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Delft University of Technology

PREFER: Professional Roles and Employability for Future EngineeRs

Leandro Cruz, Mariana; Saunders, Gillian; Groen, Pim

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PREFER: Professional Roles and Employability for Future EngineeRs

PhD Candidate: Mariana Leandro Cruz
Department: AE Structures & Materials
Section: NOVAM
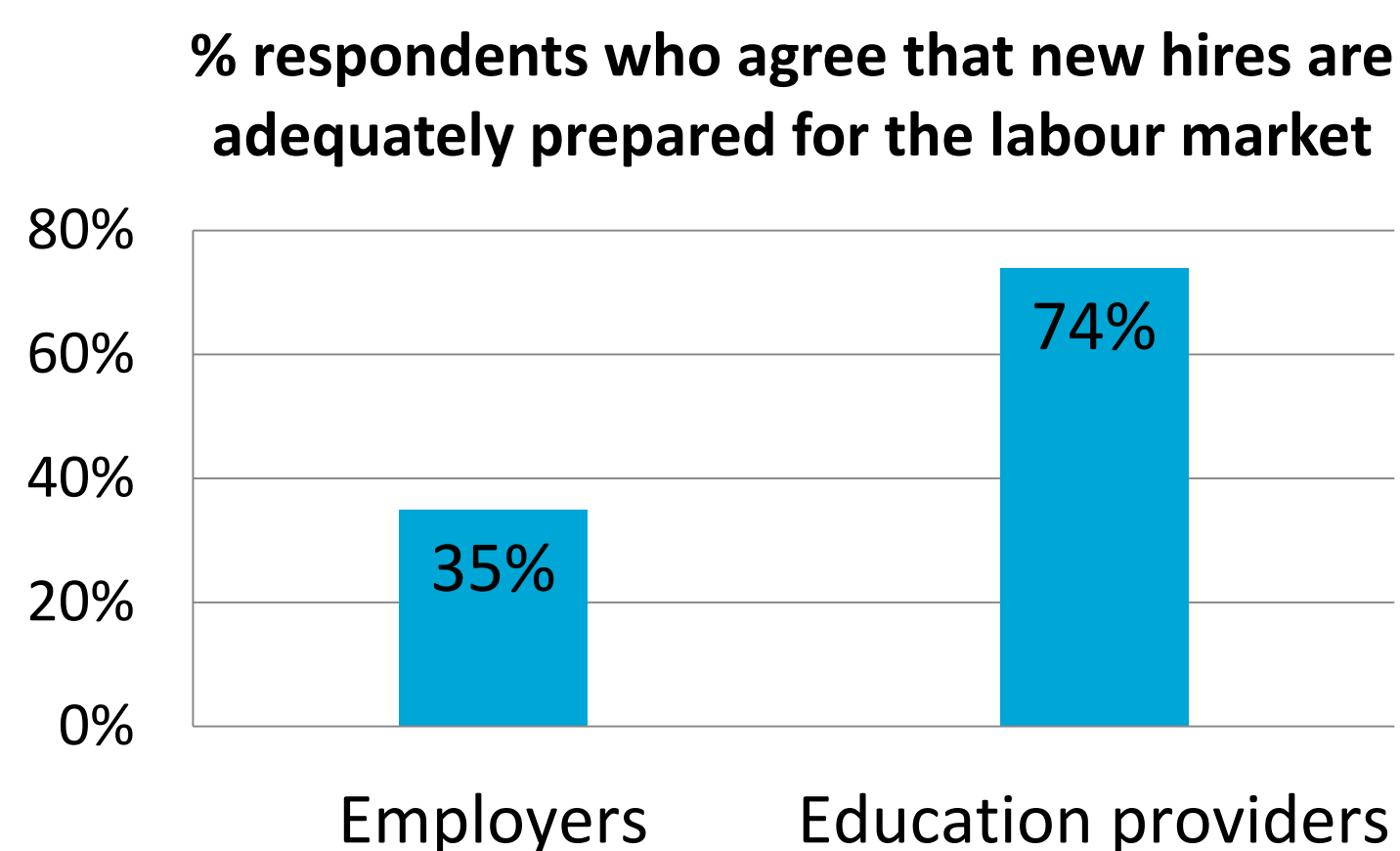Supervisor Dr.ir. Gillian N. Saunders
Promotor: Dr. W.A. Groen
Contact: m.leandrocruz@tudelft.nl

| 1 | 2 | 3 | 4 |

Problems

% respondents who agree that new hires are adequately prepared for the labour market

Skills mismatch

- Employers: 35%
- Education providers: 74%

Lack of self-awareness

"What kind of an engineer am I and do I want to be?"

PREFER consortium

Mission

- **Reduce the skills mismatch** in the field of engineering
- Help engineering students/graduates with **identifying their strengths and weaknesses**
- Provide students with opportunities to actively explore the wide **variety of engineering roles** in the labour market

Goal

- **Create new curriculum elements** that focus on the acquisition of a particular set of transversal skills

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What transversal competences are needed to reduce the gap between the labour market requirements and engineering graduates' competences?

Competence selection:
- Communication
- Entrepreneurial
- Innovation
- Lifelong learning
- Teamwork

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Define competences and criteria based on:
- Siemens competence model
- Literature review

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Levels description per criteria (Level 0 to 3)

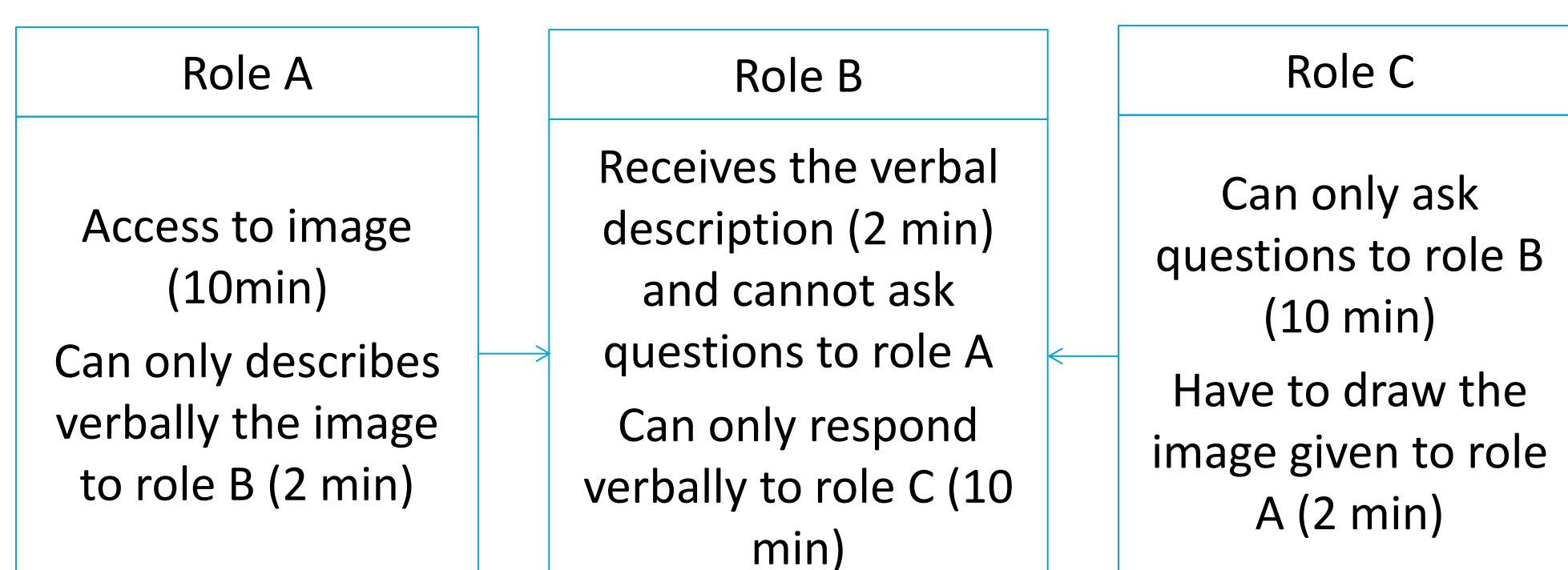| Criteria	Absent (Level 0)	Basic (Level 1)	Advanced (Level 2)	Expert (Level 3)
Technology benchmarking	Not aware of market drivers, emerging technologies, competitions, pricing and customer needs, regulations and standards	Little awareness of market drivers, emerging technologies, competitions, pricing and customer needs, regulations and standards	Awareness of market drivers and emerging technologies, but little awareness of competitions, pricing and customer needs, regulations and standards	Awareness of market drivers, emerging technologies, competitions, pricing and customer needs, regulations and standards
Financial awareness	Not aware of financial capital (funding, cash flow, taxes, wages, etc.)	Little awareness of financial capital (funding, cash flow, taxes, wages, etc.)	Awareness of financial capital (funding, cash flow, taxes, wages, etc.)	Deep awareness of financial capital (funding, cash flow, taxes, wages, etc.)
Business acumen	Not able to identify business opportunities nor to apply business modelling and problem solving to implement strategic responses	Difficulties with identifying business opportunities and applying business modelling and problem solving to implement strategic responses	Identifies business opportunities but has difficulties with applying business modelling and problem solving to implement strategic responses	Identifies business opportunities and applies business modelling and problem solving to implement strategic responses
Negotiation skills	No knowledge of basic negotiation methods nor ability to negotiate in low risk business environments	Knowledge of basic negotiation methods but no ability to negotiate in low risk business environments	Knowledge of negotiation methods and ability to negotiate in low risk business environments	Knowledge of negotiation methods and ability to negotiate in medium-high risk, long-term and international business environments

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Utility of rubric:
- Assessment tool: what competence level do students hold pre and post-course?
- Industry questionnaire: what competence level should students hold at BSc and MSc graduation?

(Submitted) Leandro Cruz, M., Saunders, G.N., and Groen, W.A. (2017) Competence Level Assessment of Communication, Innovation, Lifelong Learning and Teamwork in Engineering Education.

Which learning elements effectively support student developing or improving transversal competences?

Developed and currently implemented

Communication activity based on Chinese whispers

| Role A	Role B	Role C
Access to image (10min) Can only describes verbally the image to role B (2 min)	Receives the verbal description (2 min) and cannot ask questions to role A Can only respond verbally to role C (10 min)	Can only ask questions to role B (10 min) Have to draw the image given to role A (2 min)

Lifelong learning through reflections

Reflection on:
- Course contribution to student's future career
- Strengths and points to improve when working in teams
- Competences acquire or develop in the course
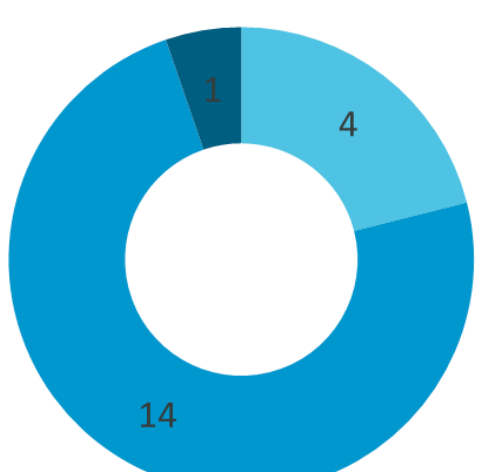
Student survey after communication activity

Please indicate how was your communication skills in this activity?

- Good: 17
- Neither good nor bad: 2
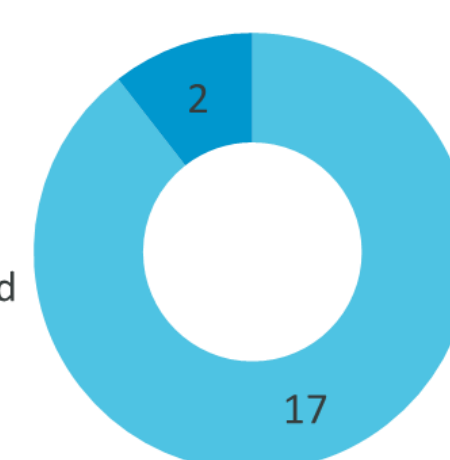
Do you feel that this activity helped you to understand the importance of communication?

- strongly agree: 14
- agree: 4
- neither agree nor disagree

What do you feel you can improve?

- Pay attention to details: 5
- Describe information: 6
- Write down information: 4
- Ask questions: 6
- Listen to others: 3
- Reply to questions: 2
- Other: 3

(Y-axis: Number of students)

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