Challenge-driven education as a means to build mutual innovation capacity addressing sustainable development in Africa and Sweden.

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Background

The grand challenges of our time, as expressed by the Sustainable Development Goals in the UN 2030 Agenda, are shared by all countries.

In light of these goals we are all developing countries...And the universities have a key role in creating the capacities needed.
A scalable platform for students, faculty and external stakeholders to engage in global development engineering through cross-culturally and cross-disciplinary collaboration.

Challenge Driven Education that integrates challenges related to the Sustainable Development Goals (SDG’s) into the regular curricula at KTH and at African partner universities.

Facilitates and sponsors student exchange between KTH and African partner universities for mutual learning.

Provides teacher training at KTH and at African partner universities.
Current GDH partner universities
CDE<sup>GDH</sup> : Challenge-Driven Education as promoted by KTH Global Development Hub

- The learning outcomes are key for the universities
- Design methods and tools
- Developing ways of working that explicitly links the SDG’s to local challenges and projects goals
GDH student collaborations

At KTH in Sweden

2017: 5 students from Botho, Strathmore and USDM
    *OpenLab master course*

2018: 9 students from Botho, Strathmore and USDM
    *OpenLab master course*
    AG2129 Sustainable Urban Planning

2019: 9 + 9 students from Botho, Strathmore and USDM
    *OpenLab master course*
    AG2129 Sustainable Urban Planning
    MF2088 Innovation and Product Development

At African universities

2018: 7 KTH students doing their BSc thesis at Strathmore university in different projects on IT & transport, IT & energy, IT & agriculture.

2019: 4 KTH students doing their BSc thesis at Strathmore and university in different projects on IT & transport, IT & energy, IT & agriculture.

6 KTH students doing their BSc thesis at UDSM in a large project about water and sanitation
Examples of external stakeholders in the collaboration projects

Stockholm City

Stockholm County Council

Municipalities

DAWASCO (Dar Es Salaam water and sanitation authority)

Kenya Green University Network, Kenya Climate Innovation Center.

University Cafeteria Staff

Farmers, Wholesalers and Suppliers

Scania, Nairobi
Examples of challenges addressed in the collaboration projects

• Smart and connected lighting project managed by the Traffic Department.
• Find ways to improve the patient experience at the Sachsska Children's emergency room.
• Improve access to food (or food security) through hydroponics.
• Developing a router to provide internet access to villagers in the rural Bundala district, northern Tanzania.
• Developing sustainable transport in Haninge Municipality.
• Safety Perception - how inhabitants perceive safety in relation to their environments.
Teacher training
LH233V Teaching and learning for challenge driven education

A new teacher training course developed at KTH

Themes:
- Challenge driven education for sustainable development
- Design methods and creativity
- Designing challenge-driven project courses
- Stakeholder engagement, challenge definition, innovation & impact planning
- Facilitation and collaboration for learning in project teams

Some themes prototyped together with around 40 teachers at Botho, Strathmore and University of Rwanda during 2018 and 2019.

Full course performed at KTH spring 2019 (13 teachers).
Examples of CDE courses developed by participants in the teacher training course

- Sustainable Urban Development
- Challenge Driven Innovation for Sustainable Development
- Ergonomics in Challenge Driven Product Development
- Challenge-Driven course in Computer Science and Industrial Management
- RE-Pair: Strategies for Care, Maintenance, Waste Management and Circular Economy in Architectural Design

The challenges addressed in the courses are more or less open-ended and complex
Challenges in open-ended and complex student projects

- Goal confusion in the team: "Where are we going?" "What are we going to solve?"
- To make students taking the responsibility/ownership over their project
- Personal conflicts in the team due to difference in values, mental models etc.
- To get students accepting that making mistakes and using iterations and experimentation are good approaches because learning is the goal
- Managing dissatisified stakeholders
- Post-course dissemination – long term impact

Pedagogical research ongoing to build knowledge on the learning process and outcomes. Recently started to investigate relevant research questions related to the innovation process. We are open to collaboration!
More information…

…about GDH:
https://www.kth.se/en/om/internationellt/projekt/globaldevelopmenthub/

…about Challenge Driven Education:
https://www.kth.se/social/course/LH233V/

Follow us at LinkedIn and Twitter:
https://www.linkedin.com/school/globaldevelopmenthub/ #gdh
GDH challenge driven education concept

**Societal Challenges**

**External Stakeholders**
- In Sweden
- Or in partner countries

**Challenge Driven Courses**
- @KTH
- Or @Partner Universities

**Multi-perspective Student Teams**

**Solutions**

**Impact**
- Real solutions contributing to the SDGs
- Continuing innovation
- Students as change agents