



TU/e



# Virtual Campus Hub

*Toward a concept for international collaboration in education*

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**TU/e**

Technische Universiteit  
**Eindhoven**  
University of Technology

**Where innovation starts**

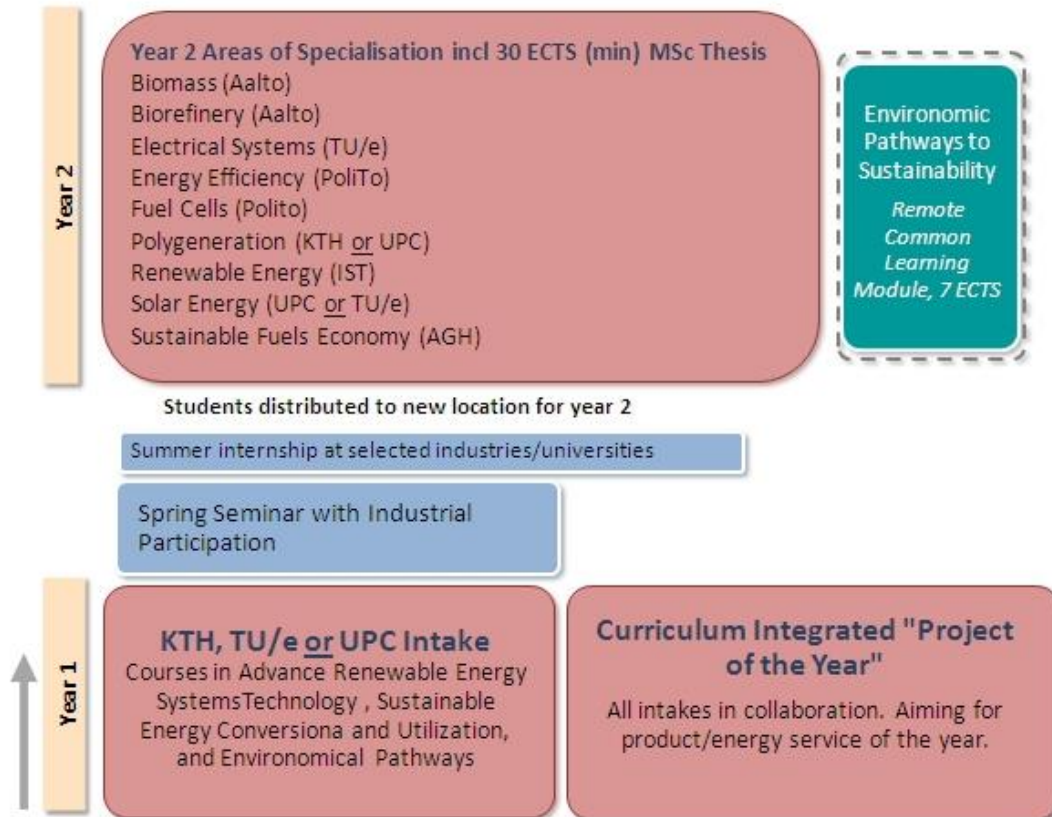
# Context: Cross-border collaboration in education, research and innovation



Examples in the energy field:

- [KIC InnoEnergy](#), Virtual organization of universities, research institutes and SMEs
- [SEEIT](#): Strategic partnership for sustainable energy
- [Explore Energy](#): Gateway for life-long learning

# Context: Cross-border joint programs



Example is [KIC InnoEnergy Select MSc](#):

- Network with many partners, incl. industry
- Students change location in Y2
- Integrated project: Student groups with members from all locations
- Optional courses at other locations through distance learning

Other example: Post educational course on wind energy (WAsP) by DTU.

# Problem: ICT barriers for collaboration across institutional borders

Application	Local education portal	National	International	Industry	Schools
Online meetings, online coaching of students	😊	😞	😞	😞	😞
Collaborate on documents	😊	😞	😞	😞	😞
Remote lectures (in realtime)	😊	😞	😞	😞	😞
Retrieval of (interactive) learning materials	😊	😞	😞	😞	😞
Weblectures (recorded)	😊	😞	😞	😞	😞
Retrieval of course and timetable information	😊	😞	😞	😞	😞
Online study agenda	😊	😞	😞	😞	😞
Online registration for courses and exams	😊	😞	😞	😞	😞
Online retrieval of results	😊	😞	😞	😞	😞
News and information on your study programme	😊	😞	😞	😞	😞

# Objectives Virtual Campus Hub

1. Inventory of the most important ICT barriers for international collaboration in education.
2. Demo platform to prove that some of these barriers can be removed:
  - Easy access to partners' applications
  - More efficient and more flexible setup of online activities or online participation in regular activities.
  - Easier collaboration with industry
3. Vision on how to apply these insights and experiences in concrete collaboration initiatives (e.g. international joint programs)

# Demo portal (proof of concept)

The screenshot shows the Virtual Campus Hub demo portal. At the top left is the logo for VIRTUAL CAMPUS HUB, Part of Explore Energy. In the top right corner, there is a 'Login' link. Below the header, there are four main sections: 1. DTU (Danish Technical University of Denmark) with the text 'Post educational course on wind energy'. 2. The University of Turin logo with the text 'Virtual Incubator'. 3. KTH (Royal Institute of Technology) logo with the text 'Remote cascade lab'. 4. TU/e (Technische Universiteit Eindhoven) logo with the text 'Collaboration environment'. Below these sections is a heading 'My Virtual Campus group memberships'. A horizontal line separates this from the 'Virtual Campus Hub' section, which contains a description of the project and its funding by the European Commission under the 7th Framework Programme, accompanied by the European Union flag and the 7th Framework Programme logo. Another horizontal line separates this from the 'Partners' section, which lists SURF NET, WAYF (Where are you from), SWAMID, and IDEM - Italy.

## Functionality:

- Access with your own account to partners' applications
- Create international groups (virtual organizations)
- Single sign-on access through simple website (<https://vch.tue.nl>)

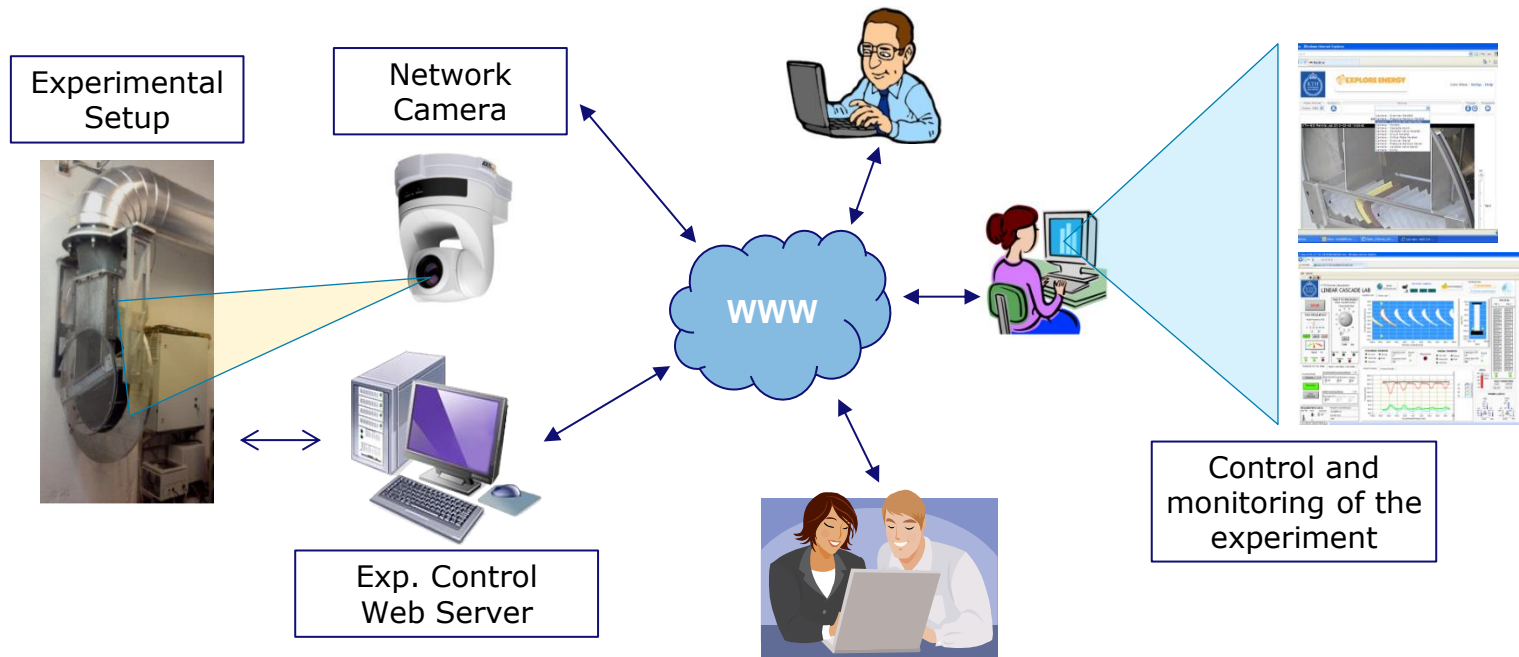
# Access to learning materials: Post educational course on wind energy (DTU)

The screenshot displays the 'itslearning' LMS interface for the 'DTU Wind Energy' course. The browser address bar shows the URL 'https://windenergy.itslearning.com/main.aspx?CourseID=2'. The page features a navigation menu on the left with options like 'Dashboard', 'Courses', 'Projects', 'Calendar', 'ePortfolio', and 'My library'. The main content area is titled 'WASP course' and includes a 'Course dashboard', 'Status and follow-up', 'Participants', 'Groups', 'Settings', and 'Course content' sections. The 'Course content' section lists various topics such as '0. Welcome to the WASP course!', '1. Introduction to WASP', '2. Wind-climatological inputs', '3. Topographical inputs', '4. Land cover and roughness effects', '5. Elevation and orographic effects', '6. Wind Resource Assessment (WRA)', '7. Wind farm calculations', '8. Case study', '9. Working with WASP', 'After the course', and 'Teacher's resources'. A 'Bulletins' section contains a 'Student login' announcement with user 'student' and password 'Online2306', and an 'Interesting video about online learning of the future' link. A 'Funding and collaboration' section features logos for DTU, SEVENTH FRAMEWORK PROGRAMME, and VIRTUAL CAMPUS HUB, along with text stating the course is developed by the Technical University of Denmark and partially funded by the European Commission. A 'Latest changes' section lists updates like '6.4B Discussion Forum available in 6.4 Observed, generalized and predicted wind climates' and '6.3B Discussion Forum available in 6.3 Inputs for wind resource prediction'. The interface also includes a search bar, user profile 'Badger, Merete', and navigation options like 'Add content block' and 'Change layout'.

Course materials and interaction through LMS (itslearning from external service provider)

# Access to learning materials: Remote laboratory (KTH)

The **remote laboratory** is operated and monitored on-distance for **real-time experiments** and collection of measurement data. More info at [http://www.energy.kth.se/proj/projects/Remote\\_labs/RL/RL\\_website/RCL/RCL.html](http://www.energy.kth.se/proj/projects/Remote_labs/RL/RL_website/RCL/RCL.html).



*Remote labs: web application developed by KTH*



# Collaboration environment (TU/e)

- **Sharing and collaborate on documents (Sharepoint)**
- **Efficient and reliable setup of online activities (unified communications, together with Surfnet)**  
(fully online or with online participation of some)
  - Remote lectures
  - Joint meetings and events
  - Supervision of student projects and consultation of experts


# Virtual incubator (PoliTo)

## Virtual incubator (PoliTo)


- Enable close contacts between universities and industry
- Stimulate entrepreneurship and “matching”

# Virtual Campus Hub Technology


Login




**Post educational course on wind energy**



**Virtual Incubator**



**Remote cascade lab**



**Collaboration environment**

**My Virtual Campus group memberships**


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**Virtual Campus Hub**

Virtual Campus Hub is a collaborative project between four technical universities in Europe. The project runs from October 1, 2011 to September 30, 2013.

The project is partially funded by the European Commission under the 7th Framework Programme.

More information can be found on the official project website.








SEVENTH FRAMEWORK PROGRAMME

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**Partners**



Where are you from



SWAMID

IDEM - Italy

# Technological components

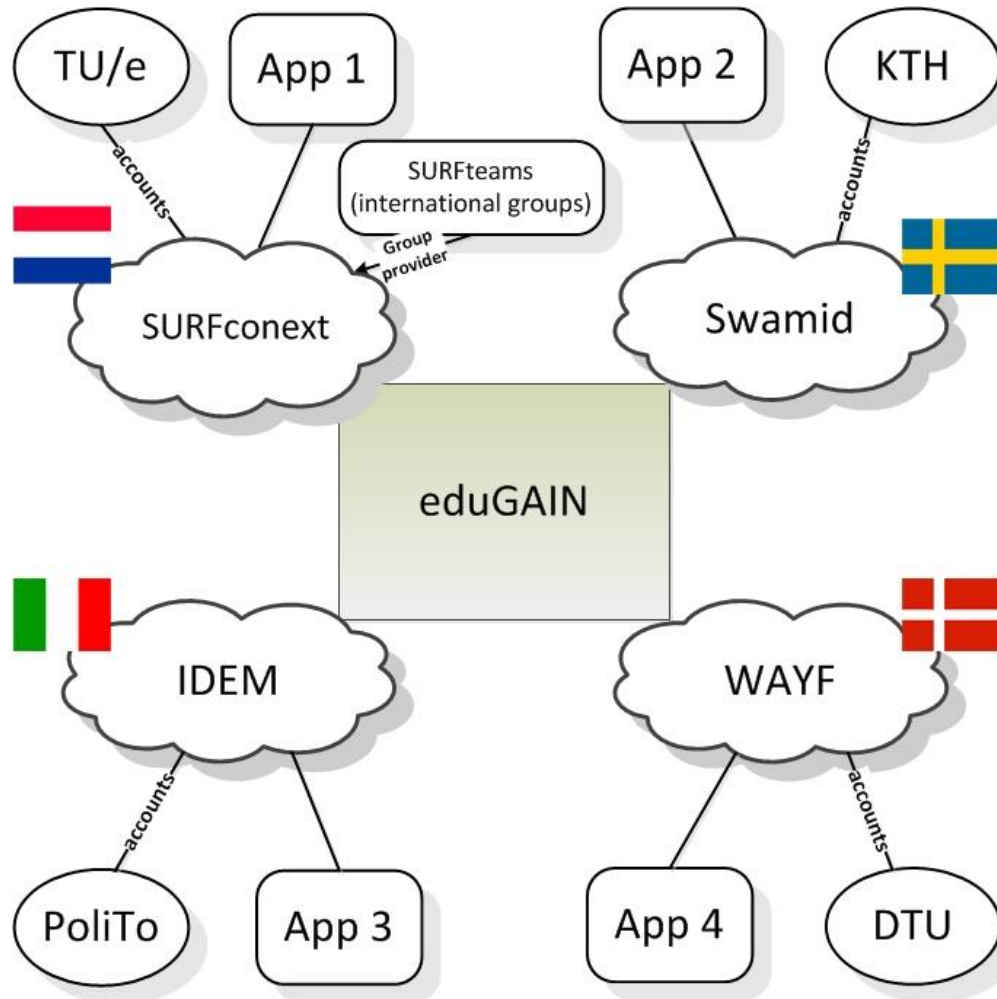
## ***Federated authentication***

- ✓ Use your own institution's account for applications elsewhere

## ***Group management***

- ✓ Using cross-institutional and cross border group definitions (virtual organizations) for authorization at different locations and in different applications
- ✓ In this project: Surfteams (part of Surfconext). Also available as open source (Openconext, <http://www.openconext.org>).
- ✓ No general standard across NRENs available yet. However, work started on this within Géant.

# Enabling international collaboration: National (NRENs) and European (Géant)



# Experiences

- Promising technology and fairly well standardized across NRENs (except for group management)
- Enables institutions to join forces in education
- Knowledge and motivation at local institutions still very limited
- Crossing borders is also new to NRENs
- Difficult to sell infrastructure improvements to users
- Not allowing industry on Géant infrastructure as identity provider hampers collaboration with industry