2:** pre- and postprogram measures (e.g. knowledge, entrepreneurial intentions)
- **Level 3:** measures between 0 and 5 years postprogram (e.g. number and type of start-ups)
- **Level 4:** 3 to 10 years postprogram (e.g. survival of start-ups)
- **Level 5**: 10 years plus postprogram (e.g. contribution to society and economy)

- General focus on lower level, short-term, subjective impact indicators
- More research on entrepreneurial behavior needed
- All pedagogical methods (supply, demand, competence, hybrids) have positive impact at Levels 1 and 2
- Pedagogical methods based on competence are better suited for developing higher level impact
- Deeper, more experiential pedagogies seem to have most potential to have impact at higher levels because students focus on developing behavioral competency in solving problems in real-life entrepreneurial situations

Nabi, G., Liñan, F., Fayolle, A. Norris Krueger, F, Walmsley, A. (2017), The Impact of Entrepreneurship Education in Higher Education: A Systematic Review and Research Agenda, Academy of Management Learning & Education, 16 (2),

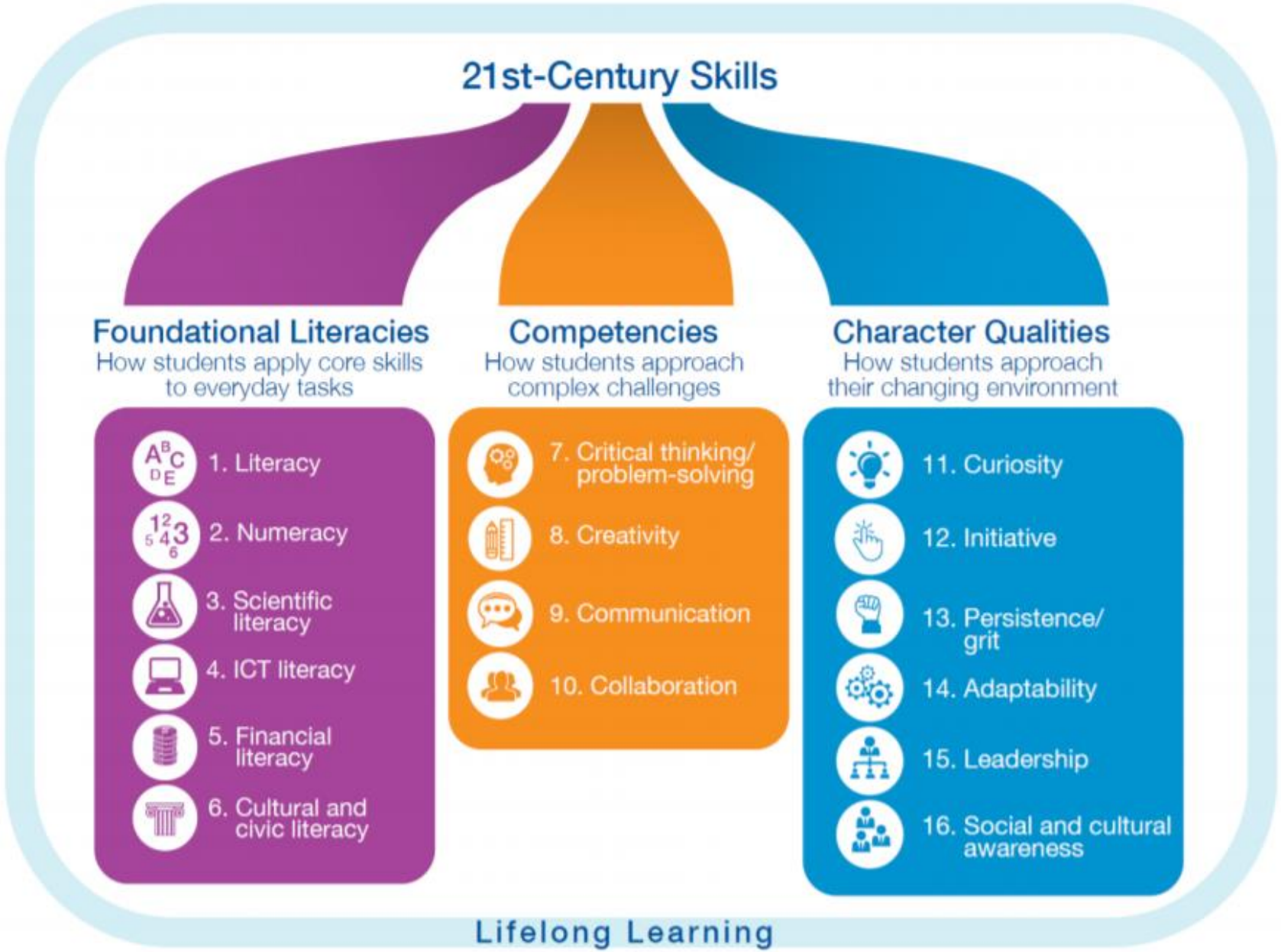
“Academic” versus “Real-life”

Cases

- A junior majoring in political science can either: (a) take a nonrequired upper-division course in statistical analysis (taught by a professor of statistics) or (b) do a service-learning experience with a state legislator
- A junior majoring in environmental science can either: (a) take a nonrequired upper-division laboratory course in the biochemistry of water-based environmental toxicity or (b) work with the Fish and Game Department monitoring impact of pollution on local duck population

Conclusions

- In the long term, the (a) options will serve the student much better than the (b) options.
- Each (a) option provides the student with opportunity to learn a difficult subject matter, something that can’t easily be learned “experientially”
- Let’s not overrate importance of experiential learning: experiences are, of course, valuable, but they should not be done at the expense of credits that could be devoted to learning difficult intellectual skills



- Most employers are not searching for instantly useable talent
- The majority prefer wide-ranging expertise to sector-specific experience
- Priority to competencies like good verbal and written communication, critical thinking, problem-solving capabilities, a sense of responsibility, creativity and, with increasing frequency, ethical judgement and integrity
- These are qualities that are most ideally cultivated in research-driven teaching

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Some concluding remarks

- Research-driven education is not incompatible with a practice-based approach
- Research-driven education can also mean dealing with practical situations in a scientifically well-founded manner and with a respect for logic and empirical evidence, in which the rigorous assessment of alternative solutions takes precedence over ‘gut feeling’
- Research-driven education will gain in support and strength if we can better succeed in making clear its practical relevance and if we give students the opportunity to experience that relevance in practical situations
- The importance of a “translational component”: blending of knowledge students acquire at university with authenthic application of that knowledge in the workplace