

Chapter XI

Reviewing Traces of Virtual Campuses: From a Fully Online Virtual Campus to a Blended Model

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ABSTRACT

The chapter first describes the concepts of virtual campus and virtual mobility and refers to several past and present projects and initiatives in the field. Through these previous experiences, a shift of concepts is noticed: from the fully online virtual campus to virtual mobility, whereby the more traditional universities open their borders and “blended models” gain more and more interest. Three cases demonstrate this evolution: the Katholieke Universiteit Leuven (Belgium) is progressively organising its educational support from a multicampus perspective; the Open University of The Netherlands is broadening its tasks towards lifelong learning; and in the GIS case, the virtual campus is used as a strategic means to

ensure a valuable and transdisciplinary approach. To redefine the concept of virtual campus in order for it to be applicable to the changed educational needs of today, the Re.ViCa project has been set-up. The project makes an inventory and systematically reviews cross-institutional virtual campuses from the past decade. Outputs will include a set of recommendations that can be applied to ensure the realisation of new successful virtual campus initiatives.

INTRODUCTION

The European Commission has set a goal in its Integrated Action Programme in Lifelong Learning that by 2012, three million European students should participate in the Erasmus programme. But what about the remaining 80% of students that do not have the opportunity to participate in Erasmus for social, financial or other reasons? Virtual mobility and virtual campus schemes could offer educational opportunities that are no longer location dependent and allow for collaboration with foreign students and teachers and thus promote intercultural understanding.

Apart from these cross-cultural and mobility aspects, a virtual campus has a huge potential to contribute to increased participation in lifelong learning: adult learners are part of the “non-traditional students” universities want to target. They learn from their homes, after work in the time that is available for them. But also on-campus students, due to working life, social conditions and other constraints are demanding more individualised and flexible learning pathways.

This, in fact, responds to the European Commission’s “Detailed Work Programme on the follow-up of the objectives of Education and Training Systems in Europe”. Key issues that are mentioned in reaching the implementation of strategic objective “Facilitating the access of all to education and training systems” are: “Delivering education and training so that adults can effectively participate and combine their participation in learning with other responsibilities and activities” and also “Promoting flexible learning paths

for all”. In many universities nowadays there is indeed a strong desire to open up the campus, to break down the barriers that have traditionally kept out those not directly involved in full-time courses and to invite the citizen to share the academic richness of the modern-day university. It is therefore of the utmost importance that decision makers are aware of the possibilities but also the pitfalls of virtual campuses.

The following section provides some broad definitions of what is understood by and what the benefits are of virtual mobility and virtual campus activities. Through previous experiences of past and present projects and initiatives in the field, a shift of concepts from virtual campus to virtual mobility and more “blended models” is noted. The next section also describes this evolution more in depth with three case studies: the Katholieke Universiteit Leuven (Belgium) which is progressively organising its educational support from a multicampus perspective; the Open University of the Netherlands which is broadening its tasks towards lifelong learning; and the GIS case shows how a virtual campus can be used as a strategic means to ensure a valuable and transdisciplinary approach. The last section presents the Re.ViCa project, which has been set-up with the aim to redefine the concept of virtual campus in order for it to be applicable to the educational needs of today. The project furthermore makes an inventory and systematically reviews cross-institutional virtual campuses from the last decade to identify a set of action points that can be applied to ensure the realisation of new successful virtual campus initiatives.

BACKGROUND TO VIRTUAL CAMPUSES AND VIRTUAL MOBILITY IN HIGHER EDUCATION

Throughout the last decade, numerous initiatives have been set up to experiment with the establishment of virtual campuses and virtual mobility activities. Virtual campuses have appeared in various forms and structures and also to varying degrees of success: Finnish Virtual University, Swiss Virtual Campus, FernUniversität in Hagen, Open University of Catalonia and the African Virtual University are just a few of the many examples. But what is actually a virtual campus or a virtual university? And what do we mean by virtual mobility? How 'virtual' is a campus or a mobility?

Virtual Campuses

In our search for definitions or background information we start with BENVIC ("Benchmarking of Virtual Campuses"), one of the earliest projects funded by the European Commission addressing the issue of benchmarking virtual campuses. In the BENVIC project the virtual campus concept is referred to as "a specific format of distance education and on-line learning in which students, teaching staff and even university administrative and technical staff mainly 'meet' or communicate through technical links" (<http://www.benvic.odl.org/indexpr.html>). The following classification was proposed (<http://www.benvic.odl.org/typology.htm>):

Virtual Class

Teaching and learning are taking place in a virtual environment for campus-based students or/and distance learners. The virtual environment could be an online (digital) learning environment as an add-on to the traditional face-to-face knowledge transfer in physical class rooms or as a completely stand-alone e-learning system for off-campus

students. It could also be any other technology supported by way of knowledge sharing (e.g., using videoconferencing to link local groups of learners with an expert at a distance).

Virtual Campus

Next to virtual classes this includes also research communication and collaboration as well as scientific services to society at large, like contract research and consultancy for companies and governmental bodies. This means that the virtual environment is not only meant for learning, but other activities are taking place (e.g., remote use of expensive laboratory equipment for research purposes).

Virtual University

In this case most, perhaps all of the university working processes are virtualised. Student registration, student and staff administration, eventually examinations and creditation, or any other administrative procedures are all taking place and supported in the virtual environment.

Virtual Mobility

Virtual mobility on the other hand means, in the words of the glossary of the elearningeuropa.info portal: "The use of information and communication technologies (ICT) to obtain the same benefits as one would have with physical mobility but without the need to travel". The Being Mobile project opted for a more elaborate definition: "Virtual Mobility is a form of learning which consists of virtual components through a fully ICT supported learning environment that includes cross-border collaboration with people from different backgrounds and cultures working and studying together, having, as its main purpose, the enhancement of intercultural understanding and the exchange of knowledge" (Bijnens, H. et al., 2006, p. 26). Based on this broad definition

four main types of virtual mobility activities are identified. The typology is mainly based on the type of activity and the circumstances in which the virtual mobility activity takes place:

- **A virtual course or seminar:** Learners in a higher education institute engage in virtual mobility for a single course (as part of a whole study programme) or a seminar (series) and the rest of their learning activities take place face-to-face in a traditional way (Bijnens, H. et al., 2006, p. 29).
- **A whole virtual study programme:** An entire virtual study programme is offered at one higher education institute, giving students from different countries the chance to take this programme without having to go abroad for a whole academic year (Bijnens, H. et al., 2006, p. 33).
- **A virtual student placement:** Student placements are organised between a higher education institute and a company (sometimes in a different country). In the virtual equivalent students are using ICT to support their internship, giving them a real-life experience in a corporate setting without the necessity to move from the campus to the company or to relocate to another country for a certain period of time, and providing them with a practical preparation for new ways of working through (international) collaborative team work (Bijnens, H. et al., 2006, p. 33).
- **Virtual support activities to physical exchange:** Virtual mobility enables both better preparation and follow-up of students who participate in physical exchange programmes. Preparatory activities could include student selection at a distance through video or web conferencing (for checking social and language skills) and online language and cultural integration courses. Follow-up activities will help students to keep in touch with their peers scattered around

the world, to finish their common research work and/or paper work. They could also take on the form of a so-called ‘Virtual Alumni’ organisation, to foster lifelong friendships and networks (Bijnens, H. et al., 2006, pp. 33-34).

All this virtualisation has tremendous benefits (e.g., Boonen et al., 2007, pp. 128-130), of which some of the more important ones include:

- **Access:** Virtual initiatives enable easier, maybe faster access to education for a new, non-traditional, remote group of students or learners.
- **Flexibility:** Virtual initiatives make learning and teaching happening anytime and anywhere.
- **Skills:** Through using advanced new (educational) technology students acquire new skills necessary for today’s new work methods and business structures.
- **New partnerships:** Through (virtual and/or face-to-face) collaboration different institutions embark together into the creation, delivery and support of virtual courses and into new ways of common knowledge transfer and sharing, giving them enlarged visibility in the European higher education area.

However, not all virtual initiatives could be considered entirely as great success stories. It is beyond the scope of this chapter to go into detail, but as critical success factors we could mention firm business models, empowerment and attitude of teachers and learners, commitment of university management and other stakeholders etc. Encouraging is the fact that in numerous eLearning, Minerva and other projects supported by the European Commission in the last decade, many institutions and organisations have been working on exploring and refining the concepts of virtual campus and virtual mobility. Results have been published in for example:

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- *Manual for a Collaborative European Virtual University* (Van den Branden & Opsomer, 2004) – the cEVU (“a Collaborative European Virtual University”) project studied why a collaborative European Virtual Education would be beneficial to universities, how it should be structured and operate, and what should be put in place to create it. The report focuses on collaborative European Virtual Universities, as one format of transnational virtual higher education (<http://www.europace.org/rdcevu.php>).
 - *Virtual Mobility Manual. How to teach internationally from your own desk* (Bijnens, K. et al., 2006), which was the outcome of the online manual of the REVE (“Real Virtual Erasmus”) project. REVE was aimed at enhancing the impact and efficiency of traditional Erasmus programmes through the set-up and support of mainstream virtual Erasmus actions in the European higher education area (<http://reve.europace.org>).
 - *Peer-Review Handbook* (Cullen et al., 2007) which was the outcome of the MASSIVE (“Modelling Advice and Support Services to Integrate the Virtual Component in Higher Education”) project which designed a model of necessary support services for European traditional universities to successfully implement the virtual component of teaching (<http://cevug.ugr.es/massive>).
 - *Virtual Seminars. Creating New Opportunities for Universities* (Reynolds et al., 2008), handbook of the VENUS (“Virtual and E-mobility for Networking Universities in Society”) project. VENUS aimed to internationalise prestigious courses, with international scope and importance, in each member university through virtual mobility, open to both students and citizens. The handbook is based on the experiences of the project partners who organised virtual seminars on a broad range of European subjects and a Summer School (<http://www.venus-project.net>).
 - *European Networking and Learning for the Future*. The EuroPACE approach (Boonen & Van Petegem, 2007). This book gives an overview of the history of the EuroPACE network and the changes that took place in the field of technology enhanced education and training over the past twenty years.
- It is striking to see that in all those reports and publications, there is the gradual shift from stand-alone virtual initiatives towards integration of virtual components into traditional universities. Indeed, through these experiences, we notice a shift of concepts: from the “well-defined” clear, fully online virtual campus to virtual mobility, whereby the more traditional universities open their borders, collaborate supra/intra institutionally and often (inter)nationally, and/or involve non-traditional students through e-learning. There is no strict definition of virtual campus or virtual mobility anymore. Every campus becomes a virtual campus, and every mobility now has some form of virtual mobility included - “blended models” gain more and more interest and attention. In this context, several kind of models or scenarios could thus be thought of, differing from each other by the level of collaboration between institutions and to what extent virtual components are added:
- Traditional universities provide their courses through e-learning for the “distant”, “off-campus” student;
 - Virtual communities of practice and virtual learning communities are integrated into traditional universities;
 - Virtual classes and seminars are organised for traditional students;
 - Virtual collaboration between universities is stimulated through for example, joint course development and joint Masters degrees;
 - The “extended university” reaches citizens through e-learning using mostly non-formal online evening seminars;

- Multiple campuses of one university collaborate in course provision by technology, enabling for example, the teacher to teach in one campus for local and distant student groups through the use of videoconferencing.

This list is not exhaustive, but just exemplary in terms of possibilities. There seems to be a common feeling a redefinition of the “virtual campus” concept is necessary. This is one of the aims of the Re.ViCa project but without losing sight of the justification in terms of Erasmus aims.

OPENING UP THE VIRTUAL CAMPUS: SOME EXAMPLES

We have already indicated in the introduction that in many universities nowadays, there is a strong desire and a need to open up the campus. They have a mission to provide knowledge not only to their on-campus students but also beyond the “walls” of the institution. Universities are not only opening up their borders to local citizens, internationalisation is high on the agenda of all educational institutions. New media and ICT have made it possible to involve citizens from virtually anywhere and universities are increasingly seeing their role within a far wider regional and national context than in the past. Not only can the modern-day university open its physical gates and invite citizens in to listen and take part in academic discussion and debate, but with the support of technology, this opening up can be taken a step further, placing the notion of a university clearly in the virtual world.

As stated in the VENUS handbook (Reynolds, et al., 2008, p. 5), many higher education institutions open up the campus not only “*towards the current community of campus based students but also the wider community of alumni as well as those concerned with lifelong learning in the catchment area, however wide this might be.*”

Lifelong learning encompasses professional learners who need not only to maintain their existing qualifications, but also to keep abreast of current developments in their respective fields. It also includes those citizens who wish to find new interests and add to their portfolio of skills, many of whom look to their local university as a source not only of expertise but also of learning services of which they can avail.”

In this section we explore three very different examples of how higher education institutions open up their own campus and how the concept of “virtual campus” could be redefined. The first example is found at the Katholieke Universiteit Leuven (K.U.Leuven) in Belgium. This traditional university progressively organises its educational support with attention for communication and collaboration between the various campuses (‘multicampus’ education).

The second example comes from the Netherlands where the Open University (OUNL) makes an interesting example of a traditional distance teaching university that changed its vision and broadened its tasks towards lifelong learning. The final example shows how virtual campuses can support higher education institutions and can be a strategic means in a field of study such as Geographic Information Systems (GIS) which is becoming more and more complex and is seeking a more transdisciplinary approach.

Katholieke Universiteit Leuven: From a Traditional to a Multicampus University

Multicampus education stands for learning and teaching between two or more sites or campuses. In recent decades, the ‘Katholieke Universiteit Leuven’ (K.U.Leuven) in Belgium has become a multicampus university. As a result of the historic expansion of the university its three groups of faculties have become separate entities, geographically spread over Leuven: Human Sciences are housed in the city centre, Exact Sciences in

the east and Medical Sciences in the north. Since 1965, the university also has an additional campus in Kortrijk, in the west of Belgium. And in 2002, thirteen institutions of higher education in Flanders have joined forces with the K.U.Leuven in the Association K.U.Leuven in order to occupy a position of strength within the new European educational landscape and to work together towards quality improvements in education. This Association has 23 different campuses. In addition, the K.U.Leuven profiles itself as an international university. The institution has agreements with various universities worldwide to enable and support a growing number student and staff exchanges between campuses. With the introduction of ICT, the university is now also facing an extended form of multicampus education. Online networks of student groups and/or teaching staff – sometimes linked to but often independent from the institution – are emerging in learning communities or communities of practice. Each participant in these networks can be considered a small virtual ‘campus’, learning from home, work or through a mobile device.

The current structure of the university thus challenges the K.U.Leuven to organise and support its education with attention for communication and collaboration between the various campuses. Today this is most often realised through physical mobility: staff and/or student move between different locations. This is the case for interdisciplinary courses between Leuven’s three groups of faculties and for staff mobility between Kortrijk and Leuven. It is also the most common form for international exchanges. Yet the university is progressively supporting initiatives that replace or enhance physical with virtual mobility, seeking to integrate aspects of ‘virtual campuses’ into traditional education to stimulate collaboration between the sites of the Association, to support student and/or staff exchanges in Europe or in the world, to enhance communication with developing countries or to sustain virtual learning communities.

At a basic level (virtual/blended) multicampus education in Leuven is revealed in initiatives that create, offer and localise *joint course materials*. While teaching staff and students remain at their own campus for the entire course, specific course module learning materials are used that have been developed, at a distance, by an inter-institutional (multicampus) teaching team. These course materials are often offered on a common website, a databank or a virtual learning environment. Recently there are also teachers who (co-)develop or use ‘Open Educational Resources’.

Not only are course materials collaboratively created or shared, but also infrastructure (e.g., laboratory infrastructure) is shared between locations to avoid a double set up of equipment. In some cases this *pooled infrastructure* is also virtual. Some (dangerous) laboratory experiments or experiments that require students and staff to be at different locations (students watch a complex surgical operation) can now happen thanks to virtual support to bridge the distance between the actual experiment and the audience. The infrastructure of the experiment itself is in a limited number of cases entirely digital by means of a simulation on a common virtual platform.

Furthermore, multicampus education can be about *joint learning activities*. For the ‘Student Business Game’ for instance, students from different institutions of the Association K.U.Leuven play a business game on their own campus after which the winning teams compete with each other via videoconferencing before a jury of teaching and company staff. Joint learning activities can also be about e-coaching, about writing an academic paper at a distance or student placements. All activities invite multiple sites to collaborate in the creation, delivery or support of the activity, with the help of technology. At K.U.Leuven joint learning activities are particularly interesting for interdisciplinary modules, courses or programmes, such as activities involving both learners studying medicine or nursing, industrial or civil engineering, etc.

Building on joint learning activities, another type of multicampus are *joint courses*. A joint course can be (a) a course developed by one campus (institution) and offered to students at another campus (institution); (b) a course developed by one institution and used but adapted by another institution; or (c) a jointly developed course offered to students of all involved institutions (Haake et al., 2006). One variation of this type are virtual seminars: co-created or co-delivered seminars set up as a single course, or in a series of courses - broadcasted over multiple sites using ICT (videoconferencing, web conferencing, streaming, etc.). The K.U.Leuven has a strong expertise and long tradition in organising virtual seminars. The 'Pentalfa' project for instance is a multidisciplinary, post-graduate distance learning initiative of the Faculty of Medicine, aimed to offer (extra) training broadcasted to various hospitals of the Flemish Hospital Network K.U.Leuven. It is currently in its eighth year and there are plans to enhance the initiative with an international component. The University is also looking into the use of virtual seminars for knowledge exchange and networking between the institutions of the Association and beyond (society in general, companies, alumni, etc.).

Next, multicampus education is also revealed in the offer of a complete, '*multicampus*' programme, which many institutions can be contributing to. A number of Bachelors and Masters are already set up within the Association K.U.Leuven, involving multiple teaching teams from different institutions. The challenge is to streamline these programmes around a common denominator, yet with respect to any local specificities of each campus involved. Virtual initiatives – joint learning materials, joint learning activities, joint courses – all play a vital part in this. Eventually a completely virtual multicampus programme comes close to the traditional form of distance education, as offered by the Open University for

instance. From the perspective of more and better flexibility in education, it could be interesting to bring distance and regular education together. Regular programmes could put forward a number of distance learning courses (and vice versa), in replacement of or as an enhancement to their offerings: they could support or realise the transition between certain Bachelors and Masters courses in a flexible manner, students could enhance their own study package with a number of distance education courses. In Flanders, the current offerings of both the regular universities and the Open University are still entirely separate from each other. Yet under certain conditions the Open University does already allow its students to take courses from other universities in addition to its own curriculum. K.U.Leuven is currently studying the opportunity to present this interpretation of multicampus to its students.

Ultimately, multicampus education is also about a range of *virtual support activities with regard to real, physical mobility*. A large range of actions can be highlighted here. At the early, preparatory phase of a physical student (or staff) exchange, multicampus support can be given through the set up of community websites for future exchange students where they can meet current students who help them find housing, give them information etc. Within the Association K.U.Leuven such a platform is being created and tested for new foreign students to find a '(virtual) buddy'. There is also the opportunity for teaching staff to meet the interested new students online, for a language 'pre-selection' or just a first get-together. This has been tested as a pilot in the REVE project for the Erasmus Mundus Master in Adapted Physical Activity (Rajagopal et. al., 2006; Bijmens, H. et. al., 2006). After the exchange, the aforementioned communities can continue to live on as a virtual alumni platform; or students could be examined at a distance through virtual mobility (video communication).

Supporting Lifelong Learning: Open University of the Netherlands

A common understanding of the multiple purposes of higher education is emerging. Rapid and continuing changes of the social and technological context of adults already working have influenced the growing emphasis on lifelong learning. The rationale for lifelong learning is often associated with the demands of a knowledge society that requires individuals to gain new skills and update existing ones. The term lifelong learning (LLL) began making appearances in the educational professional and policy discussion during 1970s. The notion of lifelong learning has evolved, for example, by way of continuing education and Universities of the so-called Third Age which values learning for its own sake and personal fulfilment through learning.

The ways in which universities are opening their campuses to local citizens are manifold and diverse. Many universities have launched initiatives aimed at opening up to the wider community and adapting to the changing needs of their students and citizens at large. In the Trends V report published recently by the European University Association, this point is emphasised: "Institutions need to develop their capacity to respond strategically to the lifelong learning agenda, taking advantage of the opportunities provided by the structural changes and tools that have been developed through the Bologna process" (Crosier et. al., 2007, p. 10).

The traditional distance teaching university Open University of the Netherlands (OUNL) changed its vision and broadened its tasks towards lifelong learning. Although the Open University still develops, provides and promotes higher distance education for Dutch speaking countries it addresses more and more the wide-ranging learning needs of people during their course of life, plus the need to achieve a considerable increase of the knowledge level of the community at large. Adding value to the community is an

important goal. In their own opinion keywords are flexibility and innovation. They try to provide well-grounded distance education at an academic level. Students are offered new learning tools that they require for self-study. Course offerings become more and more personal and flexible and have to make learning effective and interesting. This ambition makes research and development at their own campus an important activity. Their academic programmes include cultural studies, management, physics of the environment, psychology, law, education and computer science. Students who do not want to follow a complete programme can choose from nearly 300 courses. On a commercial basis the University also offers open enrolment programmes and in-company and customised training programmes, often in collaboration with universities of professional education (HBOs). A new offering has started in 2007; Open Educational Resources: short courses that anyone can take via the Internet at no cost. Next to the idealistic idea of providing education for free, these courses serve also as 'teaser' to attract new students. Interactive CD-ROMs and DVDs, plus the possibilities of the Internet, must enhance the educational process. Many students make use of an electronic learning environment (called Study-net) to organise their personal work location. Course sites, newsgroups, email and conference facilities make distance learning even more appealing. This enables people to combine their study with work and private life and to determine where, when and at what pace to study. Still, even in distance learning it is important to have personal contact. That is where the value of the study and support centre network lies. Support sessions are organised at these centres (12 in major cities in the Netherlands, 6 in Belgium), and they serve as a meeting place for study groups and student societies. The study and support centres fulfil a key role in the educational process at Open Universiteit Nederland. They are an answer to the growing call for blended learning, a mix of distance and contact education. At the

Heerlen campus the university also applies LEX, The Learning Experience, in this context, which enables interactive learning events.

Traditionally the OUNL seeks to be an institution that is strongly anchored in the Dutch higher education system, but through its educational, research and innovation activities, it became 'overnight' a pioneer and expert in e-learning. Nowadays it still tries to be also a leader in educational innovation (although the international competition is growing). The most important category of innovation focuses specifically on the use of innovative learning methods. Thanks to its fine reputation, the OUNL got an other (extra) task from Dutch Government that of 'helping to address the shortage of teachers within primary and secondary schools in the Netherlands'. Therefore, the Ruud de Moor Centre for the professionalisation of teachers was established. This centre develops products that help raise the quality of teachers in which ICT plays an important.

Virtual Campuses: A Precious Support for Educational Institutions in Geographic Information Systems and Science

Before going into detail on how virtual campuses are supporting higher education institutions in GIS we first want to define what we mean by GIS. The term Geographic Information Systems (GIS) in the strictest sense refers to any information system capable of integrating, storing, editing, analysing, sharing, and displaying geographically referenced information. In a more generic sense, GIS is a tool that allows users to create interactive queries, analyse the spatial data, edit data, maps, and present the results of all these operations as spatial information. But GIS has come to mean, variously, an industry, a product, a service, a technology and a science. Usually students in GIS degree and GIS certificate programmes are taught about science, spatial thinking, spatial information management, technical issues, algorithms and applications. The

list of disciplines in which geographic information technology and science can be used is very broad: scientific investigations, resource management, asset management, environmental impact assessment, urban planning, cartography, criminology, history, sales, marketing, and logistics are some current examples.

The most important point to note in the GIS environment is that although GIS seems to be a sharp and narrow oriented discipline, it is becoming more and more complex and open. First of all with regard to the technology itself data is more accurate and complex. The geographic information systems follow this evolution. As a consequence, students have to be trained in more sophisticated software. A second issue concerns the labour market. GIS experts have to face complex problems and transdisciplinary approaches are essential. GIS experts (and the education of GIS experts) cannot focus on GIS alone because they have to be prepared to interact and collaborate with experts in other disciplines (e.g., engineers, farmers, municipality people, media etc.).

Consequently, the educational system had to adapt in this environment, and in this respect, virtual campuses are a strategic means to ensure a valuable and transdisciplinary approach. Because of the wide-ranging field of application of GIS it is impossible to develop all the different aspects in one curriculum in one location and that is exactly the reason why universities collaborate to develop virtual campuses. A first step was a virtual campus in which the student can follow their studies in different virtual locations. The path was 'fledged' in that progressively, with the development of networks and virtual learning, virtual campuses moved from a 'fledged' approach to a blended approach. Students can choose in a wider network of universities what specialisation they want to do and can customise their paths and profiles in function of their field of interest.

Two examples of virtual campuses in the GIS field are "UNIGIS" and "OLLO". UNIGIS is the name of a worldwide network of universi-

ties cooperating in the design and delivery of distance learning in Geographical Information Systems and Science. It is an example of a virtual campus in a fully blended format. The UNIGIS programme was founded in 1990 and currently includes sites in ten countries. Members of the UNIGIS network offer postgraduate Certificate, Diploma and Masters courses in GIS by open and distance learning. Core course resources are adapted, translated and supplemented with additional materials to support the needs of local students. Members of the UNIGIS network also work together in research and curriculum development activities related to GIS education. The courses are in continuous development and are currently offered in English, Czech, German, Hungarian, Portuguese and Spanish. UNIGIS is the largest and best-established e-learning GIS programme in the world. Each year more than 400 students are enrolled world-wide and it has over 3.000 UNIGIS alumni in more than 40 countries.

OLLO (“Open Learning for Land Offices”) is an example of a virtual campus, ‘fully fledged’, lead by one institute. The OLLO project was running from 1995 to 1998 in Hungary. The main objective of the OLLO TEMPUS Joint European Project was the development of open learning materials and course infrastructure in Land Information Management within Hungary for Hungarian land office workers (130 offices) by the Faculty of Geo-informatics in Székesfehérvár. Fourteen distance education modules in Infrastructure, Data Acquisition, Management and Applications were developed. The materials were developed for professional and postgraduate levels. For the staff of Land Offices and Surveying/GIS companies, distance learning offers a particularly flexible and effective way of training, eliminating most of the barriers, providing much better accessibility than traditional education.

REDEFINING AND REVIEWING VIRTUAL CAMPUSES

We have described in the previous section three examples of how a “virtual campus” can be interpreted, but in the past decade numerous other types of virtual campus initiatives have been developed, gaining experience and know-how. However, there seems to be a noticeable lack of validation and dissemination of this knowledge. There is an urgent need for awareness raising and providing detailed and, more importantly, consolidated information on virtual campuses.

The European Commission acknowledges this need and has in for example the General Calls for Proposals in the Lifelong Learning Programme 2006 and 2008 attached specific priority to projects which are aiming at:

- Systematically reviewing existing virtual campus and virtual mobility projects or experiences, including their valorisation in terms of sharing and transfer of know-how, with a view to supporting deployment strategies at the European level;
- Supporting the development and dissemination of replicable solutions and approaches to help establishing and sustaining virtual campuses at European level;
- Promoting cooperation and exchange of strategic experience between decision-makers in the area of virtual campus developments.

Consequently, several projects and initiatives in the field have emerged. One example is the PBP-VC ‘Promoting Best Practice in Virtual Campuses’ project (Connolly et al., 2007) that started in early 2007 and is aimed at providing a deeper understanding of the key issues and success factors underlying the implementation of virtual

campuses. PBP-VC is working towards developing a practical framework to help guide the process of creating best practice in virtual campuses, as well as raising awareness of issues and approaches to creating sustainable virtual campuses.

At the end of the same year, the Re.ViCa project was set-up and aimed at raising awareness and redefining the concept of virtual campus in order for it to be applicable to the educational needs of today. Re.ViCa stands for “Reviewing (traces of) European Virtual Campuses” (<http://revica.europace.org>). The project brings together nine partners in the field that uses their strategic positions to collect vital information and open it up for the wider community of the European Higher Education Area. Re.ViCa can build upon the partners’ experience with and involvement in Virtual Mobility/Virtual Campus projects (e.g., cEVU, e-LERU, VENUS, REVE, Victorious, BEING MOBILE, BENVIC) and initiatives (e.g., Finnish Virtual University, UNINETTUNO, UkeUniversity, Open University of the Netherlands, FernUniversität in Hagen).

The Re.ViCa project is making an inventory and a systematic and critical review of cross-institutional virtual campus initiatives over the last decade within higher education at European, national and regional levels. The aim is to develop a useable definition of the concept of virtual campus and to suggest a categorisation which applies the theory and respects the differences between the initiatives. It also draws up a historical overview of the evolution of the concept of the virtual campus and the societal context with which it is so closely linked.

As the virtual campus concept nowadays can be understood in so many different ways, Re.ViCa currently aims to take virtual campus as synonymous with *large-scale e-learning initiatives*. This avoids the issue of giving distance e-learning a privileged position over campus-based e-learning but begs the question of what is large-scale? An e-learning initiative in a university - or consortium of universities – is a Major E-Learning Initiative

(MELI) if it has many (but not necessarily *all*) of the following characteristics:

- It requires at least one per cent of the institutional *budget*;
- It affects or is planned to affect at least *10% of students*;
- The *person responsible*, (as the major part of their job) for leading that initiative has a rank and salary at least equivalent to that of a university full professor at Head of Department level, or equivalent rank of administrative or technical staff (usually an Assistant Director) – and ideally that of Dean or full Director’
- There is a *specific department* to manage and deliver the initiative with a degree of autonomy from mainstream IT, library, pedagogic or quality structures;
- Progress of the initiative is overseen by a *Steering Group* chaired by one of the most senior managers in the institution;
- The initiative is *part of the institution’s business plan* and is not totally dependent on any particular externally funded project;
- There are strategy, planning and operational *documents defining the initiative* (including its costs and benefits) and regularly updated;
- The head of the institution (Vice-Chancellor, Rector, President, etc) will from time to time in *senior management meetings* be notified of progress and problems with the initiative;
- The head of the institution is able to *discuss the initiative in general terms with equivalent heads of other institutions* – in the way that they would be able to discuss a new library, laboratory or similar large-scale development.

A further distinction is made between ‘giant’, ‘notable’, and ‘failed’ e-learning initiatives. A Giant E-Learning Initiative (GELI) is a very large

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MELI. A Notable E-Learning Initiative (NELI) is defined as one which is interesting in a country (e.g., to other universities, ministries, EU, analysts etc) and satisfies many, but not all of the above criteria, or all the criteria but not at the same level. A FELI is a Failed E-Learning Initiative, examples of which include the UK e-University and the Interactive University in Scotland.

Following from the historical overview Re.ViCa makes an inventory of European, national and regional initiatives from the past decade, looking not only at currently existing and operational virtual campuses, but also the legacy and impact of those virtual campus initiatives that have closed down or become dormant (failed e-learning initiatives).

From the inventory in-depth case studies are selected. Different types of virtual campuses are examined and to this end relevant parameters and success factors along which the review is designed are identified and described. Parameters include environmental parameters (e.g., legislation, financing, educational structures, etc.), pedagogical approach, technology assessment, quality procedures, content production and relation to research activities, business models, organisational embedding, student and teacher support, accreditation procedures, language and culture. Data for each case study are gathered by questionnaires, interviews and campus visits.

In a second stage of the project in-depth discussions are organised to incorporate the input of different interest groups: including virtual campus management bodies, relevant networks, students, policy-makers and a range of experts. An International Advisory Committee - consisting of European and non-European experts in the field of virtual campuses - is invited to comment on the findings of the Re.ViCa research during three key meetings where dialogue between all stakeholders is stimulated (First International Advisory Committee Meeting has taken place at the EDEN Annual Conference in Lisbon, June 2008). This allows comparing European cases

to selected non-European initiatives. Exchange of information, expert validation and sharing of good practice from beyond the partnership and the continent itself will be helpful in identifying strengths and weaknesses common to European initiatives and to assess Europe's efforts in the light of experiences in totally different cultural contexts. Finally, a set of action points and guidelines for decision-makers are to be formulated that can be applied to ensure the realisation of successful European virtual campus initiatives. All in all, main results of Re.ViCa will be:

- A global benchmark overview;
- Sharing of knowledge and know-how through meetings with experts, policy and decision makers and the organisation of discussion sessions at major e-learning conferences such as the EDEN and the Online Educa Berlin conferences;
- A manual with guidelines, best practices, recommendations.

All results and information gathered during the project (manual, desktop research results, outcomes of the workshops, etc.) are collected on the project wiki, which will be made public at the end of the project (<http://virtualcampuses.eu>). The wiki includes for example links to programmes that are of interest to virtual campus analysts, an overview of all countries where it is likely that some virtual campus activity is taking place, a glossary, references to publications and other resources materials etc. Furthermore, the wiki acts as a platform where both experts, policy-makers, providers and key actors can meet and stimulate dialogue.

FUTURE TRENDS

If e-learning and virtual campuses initiatives are to be sustainable and cost-effective, it is of the utmost importance to identify the factors that

contribute to that sustainability. As the current trend is that online education is shifting from small-scale experiments to large-scale, mainstream operation this is going to be even more important. Online education initiatives that are not robust and sustainable might be acceptable in small-scale experiments, but not any longer in large-scale mainstream operations (Arneberg et al., 2007, p. 5). In the final book of the Megatrends project (Keegan et al., 2007) the authors present important success factors identified by the in-depth analyses of both the megaproviders of e-learning in Europe and the discontinued initiatives identified in the project. The hypothesis of the project was that it is possible to detect specific conditions that increase the possibility of success and sustainability of e-learning programmes; sustainability being defined as programmes offered on a continuous basis and not phased out after a defined project period or after specific subsidies are terminated. The Megatrends report concludes with several recommendations for robust and sustainable large-scale e-learning (Arneberg et al., 2007, pp. 127 -143).

Further investments in research and development in this area are however indispensable. The added value of a project such as Re.ViCa therefore lies not in the creation of a new virtual campus but in the foundations it will lay for all future or current initiatives which can learn from past and ongoing initiatives. Detailed and rigorous research results are needed, in which feedback from all stakeholder groups has been incorporated and which can be used as standard literature. Re.ViCa will help to make the most out of the knowledge gained by each initiative, to foresee hidden traps and to find ways of incorporating successful features of the initiative in the university structure itself, should the virtual campus in its original form have to be discontinued. The aim is to avoid a situation whereby every new virtual campus development has to start from the beginning, and to provide stakeholders instead with a validated and comprehensive view of the

virtual campus landscape in Europe as evidenced in the last decade. Roadmaps for establishing virtual campuses should be promoted, exchange of information, expert validation and sharing of good practice should be a key objective. We should look at past virtual campus initiatives to enhance their future.

CONCLUSION

In this paper we have tried to describe the concepts of virtual campus and virtual mobility based on work carried out in several past and present initiatives and projects in the field, such as BENVIC and BEING MOBILE. In several reports and publications a gradual shift is noted from stand-alone virtual initiatives towards the integration of virtual components into traditional universities and other “blended models”.

Nowadays, many higher education institutions feel the need and desire to open up their campus and they are seeing their role within a far wider regional and national context than in the past. This evolution was demonstrated by three cases: the case of the Katholieke Universiteit Leuven (Belgium) showed how a traditional university is organising its educational support from a multi-campus perspective. The Open University of the Netherlands on the other hand is an interesting example of a distance teaching university that broadened its tasks towards lifelong learning. The third case indicated how the virtual campus can be used as a strategic means and support for educational institutions to ensure a valuable and transdisciplinary approach within the Geographic Information Systems field.

While numerous virtual campus initiatives from the past decade have gained experience and know-how, there is a striking lack of validated and consolidated information on virtual campuses. Moreover, there seems to be a common feeling a redefinition of the “virtual campus” concept is urgently needed. To this end, the Re.ViCa project

has been set-up. The project will systematically review virtual campuses of the past decade and will formulate guidelines that can be applied by decision-makers to enhance the realisation of future sustainable virtual campus initiatives.

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