



Educating socially responsible engineers for the future

Workshop: Gender and Diversity inclusive engineering education.

What are the challenges for CDIO programmes?

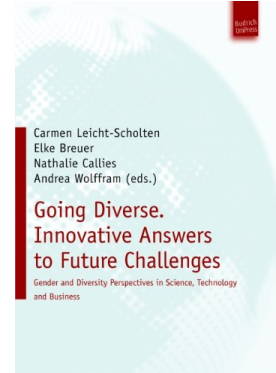
October 10th 2018, Chalmers University, Sweden

Univ.-Prof. Dr. Carmen Leicht-Scholten

Outline

1. Background
2. State of the art : RRI and Gender
3. Being a change agent: Bridging Professorship GDI
4. Fostering social responsibility in engineering education
5. Good practices
6. Vision
7. Sources

1. Personal background



1. Institutional background

547 Professors (92 females)

45.377 Students

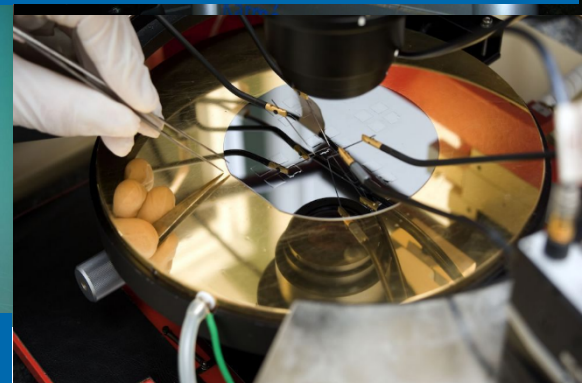
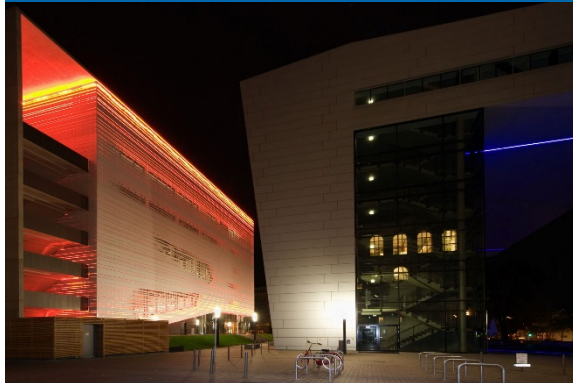
948 million € Budget



9 Faculties

Excellence University (DFG)

360 million € 3rd party fund.



Leading technical university

Source: <https://www.rwth-aachen.de/cms/root/Die-RWTH/Profil/~enw/Daten-Fakten/>, 2017.

Source images: RWTH Aachen University

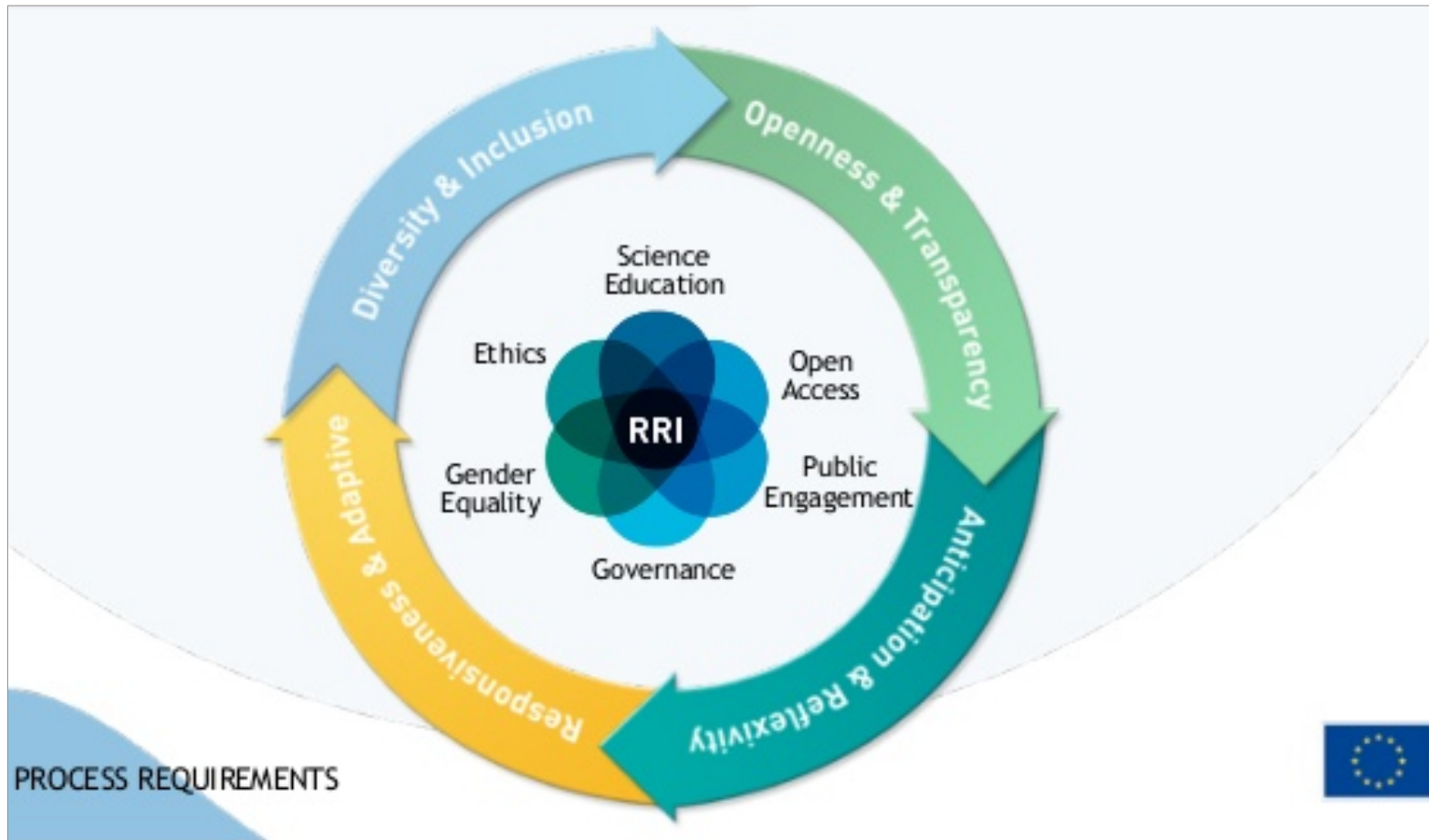
2. State of the art : Responsible Research and Innovation...

„...is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the **(ethical) acceptability, sustainability** and **societal desirability** of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).”

(René von Schomberg 2013: 19)

Source: www.berlin.de/stadtbibliothek-spandau/bibliotheken/kladow/stadtteilbibliothek-kladow-182136.php

2. State of the art: Responsible Research and Innovation



Source: www.rri-tools.eu/de/uber-rri

2. State of the art: Responsible Research and Innovation



Source: www.un.org

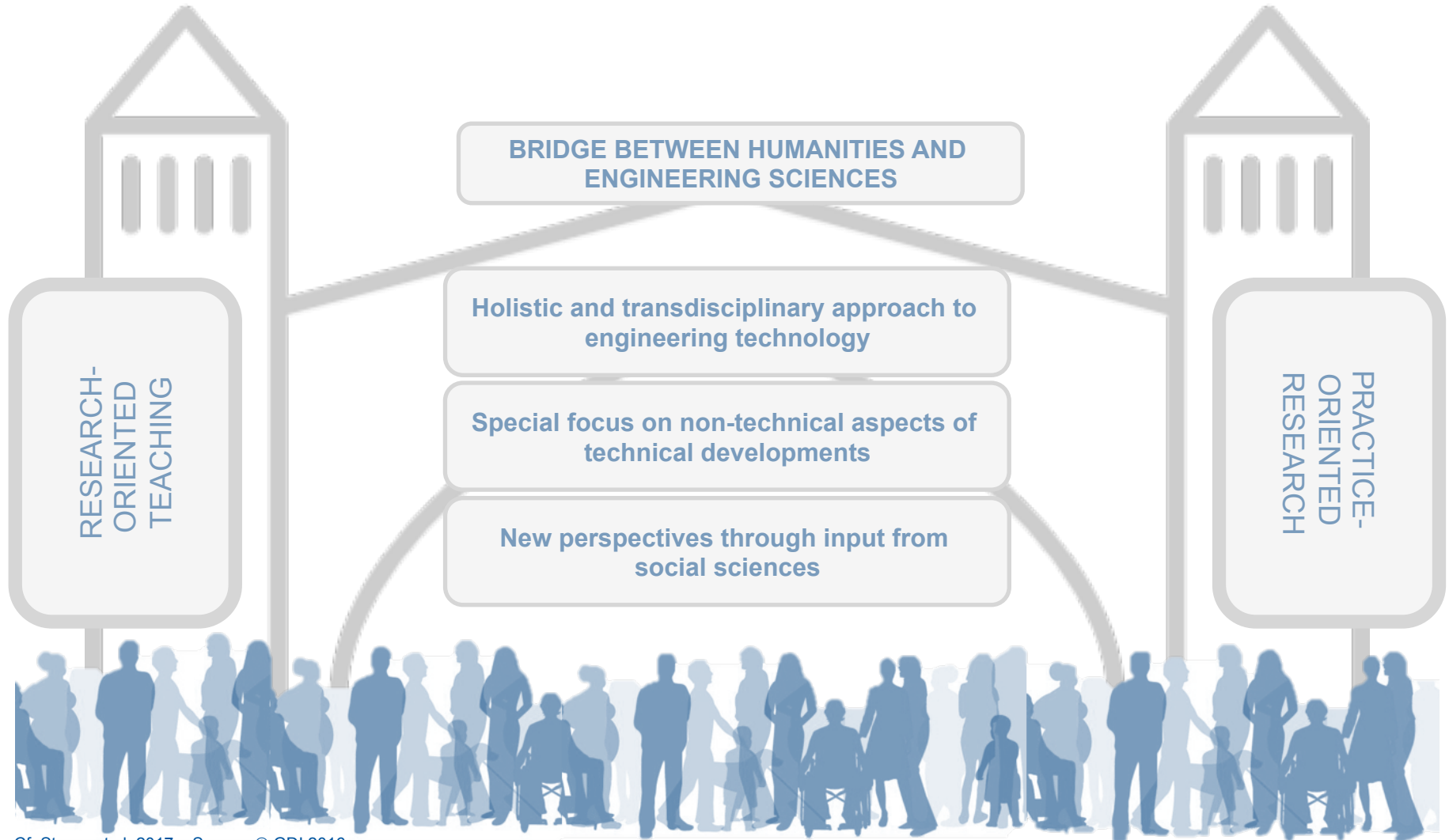
2. State of the art: and gender



Quelle: Steuer, Bouffier & Leicht-Scholten (2017)

© GDI 2016

3. Being a change agent: Bridging Professorship GDI



Cf. Steuer et al. 2017 – Source: © GDI 2016

Becoming aware of privilege
should not be viewed as a burden
or source of guilt,
but rather,
an opportunity
to learn and be responsible
so that we may work toward
a more just and inclusive world.

CHECK YOUR PRIVILEGE:

- WHITE
- MALE
- CLASS
- CHRISTIAN
- CISGENDER*
- ABLE-BODIED
- HETEROSEXUAL

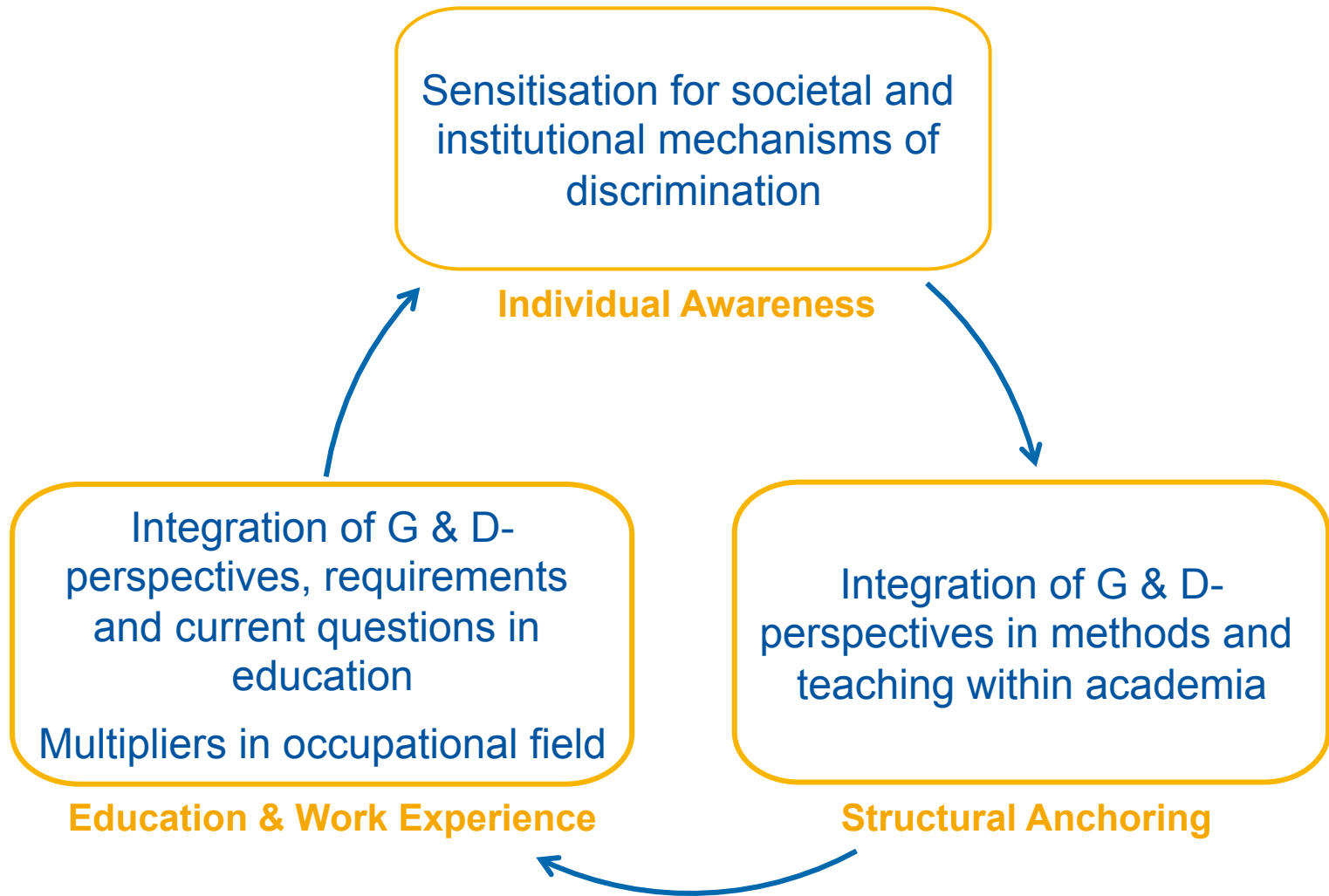
*CISGENDER: a description for a person whose gender identity, gender expression and biological sex all align

privilege: unearned access to social power based on membership in a dominant social group

Presented by Dr. Walker (Psychology Dept.), Dr. Poole (School of Management, Marketing Dept.), Professor Murray (Design Program), and Student Life. Poster designs by Camille Esposito, Ray Choi, Veronica Cabanayan and Cat Bagg.

Quelle: theodysseyonline.com

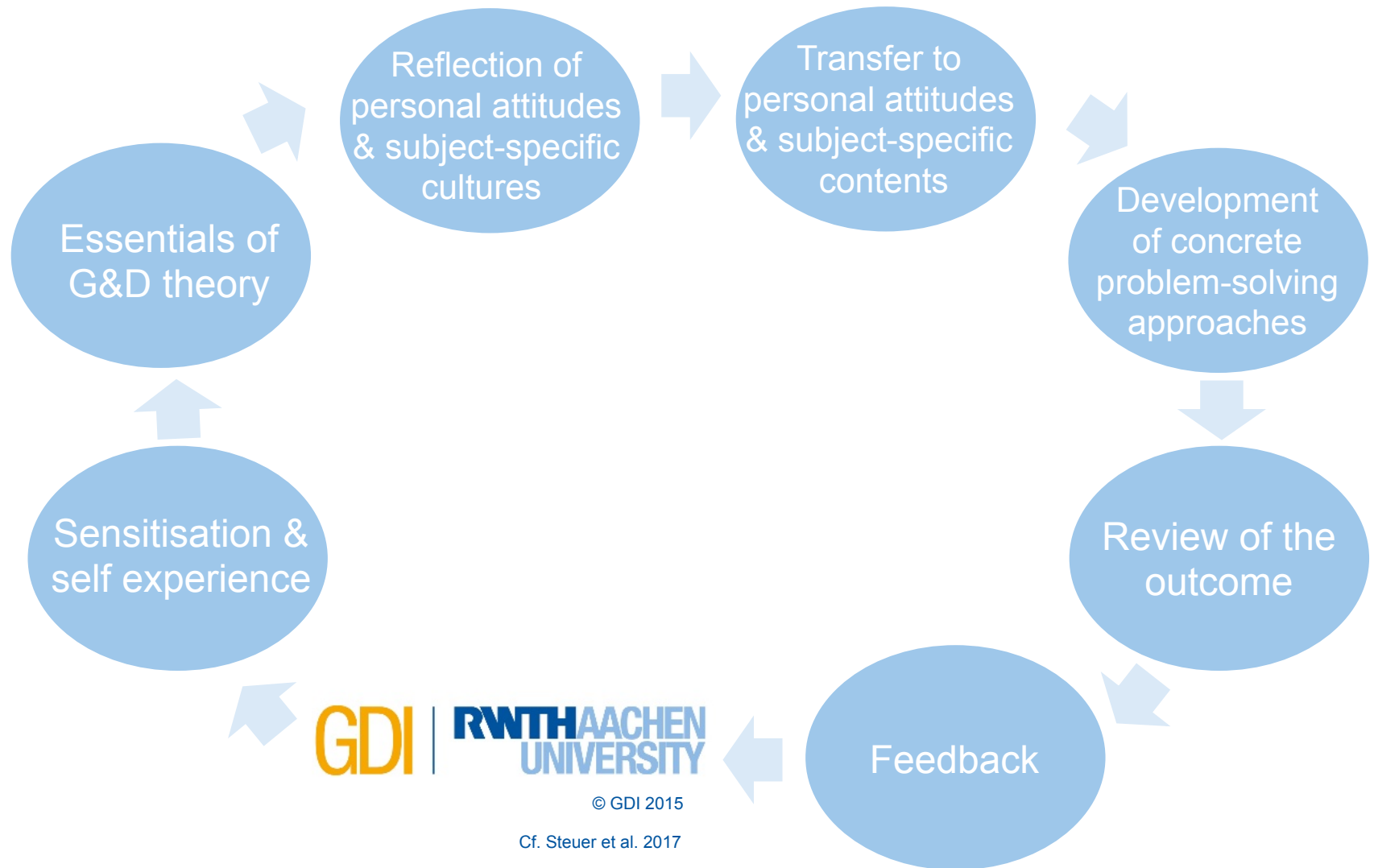
4. Fostering social responsibility in engineering education



Cf. Leicht-Scholten 2018

Source: © GDI 2016

4. Fostering social responsibility in engineering education



5. Good practice – diverse concepts



Source: GDI

bft
COGNOS
Sachverständige
Berater
Gutachter



Source: GDI



Source: GDI



Source: Ingenieure ohne Grenzen



Source: RWTH Aachen University

5. Good practice: Mandatory lecture

Mandatory module as part of curriculum



RWTH Aachen University:
Introduction of Gender- and Diversity-
Perspectives: Discussion of social questions with
regard to the area of specialisation in Civil
engineering.



Source: RWTH Aachen University

5. Good practice: Mandatory lecture

Gender and diversity perspectives in Civil Engineering – An introduction

- Interactive teaching units
- Lectures by external experts from practice
- References to the different scientific fields of Civil Engineering
- Application of a Blended Learning Concept
- Computer-based e-tests
- Virtual learning space during the semester



Source: RWTH Aachen University

5. Good practice: Problem-based learning in master course with NGOs and companies



Source: <http://www.ingenieure-ohne-grenzen.org/de/Regionalgruppen/Aachen>



Water supply



Sanitation



Renewable energies



**Structural +
bridge
engineering**



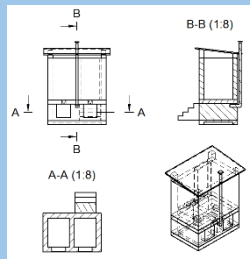
**Intercultural
communication**

Source: <http://www.ingenieure-ohne-grenzen.org/de/Projekte>

5. Good practice: Problem-based learning in master course with NGOs and companies

Case: Urine-Diverting Dry Toilets – Sierra Leone

Technological sustainability



Social sustainability



Cultural acceptance



Source: Ingenieure ohne Grenzen 2014, within the GDI seminar "Skills for social and sustainable technology design", own diagram

5. Good practice: Problem-based learning in master course with NGOs and companies

Perspectives - Gender and Diversity Modules in Science

Identifying technical difficulties by German *Engineers without Borders* in Tanzania

Introducing four challenges to the students

Elaboration of the challenges by the students regarding Gender- and Diversity-perspectives

Presentation of the results to the jury of *Engineers without Borders* on a graduation event

Feedback of the implementation concepts to the project partner MAVUNO in Tanzania

INGENIEURE
OHNE GRENZEN
CHALLENGE 

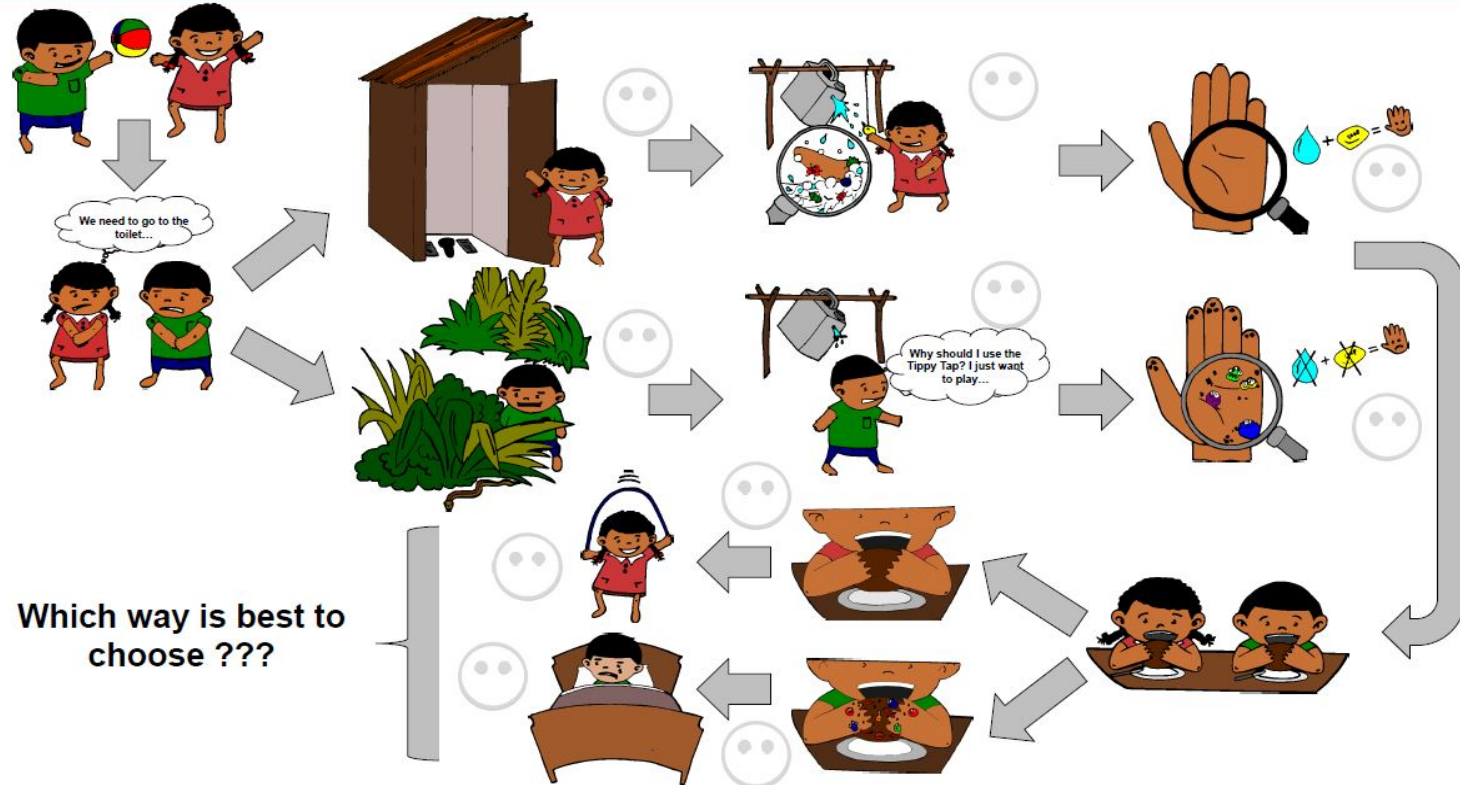
 INGENIEURE
OHNE
GRENZEN

Source: GDI 2014

5. Good practice: Problem-based learning in master course with NGOs and companies

Hygiene Promotion

*** Sam 's and Samita 's Day ***



Source: Ingenieure ohne Grenzen 2014, within the GDI seminar "Skills for social and sustainable technology design"

5. Good practice: Expanding Engineering Limits



© GDI 2015

5. Good practice: Expanding Engineering Limits

RWTH AACHEN UNIVERSITY



Students from RWTH Aachen University visiting Stanford University



"Expanding engineering limits: Culture, diversity and gender"



Students from Stanford visiting RWTH Aachen University

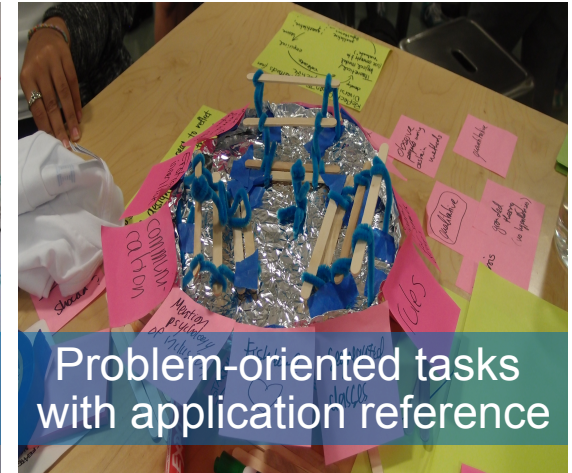
Stanford University



Source: „RWTH Aachen Hauptgebäude“ von \aleph (Aleph) - Eigenes Werk. Lizenziert unter CC BY-SA 2.5 über Wikimedia Commons; Stanford.edu, aachen.de, "32 aerial" by Zadonix at en.wikipedia - Transferred from en.wikipedia by SreeBot. Licensed under Public Domain via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:32_aerial.jpg#/media/File:32_aerial.jpg

5. Good practice: Teaching concept

Joint Pop-Up Class



Follow Up Course



Cf. Steuer & Leicht-Scholten 2016

5. Good practice: Testimonials for “Expanding Engineering Limits”

“I realized why Gender and Diversity-skills are also important for engineers!”

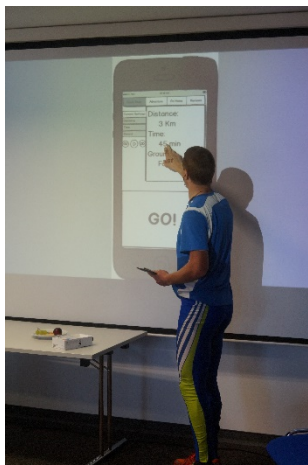
“Working in interdisciplinary teams was a challenge and has brought me closer to other points of view.”

“It's good to talk about non-technical content and to take the chance to think outside the box!”

“Great that the lecture was not about feminism, but was scientifically sound on the issues of Gender and Diversity”

Source:
Evaluation form Stanford University
Evaluation form RWTH Aachen University
Recalibration Survey, Project EEL

5. Good practice: Idea League Challenge



Source: GDI

6. Vision

Integrating the knowledge and perspectives of
gender and diversity studies



as central approaches into engineering research and teaching as
chance to foster social responsible research and innovation in
technology.

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The Aachen Way

Thank you for your attention!

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