

Sustainability in the classroom: from practices to teaching

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Odense

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CHALMERS
UNIVERSITY OF TECHNOLOGY

kea
KØBENHAVNS ERHVERVSAKADEMI

 NTNU



VIA University
College

 **konstruktør
foreningen**

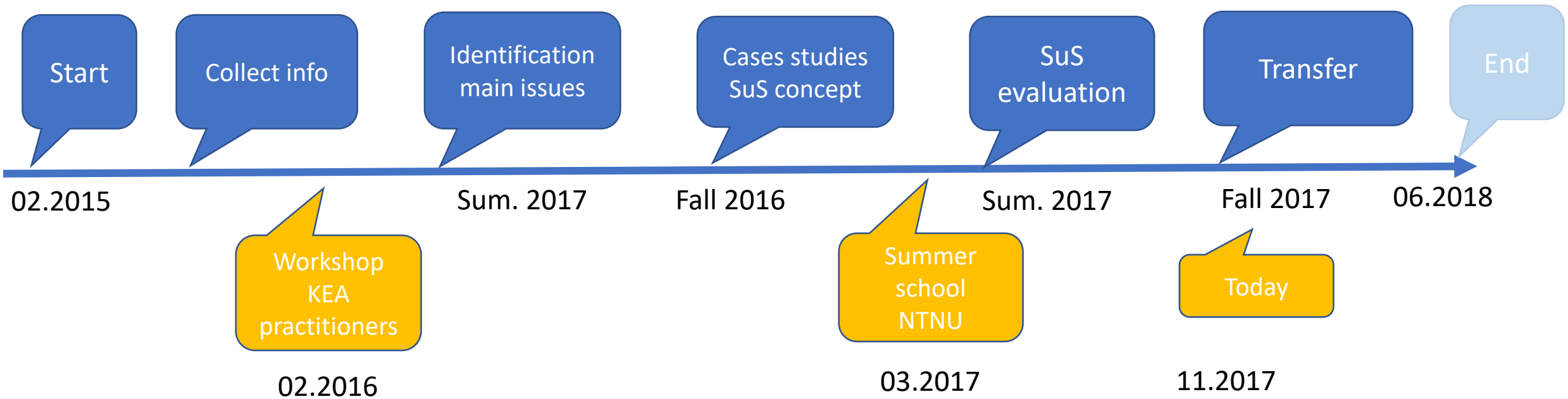
 **NORDIC
BUILT**

Our project

- Work across boundaries :
 - Nordic Built
 - Countries: DK, NO, SE
 - Schools: Chalmers, KEA, NTNU, VIA
 - Language: Danish, Norsk, Svensk, and English
 - Educations: bygningskonstruktør and master students in FM and CM
- Aim: creating teaching material to support sustainability FM

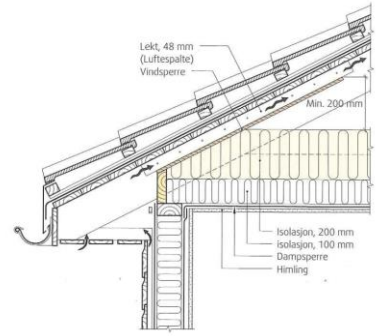


Project time line



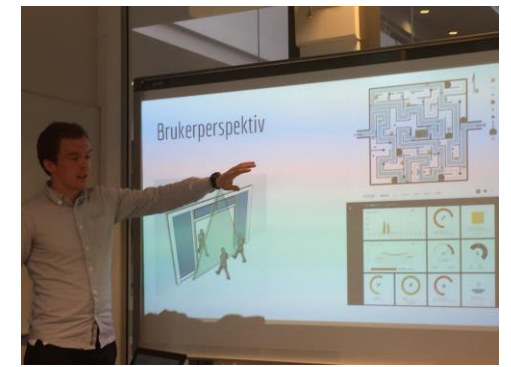
Topic : sustainability in FM

Himling
Innertak
Loft



- Scandinavian countries common understanding of FM and sustainability (flat hierarchy, well organized labour, social values)!
- To achieve sustainability goals users need to be involved!
- If clear that FM can contribute to sustainable agenda, not clear how to handle the users
- Our educations address sustainability but do not equip students with awareness and concrete tools to solve issues related to the social aspects of environmental and economical sustainability solutions.
- The complexity of these issues require multidisciplinary competences. So we need to cross barriers between traditional disciplines.

Summer school



- 4 ongoing cases studies
- Actors: FM companies, researchers, teachers, PhD student and academics, 1 contractor, 1 FM company, 2 public housing companies, students
- Project Base Learning PBL and multi disciplinary team
- Setting: 2 groups of 4-5 students working on the same case.
- Results presented by the students and evaluated by both teachers and practitioners
- Our role: create the frame, find cases and engaged practitioners, set the goals!

4 Case studies



1. Hotel in Norway



3. Social housing DK



2. University, Sweden



4. Eco housing in DK

Case	1 Hotel, Norway	2 University, Sweden	3 Social housing, Denmark	4 Eco housing, Denmark
Context	Large ambitious renovation of a hotel built in 1870	Retrofit of a university building, the creation of small open offices and new meeting area	Designing retrofit for social housing targeting inner climate issues	New built of sustainable housing, users participation in operation and maintenance
Goal	How to integrate sustainable solutions including the hotel's guests	How to engage users (students and employees) to behave according to the sustainable goals integrated in the building	To solve inner climate issues and engage the residents to act accordingly to new standards	To motivate the residents' association to take responsibility, operate and maintain the buildings and surrounding
Client	Contractors	Facilities management company	Public housing company	Public housing company
Challenges	To create a luxury hotel which builds on sustainable principles and engage clients to behave accordingly	To create an attractive environment that inspires and supports the interaction between researchers, students and companies.	To engage and motivate residents to take an active role	To motivate the residents to do self-management and operation of housing and common areas
Students contribution	App technology Smart intelligent rooms Adapt prices to sustainability contributions sustainability: demonstrate how guests can contribute to save energy by choices of different prices in the booking	Apps and smart technology for the FM unit: Monitoring use of space Room booking BIM for all buildings Information Operational planning Training program Motivation/points User: Social zone with a green garden with fresh vegetables Gaming café	Formation and monitoring tool that affects the behaviour of the residents: Inspiring information What is expected when living here Social events Surveys Professionals to handle technical installations	Organize tasks and inform the residents in what task they are expected to engage in Information channel Clear Incitement's for doing the tasks and consequences for when the maintenance tasks Yearly maintenance day for fellowship and common good

Table 2. Results of the students' questionnaire

Questions	Scale	Very good	Good	Fair	Bad	Total
What is your assessment of the SuS		19	15	0	0	34
Does the SuS contributing to your education		15	15	4	0	34
Do you have a better understanding of the social aspects of sustainability challenges after the SuS		10	19	4	1	34
How do you assess the participation of the professionals to the setting		14	12	6	1	33
Do you feel you participate constructively to the group work		19	15	0	0	34
As the SuS improve your understanding of the two other national cultures		22	11	0	1#	34
Would you recommend the SuS to other students		26	3	1	0	30

non Scandinavian student

Results



- A success ;-)
- Students very attentive to language and culture differences
- Values for students, teachers and some of the practitioners...
- However
 - This is a project with a substantial budget, how to translate this in everyday teaching context?
 - Divergence between the teachers regarding the contribution of SuS, either focus on process or content (cases)
 - Difficult to assess the outcomes in term of learning and sustainability

How do we bring the new practices and research to the classroom ?

- How do we know what we need to teach?
 1. In a world in constant change, how can we integrate the practitioners' new developments in our teaching activities?
 2. Can our Nordic Built project and other similar projects contribute to your work in the classroom?
 3. And if they can, how should it be done it?





**Thank you for your attention!
And now it is your tour**

