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Collaborate across Europe with virtual university campuses

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Collaborate across Europe with virtual university campuses

Four universities in Europe have formed a network through eduGAIN. A secure single sign-on system facilitates sharing of applications for teaching and collaboration within this network.

The EU-funded [Virtual Campus Hub](#) project has demonstrated for the first time how functionalities can be shared in a virtual network across university campuses. The challenge for the two-year project, which came to an end in autumn of last year, has been to develop and enable sharing of a series of virtual applications for teaching and collaboration. The applications are shared among the four member institutions of the project consortium, which consists of the Technical University of Denmark, [the Swedish Royal Institute of Technology](#), [Eindhoven University of Technology](#) in the Netherlands, and [the Polytechnic University of Turin](#) in Italy. The collaboration has focused on renewable energy as all four universities are strong players in this field.

The virtual campus vision

The vision of a virtual university campus embraces education, research, and innovation — just like a real campus environment would do. Students and teachers have access to learning material, study plans, and even exam results. The campus also offers facilities for conferences and meeting and is typically linked to industry through collaborative research and training, as well as through incubators that fosters new companies.

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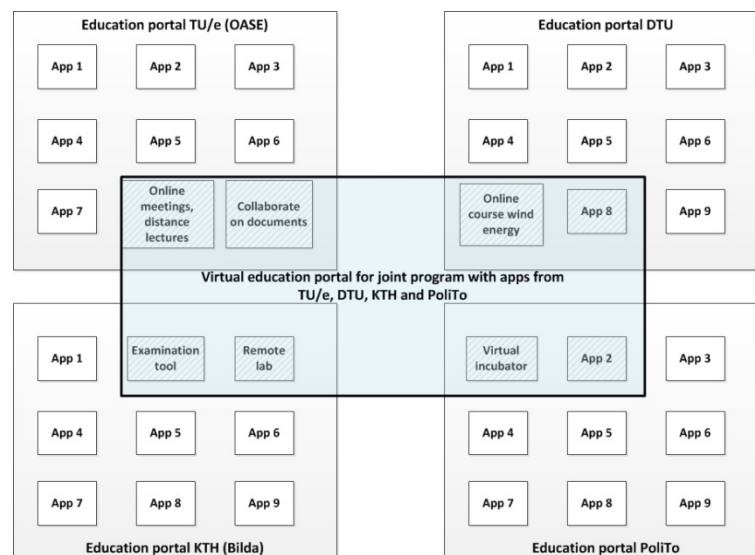
A Virtual Campus Hub embraces all of the functionalities a real university campus would offer. Image courtesy [college.library](#), [Flickr](#) (CC BY 2.0).

Like most universities, each of the Virtual Campus Hub partners has a well-functioning internal education portal, offering a range of applications in a seamless way. Sharing of the content with other institutions can, of course, be difficult and time consuming, because guest accounts need to be setup and administrated, which may cause security issues. As universities collaborate more and more with the outside world through joint educational programmes and research alliances, increasing demands are placed on the ICT support services.

A proof of concept

The Virtual Campus Hub is a proof of concept. It simulates a situation where four universities offer a joint educational program, whereby both students and teachers are able to access

virtual applications from the other partners with the user name and password from their own institution. The shared applications include an e-learning course in wind energy, tools for online examination, remote laboratories, a common Microsoft SharePoint site, and a virtual incubator. A fundamental aspect is that institutions can continue to use and share the tools they have already got. As such, there is no need to conform to a common standard. The access point to Virtual Campus Hub's applications is a personalized web site with single sign-on. Users and groups are managed centrally from here.



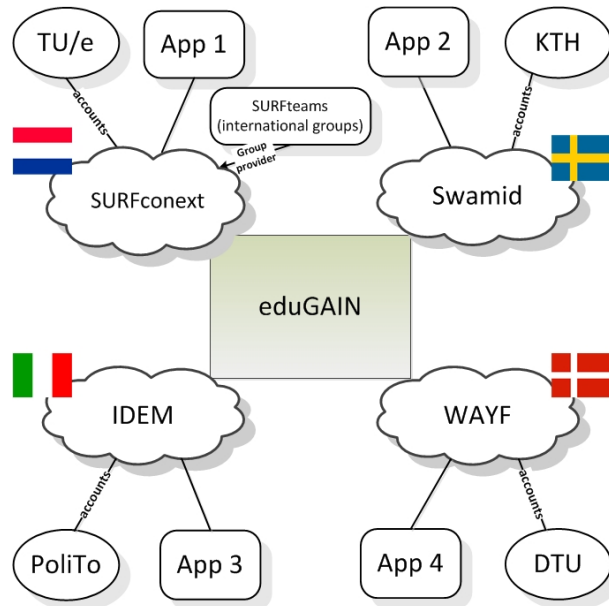
A virtual education portal gives users from different universities access to each other's applications with the user identity from their local university.

The underlying e-infrastructure

European e-infrastructure has been essential for achieving secure connections between the Virtual Campus Hub partners. The universities are connected as identity providers to a national federation. Likewise, the services that the universities wish to share are connected. All European countries and a large number of non-EU countries have established national federations. This demonstration project relies on assistance from [WAYF](#) in Denmark, [SWAMID](#) in Sweden, [Surfnet](#) in the Netherlands, and [IDEM-GARR](#) in Italy.

In order to achieve international connections between the accounts and applications, the individual federations will also have to be linked. This is now possible thanks to [eduGAIN](#), an infrastructure facilitating the secure exchange of data between participating federations. The Virtual Campus Hub project illustrates that we now have the capacity and technology to achieve what was previously only possible at national level.

David Simonsen, head of the WAYF secretariat says: "Virtual Campus Hub represents a pioneering effort when it comes to the development and use of systems for cross-institutional authentication. In spite of many technical and organisational barriers, we have established an international single sign-on system and achieved our goal. The project is not only a success; it serves as an example of how international projects can benefit from eduGAIN in the future."



In the Virtual Campus Hub network, identity providers and service providers are connected through eduGAIN and the national federations of the Netherlands, Sweden, Italy, and Denmark.

Lessons learned

Students and teachers in renewable energy have tested the different applications that form the Virtual Campus Hub environment. The applications have now been used more than 1,200 times by over 500 individuals. Their feedback is positive. Lessons learned from these real-life situations have been valuable for improving the concept and for documenting the best practises for online teaching and collaboration. The tests have also shown that some barriers remain for making connections easy and achievable for any educational institution or external service provider. Most importantly, the private sector must be included in the existing research infrastructure, in order to support further integration of research, education, and innovation in society.

Perspectives for the future

The content and the connections of Virtual Campus Hub can be re-used and scaled up in other collaborative projects and scientific fields. As more and more institutions get connected to a federation and the federations get inter-connected via eduGAIN, a global virtual campus can be envisioned. This has the potential to strengthen the collaboration between institutions worldwide in numerous ways: universities' resources are used more efficiently, specialized knowledge can be more easily unlocked, and education becomes accessible for a wider community.

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