

# Chemical engineering education

## Fit for purpose?

Jarka Glassey

School of Chemical Engineering and Advanced Materials

Newcastle University, England

[jarka.glassey@ncl.ac.uk](mailto:jarka.glassey@ncl.ac.uk)

Chairperson of IChemE EdSIG, secretary of WPE EFCE

Coordinator of iTeach

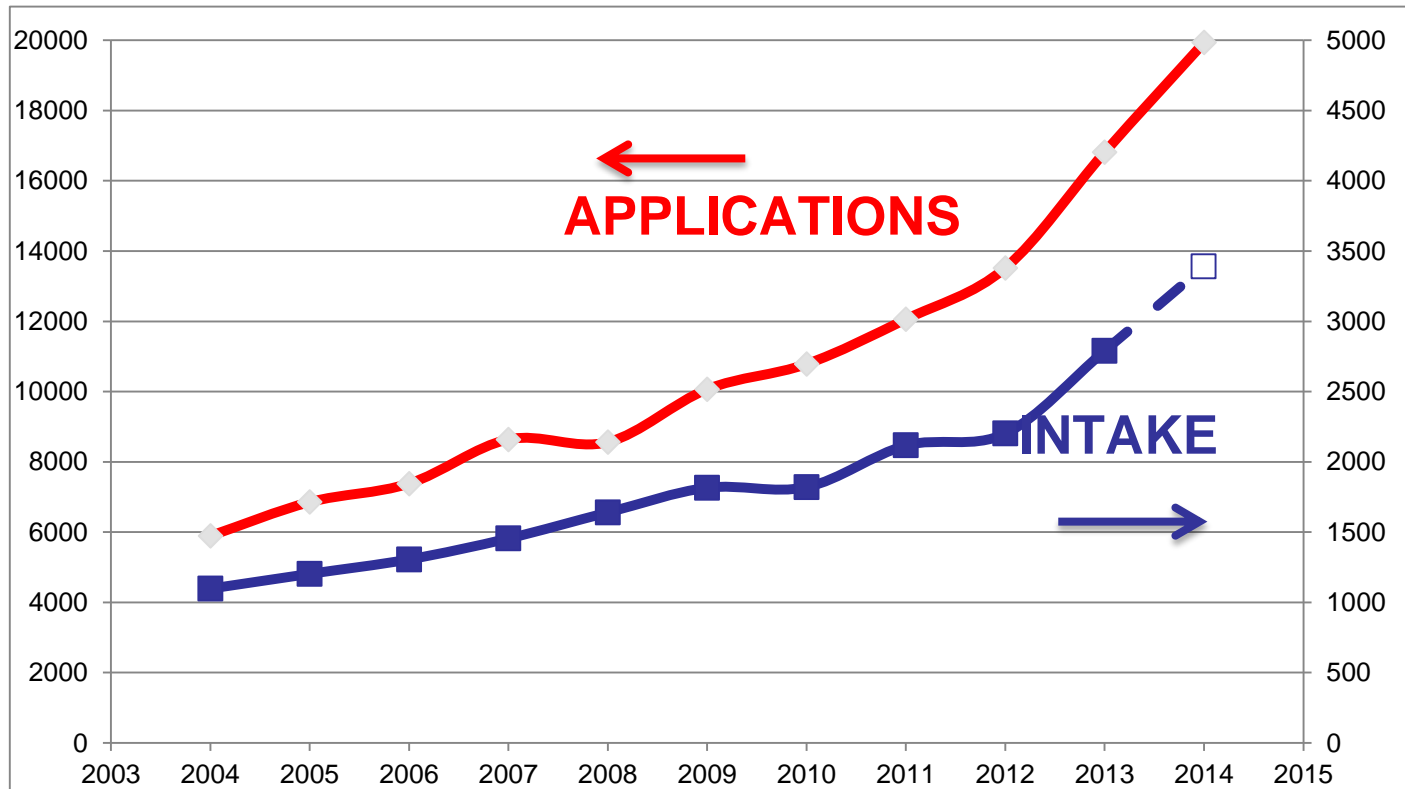
# ChemEng Education

At a (relatively) recent ChemEng Matters workshop we were asked to define ‘**why we do this**’

**“We do this because the world needs people to safely and sustainably create the products and processes that make better stuff, from ordinary stuff without making bad stuff. This is done through continuous improvement that enhances quality of life for all.”**

# Education challenges

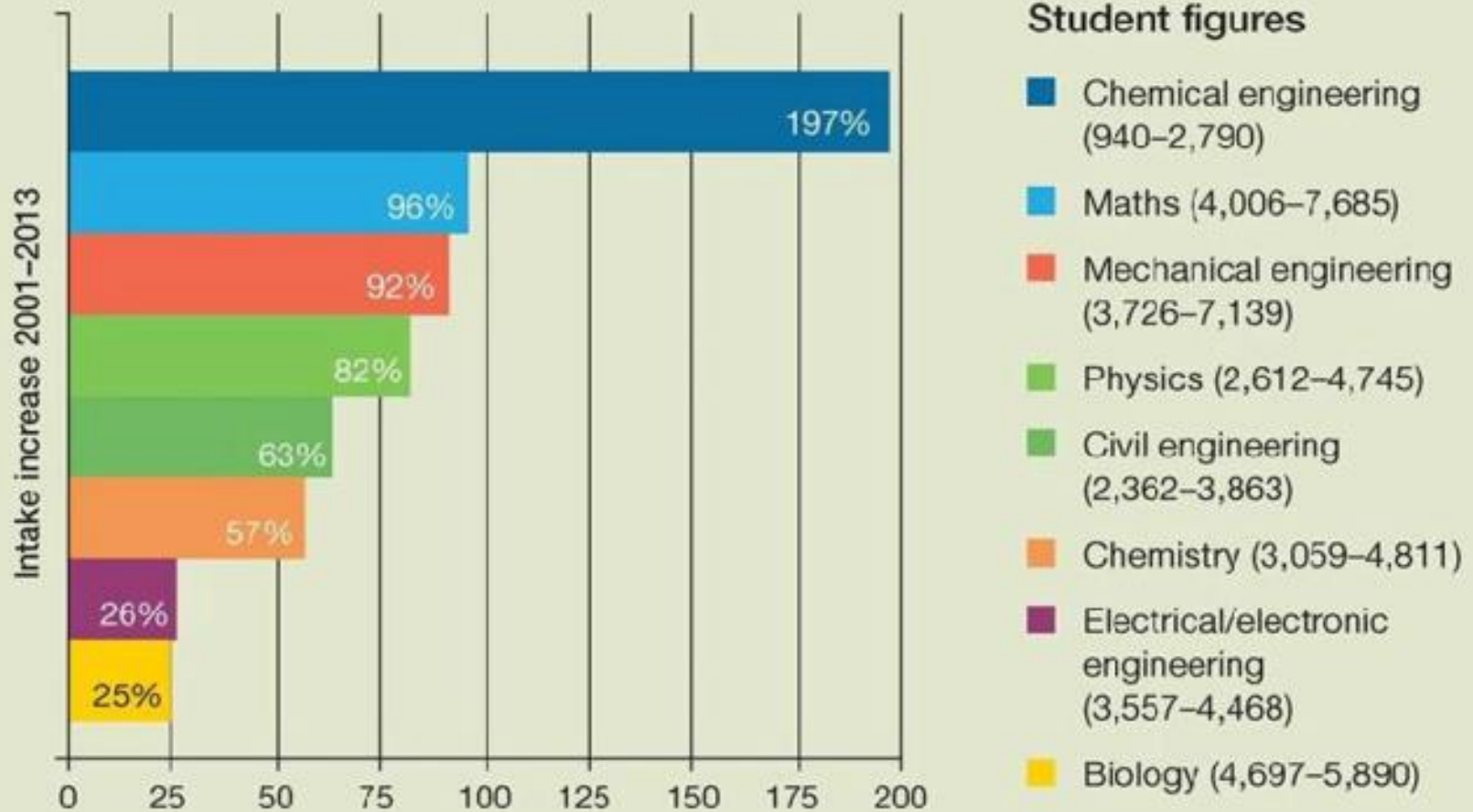
- Trends in CE application/graduation numbers



# Education challenges

Source: adapted from UCA

## Figure 1: growth in UK student intake by subject

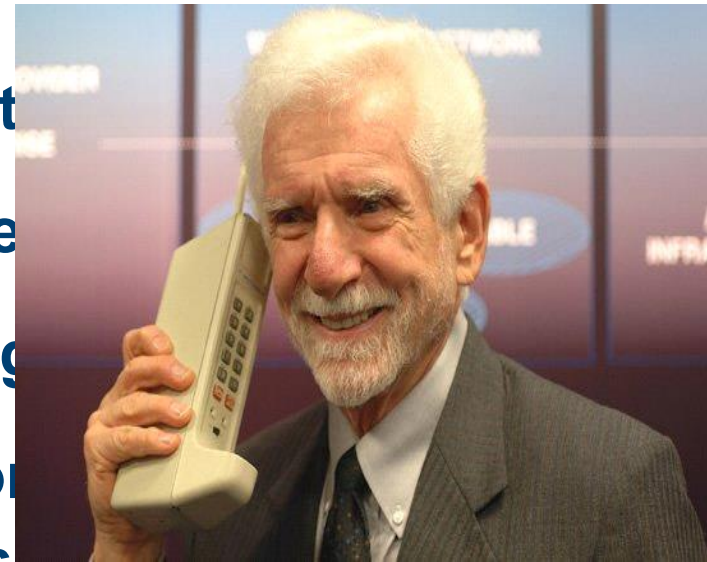


# Education challenges

- How do we ensure 'quality experience' for the increasing student numbers?
- Lab provision, tutorials, placement



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narter' thing  
(expectation  
'savviness')



YouTube



WIKIPEDIA  
The Free Encyclopedia

# Effectiveness and efficiency



Jarka Glassey



Eric Schaer



Verka Meshko



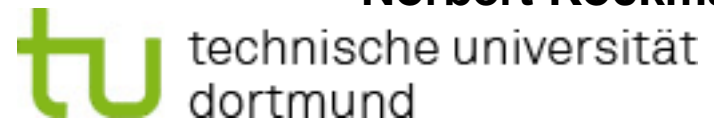
Luis Miguel Madeira



Milan Polakovic



Norbert Kockmann

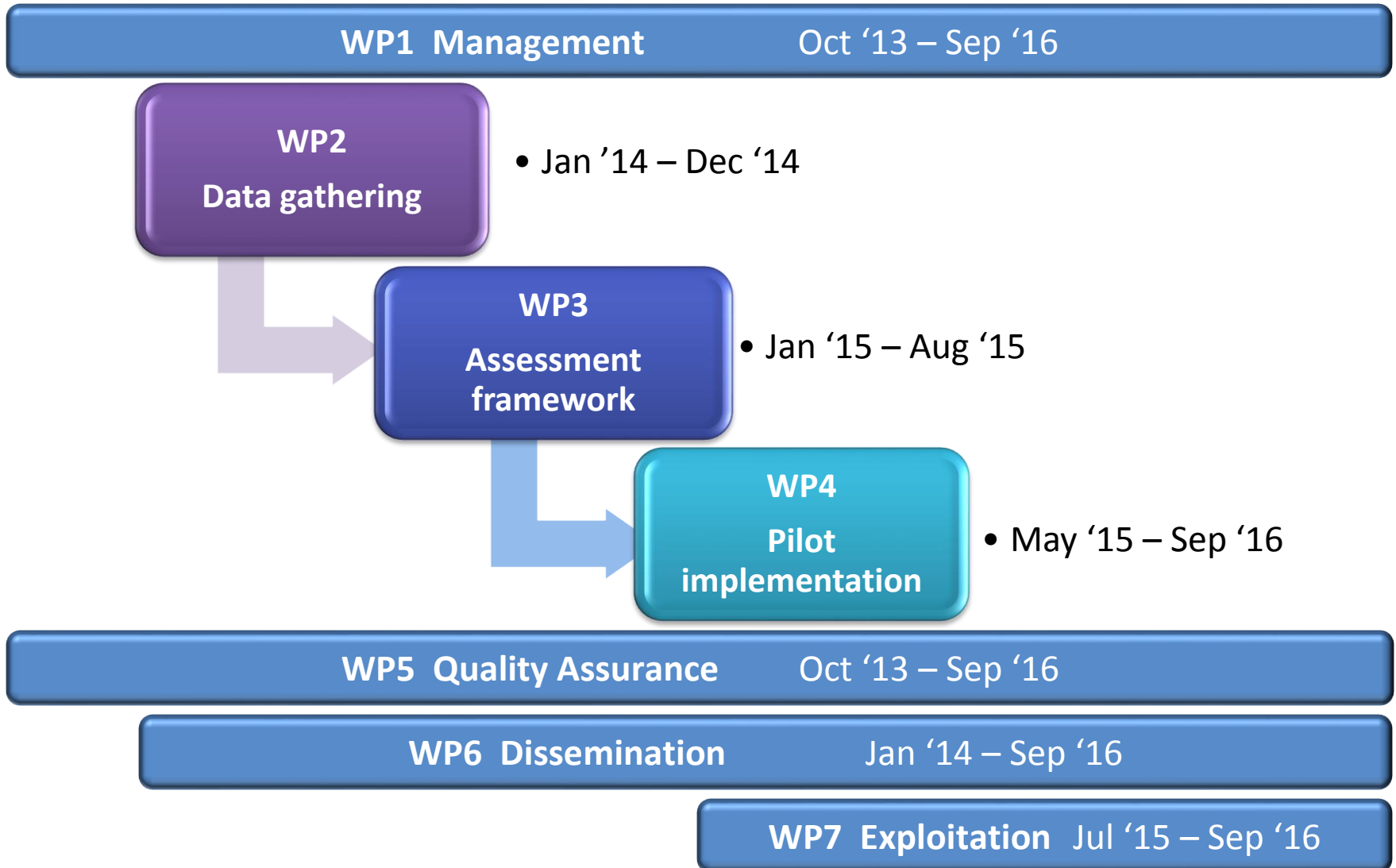


16 associate partners formally signed up, representing professional institutions, employers, HEIs

# iTeach aim

- develop a framework which will support the assessment of teaching effectiveness (efficiency) in delivering not only core chemical engineering knowledge, but also core employability competencies.
- More detail on [www.iteach-chemeng.eu](http://www.iteach-chemeng.eu)

# Project overview

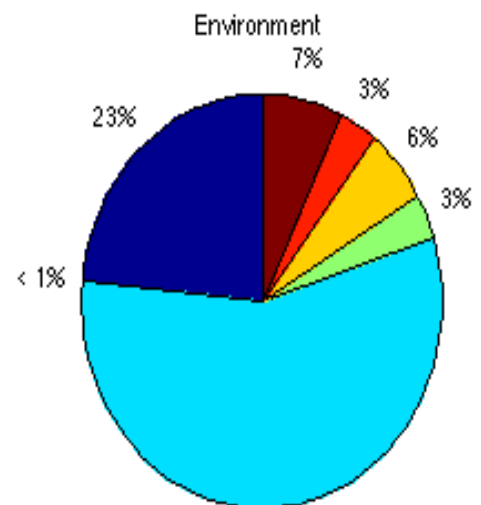
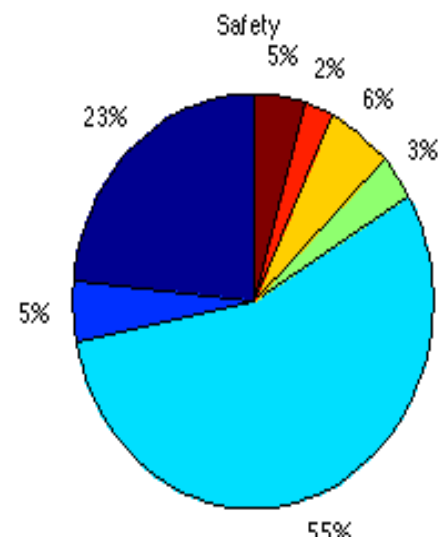
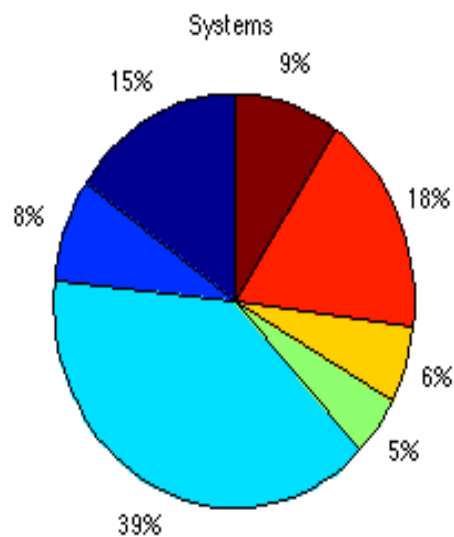
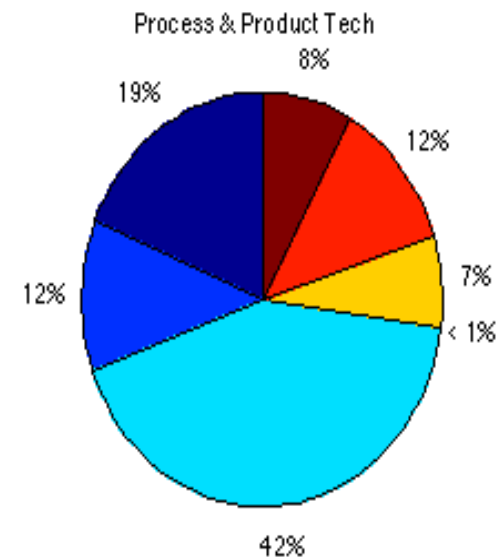
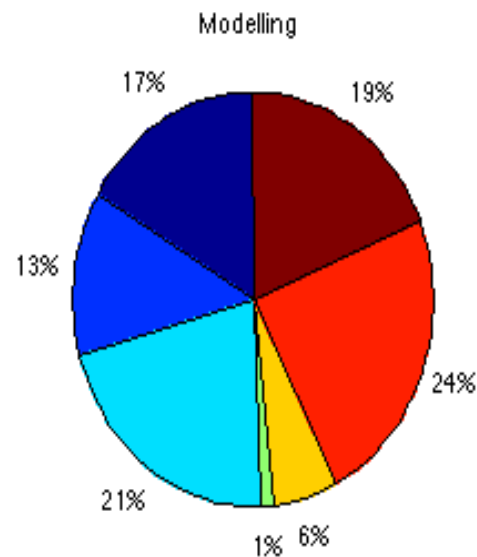
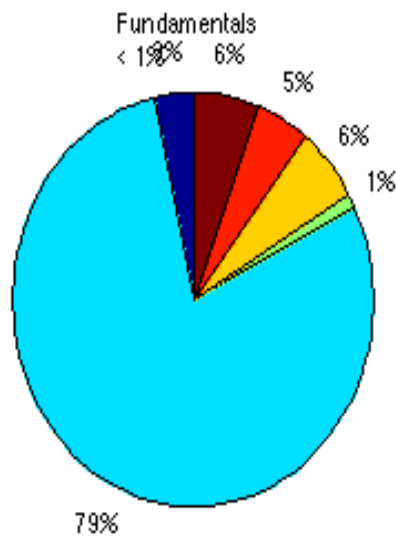




# Effectiveness

- Review of various (inter)national CE accreditation requirements
- List of learning outcomes (LO) collated
- Survey sent to academics, industrialists and graduates on the importance of knowledge, skill and competency areas (> 260 valid responses)
- Clear agreement of all groups on the LO with only minor differences based on geographical or sectoral variations
- Importance of fundamentals, but also core competencies

# Current position



# Efficiency

## Academics



## Industry



**CV** **Mohammad Hassan**  
M. 7122 Upper Grand Street, Boston, MA 02118  
E-mail: mohammad.hassan@att.net  
Cell: 617-252-1346

**OBJECTIVE:**  
To enhance my knowledge and experience by working in a growth organization and to contribute to the organization's success.

**PERSONAL INFORMATION:**

- Address: Boston, MA
- Phone: 617-252-1346
- Email: mohammad.hassan@att.net
- Languages: English, Arabic
- Marital Status: Single

**QUALIFICATIONS:**

- Bachelor's Degree in Business Administration (2007)
- Master's Degree in Business Administration (2009)

**OTHER SKILLS:**

- 1 Year Diploma in IT
- 3 Months Hardware
- 6 Months Graphics

**EXPERIENCE:**

- 4 Years System Administrator
- 4 Months System Administrator
- 3 Months Network Administrator
- 3 Months Project Manager

**HOBBIES:**

- Reading
- Traveling
- Playing Sports

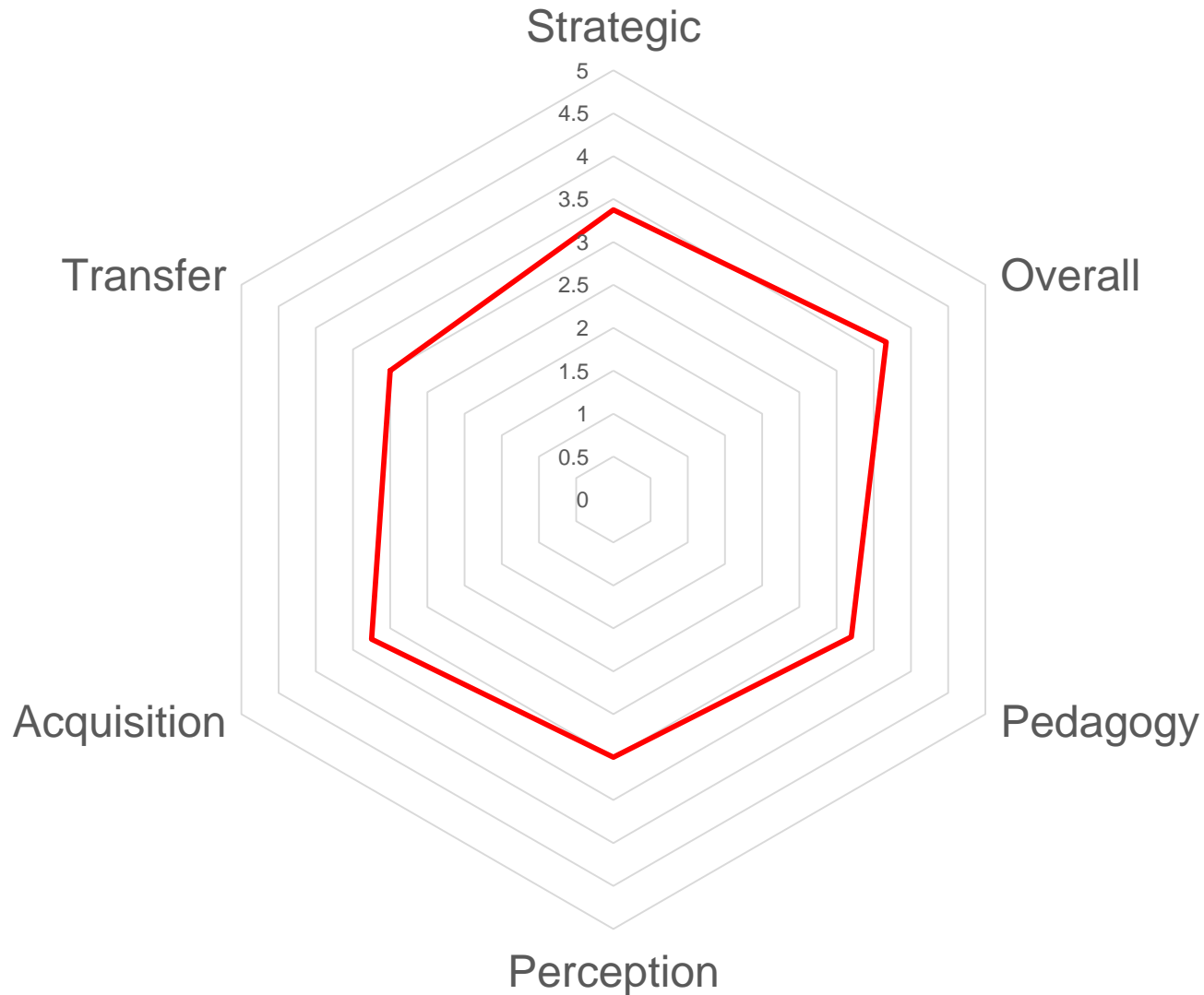


# Proposed metrics

## Assessment of the efficiency of individual pedagogical approaches:

1. Strategic nature of the course
2. Implementation of the course within the programme
3. Pedagogical relevance of the proposed intervention
4. Student perception of the pedagogical approach
5. Knowledge/skills acquired
6. Ability to apply/transfer the acquired knowledge/skills to professional practice

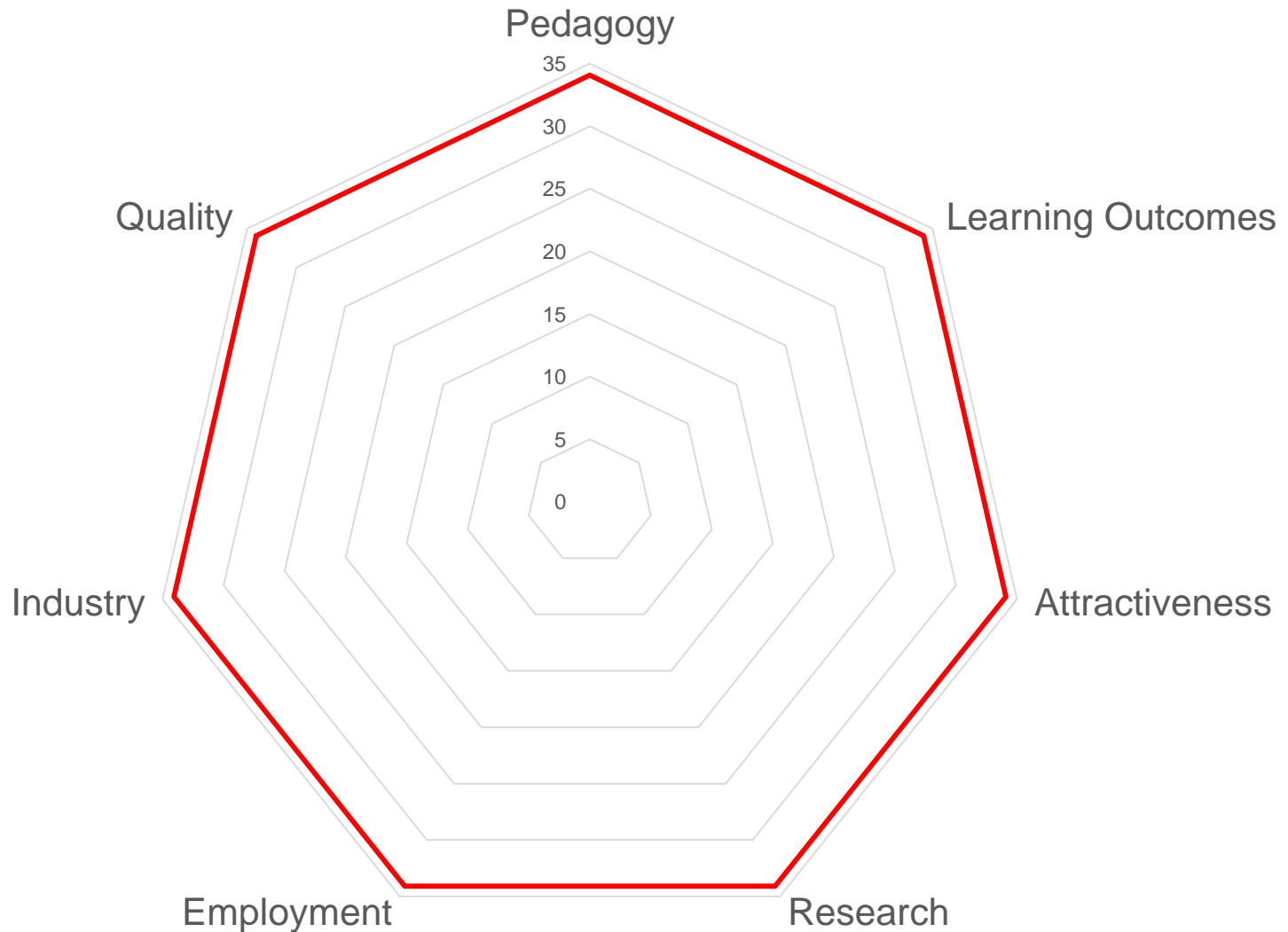
# Framework representation



# Pedagogical approaches tested

- P1(UNEW) – recorded lectures, problem based learning
- P2 (UL) – problem based learning, self-instruction delivery
- P3 (IBU) – work-based learning, traditional lectures
- P4 (FEUP) – recorded lectures, practical instruction via labs
- P5 (STU) – traditional lectures, practical instruction via labs
- P6 (TUDO) - work-based learning, problem based learning

# Evaluation of whole formation



# Concluding remarks

- Societal, economic and demographical changes introducing additional challenges to CE education
- Importance of fundamentals and employability competencies
- Need to measure efficiency of pedagogical interventions
- Global professional formation evaluation
- Involvement of all stakeholders throughout the whole process



# Acknowledgements

- All iTeach consortium partners, associate partners and colleagues involved in the collection and data analysis
- All respondents to the questionnaires and focus groups
- Education, Audiovisual and Culture Executive Agency, Project No. 539959-LLP-1-2013-UK\_ERASMUS-EQR



Education and Culture DG

Lifelong Learning Programme

