Virtual Campus Hub

Merete Badger, Technical University of Denmark

An EU-funded project running October 2011-2013

www.virtualcampushub.eu
Virtual Campus Hub – Objectives

Why?
To boost integration of research, innovation and education in sustainable energy.

How?
Through delivery of a working concept for a Virtual Campus Hub ready to be implemented at partner universities, research organizations with links to industries, businesses, and innovation parks.
Virtual Campus Hub – Components

1. A technical platform
   - Virtual meeting spaces for lectures, conferences, laboratory and numerical exercises
   - Innovation tools, executive learning modules, self-study, etc.

2. A set of documented best practices
   - For using the platform for courses, teaching & learning methods, innovation processes, networking and joint programs, developed through continued complementary on-site activities.

3. An inventory of staff competence and experience
   - Enhancing quality
   - Scaling-up innovation, education and training activities, - primarily related to sustainable energy
   - Dissemination and communication of the resulting best practices
## Virtual Campus Hub – Participants

<table>
<thead>
<tr>
<th>Institute</th>
<th>Acronym</th>
<th>Leading staff</th>
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<tbody>
<tr>
<td>Technical University of Denmark</td>
<td>DTU</td>
<td>Merete Badger</td>
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<tr>
<td>Royal Institute of Technology, Sweden</td>
<td>KTH</td>
<td>Lucio Monaco</td>
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<tr>
<td>Politecnico di Torino, Italy</td>
<td>Polito</td>
<td>Laura Farinetti</td>
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<tr>
<td>Eindhoven University of Technology, Netherlands</td>
<td>TU/e</td>
<td>Frank Vercoulen</td>
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Virtual Campus Hub - Roles

Dissemination

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Dissemination

Virtual Campus Hub technology

E-linked innovation

E-learning programmes and courses

E-learning tools

Project management

Co-ordination / Studies

WP6

03 06 09 12 15 18 21 24

TU/e, DTU, KTH, Polito

DTU, KTH, Polito, TU/e

Polito, DTU, KTH, TU/e

DTU, KTH, Polito, TU/e

KTH, DTU, Polito, TU/e

Management

WP1

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

DTU, KTH, Polito, TU/e
Virtual Campus Hub - Relations

Other energy networks:

- SEEIT – a European Strategic Partnership for Sustainable Energy Education, Innovation and Technology (http://www.seeit-alliance.eu)
- Explore Energy – gateway for life-long virtual campus learning (www.exploreenergy.eu)

Virtual Campus Hub is linked to:

- Europe 2020 and SET Plan goals
- The European e-infrastructure network incl. Géant
WP2 – e-Learning tools

The **remote laboratory** is operated and monitored on-distance for real-time experiments and collection of measurement data.

The **exercise** is combined with on-line **self-assessments** and **pre-tests**, all 100% automatically corrected.

No need for teachers to provide supervision or correction of exercises.

![Diagram of remote laboratory setup](image)

**Figure 1** Remote laboratory setup (Remote Linear Cascade Lab)
Examination Tools

On-line examination tools for **100% automatic correction** including

multiple answers on “simple questions”:

self-assessments will be developed such that a pool of questions can generate a significantly (factor of 100 or more) number of possible answers to multiple choice questions.
WP3 – e-Learning Programmes and Courses

WP3 includes selection, implementation and evaluation of VCH elements in ongoing and new sustainable energy educational programs. At least 3 test cases will be selected.

WAsP online course:
DTU Wind Energy has developed an online course in wind energy (WAsP course), which represents one test case.
Learning Management System ("itslearning")
- holds the WAsP online course material
WP4 - e-Link Innovation for Decision Makers

• Specific learning material for managers and enterpreneuse
  – Requirement analysis
  – Contents development / adaptation

• Sharing of data sets and best practices
  – Real data, useful for creating simulations, validating business plans, showing SMEs added value, ...
  – Best practices in a comprehensive directory of skills and competences
Universities have an increasing number of and increasingly diverse relations with the outside world, but ICT is still inward looking

→ Barriers for access, collaboration and data exchange across institutions and companies

→ Everybody has plenty of tools available, but using them across an institution’s border is cumbersome

→ Labour-intensive workarounds offer far from perfect solutions
Lower barriers for access, collaboration and data exchange for:

- **Federated authentication**: Use your own account at other institutions / companies
- **Group management**: Create groups across institutions and companies and grant these groups access to applications at an institution or company
- **Portal**: Easy access for groups to applications or data *(portal)*
- **Data exchange mechanism**: Easily retrieve data from different institutions (e.g. course information or student results in joint programs)
What does a Virtual Campus Hub consist of?

Virtual Campus Hub:
- Functionalities
- Infrastructure
- Presentation in portal

- Single Sign On based on account from home institution
- Collaboration Environment
- Virtual Conference Room
- Virtual Coffee House
- Access to Learning Materials
- Virtual Incubator
- Learning Results
- Subject Information
- Scheduling Information
- News
- Value Added Services (Group management, ID-mapping, Presence, Calendaring, Exchange of study program data)
- Federated Authentication (cross border)
- Network (internet backbone)
Challenges

**Géant infrastructure:** EduGain, SurfFederatie, WAYF, Swamid, IDEM

- Enable federated authentication across borders
- Enable group management across borders

**Local institutions or companies:** DTU, KTH, PoliTo, TU/e

- Provide identities across borders (IdP)
- Connect applications to the national hub (SP)
- Enable applications for group management
- Develop (simple) reusable gadgets for own VCH applications

**TU/e** (but others may setup own portals as well)

- Setup demo portal and incorporate gadgets developed

**Local institutions with Géant as hub?**

- Design of a exchange mechanism for formal data (e.g. course information, student results)
More about Virtual Campus Hub

Terena VAMP workshop
Thursday 6 September 2012 in Utrecht

10:30-12:00 Workshop Programme A:
VO use cases (i)

• Virtual Campus Hub, Frank Vercoulen (TU/e - Eindhoven Technical University)
• Project Bamboo, Keith Hazelton (University of Wisconsin - Madison)
• Discussion topics

VO use cases (ii)

• Identity management in the European Grid Infrastructure: established solutions, new needs, open questions, Gergely Sipos (EGI)
• Globus Nexus, Steve Tuecke (University of Chicago / Globus Online)
• Discussion topics