Global Engineers –
the role of culture in a global engineering workplace

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COURSE BACKGROUND

Teaching global engineering competency has been a key focus in engineering programmes across the world for the past few decades [1, 2]. Research has shown that a more effective approach to learning the intercultural competency aspects is found by using an experiential learning model, where students are provided with opportunities to engage with the content and develop their own perspectives through interactions with each other [2]. For a collaborative course for 6 semester and higher engineering students at two universities, one in South Africa and one in Germany, this approach was used for a one semester course called Global Engineering. The course design aligns with the WEEF theme of addressing Novel approaches for transforming educational environments, and Curriculum adaptation for Preparing Workforce for Industry 4.0. Additionally, UN Sustainable Development Goals #4 Quality Education and #7 Reduced Inequality are addressed through the course offering.

FACTS & FIGURES

Module Name:	**Global Engineering**
Course Offering: co-curricular	✧ Faculty of Engineering, Stellenbosch University (SU): module for transcript recognition
Düsseldorf for 6	✧ Department of Mechanical and Process Engineering, University of Applied Sciences (HSD): elective course ECTS
Participants:	max. 30 students per semester (March-July 2023)
Prerequisites:	min. completed 6 semesters of basic/undergrad engineering degree
Language:	EMI (English as a means of instruction)
Assessment: and activities	group project: report & presentation, class participation
Contact time: workshop	2 hrs every week, 10 hybrid (online & in-person)

LEARNING GOALS

- to offer an **experiential learning opportunity** to students who want to build their **professional competency**
- to learn about **different cultures, their world views and communication styles**
- to teach students the skills required from engineers who **work in a global environment**
- to **learn from experts from industry and academia** in the fields of engineering practice and intercultural communication
- **understanding the role of culture** in navigating a multinational, diverse intercultural work environment
- to **actively engage in communication and learning activities within the multicultural and cross-institutional classroom space** between South Africa and Germany

COURSE STRUCTURE

Cultural Models
- ✓Identify, understand and communicate cultural similarities and differences
- ✓Create an iceberg model on your national experiences
- ✓Explain workplace problems based on cultural misunderstandings

Global Workplace
- ✓Panel discussion and Q&A with industrial experts
- ✓Statistics on the global workplace 2022
- ✓Understand differences of global work standards

Networking
- ✓How, where and when to build a professional network
- ✓Practice self-marketing in a 60 sec. elevator pitch

What is Culture?
- ✓ Analysis of different forms of cultural expressions
- ✓Communication as a key aspect of culture
- ✓How culture is learned
- ✓What influences entrepreneurship

Intercultural Communication
- ✓Behavioural model for interpersonal communication
- ✓What determines effective intercultural communication
- ✓Differences in communication practices
- ✓Communication goals and strategies

Subcultures at Work
- ✓How does culture influence the workplace
- ✓Organisational cultures
- ✓Hofstedes cultural dimensions, work behaviour and norms
- ✓Examples of work cultures of engineering companies

Women in Engineering
- ✓Status Quo / literature overview of women in engineering today
- ✓Gender diversity in engineering
- ✓Critical discussion of (false) expectations

Global Engineer
- ✓Global Problems for global engineers
- ✓United Nations Sustainable Development Goals
- ✓Requirements for being a globally competent engineer

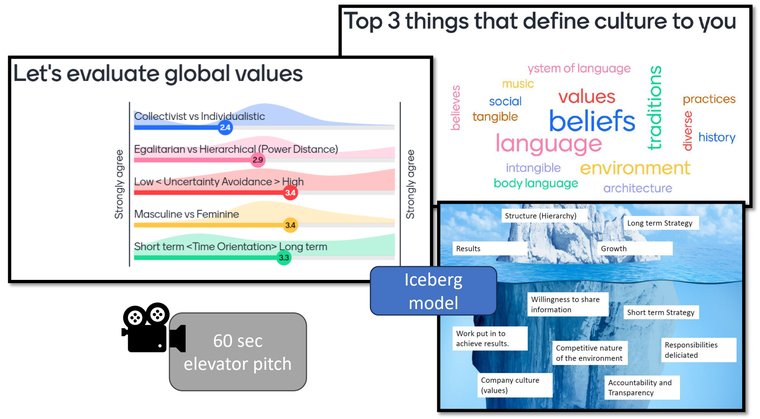
Group project:

Cross-cultural perspective on global engineering projects

- Assigned teams with students from both universities
- Investigate cross-cultural, diversity and global engineering considerations relating to a chosen global industry
- Compile a 10 page report with a 10 min presentation
- Includes peer assessment of presentations and reflection on group project

CLASS ACTIVITIES

A critical part of the experiential learning process was participating in class activities online. Some examples from our interactions…



FEEDBACK FROM THE STUDENTS

The following quotes were mentioned in a qualitative questionnaire after the class was finished:

"The main lesson was how impactful culture and language barriers and cultural differences can affect business"

"we all played on our different strengths and it was evident when the work was being done"

"…cross cultural teams are a powerful tool"

" we encountered diverse perspectives, communication styles, and approaches to problem-solving"

" the experience highlighted the significance of cultural sensitivity, adaptability, and empathy in cross-cultural collaborations, ultimately enhancing our ability to work effectively in a diverse global work environment"

REFERENCES

1. Hazelton, Malone & Gardner (2009) A multicultural, multidisciplinary short course to introduce recently graduated engineers to the global nature of professional practice. EJEE, 34:3, 281-290.

2. Handford, van Maele, Matous, Maemura (2019) Which "culture"? A critical analysis of intercultural communication in engineering education. JEE, 108:2, 161-177.