Industry – Academia Collaboration: Is Problem Based Learning the answer?

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Agenda

1) History of Aalborg University

2) An industry perspective

3) A students' perspective

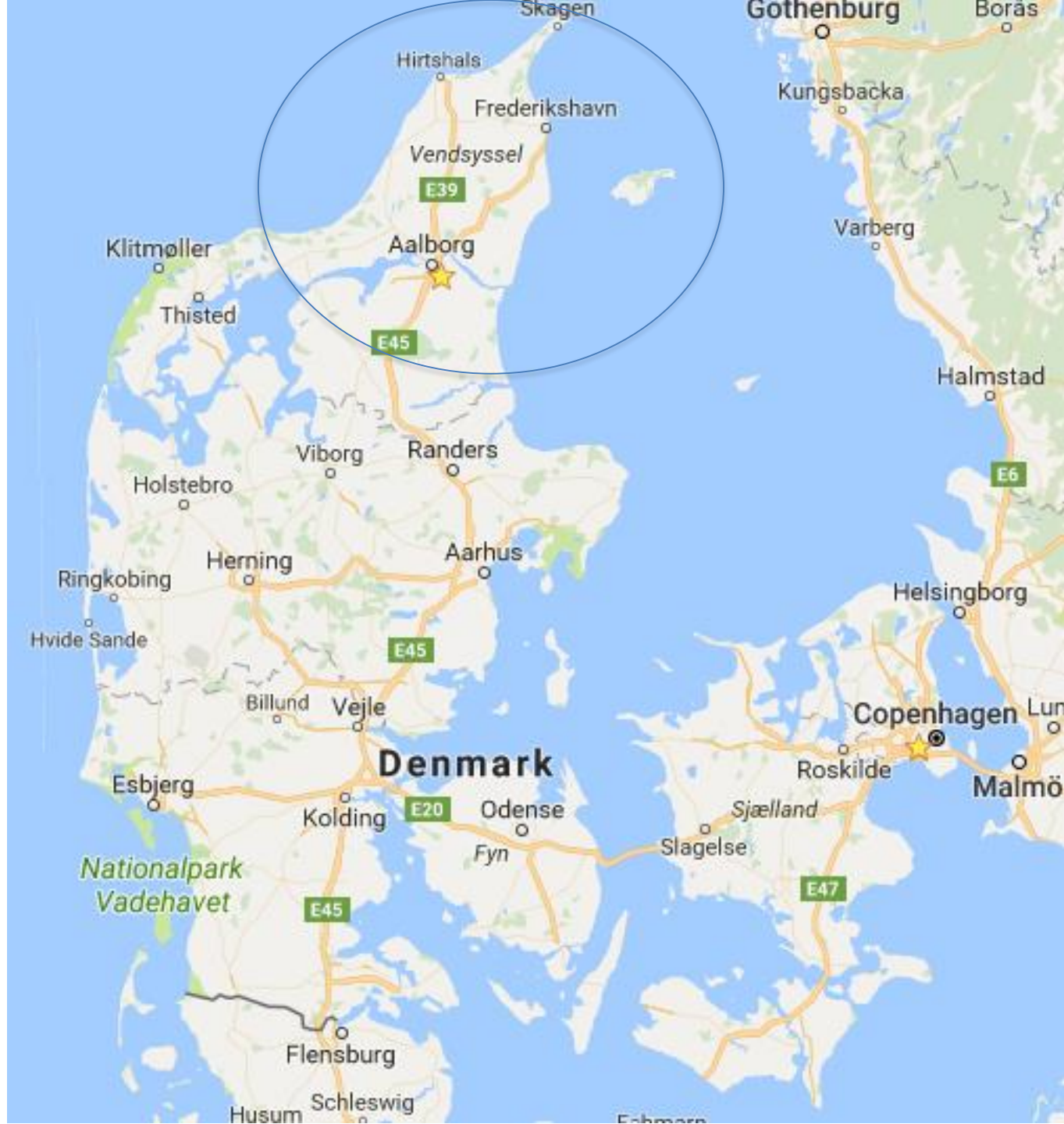4) An example of a students' project

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1. HISTORY OF AALBORG UNIVERSITY

Aalborg and North Jutland - before

From

- low-tech industrial processing ….
  - (shipyard, tobacco, textile, alcohol, cement etc)
- fewer people with higher education
- higher unemployment rates

  than average in Denmark
- lower average wages

Aalborg University Center

The main stakeholders:

- A local VIP lobby group
- Local high-school students
- Progressive government
- Students' revolt in 1968
- A new university in 1974

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Aalborg and North Jutland - now

From
- low-tech industrial processing ….
  - (shipyard, tobacco, textile, alcohol, cement etc)
- fewer people with higher education
- higher unemployment rate
- lower average wages
- ….to hich-tech production and services, especially in electronics and IT – only one cement factory remains ;-)

"Aalborg University has had enormous influence on the development of Aalborg and North Denmark during the last 40 years... The university has been pivotal in the region's transformation from traditional industrial society to knowledge society characterised by advanced technology companies"

(Former Aalborg Mayor Henning G. Jensen and North Denmark Regional Council Chairman Ulla Astman)

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2. AN INDUSTRY PERSPECTIVE

Competences taught and required
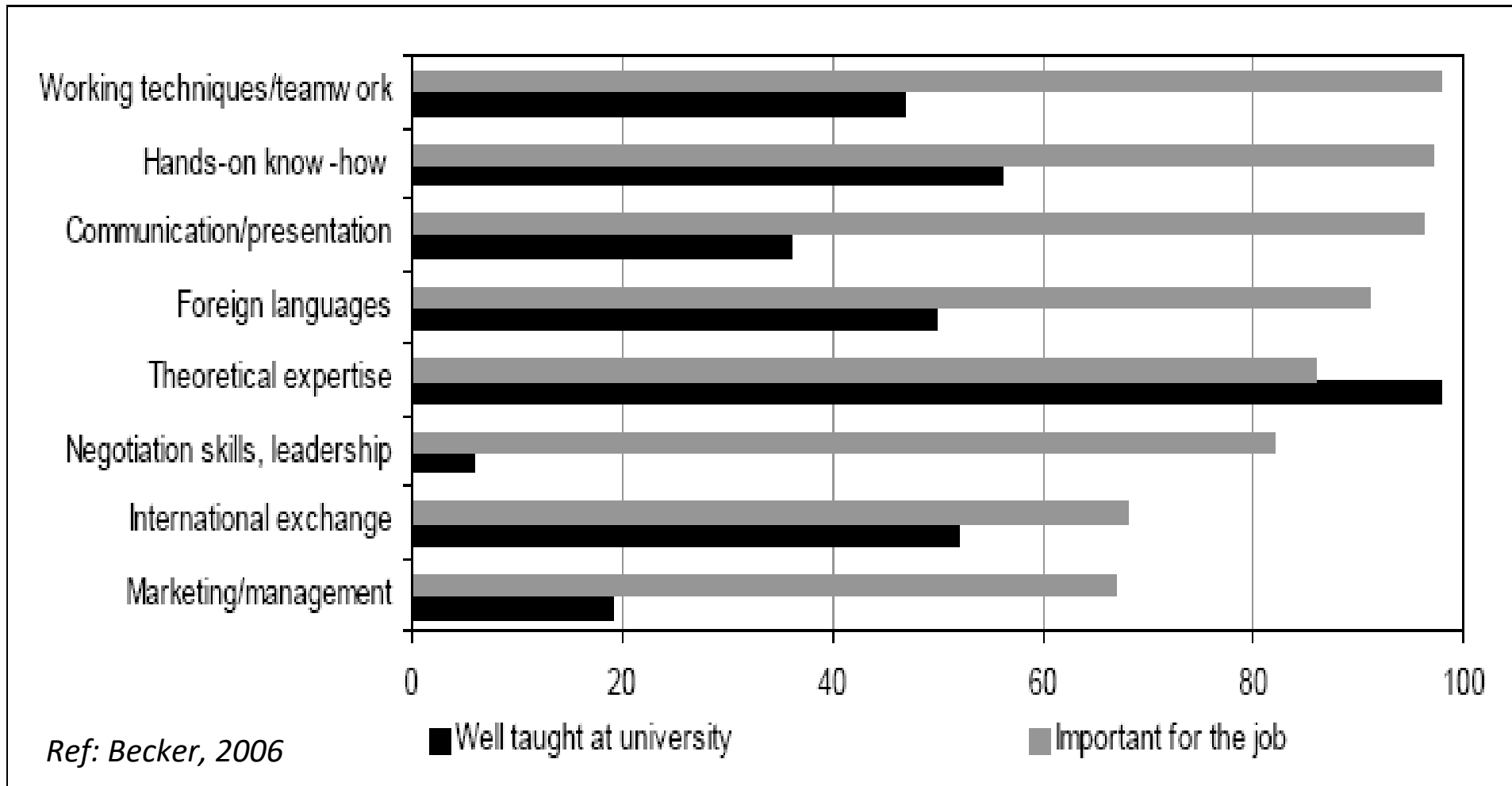# – as seen by young German engineers
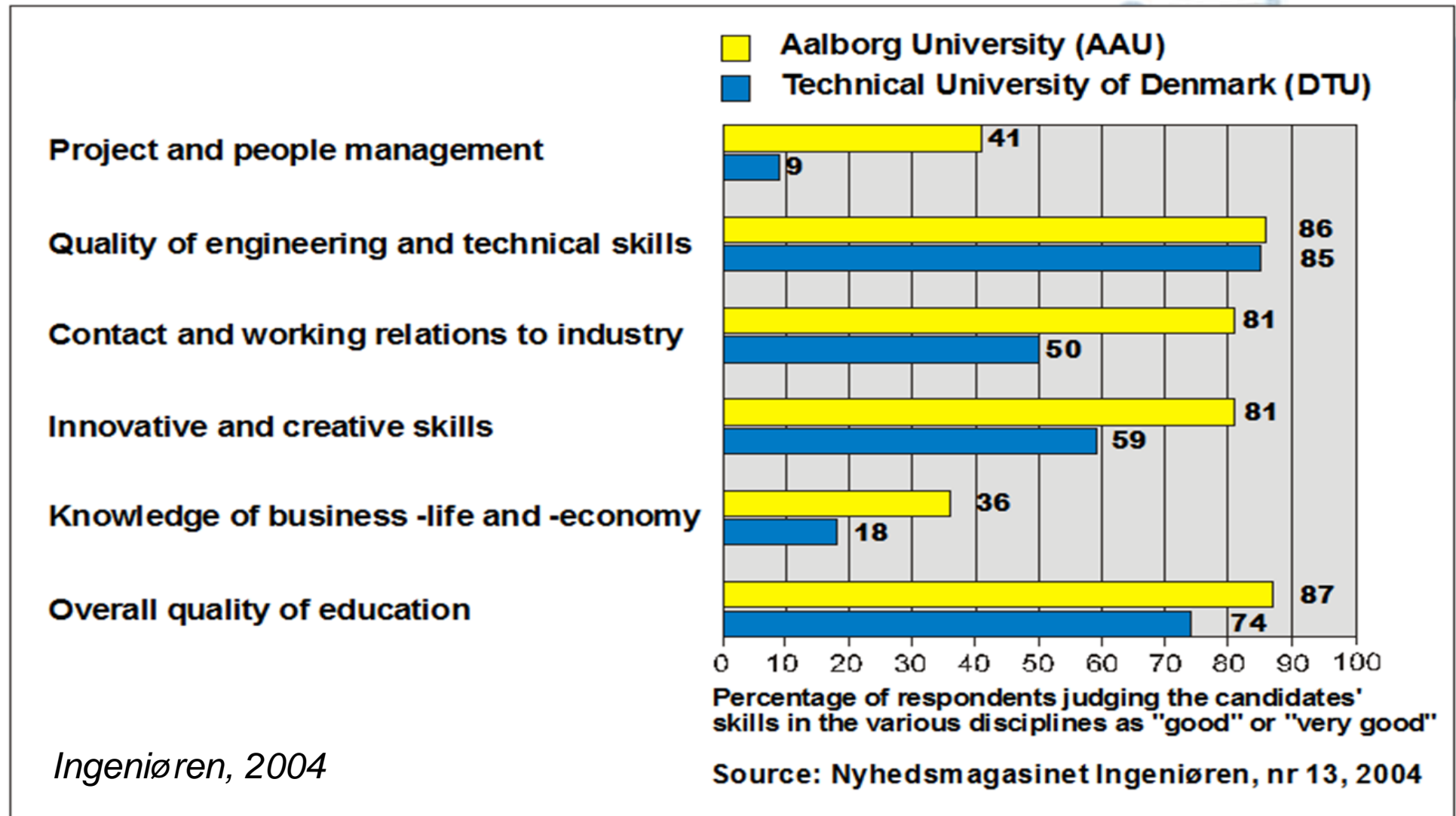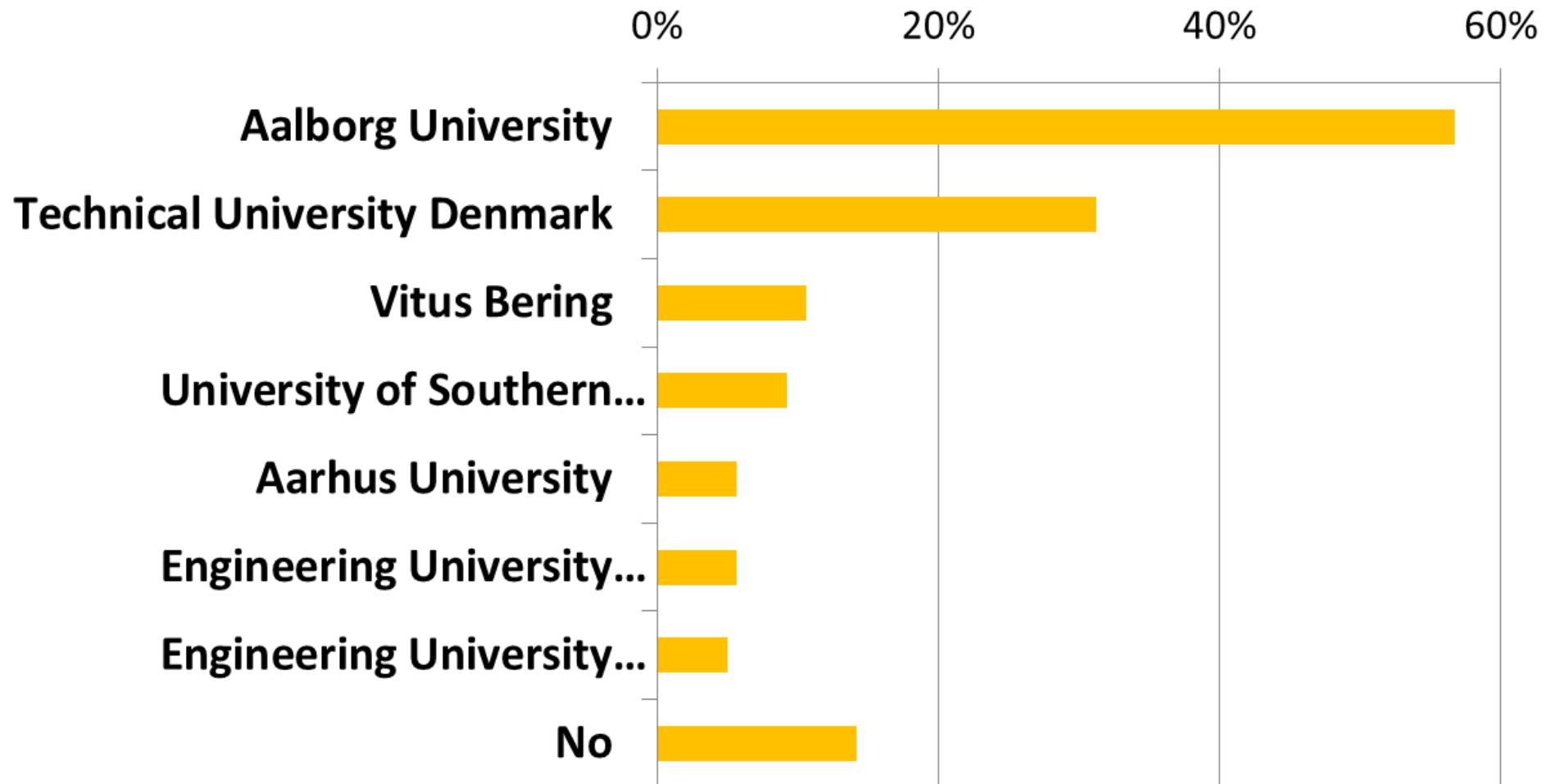

Ref: Becker, 2006

Figure 4 Comparison of capabilities taught at universities and required in professional life by young professionals [7]

Competences of engineering candidates – as seen by employers DK

Ingeniøren, 2004

Engineering education versus needs of society and companies?

Chart showing percentages (0% to 60%) for:
- Aalborg University (~58%)
- Technical University Denmark (~32%)
- Vitus Bering (~11%)
- University of Southern… (~9%)
- Aarhus University (~6%)
- Engineering University… (~6%)
- Engineering University… (~5%)
- No (~15%)

Ingeniøren, 2008

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- an industry perspective

- 57% of private employers prefer candidates from AAU over candidates from [a traditional university]
- Reasons given by industry:
  - good skills in team work
  - innovation skills
  - project management skills
  - ability to acquire new knowledge and skills
  - methodological and structured way of working

Kandidat 2002

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- an industry perspective

One respondent in the survey said:

– *"The ones* [i.e. the candidates] *coming from, for example, Aalborg University, go in and work in projects from the start."*

No lengthy 'on-the-job' training is needed!

Kandidat 2002, p. 33

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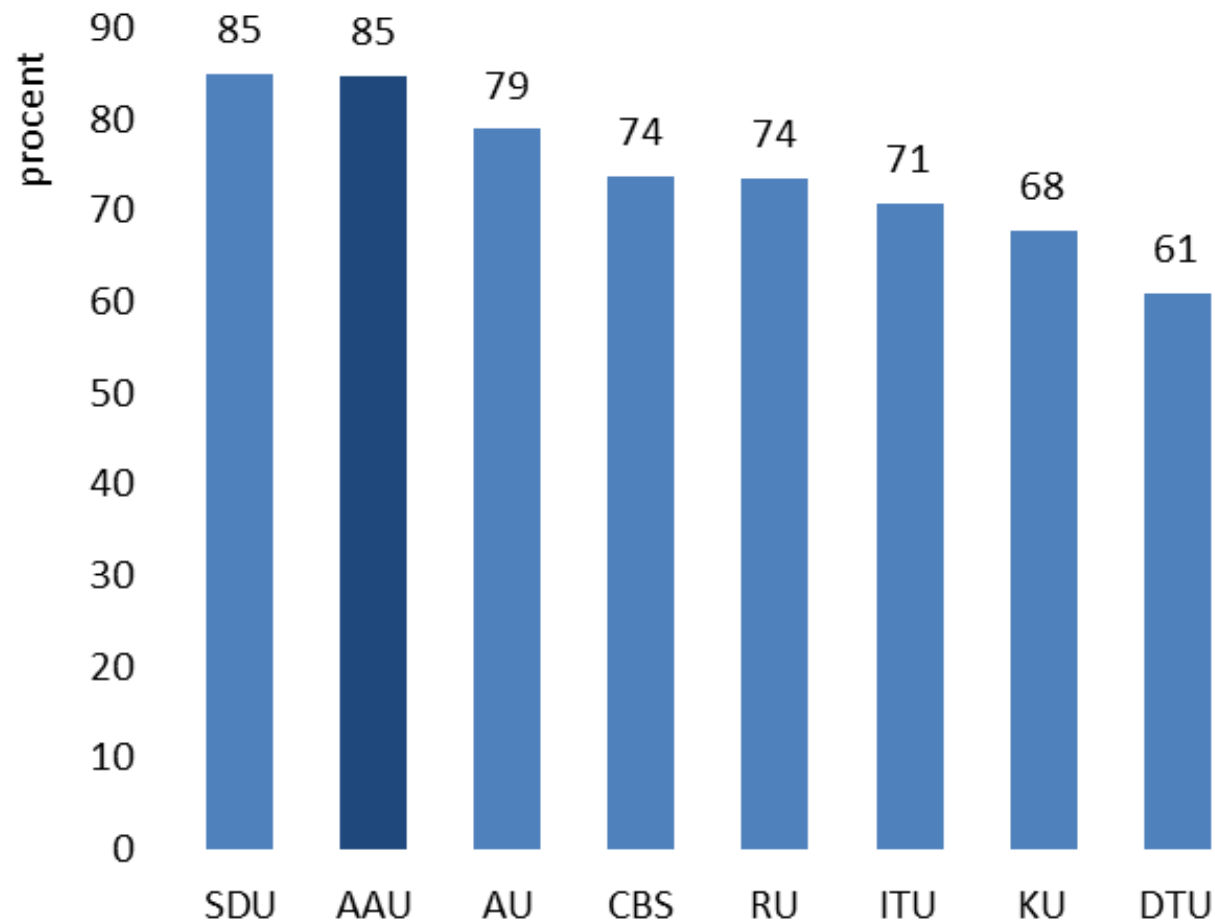Educational, Scientific and
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3. A STUDENTS' PERSPECTIVE

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Students' family background – pattern breakers at SDU and AAU

Bachelor students enrolled
2010 - 2013

PBL from a students' perspective

Working with real life problems…

- meets the interests of students and therefore enhances their motivation and their study efforts

It further develops students'

- ability for critical thinking
- problem solving skills
- project management skills
- communication, negotiation and conflict resolution skills
- analytical and methodological skills, i.e. transferable skills
- life long learning skills

PBL Workshop - Chile   Feb.-
Mar. 2008

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PBL from a students' perspective

➢AAU students on problem orientation:

  ➢*"We are engineers – our responsibility is to solve real technological problems."*

  ➢*"This way of learning is much better than only attending lectures, because I have to know why I need to learn this. When I know the objective clearly, I learn much better."*

  ➢*"When working on a problem, I am strongly motivated and attracted. We need to solve this problem."*

Collaboration students – industry/society

- At lower semesters (1. – 4.) projects are related to society, possibly including industry

- At intermediary semesters (5. – 7.) projects are inspired by industry relations

- At highest semesters (8. – 10.) projects are either industry projects or research projects

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4. AN EXAMPLE OF A STUDENT PROJECT

The Area

The Problem

How do we solve it?

The problem only arises in the summer

The problem varies according to the weather

Introducing Big Belly

What is Big Belly?

A smart garbage system that automatically communicates to municipality when it is full

It compresses the garbage, increasing the amount of garbage you can put in the garbage system

Does it solve the problem?

Only 50 % of it. Another aspect of the problem is young people leaving the garbage in the park

How do we encourage young people to use the garbage system?

The talking garbage system

Big Belly talks to you, when you open it.

Nudging people to perform a certain action.

So what did the students do?

- They established contact between the company and municipality
- They performed observations in the park
- They got test units to put in the park and evaluated the performance of these test units
- They developed different sounds in cooperation with young people and installed them in the garbage system
- They evaluated the performance and gave feedback to the municipality and company.

THANK YOU FOR YOUR ATTENTION