Institutional Transformation through Best Practices in Virtual Campus Development

Advancing E-Learning Policies

MARK STANSFIELD & THOMAS CONNOLLY

Mark Stansfield  
*University of the West of Scotland, UK*

Thomas Connolly  
*University of the West of Scotland, UK*
List of Reviewers

Gavin Baxter, University of the West of Scotland, UK
Elizabeth Boyle, University of the West of Scotland, UK
Antonio Cartelli, University of Cassino, Italy
Thomas Connolly, University of the West of Scotland, UK
David Edgar, Glasgow Caledonian University, UK
Kevin Grant, Glasgow Caledonian University, UK
Athanassios Jimoyiannis, University of Peloponnese, Greece
Hugo Magalhães, Sociedade Portuguesa de Inovação, Portugal
Katherine Maillet, Institut National des Telecommunications, France
Andreas Meiszner, Sociedade Portuguesa de Inovação, Portugal
Mark Stansfield, University of the West of Scotland, UK
Daune West, University of the West of Scotland, UK
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Johannes De Gruyter, AVNet – K.U.Leuven, Belgium
Wim Van Petegem, AVNet – K.U.Leuven, Belgium
Sally Reynolds, ATiT, Belgium
Paul Bacsich, Matic Media Ltd, UK
Theo Bastiaens, FernUniversität in Hagen, Germany & Open University of the Netherlands,
The Netherlands
Anna-Kaarina Kairamo, Helsinki University of Technology, Lifelong Learning Institute
Dipoli, Finland
Grégory Lucas, University of West Hungary - Faculty of Geoinformatics, Hungary

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Stefano Tardini, eLab – eLearning Lab USI-SUPSI, Switzerland
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The E-Learning Phenomenon: A New University Paradigm? ................................................................. 1
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This chapter contributes to the ongoing discussion on current best practice and trends in e-learning and virtual classes in higher education. With the increasing importance of knowledge as competitive advantage and engine of economic growth in an increasingly interconnected, multicultural and multilingual world, modern universities based on building and transport technologies are assuming virtual dimensions to address the pressures of rising enrolments, increasing fiscal constraints and rapid technological advancements. The Internet and globalisation are changing how we bank, shop, play and learn. Can universities adapt, or is e-learning going to be an educational fad like educational television of the 1970s? Based on international research, this chapter examines some signposts using pilot projects as a key pedagogical method in the journey from idea to execution and the factors leading to success or failure of e-learning initiatives. Will the e-learning phenomenon represent a new and sustainable university paradigm for the emerging knowledge society?

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An important task of higher education is to assist students in participating in an increasingly global economy. This global economy is transforming into a knowledge economy. Individuals need to develop the necessary competencies to be able to participate in a working life that is mainly based on knowledge
productivity. The competencies include self-directed lifelong learning, in particular, through e-learning. E-learning refers to using electronic applications and processes to learn. Such applications and processes include Internet-based learning, virtual classrooms, and digital collaboration. The traditional classroom-based approaches to education will not provide the learning environment that is required for student-directed learning. The digital revolution makes new approaches to higher education — approaches which do foster lifelong learning — practical. The current chapter therefore examines the importance of linking e-learning to current knowledge in general, and to self-directed lifelong learning specifically. Higher education today must commit to new roles: providing educational communities such as virtual campuses; and increasing capacities to produce knowledge available to all.

Chapter III
The Online Seminar as Enacted Practice

Lars-Erik Jonsson, University of Gothenburg, Sweden
Roger Säljö, University of Gothenburg, Sweden

The academic seminar can be seen as the core of university culture. In a seminar, claims to knowledge – presented in an essay and/or orally – are critically scrutinised and subjected to further articulation. The point of this chapter is to report on attempts to develop critical features of seminar culture in the online context. The basic premise is that participation in seminar activities has to be learned through experience. For the participant with little prior experience of online textual discussions, the online seminar introduces an unfamiliar learning situation in which organisational as well as cognitive and communicative issues must be attended to explicitly. In order to illustrate the attempts to socialise students into this kind of discourse communities, the authors use a Masters course for mature students as a case. It is pointed out that students must be involved in the activities of establishing a community with rapport between members and with an understanding of how to conduct the interaction. By giving the students responsibility for solving a range of practical problems and letting them help each other, the authors induce them into the status of legitimate online participants. Several issues are important to attend to in the building of such collaboration such as balancing increasing independence of students with a clear leadership and focus of the activities. It is argued that the face-to-face seminar and the online seminar may fulfil complementary roles, but in both cases learning how to contribute is essential.

Chapter IV
Is E-Learning Used for Enhancing Administration or Learning? On the Implications of Organisational Culture

Stefan Hrastinski, Uppsala University, Sweden
Christina Keller, Uppsala University and Jönköping International Business School, Sweden
Jörgen Lindh, Jönköping International Business School, Sweden

The transition from learning on campus to e-learning presents many challenges. One of the key challenges is the organisational culture, which may enhance or hinder e-learning implementation. In this chapter, the authors describe how the organisational culture shapes e-learning use at universities. We compare a School of Business and a School of Health Sciences. It is argued that strategies for e-learning have played a key role in shaping the organisational culture, which in turn shapes how e-learning is being used. The School of Business regarded efficient administration as the key driver while the School
of Health Sciences regarded collaborative learning as the key driver for e-learning. We introduce the concepts of administration-centered and learning-centered e-learning culture to pinpoint the difference identified. A challenge is to develop an e-learning culture that values both how e-learning can be used to enhance administration and learning.

Chapter V
Advancing E-Learning Policy and Practice: Influences on Academics’ Adoption, Integration and Development of Multimodal E-Learning Courses

Dawn Birch, University of Southern Queensland, Australia
Bruce Burnett, Queensland University of Technology, Australia

Tertiary education is increasingly a contested space where advances in Information Communications Technologies and their application to technology-mediated e-learning environments have forced university administrators and educators to dislocate themselves from traditional correspondence modes of student engagement. Compounding this paradigmatic shift within the traditional sphere of distance education pedagogy are multiple and conflicting pressures on academics to develop flexible, engaging, cost-effective and sustainable interactive learning resources that incorporate both multimedia and hypermedia. This chapter reports on a study that examined factors that influence educators’ decision to adopt and integrate educational technology and convert traditional print-based distance education materials into interactive multimodal e-learning formats. Although the broader study was conducted in a single Australian university and investigated pedagogical, institutional and individual factors, this chapter restricts its focus to solely the pedagogical motivations and concerns of educators. It is argued that findings from the study have significance at the institutional level, particularly in terms of developing an underlying pedagogical rationale that can permeate the e-learning culture throughout the university, while at the same time, providing a roadmap for educators who are yet to fully engage with the e-learning format.

Chapter VI
Flying under the Radar: The Importance of Small Scale E-Learning Innovation within Large-Scale Institutional E-Learning Implementation

Gill Kirkup, Open University, UK

This chapter argues that e-learning innovation is best done in an environment that allows for small scale experimentation and development and that this can be made more difficult in an environment that prioritises large scale e-learning systems (i.e., virtual learning environments and content management systems). These larger systems tend to function more as systems for the control and regulation of knowledge production and management, as well as being very resource hungry. The chapter discusses e-learning activities in the Open University (UK), in particular those of the MA in Online and Distance Education programme in the Institute of Educational Technology. This is a case study of e-learning innovation in what has been described as an industrial production model of university education.
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Albert Sangrà, Universitat Oberta de Catalunya, Spain
Lourdes Guàrdia, Universitat Oberta de Catalunya, Spain
Pedro Fernández-Michels, Universitat Oberta de Catalunya, Spain

This chapter presents the findings of an in-depth analysis through several qualitative research studies, pointing out the key issues in relation to succeeding in developing effective and sustainable institutional virtual campuses and e-learning provision initiatives. An appropriate balance between the issues concerning technology, organisation and pedagogy, the TOP triangle model, is needed, although every higher education institution is different and develops its activity in a particular context. In addition, the design and implementation of a strategic plan for such initiatives is highly recommended.

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Irene le Roux, University of Pretoria, South Africa
Karen Lazenby, University of Pretoria, South Africa
Dolf Jordaan, University of Pretoria, South Africa

The University of Pretoria (UP) implemented a virtual campus in 1999. The measure in which and rate at which the virtual campus environment was adopted in the institution, was substantial. To accommodate the expected growth the University decided in 2004 to upgrade the learning management system in order to provide more stability and better integration with the student information system. However, the more complex integrated environment resulted in more points of failure and a less stable environment. Higher user frustration levels led to a decline in the number of users. The chapter discusses four key variables that influence growth and sustainability in an e-learning environment: Management, Training and Support, Measurement, and Technology strategies. The authors argue that additional resources required in Information Technology Services (ITS) were not adequately provided for. They give suggestions for future directions.

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Morten Flate Paulsen, The Norwegian School of Information Technology, Norway

This chapter presents an analysis of 26 European megaproviders of e-learning which had more than 100 courses or 5000 course enrolments in 2005. The focus is on distance education provision, not on e-learning for on-campus students. Among the megaproviders, which represent eleven countries, there are
eight distance education institutions, 13 universities and university consortia, and five corporate training providers. Five institutions started e-learning in the eighties, ten in the nineties and eleven after the turn of the century. The largest provider, Learn Direct, claimed to have 400,000 course enrolments in 2005. However, only six of the 26 reported to have more than 20,000 course enrolments. Among these six top ranked institutions none are universities, only corporate training providers and distance education institutions. The chapter concludes with the 27 recommendations extracted from the analyses to help institutions obtain robustness and sustainability in online education.

Chapter X
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

Mark Stansfield, University of the West of Scotland, UK
Thomas Connolly, University of the West of Scotland, UK

This chapter will outline a set of guiding principles underpinning key issues in the promotion of best practice in virtual campuses. The work was conducted as part of the ‘Promoting Best Practice in Virtual Campuses’ (PBP-VC) project that is aimed at identifying underlying issues and examples of best practice in providing a better understanding into virtual campus development and sustainability. The PBP-VC project was a two year European Commission Education Audiovisual and Culture Executive Agency (EACEA) co-financed project running from March 2007 to February 2009. The PBP-VC project team has worked with key stakeholders from virtual campus projects across Europe and globally in identifying and exploring key issues relating to best practice. The importance of developing a practical set of guiding principles for identifying, evaluating and promoting best practice in virtual campuses and e-learning can be demonstrated by the significant number of high profile e-learning and virtual campus failures that have occurred over the last decade both within Europe and globally at great financial cost. This chapter will highlight key enablers and inhibitors to success, provide a description of the different elements comprising the guiding principles in the promotion of best practice, as well as describing a tentative four level model aimed at illustrating different levels of virtual campus maturity in the achievement of sustainability and organisational transformation.

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

Helena Bijnens, EuroPACE ivzw, Belgium
Ilske Op de Beeck, EuroPACE ivzw, Belgium
Johannes De Gruyter, AVNet – K.U.Leuven, Belgium
Wim Van Petegem, AVNet – K.U.Leuven, Belgium
Sally Reynolds, ATiT, Belgium
Paul Bacsich, Matic Media Ltd, UK
Theo Bastiaens, FernUniversität in Hagen, Germany & Open University of the Netherlands, The Netherlands
Anna-Kaarina Kairamo, Helsinki University of Technology, Lifelong Learning Institute Dipoli, Finland
Grégory Lucas, University of West Hungary - Faculty of Geoinformatics, Hungary
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.

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  Ron Cörvers, Open University of the Netherlands, The Netherlands
  Joop de Kraker, Open University of the Netherlands, The Netherlands

The main objective of this chapter is to highlight the importance of subsidiarity in the development of a virtual campus. Subsidiarity is the principle that matters ought to be handled by the lowest competent authority. In the authors’ view, subsidiarity is crucial to sustainable approaches in virtual mobility. The authors support this view by two case descriptions: the development and implementation of a very successful virtual course - European Virtual Seminar on Sustainable Development (EVS) and the project to expand from this single course to a virtual campus - Virtual Campus for a Sustainable Europe (VCSE). They conclude that the factors determining the viability and uptake of international online learning initiatives, such as virtual campuses, are a bottom-up approach enabled by the availability of inexpensive ICT, an educationally driven need for virtual mobility, and interdependence within the international partnership.

Chapter XIII
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  George Ubachs, European Association of Distance Teaching Universities, The Netherlands
  Christina Brey, European Association of Distance Teaching Universities, The Netherlands

In higher education, international student mobility has become increasingly important for learners as well as for institutions. But today’s mobility schemes are first and foremost aimed at physical mobility. This approach covers the majority of students, but does, however, not take into account the needs of the lifelong learners who are not mobile due to family or work commitments, or who are constrained by disability, or do not have the financial means for traveling abroad during their academic education. The need to offer all students in higher education the possibility of an international experience and the European strategy of boosting student mobility requires new and alternative mobility concepts in addition to physical mobility. The European Association of Distance Teaching Universities (EADTU) initiated an operational analysis of virtual mobility under the e-move project. Different models of virtual mobility
have been developed, analysed and put into practice. This chapter will explore how a particular virtual mobility scheme can be put into practice and what is required from an organisation to implement this model and incorporate it into its own curriculum.

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Yuri Kazepov, University of Urbino “Carlo Bo,” Italy
Giovanni Torris, University of Urbino “Carlo Bo,” Italy

Starting from the increasingly widespread need to develop effective teaching in complex transnational settings, this chapter presents an innovative blended model with Web 2.0 collaborative learning strategies built in. The model balances pedagogical, technical and content related issues into an ad hoc institutionally designed 60 ECTS (European Credit Transfer System) curriculum of the European Masters in Comparative Urban Studies (E-Urbs). The chapter aims at disentangling the different dimensions involved in the curriculum delivery, highlighting the pros and cons of all dimensions of the model adopted. In doing so the chapter is divided into three parts. The first part addresses the challenges that effective teaching in complex transnational settings has to face, in particular it highlights the crucial need of managing differences. In the E-Urbs project the authors had 24 students from 14 countries, 5 continents, 6 disciplinary backgrounds, 32 scholars from 9 partner institutions in 8 countries. The second part deals with the way in which challenges and differences have been addressed and describes the dimensions of the blended model the authors adopted, arguing that a sound virtual campus arrangement should address the pedagogical, technical and content related dimensions in a balanced way considering the institutional setting within which they are embedded. The third part addresses the way in which the blended approach has been enriched through a Web 2.0 perspective, promoting p2p (peer-to-peer) collaboration in the generation of knowledge. The main argument is that an increasingly fluid society generates and treats information differently and learning agencies should not only acknowledge these differences but should address them with balanced learning models which take advantage of the new 2.0 paradigms. The authors argue that the result of a balanced blended Web 2.0 approach helps to transform the challenges into a resource for each of the stakeholders involved (e.g., students, scholars, partners, institutions) providing an added value in each dimension of the learning process (pedagogical, technical, content related and institutional).

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François Fulconis, University of Avignon et des Pays de Vaucluse, France
Thierry Garrot, University of Nice Sophia Antipolis, France

In the restructuring and reforming of European education, e-learning has become one of the priorities of the Ministry of Education, Higher Education and Research in France. Since 2001, e-learning virtual campuses have been promoted by the State. Within the context of Economics and Management, the
CANEGE project (Campus Numérique en Economie-Gestion) was created. Identified as a form of network organisation, this virtual campus will be explored in this chapter in relation to its functioning and its management. Through the academic literature covering network organisation, the main purpose of this chapter is to make recommendations and establish best practices regarding the management of e-learning virtual campuses based on the CANEGE experience. This chapter explores what the authors consider to be the most relevant aspects that need to be considered in relation to the establishment and implementation of virtual campus initiatives that comprise several partners.

Chapter XVI
Developing and Managing an Effective Virtual Campus: The eLab Experience in the Swiss Higher Education Context

Luca Botturi, eLab – eLearning Lab USI-SUPSI, Switzerland
Lorenzo Cantoni, eLab – eLearning Lab USI-SUPSI, Switzerland
Benedetto Lepori, eLab – eLearning Lab USI-SUPSI, Switzerland
Stefano Tardini, eLab – eLearning Lab USI-SUPSI, Switzerland

This chapter presents a successful Swiss experience in developing and effectively managing virtual campus projects: eLab, the eLearning Laboratory of the University of Lugano and the University of Applied Sciences of Italian Switzerland. eLab activities are presented at two distinct moments in time. The authors first describe the context of e-learning in Swiss higher education institutions, focusing in particular on the Swiss Virtual Campus programme. During that programme, eLab emerged as one of the best performing e-learning support centres in Switzerland, thanks to three main elements: the establishment of a clear prototype-based design and development model, the definition of quality control procedures, and the implementation of a consistent and institution-wide online learning environment. After the end of the programme, eLab had to switch from a project-oriented laboratory towards a service unit. The general strategy that drove this change and the concrete tools and practices that made it possible are presented in this chapter.

Chapter XVII
A Business Model for the Exchange of E-Learning Courses in an International Network

Christoph Brox, Institute for Geoinformatics, University of Münster, Germany

In three projects funded by the European Commission (EC), European and Latin-American project partners have developed, improved, and successfully tested an e-learning business model for the exchange of e-learning courses. Typically, high-quality e-learning is expensive and many ambitious e-learning projects have been discontinued after the end of the funding period. The mission of the three EC projects was to ameliorate this problem by creating an organisational model for exchanging e-learning courses with limited resources. The design of this model rests on two pillars: firstly the re-use of existing resources and secondly the sharing of resources in an international network. Each university in the consortium develops one e-learning course, which is based on an existing course and teaching materials. This is then provided, including teaching, to the students of the partner institutions. In return, each partner university receives two or more courses on a non-fee basis. As a result, the business model was validated. After the
end of the project, eduGI, the project partners have continued with the model, exchanging e-learning courses without the need for further funding and with even lower costs and higher benefits than providing the courses as regular face-to-face classes. Although this business model was developed by institutions specifically in the context of Geoinformatics, the exact field is irrelevant; teachers and decision makers of all scientific fields can apply this business model.

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Foreword

The book you are holding in your hands is a multiform tool enabling learning and insights into the potential that could be obtained by a virtual campus at its best. I feel privileged to have had the opportunity to access all these articles ‘fresh from the oven’. Besides enjoying the process, my reading quest naturally had a more serious purpose as well, that is, pinpointing such aspects from the material that I would like you to draw your attention to, or rather through which to challenge you to learn. At the same time, I attempted to identify new insights which have such significance for me that I wish to share them with others. As always when I read, I associate my findings and insights with individuals with whom I collaborate in smaller or larger teams and networks in pursuit of some common goal.

Several articles describe both the theories and practices of the ongoing paradigm shift. The endless world of knowledge enabled by ICT is a sphere that books cannot even compare with. However, the core of the change is not technology. The core is culture – the paradigm shift related to how and what people learn, learn as individuals, learn as teams and learn as networks. Enormous opportunities for empowering through networking means an increasing number of people whose driving force is the passion to learn. Our world is an e-world with easy access to the kind of information we need. And not just access to information, but to knowledge that we, as members of networks, wish to disseminate to and process with others. Everyone is also allowed to question and argue, in favour or against. Not to mention proposing new views and pushing the limits of our own thinking. As a foundation of this type of processing we require cross-sections such as this book to indicate where we stand in a particular field.

This is what the world of information and knowledge framed in this book is about. The importance of pioneers and early adopters is clearly recognised. Global challenges cannot be met without the potentials painted throughout this book. You, the authors of this book and your network partners, play a crucial role. This all deals with knowledge creation and knowledge management which we engage in with others with the same interests, independent of where we come from and of whether we have ever even met face-to-face.

We are invited to form a common learning organisation that operates without boundaries or limits. I have described this by saying that this is not just about active interacting but about creating a shared knowledge reality – the elements, processes and concepts of which are available to all of us and are in use by all of us, at all times. And by means of the semantic web and all other sophisticated forms of ICT this knowledge reality is constantly expanding and deepening.

This book is in many respects an outstanding manual and a door to the world of virtual campuses. The articles provide well-grounded insights into what the future learning community and university could be like. Several articles include long lists of recommendations, as well as clearly focused concluding remarks which help decision makers to write the policy papers needed for setting the frames for implementation.
The future of education is learner centric. This means that we – the educators and decision makers – need systems intelligence to operate within the complex ecosystems and, in particular, to understand and to develop them further. In education the complexity increases when the trend is towards Personal Learning Environments, instead of large learning management systems. PLEs require virtual campuses which embrace the future culture of working and learning together.

In this book learning is characterised as a social process, where learners are co-producers in the learning process and not just consumers of learning content. Virtual campuses are collaborative communities providing added value to especially all those contributing. I encourage all of you, the readers of this book, to respond by becoming creators of a shared virtual knowledge reality of advanced e-learning practices.

*Markku Markkula*  
*Director of Lifelong Learning Institute Dipoli*  
*Helsinki University of Technology*
Preface

INTRODUCTION

Over the last decade the Internet has had an important impact upon higher education with the development of e-learning and virtual campus initiatives providing significant opportunities in terms of enhanced access to courses, knowledge, learning experiences and information for a wide range of different learners from across the world. E-learning is now commonly accepted within many educational establishments as an increasingly popular means of providing flexible learning and delivery through the provision of virtual campus opportunities in addition to their physical based campus courses.

The term e-learning has been used to describe an educational setting in which teaching and learning take place within an Internet-based environment in which digital technologies and media are used to enhance teaching, learning and assessment. Some authors have distinguished between online learning and e-learning, where online learning is used to represent any class that offers its entire curriculum via the Internet thereby allowing learners to participate regardless of geographic location, theoretically 24 hours a day. This is in contrast to the traditional classroom instruction, which is time and place bound, face-to-face, typically conducted in an educational setting and consisting primarily of a lecture/note-taking model, and blended learning, which is a combination of online learning and traditional classroom instruction. The term e-learning can be used as a generic term to encompass both (fully) online learning and blended learning. The term virtual campus has been used to describe a scenario where several higher educational establishments and organisations, through alliances and cooperative agreements, provide joint curricula and deliver programmes that can utilise e-learning and blended approaches to learning aimed at learners from across the world. The most recent developments in e-learning and virtual campus developments are characterised by more collaborative learning environments based much more on the constructivist epistemology, promoting reflective practice through the use of Web 2.0 technologies such as wikis, blogs, e-portfolios, as well as mobile learning, games-based learning and highly interactive online simulations.

Globalisation has led to the blurring of national educational boundaries, leading to the globalisation of education, with many higher education institutions developing new markets that were previously unobtainable. The development of virtual campus initiatives across international boundaries has enabled many higher education institutions to collaborate in providing courses and learning experiences to students from diverse cultural backgrounds from across the world. As a result of globalisation, institutions across the world are under pressure to integrate new technologies into teaching and learning (Connolly & Stansfield, 2007a). With increased student numbers and increased pressure on higher education re-
sources there is a drive to improve efficiency and management of the administrative elements of learning, teaching and assessment associated with e-learning and virtual campus initiatives.

Whilst e-learning and virtual campus developments have led to significant successes, over the last decade, there have been the several costly high profile e-learning and virtual campus failures across the world that has led to the discontinuation of large-scale projects and initiatives. If current and future e-learning and virtual campus initiatives are to succeed then it is vital that the lessons and best practices gained from previous and current initiatives are identified and disseminated among all relevant researchers, practitioners, decision-makers and stakeholders.

If e-learning and virtual campus initiatives are to be sustainable then it is vital that all relevant stakeholders understand how new models of teaching and learning can transform an institution and how they can be used to enhance flexibility and inclusiveness for learners from diverse cultural backgrounds. Whilst technology might be leading change at a rapid pace, it could be argued that too little attention is being paid to exploring the new forms of pedagogy made possible by e-learning and virtual campuses. Perhaps some of the more damaging criticisms are that some e-learning and virtual campus initiatives simply replicated the social organisation of traditional education and that the potential benefits that e-learning provides (i.e., personalised and accessible learning experiences) are missed. For many years, the technology (the ‘e’ part) of e-learning seemed to dominate thinking and developments in the field, and it is only recently that there has been a wider recognition that the learning is more important (Connolly & Stansfield, 2007b).

Therefore, there are a number of key pedagogical, technological, organisational and financial related issues that need to be explored and addressed in order to achieve strategic goals and provide stability and sustainability within the e-learning and virtual campus environment.

MISSION AND OBJECTIVES OF THE BOOK

The mission of this book is to disseminate knowledge, experiences and best practices relating to e-learning and virtual campus developments from across the world. If e-learning and virtual campus initiatives are to be sustainable, this presents a number of diverse challenges that institutions and relevant stakeholders must address. It is vital that key lessons gained from previous e-learning and virtual campus initiatives are shared and the transfer of know-how and expertise is achieved in order to create a firm basis and positive environment for future developments. The main objectives of this book are to:

• Provide readers with an introduction to the key issues relating to e-learning and virtual campus pedagogy and policies.
• Provide examples of experiences, best practice, benchmark activities and knowledge from some of the world’s most experienced practitioners and researchers in the field.
• Contribute to the development of best practice through the evaluation and documentation of e-learning and virtual campus successes, as well as the possible pitfalls.
• Help institutions and key stakeholders understand the diverse issues surrounding e-learning and virtual campus initiatives and the conditions necessary to achieve greater success and sustainability.
Intended Audience

The intended audience of this book is broad and includes both internal and external stakeholders within the areas of e-learning and virtual campuses. This book will be of interest to:

- Teaching and research staff (and learners) within higher educational and training institutions across the world that utilize e-learning and virtual campus concepts and technologies.
- Educational technologists who are responsible for bridging the gap between pedagogy and technology.
- Senior and Middle Management in educational and training institutions who are responsible for coordinating key resources within the context of e-learning and virtual campuses.
- Formal stakeholders – such as Governments (at local and national level), Funding Councils, Educational Support and Quality Agencies involved in e-learning and virtual campuses.
- Key stakeholders in the Developing World who are developing e-learning and virtual campus initiatives at a rapid rate. It is vital that they are able to learn the lessons and best practices from earlier and current attempts and initiatives from other parts of the world.

Through a combination of chapters that explore theoretical issues associated with e-learning and virtual campuses, as well as practical case studies that highlighted best practices, this book will benefit both the novice reader, wishing to learn about the area, as well as experts who wish to keep pace with the latest developments in the field.

STRUCTURE OF THE BOOK

In this section, we provide an outline of each of the chapters in the book.

Section I: Advancing E-Learning and Virtual Campus Policies

This section provides an introduction to some of the key pedagogical issues associated with advancing e-learning and virtual campus policies.

In Chapter I, Lalita Rajasingham contributes to the ongoing discussion on current best practice and trends in e-learning and virtual classes in higher education. Based on international research, this chapter examines some signposts using pilot projects as a key pedagogical method in the journey from idea to execution and the factors leading to success or failure of e-learning initiatives. Rajasingham raises the question whether the e-learning phenomenon will represent a new and sustainable university paradigm for the emerging knowledge society.

In Chapter II, Yukiko Inoue argues that individuals need to develop the necessary competencies that include self-directed lifelong learning, in particular, through e-learning, to be able to participate in a working life that is mainly based on knowledge productivity. Inoue examines the importance of linking e-learning to current knowledge in general, and to self-directed lifelong learning specifically. Inoue argues that higher education today must commit to new roles: providing educational communities such as virtual campuses; and increasing capacities to produce knowledge available to all.
In Chapter III, Lars-Erik Jonsson and Roger Säljö report on attempts to develop critical features of seminar culture in the online context and point out that students must be involved in the activities of establishing a community with rapport between members and with an understanding of how to conduct the interaction. By giving the students responsibility for solving a range of practical problems and letting them help each other, Jonsson and Säljö argue they are induced into the status of legitimate online participants.

In Chapter IV, Stefan Hrastinski, Christina Keller, and Jörgen Lindh explore the key challenges relating to organisational culture which they consider may enhance or hinder e-learning implementation, and describe how the organisational culture shapes e-learning use at universities through comparing a School of Business and a School of Health Sciences. They introduce the concepts of administration-centered and learning-centered e-learning culture and the challenge of developing an e-learning culture that values both how e-learning can be used to enhance administration and learning.

In Chapter V, Dawn Birch and Bruce Burnett report on a study that examined factors that influence educators’ decision to adopt and integrate educational technology and convert traditional print-based distance education materials into interactive multimodal e-learning formats. They argue that findings from the study have significance at the institutional level, particularly in terms of developing an underlying pedagogical rationale that can permeate the e-learning culture throughout the university, while at the same time, providing a roadmap for educators who are yet to fully engage with the e-learning format.

In Chapter VI, Gill Kirkup argues that e-learning innovation is best done in an environment that allows for small scale experimentation and development and that this can be made more difficult in an environment that prioritises large scale e-learning systems. The chapter discusses e-learning activities within the context of the Open University in the UK, in particular those of the MA in Online and Distance education programme in the Institute of Educational Technology.

In Chapter VII, Albert Sangrà, Lourdes Guàrdia, and Pedro Fernández-Michels present the findings of an in-depth analysis through several qualitative research studies, pointing out the key issues in relation to succeeding in developing effective and sustainable institutional virtual campuses and e-learning provision initiatives. They argue that an appropriate balance between the issues concerning technology, organisation and pedagogy in the form of the TOP triangle model is needed and the design and implementation of a strategic plan for such initiatives is highly recommended.

In Chapter VIII, Irene le Roux, Karen Lazenby, and Dolf Jordaan discuss four key variables that influence growth and sustainability in an e-learning environment, namely management, training and support, measurement, and technology strategies, and provide an example of a virtual campus that was implemented by the University of Pretoria. They highlight a situation in which as a result of upgrading the learning management system in order to provide more stability and better integration with the student information system, the more complex integrated environment resulted in more points of failure and a less stable environment.

Section II: Virtual Campus Best Practice Experiences

This section explores some of the key lessons, recommendations and best practices learnt from actual examples of virtual campus projects and initiatives.

In Chapter IX, Morten Flate Paulsen presents an analysis of 26 European megaproviders of e-learning which had more than 100 courses or 5000 course enrolments in 2005. Among the megaproviders, which represent eleven countries, there are eight distance education institutions, 13 universities and university
consortia, and five corporate training providers. In the chapter Paulsen provides 27 recommendations extracted from the analyses to help institutions obtain robustness and sustainability in online education.

In Chapter X, Mark Stansfield and Thomas Connolly outline a set of guiding principles underpinning key issues in the promotion of best practice in virtual campuses as part of the work conducted during the ‘Promoting Best Practice in Virtual Campuses’ (PBP-VC) European Commission co-financed project. Stansfield and Connolly highlight key enablers and inhibitors to success, provide a description of the different elements comprising the guiding principles in the promotion of best practice, as well as describing a tentative four level model aimed at illustrating different levels of virtual campus maturity in the achievement of sustainability and organisational transformation.

In Chapter XI, Helena Bijnens, Ilse Op de Beeck, Johannes De Gruyter, Wim Van Petegem, Sally Reynolds, Paul Bacsich, Theo Bastiaens, Anna-Kaarina Kairamo, and Grégory Lucas, describe the concepts of virtual campus and virtual mobility and refer to several past and present projects and initiatives in the field. Through these previous experiences, they identify a shift of concepts 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. They use three cases to demonstrate this evolution: 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 in the GIS case, in which the virtual campus is used as a strategic means to ensure a valuable and transdisciplinary approach. Bijnens et al., highlight the need to redefine the concept of virtual campus in order for it to be applicable to the changed educational needs of today and describe the Re.ViCa project that has been set-up to make an inventory and systematically review cross-institutional virtual campuses from the past decade.

In Chapter XII, Ron Cörvers and Joop de Kraker highlight the importance of subsidiarity in the development of a virtual campus. Subsidiarity is the principle that matters ought to be handled by the lowest competent authority and support this view by two case descriptions: the development and implementation of a very successful virtual course—European Virtual Seminar on Sustainable Development (EVS) and the project to expand from this single course to a virtual campus—Virtual Campus for a Sustainable Europe (VCSE).

In Chapter XIII, George Ubachs and Christina Brey explore the e-move project in which the European Association of Distance Teaching Universities (EADTU) initiated an operational analysis of virtual mobility through the development, analysis and implementation of different models of virtual mobility. This chapter explores how a particular virtual mobility scheme can be put into practice and what is required from an organisation to implement this model and incorporate it into its own curriculum.

In Chapter XIV, Yuri Kazepov and Giovanni Torris present an innovative blended model with Web 2.0 collaborative learning strategies built in that balances pedagogical, technical and content related issues into an ad hoc institutionally designed 60 ECTS (European Credit Transfer System) curriculum of the European Masters in Comparative Urban Studies (E-Urbs). They argue that a sound virtual campus arrangement should address the pedagogical, technical and content related dimensions in a balanced way considering the institutional setting within which they are embedded.

In Chapter XV, François Fulconis and Thierry Garrot describe a virtual campus—the CANEGE project (CAmpus Numérique en Economie-GEstion) that focuses on the areas of Economics and Management that they identify as a form of network organisation in which based on their investigations, they make a recommendations and establish best practices regarding the management of virtual campuses based on the CANEGE experience.
In Chapter XVI, Luca Botturi, Lorenzo Cantoni, Benedetto Lepori, and Stefano Tardini present a successful Swiss experience in developing and effectively managing virtual campus projects: eLab, the eLearning Laboratory of the University of Lugano and the University of Applied Sciences of Italian Switzerland. eLab’s activities are presented at two distinct moments in time. Firstly focusing on the Swiss Virtual Campus programme during which time eLab emerged as one of the best performing e-learning support centres in Switzerland. This was due to three main elements: the establishment of a clear prototype-based design and development model, the definition of quality control procedures, and the implementation of a consistent and institution-wide online learning environment. After the end of the programme, eLab had to switch from a project-oriented laboratory towards a service unit. The general strategy that drove this change and the concrete tools and practices that made it possible are presented in this chapter.

In Chapter XVII, Christopher Brox highlights three projects funded by the European Commission where European and Latin-American project partners have developed, improved, and successfully tested an e-learning business model for the exchange of e-learning courses within the context of Geoinformatics. Brox argues that the business model is also applicable to many other scientific fields.

We hope that this book will be relevant to a wide range of stakeholders involved in the design, development, implementation and evaluation of e-learning and virtual campus initiatives across the world. The goal of this book is to appeal to researchers, educators, technologists and decision-makers, as well as postgraduate and undergraduate students interested in or engaged in e-learning and virtual campus related activities.

Mark Stansfield
University of the West of Scotland, UK

Thomas Connolly
University of the West of Scotland, UK

REFERENCES


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Section I
Advancing E–Learning and Virtual Campus Policies
Chapter I
The E-Learning Phenomenon:
A New University Paradigm?

Lalita Rajasingham
Victoria University of Wellington, New Zealand

ABSTRACT

This chapter contributes to the ongoing discussion on current best practice and trends in e-learning and virtual classes in higher education. With the increasing importance of knowledge as competitive advantage and engine of economic growth in an increasingly interconnected, multicultural and multilingual world, modern universities based on building and transport technologies are assuming virtual dimensions to address the pressures of rising enrolments, increasing fiscal constraints and rapid technological advancements. The Internet and globalisation are changing how we bank, shop, play, and learn. Can universities adapt, or is e-learning going to be an educational fad like educational television of the 1970s? Based on international research, this chapter examines some signposts using pilot projects as a key pedagogical method in the journey from idea to execution and the factors leading to success or failure of e-learning initiatives. Will the e-learning phenomenon represent a new and sustainable university paradigm for the emerging knowledge society?

INTRODUCTION

The concept of e-learning as a new university paradigm provides the structure for this chapter and takes a historical perspective on the nature of universities in terms of major paradigm shifts from the classic Aristotelian model of the Greeks, to the medieval European university to the national institution with its ties to the modern state. It then examines the impact of globalisation, neoliberal economics, information technology and the demands of the knowledge society on universities, and the rise of the e-learning as a new paradigm.

Thomas Kuhn (1962) defines a paradigm as ‘what members of a scientific community, and they alone, share’ (Kuhn, 1977, p. 294) and ‘when paradigms change, the world itself changes with them’ (1962, p. 110).
Another important related concept as we examine changes in society is worldview—zeitgeist—which Michel Foucault calls an episteme, and he concludes that it is not possible for people in one episteme to comprehend the way people in another episteme think (Foucault, 1970).

Historically, higher education has seen many global paradigm shifts, with varying degrees of turmoil. The medieval university taught the word of God, and began in monasteries in Europe, and in temples, madrassas and churches in other parts of the world. Essentially elitist and male, it served princes and priests.

The emergence of communications technologies especially the printing press and the railways gave birth to industrialisation and nation states. The medieval university moved from explaining the world in terms of God’s word to become part of the structure of the industrial age explaining reality in terms of scientific rationalism catering for a nation’s managerial and professional elite, and gradually included women. This is the paradigm of national higher education that we know today. However, with the developments of the Internet, the World Wide Web, broadband, digitalisation, wireless, satellite, mobile telephony and new applications of virtual reality, HyperReality and artificial intelligence to build collaborative, immersive simulated e-learning environments, higher education is once again undergoing a paradigm shift. As technologies add new global perspectives, universities worldwide face new challenges at a time of unprecedented demand for higher education.

The prefix ‘e’ or ‘E’ to most human transactions such as e-commerce, e-shopping, e-medicine and e-learning is a phenomenon of the 1990s as these activities go online as the Internet expands in depth and reach. Shannon and Weaver’s communications model (1949) depicts a transaction, where the sender of the information/message and the destination/recipient are separated by physical distance or time, and information, and communications technologies (ICTs) provide the link and in e-commerce for example, between seller and buyer. A Google search in February 2008 on the term ‘e-learning’ reveals no precise definition for this term and covers online learning, computer-based training and web-based learning. In the context of this chapter e-learning, based on distance education concepts is defined as Internet based learning available to anyone, anytime, anywhere in text, audio, video and animation both synchronously and asynchronously where teacher and learner in virtual classes are not co-located.

A Virtual Roundtable in 2000 involving four experts in the field including Jaron Lanier concluded that the e-learning revolution is not about computers but it’s about communication for intergenerational discourse. Education is a kind of communication and shares some characteristics. Both are information intensive activities, and both rely on ICTs to link teachers and learners, where teachers help learners to apply knowledge to real-life problems. In the conventional modern universities, this process takes place as teachers and learners came together in classrooms using transport technologies. In e-learning in virtual universities, the Internet, virtual reality, HyperReality, Croquet and other emerging immersive technologies such as SecondLife bring teachers, learners, knowledge and problems/subject of enquiry together and so effect the process of education (Tiffin & Rajasingham, 1995; 2003). It is suggested that this constitutes a new paradigm from which higher education might be constructed in a knowledge society.

Since the early 1990s, researchers have examined the future of higher education in an era of rapid technological change as the modern university faces challenges to its relevance in the knowledge society. This chapter considers some reflective praxis in developed and developing economies to identify the strengths and obstacles to achieving the vision for equitable, quality, culturally appropriate education that match the needs for the knowledge society, delivered at the convenience
of the learner. Is e-learning a step towards this goal, or is e-learning going to be an educational fad like educational television of the 1970s?

The core business of universities whatever the prevailing paradigm or episteme is the creation, storage, processing, dissemination and application of knowledge to world problems. The modern university based on building and transport technologies that rely on fast depleting and increasingly costly fossil fuels provides formulaic responses to the national needs of the industrial society, but is unable to respond to the rapidly changing needs of the knowledge society. E-learning and virtual universities enabled by the Internet will respond to the needs of an increasingly interconnected, multicultural, multilingual and globalised world. Therefore, as a means of addressing the pressures of rising enrolments and increasing fiscal constraints, universities worldwide are assuming virtual dimensions to address the issues of globalisation itself, not to replace the conventional classroom but to provide alternate and complementary learning spaces to respond to the changing needs of the global knowledge economy.

While theoretical inquiry is central to the vitality and development of a field of practice to guide future developments, theoretical frameworks that are not limited to describing what is, should also help predict or foreshadow what could be. This chapter draws from international research, and the 16 year longitudinal research conducted at Victoria University of Wellington, New Zealand and published in two coauthored texts, The Virtual Class: Education in an Information Society (1995) and The Global Virtual University (2003). The purpose of the research is to examine the potential of e-learning and virtual classes to represent the new and sustainable university paradigm for the emerging knowledge society. This chapter reflects on the experience of the author teaching online some university courses under investigation in collaboration with those teaching in similar courses globally. It then examines lessons learned on the journey from idea to execution towards a new e-learning paradigm, and identifies common characteristics of success and failure in programmes, and reasons.

THUS IT BEGAN

Although distance education has a long pedigree going back to the 18th century even today with the antecedents such as e-learning, online education, and the virtual class no precise definition can be given that is universally accepted. The essential characteristic refers to education where the learner is separated by distance, time or space, convenience or personal choice from their study source usually within an institution. The bridge between learner and teacher is provided by media or combination of technology, be they print, postal, telecommunications, computers and the Internet.

Battenberg (1971) discovered an advertisement in the Boston Gazette of March 20, 1728 advertising self-instructional material in shorthand, and possibly correspondence teaching (Holmberg, 1982). Bratt (1977) discussed in Baath (1979) quotes the following advertisement which appeared in Lund’s Weckoblad No. 30, 1833 in Sweden clearly referring to postal teaching:

“A card.
The undersigned respectfully intimates to those Ladies and Gentlemen, in adjacent Towns, who study Composition through the medium of the Post that the Address for the month of August, will be Grey Friars Street, Lund. A.J. Mueller."

Börje Holmberg a long established authority in distance education described distance education as a ‘guided didactic conversation’ (1983)

In the last two decades, the merger of telecommunications and computers introducing ICT has transformed human communications and functions of modern society. Manuel Castells (2000) presents detailed analysis of the trends and nature of the emerging networked society we already inhabit. Information and communications technology is now synonymous with the Internet profoundly changing how we live, bank, shop, think, communicate, entertain and educate ourselves. Education on the Internet is borderless and is becoming a global ‘utility’ as described by Dennis Gooler (1986).

Conceptual confusion is created with new metaphors for distance education, such as open learning, flexible learning, distributed learning, e-learning, online learning, borderless education, blended learning, m-learning (mobile learning) and virtual education. All these modes involve the use of digital networks and computers synchronously or asynchronously to bring together the four factors of education, teachers, learners, knowledge and problem. With the new technologies emerge new programme demands, new audiences, and new commercially competitive providers. These developments present significant challenges for higher education to make sense of the educational technology options available. How different are the challenges and theoretical foundations faced by the education of the industrial age and e-learning in the knowledge age?

The study of distance education in the 20th century was primarily focused on distance constraints and approaches that bridged geographical borders by way of organisational strategies for the mass production and delivery of learning packages, mainly using postal and transport technologies. However, more recently, the focus has shifted to educational issues associated with the teaching/learning/knowledge transaction on the Internet to extend learning opportunities for anyone, anytime, and anywhere and in any mode.

**TIME OF CHANGE**

Today, societies face two crises, peak oil and education (Rajasingham, 2007). As knowledge and innovation replace land labour and capital as central drivers of production and competitive advantage in the global economy, worldwide there is an exponential demand for education particularly at tertiary level.

In 2007, The Chronicle of Higher Education notes that even the US, the leading developed economy is falling behind other developed nations in degree attainment. The report, *Hitting Home: Quality, Cost, and Access Challenges Confronting Higher Education Today* says the gap will widen substantially unless the nation makes post-secondary education much more accessible.

John Daniel (2007a) speaking at the Convocation of the Tamil Nadu Open University, India notes that some 24% of the ten million Indians engaged in higher education are learning at a distance in the Indira Gandhi National Open University, in 12 State Open Universities, and in the many dual-mode providers. The Government wants to raise this figure to 40% http://www.col.org/colweb/site/pid/4310 (Retrieved 19 February 2008).

Readings (1996) suggests that the contemporary university is a “ruined” institution, shifting from its core functions of knowledge discourse to the new “marketspeak” of managerialism, strategic planning, performance indicators and so on that have little to do with higher order thinking and knowledge creation. Another theorist whose
work has influenced the re-thinking of the role of universities is Jean-Francois Lyotard (1984). He argues that the changing nature of knowledge in capitalist societies has lead to commoditisation, which has changed the nature of universities’ future role in higher education (Lyotard, 1984), a view shared by Tehranian (1996) and Noam (1995).

In providing a philosophical foundation for the future of the university in an era of rapid technological change, globalisation and commercialisation, Tiffin and Rajasingham (2003) suggest that universities have yet to face the challenges of global free trade in education as a service within the WTO’s General Agreement on Trade and Services (GATS) agreement. The idea of a market where teachers and learners can trade is not new. It is the medium in which it takes place that is new. All education in the neo-Vygotskyian sense is the interaction between teacher, learner, knowledge and problem and is a basic component of any university paradigm (Tiffin & Rajasingham, 1995). It is the nature of these components, and the style and means of communication between them that vary with the episteme.

The increase in the number of tertiary students in most countries is in part because more school leavers are going on to further education, but it is also due to the growing number of adults and particularly women returning to the educational system, and the importance of lifelong learning to accommodate changes in careers that respond to societies’ needs.

Traditional education was place-based and book-paced. People had to travel by foot, rickshaw, buses, and cars and by air for international education to access education, just as they had to travel to shop, bank and work. This transaction took place at prescribed times where students were in lockstep with everyone else in their age group, and it was essentially reductionist, atomised into discrete units of instruction, hierarchical and teacher-controlled.

This education system that was successful for thousands of years is now out of synch with societies’ needs and the problem lies in the combination of the way education is administered, instructional design, content and pedagogy (Rajasingham, 1988). As governments reduce subsidies for higher education, and with the introduction of user pays, education becomes learner-centred. Advances in science and technology mean that increasingly industrial processes are knowledge-based and driven. Workers have to maintain their employability by constantly renewing their knowledge and skills particularly to satisfy the growing demand for knowledge workers with global competitive skills to solve global problems such as environmental problems, genetic engineering, pandemics like AIDS, SARS and so on, biotechnology, terrorism, cultural upheavals and credit crunches.

Robin Mason (1999) suggests that the new growth area in education is lifelong learning (1999, p.77). As the Internet redefines the environment in which business exists, Peter Senge (1995) defines a learning organisation as “…a place where people are continually discovering how they create their reality. And how they can change it” (Senge, 1995, p. 13).

Both developed and developing countries are struggling to re-align their education systems to respond to the needs of the knowledge economy. Researchers in e-learning and virtual universities pursue the same journey, but take diverse routes. This teleological approach is appropriate when exploring uncharted phenomena (Rajasingham, 2005).

**FUTURE INDICATIVE**

Developing countries, home to more than half the world population are at risk of being further marginalised in a highly competitive world economy because their tertiary education systems are not adequately preparing people with
the skills to create and apply knowledge appropriately in a changing global labour market, and the supremacy of the English language as a tool of communication.

In Asia, the demand for higher education is rising in proportion to living standards. According to IDP Education Australia, this number is predicted to rise from 17 million in 1995 to 87 million by 2020 especially in China and India. The modern university cannot cope. China will be unable to supply the 20 million university places required to meet the needs of its growing economy, and by 2015 India will struggle to supply 9 million places that will be needed. Therefore, e-learning solutions are gaining popularity (Rowe, 2003).

The population of India has grown from 300 million in 1950 to 1.26 billion in 2007 https://www.cia.gov/library/publications/the-world-factbook/print/in.html (Retrieved 11 February 2008). The demand for university education has far surpassed the capacity of traditional state funded universities, and availability has been largely confined to the urban areas. Yet, only 7% of the eligible population enrol for graduate level study as compared with 50% in the developed countries (Gupta, 2003). The reasons are similar to those that gave rise to distance education as a viable mode of learning in the 1950s and 60s, the inability to physically attend universities because of distance, transportation costs, gender discrimination and equity where education was not regarded as desirable for women and girls.

The Indira Gandhi National Open University was established in 1985 and today is literally the largest university in the world with 1.4 million students enrolled at any one time, with 125 study centres (www.ignouindia.com) (Retrieved 15 February 2008). India has gone for a ‘distributed’ model of virtual universities using satellite technology (VUSAT) and examples are the Virtual University for the Semi-Arid Tropics (VUSAT) launched in 2003 focusing on farmers of the Parbani district in Maharashtra. It is anchored by the Indira Gandhi National Open University and the Commonwealth of Learning, an inter-governmental organisation based in Canada, which promotes open and distance learning providing technical expertise to VUSAT (Press Release, Hyderabad 6 June 2003).

The VUSAT model is the basis for the Philippine National Agricultural Regional and Extension System to open an academy for agriculture. Hosted by the Philippine Rice research Association, and supported by two international institutions and a group of universities the academy will link virtually with farmers through a blend of the Internet and conventional communication tools.


Malaysia’s Universiti Tun Abdul Razak (UNITAR) which is the region’s first virtual university was created in 1998 is seen as the key to turn Malaysia into a fully industrialised country by 2020. In 2003 it had 8000 students enrolled in eight e-learning centres in Malaysia and one in Cambodia www.unitar.edu.my (Retrieved February 2008). Courses and programmes in UNITAR are fully recognised by the Ministry of Education and its students are eligible for loans. UNITAR recognises the need for a ‘campus’, echoing the importance of social aspects of education, and are continuing to work on this issue.

Indonesia’s first virtual university, Bankit University Teledukasi (IBUTeledukasi) began enrolling students in 2001. See further information online: www.teledukasi.com (Retrieved 12 February 2008).

The African Virtual University, an online university funded by the World Bank began operating in 1997 (www.col.org) and in 2004 had 31 learning centres at partner universities in 17 African countries. In 2003, 23,000 Africans were enrolled in courses such as journalism, languages and accounting, and the goal for the next five
years is to expand the network to 150 learning centres in 50 countries, offering four-year degree courses in computer science and business studies. For a more recent report see www.worldbank.org/afr/findings/english/find223.pdf (Retrieved 12 February 2008).

Furthermore, the United Nations launched the Global Virtual University of the United Nations University (GVU) in 2003, an online school that will focus on sustainable development and the needs of the developing world. Comprising of a network of universities, including some from Ghana, Uganda and South Africa, it will be headed by the UN Environmental Programme with Norway’s Adger University as the core partner, to offer common diplomas and joint degrees http://gvu.unu.edu/about.cfm (Retrieved 15 February 2008).

Similarly, The Commonwealth of Learning that embraces 54 mainly developing countries in the Commonwealth is successfully developing The Virtual University of the Small States of the Commonwealth (www.col.org).

The first virtual university in the world of its kind in a language other than English is the Tamil Virtual University. Created to promote the learning of Tamil by students anywhere in the world, all aspects of Tamil culture are offered especially for the Tamil Diaspora spread worldwide to access its comprehensive website www.tamilvu.org (Retrieved 12 February 2008).

SOME MACROTRENDS IN THE DEVELOPMENT OF E-LEARNING

Globalisation and Higher Education

Historically, globalisation stressed cross-border activities such as the acquisition of land, labour and capital and the birth of empire. The concept however is not limited to economic factors such as international trade, foreign direct investments and banking, but today extends to other human activities such as knowledge, learning institutions and culture.

A new kind of university is needed to respond to the needs of the global knowledge society, as knowledge and innovative thinking and talent to solve global problems. At a time of competitive intelligence, we see the beginnings of a war for talent and innovation. In his insightful text *The Flight of the Creative Class*, Richard Florida (2003) argues that the changes in our economy and society have combined to give a fundamentally new system of working, living and thinking, and by definition, *learning* (author’s emphasis). Florida calls this the creative age because the key factor propelling society forward is the rise of creativity as the prime mover of the economy—not just technology or information—but human creativity (Florida, 2003, p. 26).

The global virtual university of the future will need to offer effective, cost-efficient quality-assured education, that match global skills in the use of technology, delivered interactively, and multilingually at the convenience of the learner in culturally appropriate ways. While the English language enjoyed supremacy as a technological tool to enter the WWW, societies are developing software and applications in their own languages, and so overcome the perception of English as a tool of cultural hegemony (Guardian Weekly, Dec 22, 2006-Jan 4, 2007, p. 17).

One of the defining attributes of the modern nation state is a national education system and national library that houses a body of knowledge about the country in the national language. In addition, national education systems will also teach literacy, numeracy and bodies of knowledge such as science and mathematics which are global in nature, providing that ideal mix: teaching in the discipline and learning in context. However, with globalisation, the nature of knowledge in the scientific paradigm is changing. New “knowledges” are created as societies evaluate the impact of the Internet and multimedia on their conventional cultural learning approaches. Global issues re-
quire global curricula that respond not just to national needs, but to global needs; not just to the community of supply, but to the community of demand; and not to rigidly defined objectives, but to the wider issues of globalisation (Tiffin & Rajasingham, 2003).

**Information Technology Advances and Convergence**

The conventional classroom remains the ideal multimediated learning place where learning can occur through the five senses of sight, sound, smell, touch and taste and caters for synchronous and asynchronous modes. Roxanne Hiltz (1986), Tony Bates (1995) Donald Hanna (2000; 2001) and Alexander Romiszowski (2003, 2005) have published widely on ways to reflect learning in the conventional classroom at different locations by using ICTs.

In their research, Tiffin and Rajasingham seek to replicate the communications functions of the conventional classroom by using new applications such as virtual reality, HyperReality, mobile wireless technology and artificial intelligence in education on the Internet to create virtual classes and virtual universities to provide alternate and complementary learning spaces for the third millennium (Tiffin & Rajasingham, 1995; 2001; 2003).

**RESEARCH AND PRAXIS: A NEW ZEALAND PERSPECTIVE**

The longitudinal research in New Zealand began in 1986 and still continues is conducted by Professor Emeritus John Tiffin and Dr Lalita Rajasingham of Victoria University of Wellington New Zealand. The philosophical and theoretical thinking form the basis of their books titled *In Search of the Virtual Class: Education in an Information Society* (1995) and *The Global Virtual University* (2003). The research is described in the context of the theoretical research that explores the shift from the modern university of the nation state to the global virtual university of the future. While it appears that the more things change, the more they remain the same, there are some predications and rationale that remain relevant today. Lester Thurow (1996) sums it up well: “Today knowledge and skills now stand alone as the only source of comparative advantage. They have become the key ingredient in...economic activity” (p. 68). Furthermore, the ever increasing demand worldwide for higher education is yet to be resolved.

As researchers know, paradigm shifts are inevitable. In the 1970s we thought we were going to solve the problems of the world with educational television, but somehow, although television has found a role in education, it never really worked as we had envisaged. Now we turn to the Internet to solve education’s problems. But do we as yet have the kind of breakthrough technology that surgery got with anaesthetics and doctors with antibiotics? Or will e-learning prove to be a phoenix rising from the ashes, or yet another educational fad? Perhaps it could be both as some technologies that fail to deliver on expected potential in one country and one culture may prove to be the lifeline for another. There is no one-size fits all approach as evidenced on the Internet. Since the mid 1990s the literature on online education, virtual universities and virtual classes has proliferated in its many variations in the developed and developing countries.

In 2005 a Google search showed 200 entries for the ‘global virtual university’, and in 2007 there were 55,100 (Retrieved 11 February 2008). Admittedly, the numbers keep changing as do the courses, with some disappearing on a daily basis. But the underlying philosophy seems to indicate that there is an acceptance of the need for change in universities because of growing competition, commercialisation of education, the commoditisation of knowledge and the growth of the Internet.
As education moves from being teacher controlled to learner centred, a re-thinking of technology based pedagogical space is needed. John Daniel (2007b) argues that successful use of technology for learning depends on developing policy that addresses organisation, strategy, management and technology issues to help e-learning to work better by developing pilot programmes and models. This helps us understand why something works, the ingredients of its success, and the transferability of the programme to a different country www.col.org/colweb/site/pid/4359 (Retrieved 19 February 2008).

Ultimately, any form of university will always be a compromise between educational ideals, economic imperatives, clashing agendas and vested interests. The technological revolution has created the pressures for change in most countries. However, there is also the added factor introduced by Web-based e-learning: the globalisation of access to courses for students from any country. As e-learning becomes big business (like e-commerce, although built on different premises) and competitive, many countries are in the process of forming consortia of universities such as Universitas 21, the Commonwealth of Learning’s Virtual University of the Small States of the Commonwealth and the United Nations University (UNU) in order to collaborate, rather than compete, in the area of e-learning provision. But in parallel, there is an increasing amount of inter and intra-institutional competition for the same student populations. This has inevitably led to the relative success of some initiatives, for example, the University of Phoenix in the USA, and the relative failure of others, which include the projects in such prestigious institutions as the Columbia University, New York University and even the thwarted attempt of Britain’s Open University to install itself in the USA’s higher education market (Romiszowski, 2003).

Do the success stories of certain pioneering institutions necessarily reflect the overall picture of e-learning and its acceptance as a major educational paradigm shift? Or does the increasing number of cases of failure indicate that e-learning, like so many other promising educational innovations in the past, only the robust survive? What are the factors that lead to some successful sustainable e-learning programmes and others to fail? In seeking answers, only a current snapshot of some of the issues observed between idea and execution is provided as the map that precedes the territory where e-learning becomes a viable and successful mainstream learning alternative.

The next section will illustrate some of the potential and paradoxes from the perspective of the author’s experience that resonate with similar experiences of international researchers associated with the embryonic developments to implement quality, culturally appropriate, sustainable e-learning programmes.

**UNIVERSALS OF A UNIVERSITY: TEACHERS, LEARNERS AND KNOWLEDGE**

The authors’ research programme is contextualised in an era of rapid technological change and globalisation. As the 1990s grew to a close and sophisticated clusters of technologies became available, such as virtual reality (VR) HyperReality (HR) nanotechnology and artificial intelligence (AI) universities became preoccupied with technological, political and commercial imperatives to move courses and degrees online to exploit competitive advantage and market opportunities. The mass production of traditional correspondence-based distance education migrated onto the Web displacing conventional postal systems as conduit. These learning packages for passive student consumption was described by Evans and Nation (1989, pp. 244-245) as a form of “instructional industrialism”. Therefore, other than cutting down on transmission time and widening accessibility to educational opportunities, not much has changed in distance education pedagogy.
The seven cycles of our action research that looked at the impact of IT on education and the future of learning on the Internet began in 1989 is fully documented in ZIFF PAPIERE 105 and 123 (Rajasingham 1997; 2004).

The pioneering book *In Search of the Virtual Class: Education in an Information Society* (1995) develops scenarios that describe what e-learning could be, given the advances in information technology in the 1990s (Tiffin & Rajasingham, 1995). Today, many of the hypotheses offered have been tested as evidenced by the proliferation of virtual classes, e-learning and virtual universities on the Internet.

The sequel to this book is the *Global Virtual University* (2003) offers a philosophical framework from which a virtual university can be constructed that is multilingual, multicultural and that responds to the needs of the knowledge society while also in consonance with local and national needs. With the increasingly sophisticated clusters of technology and applications coming online there is a growing need for multimedia in learning that not only uses print and oral modalities, but also visuals to enable the learning society on a global scale in culturally appropriate ways, develop heuristics, and provide ways of thinking about the basic purposes of e-learning.

The move from vision of what could be where education will be distance, time, mode and location independent, to what is, given the logistics of technologies in the 1990s was tested by developing pilot projects for the teaching of the two year Master of Communications with a cohort of students online dialling in from different locations in New Zealand to join the virtual class of students in Victoria University of Wellington.

The research, since its inception in 1987 had the support of the Telecom Corporation of New Zealand, and in 1992 it also counted on support from the Australia Telecommunication Corporation. Each of the seven cycles of the action research took the form of designing a telelearning system which in some way sought to emulate an integrated standard digital network (ISDN) environment and implementing it with mature students doing graduate studies in communications. In the manner of action research of this nature, at the end of each cycle there was evaluation and discussions with stakeholders and developments in information technology that would lead to changes in our designs and the way we implemented them.

The first cycle ran through to 1988 where eighteen students involved were given a telephone line, access to StarNet and a computer-phone which we believed reflected the interface of the future. We used the system for course administration, assignments and examinations. The student response was positive.

On the basis of the promises of the first cycle we designed a more ambitious programme for the next cycle which ran from 1989 to 1990. At this time Dr Steve Acker came to Victoria University as a visiting fellow from Ohio State University. He brought support from Ameritech for audio-conferencing and videoconferencing links between Victoria University and Ohio State University for joint seminars in a course on international communications. Teachers and students had personal computers, a telephone headset and were provided with two telephone lines in addition to the one they already had in their homes. The idea was to emulate narrowband ISDN with its three channels. The students had access to BITNET so they could communicate with their colleagues at Ohio State and the course had its own network which allowed for email and for teleconferencing with audio and data system for teletutorials.

We moved too far and too fast. Added to this the BITNET connections were frustrating to use. When we tried to videoconference between the two universities a transponder in the link carrying the video signal from Ohio to Wellington was pirated, causing frustration for both cohorts of students.

The third cycle in 1991 was known as the Tri-Centre Project because it linked three telelearning centres in New Zealand which were set up at a
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school for its teachers, at a remote rural Polytechnic and at the Communications Department at Victoria University as a response to a real problem of geography and time that prevented people from attending classes at the University.

The media combination used was email, fax and audiographic teleconferencing. From the lessons learned in the second cycle, fail safe systems were built in. For example, all seminars at Victoria University were videoed and copies of the videos were distributed to the remote centres. This seemed to give them a special advantage. Unlike the students who attended class conventionally at the University, they used the videos for review and found by doing this they had better understanding of the issues raised in the seminars.

The audiographic conference system used in 1991 was developed with financing from Telecom New Zealand on the basis of our designs. It worked well and gave some indication of what could be possible if telecommunications technology was designed on the basis of the needs of learners and teachers, as distinct from what software designers think they need. The system was intuitive and user friendly. However, it proved impossible to continue with the development due to proprietary issues, and in 1992 with support from Australia Telecom we used what was known as the Vis-a-Vis system. It had all the facilities we needed and more, including many of the updates we wanted. The technology was beginning to catch up.

By 1992 the system was working well and an independent evaluation of the Project established that the remote students were satisfied that the system was giving them an education that they would not otherwise have been able to have and that there was no significant difference between their learning and that of the conventional students. By this time another outcome of ‘the search’ had born fruit. With Stan Harms, at the University of Hawaii and Syed Rahim, of the East-West Centre, we had established the Network College of Communications in the Pacific (NCCP) initially an organisation of six universities and four research institutes concerned with telelearning at the international level. It envisaged the interlinking of national telelearning networks with international networks. We put this into effect by linking our national network with the University of Hawaii for audiographic seminars for a period of eight weeks and on one occasion we succeeded in linking all members of the NCCP together for an audioconference.

Student response was positive. They spoke of richness in the learning experience that came from looking at topics from many aspects and diverse cultures. Authorities from around the world would join in our teleseminars and there were two sets of students and teachers from different cultures.

The success of the cycle prompted the Telecommunications Corporation of New Zealand to develop a national telelearning network for any instructional system, private or public, training or education, kindergarten or university. This network today is operating successfully with IT enhancements as they become available. Another outcome was the adoption of the system by the Maori of New Zealand to link rural Maori communities for education and access to information and to link with indigenous peoples in other countries (Rajasingham, 1993). However, the new information technologies did not as yet seriously rival those of the classroom. The superhighways were not in place. The information society was still a vision. The technology was still in flux. We were only just beginning to address the question of multimedia and database access in education. To add to this new information technology was looming over the horizon which suggested a shift in the whole direction of education and that was virtual reality.

So we went back to the drawing board, and our focus in the next cycle was to design a system for the two-year Master of Communications degree that explores the possibilities of nascent Internet for international telelearning. At this point, we lost the support of Telecom New Zealand and
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Telecom Australia who believed that the Internet was not going anywhere, and saw their commercial potential eroded as voice over Internet protocol (VOIP) was beginning to emerge.

But we believed there had to be a more realistic and affordable option for education. We worked with Nobyoshi Terashima director of the Advanced Telecommunications Research Laboratories in Japan who had just moved to Waseda University Tokyo as Professor of Telecommunications on the design of a joint virtual teleseminar system between Waseda University and Victoria University for the year 2000.

The Internet subsumed email, audiographic conferencing and database activities in Virtual Reality Modelling Language (VRML) environments and our students were using ActiveWorlds currently exists as SecondLife an infinite virtual reality world where it is possible to visit as an avatar and interact with people from different parts of the world. No longer did the idea of the virtual class seem as alien, idiosyncratic or outlandish as it did 10 years before.

It became clear that education was more than an acquisition of cognitive skills, and the affective, socialising element was just as important in the learning process. In a videoconference, a group of New Zealand students and Japanese students joined in a seminar. To both groups of students and academics, their counterparts were virtual images on a video monitor. There was a 15 minute break and the videoconferencing link was left open for the students to interact informally from their own social realities. Suddenly, the communications changed. It seemed as though the video monitor had become a dormitory window through which the students were learning and chatting with frank curiosity. There seemed to be a clear desire for a technology that would allow learners to climb through that window and freely intermingle as full-bodied three-dimensional beings in lifesize space.

In 2003, students were given the choice of either attending classes at the University or from off-campus. While there was a preference to attend campus initially, after about a month, the preference appeared to shift to linking from off-campus.

It must be noted however, this only happened once students had met their peers physically, got used to their voices, body language and cultural protocols, and seating positions in the horseshoe-shaped classroom configuration. On becoming virtual students they indicated “a sense of liberation from the strains of three hour seminars within the constraints of a physical classroom…and the joys of interacting via the Internet where we can read the voices and body language of our peers even though we were not co-located” (Master of Communications students course evaluation, 2003). Urlich Bernath and Eugene Rubin record similar success in the Master of Distance Education jointly offered by Carl Ossietzky University of Oldenberg Germany and the University of Maryland University College.

Our research moved on to work on the HyperClass (HC), which is based on HyperReality (HR) a technological platform conceptualised by Nobiyoshi Terashima since 1996 as the intermeshing of physical reality and virtual reality, and further conceptualised by Tiffin and Rajasingham, and the use of artificial intelligence (AI) and human intelligence (HI) in a HC (Tiffin & Rajasingham, 2001).

**HYPERREALITY AND JUST-IN-TIME ARTIFICIALLY INTELLIGENT TEACHERS (JITAITS)**

We envisioned the time in the new decade when virtual reality gets out of the computer and becomes part of the physical reality around humans as books, telephones and radio did, and possibility that teaching could be done by intelligent agents in the form of avatars in a HyperClass (HC). We argued that the new academics could be an expert system, a just in time artificially intelligent teacher (JITAIT) in the mode of the Greek pedagogues,
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endlessly available to help individual students. This lead to the search for the HC. Its genesis was the world’s first HC in December 2000 held between Victoria University of Wellington, New Zealand, Waseda University, Japan and the Open Learning Network of Australia (Rajasingham, 2004). Here was a technology looking for an application, and we had an application looking for a technology where a class of students in one country teleconference with a class in another or several different countries as three-dimensional, as well as physical presences. Time was ripe for future research, but a lack of resources stalled further progress in New Zealand. HyperReality requires quantum computer capacity as well as full broadband, and is still being developed in the USA and Japan, while other similar applications that allow fully immersive learning environments are becoming available such as Croquet.

The HyperClass system is based on HyperReality and unlike systems based on transport does not recognise national boundaries and require no passports for entry. HyperReality permits the seamless interaction of VR with PR (Terashima, 2001) and Tiffin and Rajasingham researched the application of HI and AI for education. Jaron Lanier later developed a similar concept of intermeshing physical and virtual realities which he calls Tele-immersion (Lanier, 2001). However, he does not consider the interaction of artificial and human intelligence.

Even if it is more economic, the development of a virtual dimension to universities does not imply that they will cease to exist in physical reality, as students want some part of their education in physical reality to interact with teachers and peers. What we could be seeing is the development of a global/local hybrid university that exists in virtual and physical reality on the Internet and in buildings, serving global needs and local interests. HyperReality allows this duality.

Tiffin and Rajasingham (2001) coined the concept schemata: HyperClass, HyperSchool, HyperCollege and HyperUniversity to describe an educational environment in which physically real students, teachers and subject matter could seamlessly interact with virtual students, teachers and subject matter, and artificial and human intelligence could interact in the teaching/learning process. What makes this possible is a coaction field which “provides a common site for objects and inhabitants from physical reality and virtual reality and serves as a workplace or activity area within which they interact” (Terashima 2001, p. 9). Coaction takes place in the context of a specific domain of integrated knowledge. So a coaction field could be in specific subject domains such as Chinese literature, medicine, physics and so on, where who and what is real and who and what is virtual depends on the kind of perspective of self that exists in a telephone conversation, where communication exists in terms of voice only.

A HyperClass is a coaction field in which physically real students and teachers in a real classroom can synchronously interact in a joint learning activity that involves a clearly defined subject domain with virtual students and teachers in other classrooms in other universities in other countries, to reconcile learning that is local with teaching that is global. It can be conducted in more than one language and holds out the possibility of understanding a subject from the multiple perspectives of different cultures using text, aural and three-dimensional visual modes of communications providing a common field in order to understand the subject from multiple perspectives of other cultures than one’s own (Tiffin & Rajasingham, 2001, pp. 110-125; 2003).

Participants in a HC come together because of their shared interests in a specific subject domain. It is suggested therefore that the emergence of virtual universities in specific domains of study could emerge, fitting with Terashima’s definition of HyperWorlds as a technical environment where coaction between reality and virtual reality is based on a shared domain of knowledge (Tiffin & Rajasingham, 2001, p. 8). This will be in contrast to national universities that emphasise location.
In the HC, the relationship between knowledge and problem domains suggests another important contrast to conventional classroom processes. In a conventional classroom the application of knowledge to problems is expressed symbolically, through alphanumeric notation and two-dimensional still pictures. It can be argued that for hundreds of years educationalists have sought for more symbolic representation of reality in the classroom.

The interaction between the real and virtual in the HC is made possible where by using computers and telecommunications, 2D images of objects and people from one place can be reproduced seamlessly in 3D virtual reality at another, and the 3D images can be part of a physically real setting in such a way that physically real objects can interact synchronously with virtually real things. It allows people not present at an actual activity, such as a class to observe and engage in the activity as though they were actually present, and offer the experience of being in a place without actually being there. Real and virtual objects will be placed in the same ‘space’ (a database, or server) to create a HyperWorld of learning objects, where real and imaginary, real and artificial lifeforms, and real and artificial objects and settings can come together from different locations via the Internet in a common plane of activity in a coaction field. What holds a coaction field together is the domain of knowledge that is available to participants to carry out a common task, and each domain will require its own coaction field. Whereas in the virtual class, students interact with VR that is computer-generated (CGVR) and created externally by for example, IT designers and computer programmers, a strength of the HyperClass (HC) is that each participant or group of participants can create and model the objects of learning, and in a synchronous mode, collaboratively modify the 3D objects onscreen, allowing learners to interact and learn from their own cultural perspectives using text, oral/aural and visual modes of communication.

JITAITS

Vygotsky (1978) argues that when a learner finds that they cannot solve a problem by themselves a Zone of Proximal Development (ZPD) opens up. It is the role of the teacher to close that ZPD as quickly and effectively as possible, and hence the critical need to have interactive communication between student and teacher. However, Vygotsky did not envisage non-human teachers. Today human teachers can only respond immediately to a learner in working hours and in large classes student questions have to wait until a teacher is available. In higher education much learning is done asynchronously and students get feedback on an assignment a week or more after doing it. This is hardly an efficient way to close a ZPD. Most students have forgotten the things they found difficult. Therefore, it is time for the (JITAITS). As the name implies, this is an AI teacher that can be available whenever and wherever a student needs help (Tiffin & Rajasingham, 2003).

JITAITS are expert systems, effective where the domain of knowledge they address is restricted, paradigmatic and orientated toward problem solving. A JITAITS can, therefore, be an expert teacher on a subject that formed the domain knowledge of a coaction field in HR. JITAITS would always be ready to help any learner in the coaction field and would improve from each encounter with a learner, provided it received feedback from a human teacher. JITAITS could take over low-level repetitive student-teacher interactions, such as spelling and grammar checks that are today a standard component of computers, and frequently asked questions (FAQs).

JITAITS could also act as personal teachers to individual students. They could search for information, keep track of a student’s individual programme of study and help organise their learning activities. Interlinked intelligent agents that manage schedules, meetings, email and workflow, are already used in office systems. The web-based organisation of programmes of study that is taking
place in universities around the world provides a framework for such a development. JITAITs could have avatar form and a personality and act as a guide and mentor in the manner of the servant-tutor of ancient Greece, or the paper clip wizard that today pops up on the screen when not needed, or when needed is less than useful and more of an irritating distracter. But it does not mean that in future, these agents will not become more intuitive and intelligent.

Teaching has three hierarchical levels. The lower level activities consist of marking those parts of tests, exams and assignments that have set answers, collating marks, registering attendance and managing class schedules. Such automatic activities could be computerised to leave teachers to teach.

The middle level is that of tutoring. It is where teachers interact with students to guide their learning. It involves listening to students, understanding the difficulties they have in mastering a subject and its application, eliciting performance, explaining and demonstrating monitoring student practice, marking assignments, tests and exams where answers are open ended, providing detailed feedback and answering student questions. This takes up teaching time and keeps student-teacher ratios down because it involves one-on-one or small group communications, as much of the work at this level although often repetitive, needs human understanding. Each intake of students asks the same questions and has the same problems and wherever this is the case a JITAIT can be used. So the second level could be shared between human and AI tutors. As time went by and JITAITs handled more and more FAQs, their role would increase and the student-teacher ratio could be progressively increased without lowering standards.

The upper level of the hierarchy is that of the subject specialist, the professors and professionals who have achieved academic stature through research, publications and experience and can arbitrate on content. Their primary purpose is to communicate a synthesis of the subject matter in a way that brings it up-to-date, places it in context and encourages students to question. They do this by lecturing. In the US it is common in large universities to have such a person supported by a team of teaching assistants who do the tutoring, leaving the professor to lecture to very large classes. With e-learning they could stream their lectures to the whole world, and there need be no limits to the numbers who could attend. Instead of being salaried employees, professors who could attract such numbers would be valuable property. They could relate to their universities in the way authors relate to their publishers (Katz, 1999, p. 48) receiving royalties for each student taking their programme.

**CROQUET**

Another potentially useful application for a more responsive collaborative online global virtual university environment is Croquet developed by Julian Lombardi and his team. A multiuser three dimensional environment, Croquet is an ‘overlapping windows’ computer interface and represents the next step beyond today’s desktop computer interface, and unlike HR which is dependent on proprietary software, Croquet capitalises on open source programming language and advanced networking capabilities available in university campuses.

According to Lombardi, the aim is a learning environment for spontaneous interaction between cross-disciplinary and cross-institutional communities of practice. Within the Croquet environment faculty staff and students of the participating institutions will be visible to one another as digital avatars and be able to move quickly and seamlessly among multimedia learning resources including 3D models, whiteboards, webpages, video footage, flash animation, simulations, streaming video, television broadcasts and powerpoint presentations. As in a traditional face-to-face classroom learners will see one another ‘handling’ learning...
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objects and resources and support each other with realtime feedback www.opencroquet.org (Retrieved 14 February 2008).

LESSONS LEARNED

CODA

Two critical issues that determine the success of e-learning as a sustainable new paradigm of learning are costs and accreditation where knowledge that is taught is legitimised. Both these issues are well debated and documented in the literature, and are not addressed in this chapter in the interest of space restraints.

In our research projects we learned some valuable lessons. For successful learning, the most important aspect was dependable quality audio and audiographics tools. Video, the most expensive technological tool (and beyond the means of university budgets) proved the least effective and students noted that the professorial ‘talking head’ was a distracter.

The success of the virtual class was dependent on dedicated technological support. It was critical that the technological bridging of teachers and learners, and learners with learners was done as seamlessly as possible freeing the teacher to effect sound pedagogy. Our technician for 13 years consistently researched for off-the-shelf applications and ‘tweaked’ them to suit the instructors’ design and students’ needs. Using push to talk microphones in a dedicated laboratory, applications included V-Phone (with multipoint audio, video and textchat on a 28k modem) and NetMeeting with point to point synchronous audio and video interactions with multiple sites, but the technology subsequently went off the market.

As the nature of knowledge itself is changing, universities must be leaders in creating “…a fundamental shift or movement of mind” (Senge, 1995, p. 13). This means the need to look at what we teach, and how we teach.

The creation of knowledge, is the raison d’être of universities as institutions engaged in research. In these postmodern times, applied research with tangible measurable outputs funded by industry and hence tagged are favoured by cash-strapped modern universities over basic research as a process of enquiry and search for new knowledge with less tangible outcomes.

Because of commercial imperatives, user pays, and staff research outputs in Public Based Research Funding (PBRF) in New Zealand and the Research Assessment Exercise (RAE) in the UK to produce quality profiles for each submission of research activity made by universities to determine appropriate government funding. It can be argued that the quality of research is seriously compromised as staff scramble to get published in journals of varied quality which are proliferating, not as a public good to inform and educate, but for profit. Some journals even demand payment for publication. An increasing number require authors to transfer all copyright. To cite an anecdotal case, which apparently is becoming common practice, an author was told by the publisher of the book that any material that was subsequently developed such as a workbook based on the text would need copyright to be transferred to the publisher, with the prospect that the workbook would then be digitised and ‘onsold’ to a proprietary learning management system such as Blackboard, Lotus LearningSpace and so on, and the author loses all rights to their intellectual property.

As university research today is increasingly being commercialised, postgraduate students are a source of cheap labour for industry and business, and universities that are government subsidised can undercut research institutes. In a highly competitive environment where universities compete with each other for students, enrolment-based funding, and PBRF and government subsidies diminish, for universities short of resources external commercial funding of research becomes attractive. However, the more research is commercially funded, the more it ceases to be
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a public good, open to critique and scrutiny that legitimises research. Students face the pressures to get a degree, a meal ticket in the shortest possible time, and even PhD theses are now becoming formulaic, templated and narrowly focused that may not in the wider philosophy of rigorous research contribute to ‘world knowledge’.

These are some of the challenges of externalities for institutions on the cusp of the modern university and the e-learning virtual university on the Internet environment. However, universities are yet corralled by the administrative and management systems of the industrial university. Knowledge in the university resides in the library, heads of academics and in a course of study. In the first universities in Greece and India, people sought knowledge with the guidance of teachers. In the medieval theology-based university, knowledge was divine and ultimately unknowable and one tried to understand it with the help of teachers and books. In the modern university based on scientifc rationalism, knowledge becomes discoverable, quantifiable and formulaic and something that can be purchased or captured. The idea of ‘knowledge capture’ appears to have its roots in ‘expert systems’, computer programmes which can be used to respond to a domain of problems by mimicking human experts. Explicit knowledge in the form of texts, films, paintings or music manuscripts lends itself to be captured and managed as knowledge management courses and software. Where academics are engaged in the creation of new knowledge that is implicit as it gestates in their heads, it is proving to be fuzzier and more elusive than first imagined. Super expert knowledge machines are yet to emerge (Tiffin & Rajasingham, 2003).

Now we have the World Wide Web (WWW) the world’s largest library ever known, available to anyone with Internet access. With the advances in multimedia, VR, HR, AI and so on, the WWW has the potential to solve library access problems of the developed and developing world. However, the Web as a chaotic, if democratic tool has its own set of problems because it was not specifically designed to be a university library. It is growing into a vast, indiscriminate hypertextual dump that searching it and evaluating what is found becomes increasingly difficult. The Wikipedia adds to the difficulty of validating information. Herein lies a major challenge for teachers in a virtual university as they move from being sage on stage to becoming guides and information mappers in the learning process.

Processing and transmitting knowledge involves the teaching/learning axis, where from a neo-Vygotskyian perspective, teachers help learners to apply knowledge to problems in culturally appropriate ways. In the future, this process will take place on the Internet. In terms of the author’s university, the physical real estate is relatively luxurious. Staff offices, lecture theatres, library, gym, art galleries and many other facilities are well maintained and surpass those provided in many universities the author has worked in or visited. However, the technology for e-learning, technical support and staff development are lagging. The concept of dedicated technical staff for specific programmes is being discontinued as a cost-saving move, adding to the stresses faced by the fearless souls who teach online. By contrast, Wisconsin University Madison, for example provides 24/7 dedicated technical support.

Postgraduate classes catering for working adults are held after 5.30 pm. There is the legacy from the past that face-to-face is best and classes are held downtown although the main campus is only about five km from the city centre and is well served by public transport. Therefore, public spaces such as commercial buildings and the railway station have been converted into classrooms to accommodate the rise in student numbers who work within walking distance but with scant attention to the needs of e-learning and virtual classes. Poor room design, poor acoustics and lighting are the main problems. While the university in its strategic plans specify that e-learning is inevitable for survival in a competitive market,
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the prerequisites and resources needed are yet to be understood by university management.

Technology by definition tends to fail, sometimes quite often. The Internet goes down, outages occur, and upgrades and anti-virus applications are loaded onto computers in the lecture theatres after 5.00 p.m., which means that in a 2-hour class after 5.00 p.m. computers could shut down for up to 40 minutes. This is unacceptable for students online, and after complaints from teaching staff, this is now timetabled for after the last class at 9.30 pm. A record kept by the author for January 2007, showed that in a 12 week course, the technology was interrupted during nine sessions. There is a tendency amongst the management, teachers and course administrators under these circumstances to blame the technology.

The histories of the rise and falls of education television, programmed instruction (CAID, CAD, CAM) and other promising new applications of technology to education point out that the failures were due not to the inherent weaknesses or inadequacies in the technologies, but rather to the errors made by people and institutions in the process of attempting to implement innovations (Romiszowski, 2005). But if the causes of failure has more to do with the actions and decisions of people and organisations rather than the inherent limitations of technology and tools, then it is argued that these failures are avoidable if there is a will to invest in e-learning in a systemic and holistic manner.

Romiszowski (2005) notes that all not-for-profit universities in the US are confronting unexpected problems, such as dropping student enrolments and even “strikes” by the faculty. One contributing factor is that faculty have discovered that in order to provide a satisfactory learning experience, fully interactive group activity, and personal attention to individual students, they have to work much harder than they are accustomed to in the face-to-face course context. Tiffin and Rajasingham’s research indicated a 3-fold increase in time to design instruction for a one hour online course compared to a face-to-face course. So, either the teachers fail to incorporate instructional design principles, or to give the amount of attention that students expect which leads to reduced enrolments in future online courses, or they struggle with a huge workload for a semester or two and then decide to opt out, refusing to teach any more online courses — unless teaching workloads are reduced, salaries increased, instructional design training provided and appropriate resources such as technical and administrative support is available.

Another unexpected outcome at Victoria University of Wellington is that as in many universities worldwide, Blackboard is the prescribed LMS and all course outlines are required to use a template that specifies the objectives, desired learning outcome, readings, assignments, assessment criteria, mandatory course requirements, which include attending at least eight of the 12 week sessions and all tutorials. While lecture notes, powerpoints, course information and relevant URLs are posted on Blackboard, students assume that Blackboard provides total e-learning system, and attendance in classes across many subjects has dropped significantly. Class discussions, concepts theoretical framework acquisition, and questioning in the Socratic mode are being lost, lowering the quality of learning as a result.

CONCLUSION

As a contribution to the topic of this edited book, this chapter seeks to provide a pointer to some international research and projects currently taking place to understand why some e-learning and virtual class projects succeed, and why some do not. This chapter seeks to add to the discussion of critical issues that need to be addressed if e-learning is to constitute a sustainable new paradigm of learning for the global knowledge society, and is intended to provoke controversy, discussion and further research.
It is obvious that changes cannot be easily made within the framework of traditional degree courses and conventional teaching approaches. It is suggested that synchronous communication where teacher and learners are networked in face-to-face mode or through the HC, supplemented with asynchronous communications through social networks, blogs and the WWW resources offer optimum quality education where the teacher with human or artificial intelligence helps learner who may be real or virtual to apply knowledge to real life problems. And it will be hard to tell the difference. The big question for universities in the future will be who teaches what, to whom, in what mode and with what effect. This chapter seeks clues, but with a caveat. The findings maybe premature, because the merger of education and technology is a relatively recent and complex phenomenon. Bench marking best practice requires further research. Will e-learning provide a new university paradigm? While the jury is still deliberating, the main challenge for researchers will be to conduct enquiry in rapidly changing demographic and technological environments.

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Chapter II
Linking Self-Directed Lifelong Learning and E-Learning: Priorities for Institutions of Higher Education

Yukiko Inoue
University of Guam, Guam

ABSTRACT

An important task of higher education is to assist students in participating in an increasingly global economy. This global economy is transforming into a knowledge economy. Individuals need to develop the necessary competencies to be able to participate in a working life that is mainly based on knowledge productivity. The competencies include self-directed lifelong learning, in particular, through e-learning. E-learning refers to using electronic applications and processes to learn. Such applications and processes include Internet-based learning, virtual classrooms, and digital collaboration. The traditional classroom-based approaches to education will not provide the learning environment that is required for student-directed learning. The digital revolution makes new approaches to higher education — approaches which do foster lifelong learning — practical. The current chapter therefore examines the importance of linking e-learning to current knowledge in general, and to self-directed lifelong learning specifically. Higher education today must commit to new roles: providing educational communities such as virtual campuses; and increasing capacities to produce knowledge available to all.

INTRODUCTION

The advent of the personal computer, the Internet and the electronic delivery of information have transformed the world from a manufacturing, physically-based economy to an electronic, knowledge-based economy. Whereas the resources of the physically-based economy are coal, oil and steel, the resources of the new, the knowledge-based economy is brainpower and the ability to acquire, deliver, and process information effectively. (“The knowledge age”, 2005, p. 5)
Lifelong learning will be necessary to compete in the new economy. Learning is shifting from teacher-directed learning to student-directed learning (Mason, 2006), whereby learning is undertaken anytime and anywhere, from classrooms to homes and offices. The increasingly important role of information and communication technology or ICT (basically global networks of computers and other associated digital devices) is creating profound changes in institutions of higher education around the world. In the Government’s White Paper of the United Kingdom, titled 21st century skills, realising our potential, ICT-based literacy was acknowledged as a “skill for life,” along with good reading and mathematics skills (NIACE, n. d.). ICT makes new approaches to higher learning — approaches which do foster lifelong learning — practical.

Traditional classroom-based settings are inadequate for lifelong learning. Evolving ICT has made it possible to earn a degree from a major university without the need for a traditional classroom setting. ICT is making possible the development of virtual learning environments (VLEs), resulting in an emphasis on learning how to learn, and lifelong or perpetual learning.

Given the increasingly relationship between self-directed lifelong learning and e-learning, the current chapter has derived from the idea that the digital revolution and self-directed learning will jointly satisfy the needs of the “independent” adult learner. Main themes of the chapter are:

1. **Increasing importance of knowledge and information**: The economy is transforming into an electronic, knowledge-based economy with brainpower as its resource. Individuals and companies need to develop the necessary competencies to be able to participate in a working life that is mainly based on knowledge productivity.

2. **Increasing importance of e-learning for lifelong learners**: More flexible learning environments are increasing the emphases on learning how to learn, and on lifelong learning. E-learning — connecting learners without limitations of time or space — is more appropriate than traditional methods to fostering student-directed learning. E-learning is becoming a major vehicle for getting knowledge throughout life.

3. **An important role for higher education in applying ICT to lifelong learning**: The increased importance of ICT is transforming colleges and universities. Institutions of higher education have a new, unique, and valuable role in educating the populace to participate in an increasingly global economy. Higher education must commit to additional roles: making knowledge available to all; and applying ICT to self-directed lifelong learning.

4. **Increasing importance of VLE and virtual campuses**: Higher education can facilitate self-directed lifelong learning with mass-extended university outreach, educational technologies, virtual libraries, virtual campuses, and distance education. The Internet-based (or the Web-based) VLE will particularly gain increasing importance for academic education as well as for lifelong continuing adult education.

A paradigm shift is taking hold in higher education particularly, which includes the shift from institutions of instruction to institutions of learning, creating powerful learning environments, improving the quality of the exiting students, and viewing faculty as primarily designers of learning methods and environments (Goetz, 2004).

The current chapter is not specifically intended to generate practical advice for government policy makers, administrators or even for teachers, trainers or educators. Instead, it is hoped that the insights gained will be useful and practical to those grappling with the question of how best to incorporate ICT into educational plans and programmes undertaken by self-directed learners.
FOUR THEMES LINKING LIFELONG LEARNING AND E-LEARNING

The Knowledge Dominant Society

As the result of technological innovations (such as the Internet, video-conferencing, and satellite systems), a new economy (which began sometime between the 1970s and 1990s) has emerged driven by knowledge and information (“The knowledge age,” 2005). This new economy — which exists not only in the United States, but globally — has evolved from an industrial and manufacturing-based economy into a high technology-based economy. Candy (2004) describes the new economy as follows:

... a shift towards the development of a weightless economy, where a significant amount of economic activity is attributable to intangible, information-based activity. An increasing proportion of the workforce, especially in advanced industrialized countries, now works largely or exclusively with developing, transforming, storing, manipulating, combining, extracting, selling or otherwise dealing with information and, since an increasing share of that information now exists in digital form, it follows that a large proportion of world economic activity necessarily involves the use of digital technologies. (p. 183)

Knowledge and Information

As the industrial age gives away to the information age, there is already talk about a post-information age. They argue that changes on the Web will enable people to make that switch, that is, from the information age to the connected age: “The information age is the age of the knowledge worker. The connected age is the age of the Web worker. Knowledge workers create and manage information, massaging it into intangible knowledge goods. Web workers create and manage relationships across knowledge goods, hardware, and people” (Zelenka, 2007, p. 3).

Anyhow knowledge is becoming an ever more central force behind the competitive success of companies and even the survival of individual workers. Candy (2004) goes on to argue: “The present age is distinguished not only by this elevation of information and knowledge work, but also by the growing dependence on digital technologies which are increasingly ubiquitous” (p. 35).

Innovative technologies and business processes of today require the continuous acquisition of new knowledge and new skills to maintain high quality of productivity and efficiency. In the world where global competition places pressure on companies, productivity and efficiency are the key elements to the success of any company. In response, ICT has certainly become more ubiquitous. As the new economy increasingly requires people to learn new knowledge and new skills in a timely as well as in an effective manner, the advancement of computers and networking technologies is providing a diverse means to support human learning and cognition in a more personalised, flexible, portable, and on-demand manner (Zhang et al., 2004).

Because learning is a “process” that does not stop with a diploma through the traditional education, governments and companies are now forced to develop their human resources continuously (Hamburg & Lindecke, 2005). Although the foundations of knowledge, skills, attitudes, and values are laid during the school years, it is apparent that they are not once-and-for-all accomplishments, and moreover, that account must be taken of the needs of those who are beyond the age of schooling (Candy, 2004, p. 92). It may be that a four-year degree will be just a “prerequisite” to participating in the industries of the future.

Lifelong learning (referring to the activities people perform throughout their lives to enhance their knowledge, skills, and competence professionally, socially, and personally) needs to promote effective educational opportunities in the many learning settings through which people pass, including home, school, and work (Fischer,
1999). Lifelong learning embraces the idea that the “whole life is learning.” Motivation for, access to, and outcome of learning vary greatly according to the different circumstances in which people find themselves at any given stage (Schuller, 2004). The vital ingredient in lifelong learning is the motivation that drives the person to learn, and thus, the motivated person is a lifelong learner (Wang, n. d.). The concept of lifelong learning is rooted at that of adult education, then evolved to lifelong education and finally to lifelong learning (Wang, n. d.). Adults choose to continue their education, either formal or informal, for a variety of reasons. Adults would like to learn in order to improve their qualifications and to bring their skills up-to-date for a new line of work. Adults would also like to learn because of the rapidity and constancy of change in society and because of changes in lifestyles or value systems.

**Productive Lifelong Learning**

Lifelong learning is not limited to “reproductive” forms of learning but also includes “productive” activities. Learning-on-demand resulting from job-specifications and current tasks is the reproductive aspect of learning, whereas generative learning focuses on the productive aspects of active citizenship, participation in innovation, knowledge creation, and ongoing change (Allert et al., 2004). Lifelong learning (also not limited to professional development or vocational training but affects any aspect of life) needs to promote effective “educational” opportunities in the many learning and training settings through which individual workers pass, including home, school, and work (Fischer, 1999).

There is no shared understanding of the concept of lifelong learning at the global level. The economic interpretation of lifelong learning in the last ten years has become problematic for many practitioners, who substituted such terms as “Lifelong (L)earning” and “Learning to Earn” as their succinct criticism of the way the term is being promoted (Medel-Añonuevo, Ohsako, & Mauch, 2001). In many ways, a successful life, including income power, depends on what persons have learned and their understanding of the evolving world around them; moreover, persons must engage in continuous learning to remain relevant (Desikan et al., n. d.).

The term “lifelong learning” first appeared in the 1973 United Nations Educational, Scientific, and Cultural Organisation (UNESCO) Report of the International Commission on the Development of Education (Friesen & Anderson, 2004). Lifelong learning (defined in the 1973 report as a wide variety of types of learning opportunities shaped significantly by “learner-directed” requirements and contexts) has since played an important role in policy discussions as well as in studies of the sociology and economics of education. Nevertheless, as Friesen and Anderson note, the relationship of this term to the rapidly changing world of ICT has been considered much less frequently. The next section addresses this relationship.

In summary, the knowledge-based economy is characterised by businesses increasingly moving away from physical assets to knowledge assets. Lifelong learning — in the global knowledge-age economy — has become critical for companies’ survival and individuals’ capacities to adapt. It is important to enhance the knowledge environment so that it is conducive to more effective knowledge creation, transfer, and use.

**Fostering Self-Directed Lifelong Learning with ICT**

The key educational question is no longer how certain material can be taught as successfully as possible, but which learning methods or learning environments can best stimulate learning. Learner-directed learning encompasses a variety of meanings, ideas, and connotations (Alheit & Dausien, 2002). The knowledge age requires new methods for learning based on access at every time and from every place. And yet ICT innova-
tions present enormous challenges for institutions of higher learning to make sense of ICT and the options available (Garrison, 2000). Education via the Internet, networks, or stand-alone computers is known as e-learning: essentially the network-enabled transfer of skills and knowledge, and also a learning process created by interaction with digitally delivered content, service, and support. E-learning applications include: Internet-based learning; computer-based learning; virtual classrooms; and digital collaboration. E-learning is increasingly gaining importance for lifelong learning (Hutten, Stiegermaier, & Rauchegger, 2005). E-learning mediated by delivering education (1) provides learners with a flexible and personalised way to learn, (2) supports a “student-directed” approach to learning rather than a teacher-directed approach, and (3) facilitates choice and the use of a wide range of resources (Mason, 2006). E-learning has obvious disadvantages (e.g., the impersonal nature of learning; and technical problems including breakdown in multimedia software and insufficient processor speed), but has definitely advantages (e.g., flexibility in length and time of study; automated assessment and feedback, and discussion between remote users facilitating self-directed learning) (Medford, 2004).

**SELF-DIRECTED “E-LEARNING”**

Self-directed learning, self-monitoring, and self-management are essential to becoming a lifelong learner (Matuga, 2007). In self-directed learning, learners — setting learning goals and deciding what to learn and how to reach the goals — are responsible owners and managers of their own learning process (Wang, n.d.). Self-directed learning is likely to result in the development of critical thinking (Schneeweiss & Ratnapalan, 2007). Critical thinking skills are associated with solving real world problems, generating multiple solutions to a problem, drawing inferences, synthesising and integrating information, and estimating potential outcomes; yet such skills also refer to the process of evaluating the quality of one’s own learning (Lubensky, 2007).

An important principle of lifelong learning with ICT is the ability for self-direction (Flores & Flores, 2003). E-learning can empower the learner’s ownership in self-directed learning through five stages of an inquiry-based learning process: (1) Ask (learners articulate their own problems or questions); (2) Plan (learners design their problem-solving strategies within a certain time frame); (3) Explore (learners explore resources for solving problems using their background knowledge); (4) Construct (learners synthesise resources and provide solutions); and (5) Reflect (learners discuss the implications for further refinement) (Lim, 2004).

Self-directed learning with technologies can be summarised as follows (Candy, 2004):

- Self-directed learning occurs without the ideological or pedagogical overlay of teaching in formal education and training settings, and thus, provides a more direct route into understanding the actual dynamics of and relationships between learning and technologies.
- Self-directed learning is the prototype of all learning; since it has been extensively researched and documented in the pre-digital or offline world, it seems potentially fruitful to explore whether and how it has been affected by digital technologies.
- There is a close relationship between self-directed learning and that which occurs in formal education and training settings, in the sense that self-directed learning is often a precursor to, sometimes a consequence of, and increasingly accompanied by participation in formal courses of study; a relationship that seems likely to grow closer with the development and spread of digital technologies.
Since evidence suggests that at least some forms of self-directed learning are particularly suited to the online environment, and indeed many recent technological advances are precisely targeted at supporting independent learning and use, there is clearly merit in exploring the linkages at a practical as well as a conceptual level.

A great deal of learning about the uses and limitations of ICT is self-directed, with the result that it may be possible to gain some insight into why and how people learn about this increasingly important aspect of everyday life. (pp. 3-4)

Similarly, four implications can be explored when developing ICT networks for self-directed learners (Koper & Tattersall, 2004): (1) learners are responsible for their own learning process; (2) learners are typically engaged in a variety of formal and informal learning activities; (3) the door is opened to exploiting the heterogeneity of learners by setting up learning communities in which novices collaborate with more experienced people; and (4) it is necessary to maintain a record of an individual’s growth in competency in a persistent way to ensure that learners can search for new learning facilities that fit and extend their current knowledge and skills.

Access to electronic information is seen as an essential feature of self-directed e-learning. For the context of self-directed e-learning, six components are needed: (1) engaging with e-learning; (2) locating information and resources; (3) evaluating the quality of digital resources; (4) assimilating information; (5) re-conceptualising understandings; and (6) networking (Candy, 2004). Furthermore, in Candy’s words:

Given the relative ubiquity and interdependence of these two phenomena -- the digital revolution on the one hand and self-directed learning on the other -- one could be forgiven for assuming that the vision of the Learning Society is already at hand, and that no particular steps need to be taken either to encourage self-directed learning or to ensure the availability of digital technologies. (p. 20)

In summary, access to electronic information is indeed seen an essential feature of lifelong, learner-directed learning. Certainly self-directed “e-learning” is a well-suited system to reconcile the differing learner preferences; and such a system enjoys the benefits of access to a wealth of information via computers and the Internet (Desikan et al., n. d.).

NEW ROLES FOR INSTITUTIONS OF HIGHER EDUCATION

In the current age, there is a common global library where people can all go to do research, and there is a common global university where people can all go to take classes. ICT has accelerated globalisation so that increasingly people in both developed and undeveloped countries will agree that people now all live in one world (Stallings, 2001). Higher education now must be understood as a “globalising” process. This is because—derived from Cobb’s (1999) notion that an educated populace is a vital resource for national growth and developments—an important task of higher education is to assist students in participating in the global economy.

Higher Education and Adult Education

Frank H. T. Rhodes, president emeritus of Cornell University, has remarked: “The university is being forced to make choices regarding how to respond to globalisation, information technology, and the chance to serve a formidable array of new functions” (Johnson, 2002, p. 7). Rhodes illustrates four options: (1) universities will be privately supported and publicly accountable
Linking Self-Directed Lifelong Learning and E-Learning

(more than ever, universities will need to demonstrate the cost-effectiveness of their programmes); (2) universities will maintain their campus life while becoming more internationally oriented (as more graduates enter the dynamic working world of a global economy, universities will offer an international curriculum that emphasises global knowledge); (3) universities will be both technologically sophisticated and community dependent (developments in ICT may not only benefit teaching and learning on campus, but also bring electronic learning tools to the surrounding community); and (4) the successful university will focus on efficiency as well as quality (the idea that cost is no object in the pursuit of academic quality will change).

Over the past decades, adult education has emerged as an increasingly important component in national educational policy and planning; the 1980s and the 1990s were a period of rapid development in adult vocational education and as a result of the structural change in industry and the labour market, lifelong learning has become an important principle underpinning education policy (Ministry of Education Finland, 1999). Alheit and Dausien’s (2002) article (titled The double face of lifelong learning) focused on the tensions between two perspectives on lifelong learning: one is a reorganisation of the education system; and the other is an aspect of a phenomenology of lifelong learning. According to the article:

Since the 1960s, the first perspective has formed the basis for an international policy of lifelong learning…. The background to this approach is the diagnosis that a faster pace of social changes, structural changes, and transformations involving a greater role for civil society require competencies and flexibility on the part of society’s actors that can no longer be acquired at the speed and in institutionalized forms of traditional education and training …. The second perspective focuses, in the sense of a subject-centered science of education, on the learning processes of individual social actors. Here, the lifelong learning perspective has heightened attention for non-formal, informal, non-institutionalized and self-organized learning. (p. 5)

ICT, especially the Internet, is an indispensable tool or environment to enable higher and adult education to face its new practices and challenges (Motteram, 2005). Research shows the growing demand for distance and e-learning programmes as the main driving force for borderless education, emphasising a demand from a new group of learners (working adults who focus on “earning” and “learning” at the same time), for relevant, “just-in-time,” and flexible learning opportunities (Wende, 2002). Accommodating the fact that many of today’s mainstream students combine jobs with full or part-time study and family life, this explains that e-learning will become the dominant mode of higher education eventually (Calvert, 2005).

One challenge of institutions of higher education is that of adapting “student-centered” approaches to anytime, anywhere learning environments. Open and lifelong learning is a frontier created by e-learning communities. Due to the rapid development of the Internet-based technologies, increasing bandwidth, decreasing costs and widening access, online versions of distance learning programmes are becoming increasingly popular teaching strategies for higher education (Townsend & Wheeler, 2004). E-learning provides answers to both the problem of availability (accessibility and cost) and the demand for flexibility (time, place, and pace) of higher learning; technology-mediated learning and distance learning are becoming major vehicles for fulfilling the need for self-directed higher education (Beller, 1998).

SELF-LEARNER AND REFLECTION

Opportunities to explore self-directed learning within e-learning environments can only provide
insights into the most critical skills for lifelong learning: learning how to learn. Teachers should understand teaching how to learn, and learners have to understand learning how to learn (Nyunt, n. d.). The quality of the learning process is determined not by something that is delivered to a learner but by the quality of a process of co-production between the learner and the learning-environment (Ehlers, 2004). Teachers need a new method for working with students, understanding diversity, becoming technologically competent, realising that their “office” is open to the students all the time instead of during prescribed hours in the course syllabus, and expanding their horizons beyond a field of professional expertise (Stick & Ivankova, n. d.).

Research suggests that by having students learn through the experience of solving problems, they can learn both content and learning strategies. Problem-based learning (PBL) is an instructional method in which students learn through facilitated problem solving (Hmelo-Silver, 2004). The goals of PBL include helping students construct an extensive and flexible knowledge base, develop effective problem-solving skills, develop self-directed lifelong learning skills, become effective collaborators, and become intrinsically motivated to learn.

One critical element in the transformation of experience into self-directed learning is the process of reflection. A “portfolio” requires learners to reflect critically on the what’s, how’s, and why’s of their learning so that they may explain it to faculty evaluators (Brown, 2001). As Brown (2001) maintains, the portfolio can promote holistic learning by serving as a reflective bridge between the learner, the workplace, and the academy. Learning and knowledge acquisitions occur neither solely in the classroom nor exclusively in the world of life experience or the workplace. Holistic learning requires the integration of knowledge from multiple settings, and a belief that knowledge is forever changing and ongoing throughout one’s life. Learning from experience requires both reflection and reflexivity.

Electronic portfolios (e-portfolios) are popular now. An important direction for e-portfolios is that created with software tools found on computers or Web-based storage systems accompanied by data management systems that allow assessment of portfolio data (Gibson & Barrett, 2003). Such systems support consistent, secure storage, and aggregate reporting of assessment information. As Gibson and Barrett maintain, e-portfolios provide a powerful platform for linking with future learning; additional pages can be added, additional artifacts can be archived and linked, and the currently stored evidence of learning will provide a rich resource for reflection as the adult student’s learning journey continues. Future higher education will be increasingly paperless. Koepke (2000) predicts that in the future, all course materials, including course syllabi and teaching materials, will be included on a course Web page so that students can visit the Web site, which will become an “open” door to the classroom; right now, professors try to create a sense of community in the classroom; but in the future, the Web site will also create a sense of community among class members.

In summary, a decrease in importance of the campus, as students “login” from a distance to access “courseware,” new media technologies (replacing traditional lectures) courses being delivered and assessed over the Internet promise to make higher education available anywhere and at anytime. More flexible learning environments are increasing the emphases on learning how to learn, and on lifelong learning. Higher education can help students to become lifelong learners, emphasising that educational or learning opportunities are available throughout the individuals’ lives, and recognising the startling growth of new technologies and the popularity of open and lifelong learning delivery approaches (Dodds, 2003).
VIRTUAL CAMPUSES AND E-LEARNING

Higher education today must combine its traditional roles of extending the boundaries of knowledge and passing on that knowledge to students with a commitment to make higher education available to all through massively extended university outreach and the provision of opportunities for mass higher education through using media, educational technologies, virtual libraries, online distance education, and virtual campuses (Dodds, 2003).

Using high speed networks over fiber optic or satellite connections to access large electronic libraries and databases provide the basis for a learning revolution in higher and adult continuing education (Coombs, n.d.): “Combining these resources with a personal computer gives students access to vast amounts of information and will move the locus of power from the teacher to the learner. Computer communications connecting personal computers to mainframe servers via data networks can create highly interactive educational settings” (p. 1).

In 1993, Howard Rheingold, a freelance journalist, defined a new form of technologically enabled social life, marking the entry of the term “virtual community” into public use (Turner, 2005). Since the book appeared, as Turner further states, the Internet and Web have swung into public view, and then Rheingold’s notion of virtual community has become a touchstone for studies of the social implications of computer networking: “virtual community offers a venue in which members of multiple geographically dispersed groups could communicate with one another and in doing so come to see themselves as members of a single social network” (p. 489).

Virtual Teaching and Learning

In the past, virtual teaching was carried out by posting text books to students who read them and sent back assignments to be marked via correspondence (also called correspondence teaching or a correspondence university) (Bacsich, 2004). The paradigm of mostly correspondence and print (with perhaps a little TV) lasted many years, but from the early 1990s, under the impact of ICT (the Internet and Web specifically), a new paradigm has emerged. Increasingly people use the term “e-university” (also called “online university”) for virtual teaching. The truly transformative potential of computers and communication technologies for learning derives not only from the access that it provides to unprecedented treasuries of electronic resources, but also from its capacity to create virtual teaching and learning communities (Candy, 2004).

The concept of virtual communities with the increasing use of ICT has resulted in a radical change to learning communities. The Web-based VLE (which essentially parallels distance learning concepts such as distributed learning environments, and e-learning) will gain increasing importance for academic education as well as for lifelong continuing adult education (Hutten, Stiegmaier, & Rauchegger, 2005). E-learning allows participants in higher education — taking online courses distributed by VLE — to collapse ‘time’ and ‘space’ (Keller, 2005).

ICT has made possible the development of online resource-based packages and forms of VLE, leading to the creation of virtual learning campuses, for instance. As Anderson (n.d.) notes, advantages of virtual learning campuses include: students can learn at their own pace and can work to the best of their ability; and the VLE opens up access to a broad range of information. Disadvantages include: if students are not willing to perform to the best of their ability, they will not benefit from the VLE; and technical problems will affect the VLE’s ability to perform well.

VLE and Virtual Campuses

VLE — the mechanism and the maintenance of virtual campuses — creates an entirely new form
of knowledge delivery. Virtual campuses indicate a specific format of distance and e-learning programmes in which students, teaching staff, and even university administrative and technical staff mainly meet or communicate through technological links; and the following are deployed activities ("Typology of virtual," n. d.): virtual class (teaching and learning in a virtual environment for campus based students and/or distance learners); virtual university (includes student registration, student and staff administration, and eventually examination and accreditation); and virtual campus (includes virtual classes, but also research communication and collaboration as well as scientific services to the society at large).

The terms “virtual campuses” refers to the online offerings of a college or university where coursework is completed either partially or wholly online. Virtual campuses are committed to increasing learning opportunities for adults who need training or education for many reasons. Virtual campuses give further special attention to the contribution of ICT to learning, especially for those who — due to their geographical location, socio-economic situation, or special needs — do not have easy access to traditional educational settings. Resources of virtual campuses are located in different areas of cyberspace, and are two-fold: (1) online sources of information including texts, video and audio documents, bibliographies, databases, and real-time measurements; and (2) media for interacting with other members of the virtual campus such as instructors, students, and administrators (Dillenbourg et al., 1999). Virtual campuses challenge the traditional notions of academic work: learners are no longer seen as passive but active; instructors need to change their conception of teaching to be able to design effective learning experiences for their students in the virtual campus (Rickards, 2000).

Frequently used attributes for describing “virtuality” are place and time (thus two dimensions of virtuality). Some courses require students to be available at scheduled times to interact with the instructor and/or each other and such courses might be called sametime courses, whereas any-time courses have no requirement for sametime interaction among participants (Graves, 2000).

Thinking of the “place-time” characteristics in terms of the services they enable, Graves developed the generalised place-time rankings of technologies and explained:

... the rankings in the figure would reflect the way that many service receivers would rank services in a myriad of different contexts in which browser-accessible, the virtual (anyplace-anytime) delivery of many services (including learning services) is available in competition with more traditional place-time service configurations. That is why the Internet revolution is so powerful. (p. 4)

The Internet is opening the education market, creating an increasingly competitive educational landscape; and as Graves argues, both individuals and organisations seeking access to education would assign “four stars” to the convenience value of anyplace-anytime courses and programmes.

LEARNING MANAGEMENT SYSTEMS

VLE is a computer software programme designed to help instructors by facilitating the management of educational courses by tracking the student progress which, in turn, to facilitate computerised learning. The computer programme is also called: learning management system (LMS); course management system (CMS); learning content management system (LCMS); managed learning environment (MLE); learning support system (LSS); and learning platform (LP) ("Virtual learning environment," 2007). A VLE or CMS is often considered as being the starting point of any distance and e-learning programme (Cavus et al., 2005). A CMS has the unique capacity to capture significant amounts of information about
how students use the system, how they access online activities, and how they interact with other students in synchronous and asynchronous modes (Ullman et al., 2005).

The rising costs of education lead to the call for a change from the traditional, space-and-time bound institutions to ones that offer increasingly cost-effective, technologically enhanced programmes; as institutions of higher education turn to technology to address these challenges, the use of “open source” CMS is dramatically increasing (Minielli & Ferris, 2005). Some of the best known commercially available CMS systems are Blackboard, WebCT, and Desire2Learn. There are also many open source software and free CMS systems such as Moodle, Segue, Interact, CourseWork, Atutor, and KEWL (Cavus et al., 2005). The terms free software and open source software are “sometimes used interchangeably in the discussion of software…but free software is not ‘free’ as ‘free’ in the monetary sense, but users of the software should have the freedom to run, modify, adapt, customise, and share without charge” (Kennedy, 2005, p. 327).

Blackboard (a commercial product produced by Blackboard Inc.) is a mature CMS with a large number of features that support learning and the most dominant CMS provider, whereas Moodle (modular object-oriented dynamic learning environment) was developed as an educationally sound alternative to Blackboard by Martin Dougiamas of Curtin University and released in 2002 (Corich, 2005). According to Corich, the majority of early e-learning adopters in New Zealand decided to use mature CMSs like Blackboard and WebCT, but more recently, there are a growing number of the institutes looking towards Moodle. Compared with Blackboard, in Corich’s (2005) study, students found Moodle easy to use and appreciated the way that Moodle presented materials week by week. Moodle has a very large user base with 12,165 registered sites in 155 countries with 4,021,531 users as of May, 2006 (“Moodle,” 2006).

### Effective E-Learning

Learning via the Internet-based VLE demands self-discipline; students have to explore interactive links, and work through material by clicking, selecting, and entering. The following are the key characteristics of effective computer-based learning (Smothers et al., 2004): Visual (the Web is a largely visual medium and e-learning should use images, video, and audio, rather than simply text, for learners); Concise (written information that is part of e-learning should be concise and to the point); Interactive (learners can interact with courseware through quizzes and multimedia activities that let them practice, demonstrate knowledge, and discover relationships and new information); Engaging (use case-based learning and scenarios that get the learner to analyse and synthesise information and put it within a frame of reference); Relevant (e-learning should address a learner’s current needs and developers must maintain the accuracy of the content); Feasible (make sure that the technologies chosen for enabling e-learning are feasible for learners); and Empowering (provide access to additional resources so that the self-directed learners can explore content relevant to their interest).

In summary, VLE creates into open spaces of learning so that the work of the teacher changes radically; and the student should be able not only to learn new knowledge but also to learn how to learn. Virtual campuses provide learning opportunities with a variety of non-traditional ways for individuals to access education. E-learning is a means that allow the process of learning without necessarily coinciding in space and time. VLE and CMS provide learners with a flexible and personalised way to learn, and is having a widespread impact on learning.

### FUTURE TRENDS IN E-LEARNING

A survey of higher education in the United States reported that more than 2.35 million students
enrolled in online courses in fall 2004; given the rapid growth of online education and its importance for postsecondary institutions, it is imperative that institutions of higher education provide quality e-learning programmes: “Faculty training and support is another critical component of quality online education… instructors play a different role from that of traditional classroom instructors when they teach online courses, as well as when they teach residential courses with Web enhancements” (Kim & Bonk, 2007, p. 2). Leadership from the institution is crucial for faculty to receive adequate support to implement changes in the teaching process. Online education is becoming an important long-term strategy for many postsecondary institutions.

To explore future trends of online education, Kim and Bonk (2007) conducted an online survey. The survey participants were college instructors and administrators who were members of either the Multimedia Educational Resource for Learning and Online Teaching (MERLOT) or the Western Cooperative for Educational Telecommunications (WCET). Of more than 12,000 who received the email request, 562 completed the survey. Over half of the survey respondents predicted that online collaboration, case-based learning, and PBL would be the preferred instructional methods for online instructors in the coming decade. In contrast, few respondents expected that instructors would rely on lectures, modeling, or Socratic instruction for their online teaching in the future. In other words, survey respondents predicted that more learner-centered techniques would be used in the future, indicating a marked shift from traditional teacher-directed approaches. Furthermore, it should be emphasised that most respondents agreed that “blended learning” would have greater significance in higher education in the future.

The term blended learning is being used with increased frequency in both academic and corporate circles (Graham, 2004). In 2003, the American Society for Training and Development identified blended learning as one of the top ten trends to emerge in the knowledge delivery industry (Rooney, 2003, p. 1). What is being blended? Graham (2004) has identified three most commonly documented definitions: (1) combining instructional modalities (or delivery media); (2) combining instructional methods; and (3) combining online and face-to-face instruction. The first two positions reflect the debate on the influences of media versus method on learning, whereas the third position more accurately reflects the historical emergence of blended learning systems. Blended learning emphasises a central role of computer-based technologies. Blended learning (which is e-learning combined with other training methods) will perhaps be a more significant growth area than fully e-learning. Further studies should focus on aspects of blended learning that institutions of higher education need to address. Such aspects include: types of blended learning; activities that lead to success in blended-learning; and instructor training for blended-learning situations. To enhance and maintain high quality blended instructional practices, it is essential for instructors to develop and implement specific assessments to evaluate the effectiveness of the teaching-learning process within e-learning environments. For example, future studies should examine actual student performance with concrete learning tasks — not perceptions or preferences — in order to see whether these are consistent with teaching and learning effectiveness in the use of course management tools.

CONCLUSION

Administrators and faculty of higher education are expected to adjust to new paradigms of e-learning: “A misperception of the role of technology in instruction, regarding it as a ‘teaching method’ rather than a delivery tool, will continue to thwart effective technology use: faculty need to engage their creative abilities for distance learning situations” (Travis & Price, 2005, p. 99).
Four main themes of this chapter are: (1) knowledge is becoming ever more central to competing and surviving; (2) self-directed lifelong learning is more important now than every before; (3) ICT is more appropriate than traditional classroom methods to fostering self-directed lifelong learning; and (4) universities have a new, unique, and valuable role in applying ICT to self-directed lifelong learning. The evidence for the themes is summarised as follows:

• The global economy is transforming into a knowledge economy. Knowledge growth is defined by the humane uses of knowledge; and a society's wealth is determined by its educational capacity.

• More flexible learning increases the emphasis on learning how to learn, and on lifelong learning. E-learning is becoming a major vehicle for getting knowledge throughout life.

• ICT is better suited to fostering self-directed lifelong learning than traditional classroom-based settings are. ICT connects people without limitations of time or space.

• The increased importance of VLE and virtual campuses is already transforming universities, and thus, learning through virtual campuses will gain increasing importance for academic education and lifelong continuing adult education.

Finally, the confluence of the need for continuous learning and unprecedented technological innovation in communications has pushed e-learning to the forefront of the higher education curriculum and instruction. Providing an environment that supports and enhances the quality of independent lifelong learning is the common goal addressed by e-learning in any institution.

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Chapter III
The Online Seminar as Enacted Practice

Lars-Erik Jonsson
University of Gothenburg, Sweden

Roger Säljö
University of Gothenburg, Sweden

ABSTRACT

The academic seminar can be seen as the core of university culture. In a seminar, claims to knowledge – presented in an essay and/or orally – are critically scrutinised and subjected to further articulation. The point of this chapter is to report on attempts to develop critical features of seminar culture in the online context. The basic premise is that participation in seminar activities has to be learned through experience. For the participant with little prior experience of online textual discussions, the online seminar introduces an unfamiliar learning situation in which organisational as well as cognitive and communicative issues must be attended to explicitly. In order to illustrate the attempts to socialise students into this kind of discourse communities, we use a Masters course for mature students as a case. It is pointed out that students must be involved in the activities of establishing a community with rapport between members and with an understanding of how to conduct the interaction. By giving the students responsibility for solving a range of practical problems and letting them help each other, we induce them into the status of legitimate online participants. Several issues are important to attend to in the building of such collaboration such as balancing increasing independence of students with a clear leadership and focus of the activities. It is argued that the face-to-face seminar and the online seminar may fulfil complementary roles, but in both cases learning how to contribute is essential.
The Online Seminar as Enacted Practice

INTRODUCTION

A prominent feature of university culture is the development of knowledge in collaboration with others. The most significant context for this is, has been and will continue to be, the academic seminar, which in its institutional form dates back to Antiquity. In the seminar, the participants present and scrutinise ideas, arguments and claims regarding the state of knowledge in some field. Through focussed discussions the validity and legitimacy of what is argued are subjected to public and critical scrutiny. In its traditional institutional form, the seminar is an oral event where participants contribute and react *in situ* to the contributions of others. Often the seminar discussion is based on a written document or essay, where the argumentation is presented. In a profound sense, this mode of presenting and debating claims to knowledge may be seen as the core of the concept of knowledge in a democratic and open society.

Traditionally the participants in a seminar have met in a seminar room under the leadership of a professor or lecturer acting as moderator. In cases where the seminar also includes formal examination of the text/essay presented, the moderator might require at least some contribution from each participant; active participation is often a formal requirement for passing a course. Even though seminars constitute the core of what learning in a university should be like, it is important not be naïve about the state of seminar culture in many contexts. For instance, in times of mass-education limited resources make it difficult, sometimes impossible, to develop and maintain the quality of seminar culture. There are not enough qualified teachers or enough time for such activities. On many occasions the participants, students and scholars, either have not read what is required, or they attend just to listen to an interesting discussion without necessarily intending to contribute in an active manner.

Online academic seminars may be seen as a new institutional, communicative and technical context for continuing this long tradition of formulating and critically scrutinising knowledge. The new format introduces new premises for communicating, and it offers some positive features as well as some potential hazards to learning. In our Masters courses at the IT University of Gothenburg, we have attempted to develop attitudes and skills to learning that build on the traditions of the academic seminar, but which take into account the new circumstances.

The purpose of this chapter is to outline the characteristics of the online seminar in order to give an account of the genesis and development of online discussions under the specific conditions of mandatory participation, and where the outcome of the activities is a grade for the participant. We will discuss some findings about how online seminars function in comparison to the traditional (f2f) seminar. More specifically, we will discuss the following issues: how rapport is established, what instructions are given to participants, how instructions are interpreted and put into practice, and how productive discussions may be sustained. These aspects concern the structural features of online discussions. There are also cognitive features of online seminars to pay attention to. The crucial issues here are how the participants understand the issues under discussion, and how their insights develop during the time they participate.

By mapping the specific features, structural (low level issues) and cognitive (high level issues), of the online seminar, we will discuss what the advantages are, what might be problematic, and what might be common to the two kinds of contexts for seminar work.

BACKGROUND

Modern information technology allows for running distance courses fully online (Bates,
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This implies that all activities take place in a virtual space. Accordingly, it is possible to interact with participants without being limited by physical distance. It also makes possible interaction among participants in a way which differs from past technologies, such as regular mail and, later on, email. Even if email can be considered a modern and valuable IT facility, the habit of sending a message to a particular recipient is not the same as posting an entry in a forum where it can be read and responded to by many fellow students.

Even if the online seminar shares many characteristics with f2f seminars, it also, in our experiences, has some advantages. In a virtual seminar you can attract students from almost anywhere in the world, and they are free (within limits) to participate at times that are most convenient for each individual. Elements of such flexibility can of course be found in traditional distance courses, where material is sent between tutors and participants either by regular mail or by email, but seminars in learning management systems (LMS) still offer different conditions for communication, for instance through the public nature of the manner in which comments and critical points are visible.

Given that there are similarities, the crucial difference between traditional distance education (Moore & Kearsley, 2005) and modern e-learning (Guri-Rosenblit, 2005) is the possibility to connect all participants, students as well as tutors, in a network which allows for communication between all parties, i.e., the students can, and are required to, interact with each other. Another difference, which is also an obvious advantage, is that seminar entries, comments and all kinds of feedback, can be made available to all participants even prior to the time scheduled for discussion, and they are also available afterwards for further reflection. What might appeal particularly to tutors is that all participants have to contribute in order to attain the status of being participants. Compared to the traditional seminar, in which participants may attend with little or no prior preparation, the online seminar, with written contributions, requires that all participants be prepared and ready to contribute. They must expose themselves and their ideas through written texts, and they do this with the awareness that their contribution will not only be read but also uploaded and saved by fellow students.

From an empirical point of view, and to be balanced, online text-based discussions are of course not without problems. For the participant with little prior experience from online as well as written discussions, the virtual seminar may be perceived as a stressful situation. Wegerif (1998) interviewed participants in text-based discussions and found, not surprisingly, that some felt they could not express themselves as well as many others in the forum. They also experienced problems with an apparent lack of equality of attention to postings and with the sheer quantity of contributions from some students.

What can be considered as both positive and negative is that interaction among participants, and also between participants and tutors, tends to increase. This element of the progressive elimination of communication barriers between students and tutors is generally considered valuable in modern education, but the flipside of the coin is that students tend to require from tutors that they are constantly available for feedback. So, time and space constraints of f2f seminars naturally regulate what is not always easily regulated in the dynamics of online seminars.

The Idea of Learning Together

Theoretically the idea of learning together with others can be justified through the Vygotskian concept of “the zone of proximal development”, which briefly says that when individuals with different experiences and capabilities engage in some shared activity, they are given the opportunity to learn from each other. In Vygotsky’s (1978) view, it is in collaboration with “more
capable peers” that the opportunities for learning appear. Accordingly, the individual, but also the entire group, benefit from learning together and through engaging in practices of “inter-thinking” (Mercer, 2000).

Support for the online work in groups can also be found in Wenger’s theory of “communities of practice” (1998). Wenger claims that learning is based on participation in a community of people, who have something in common. More specifically, he argues that when individuals have a “mutual engagement”, a “shared repertoire”, and a “joint enterprise”, they will constitute a community of practice. In Wenger’s terminology, learning can be viewed as a gradually increasing capacity to participate in such a community and to share its skills and insights. Learning conceptualised in this way contrasts with a traditional view in which learning is seen in terms of memorising information.

Wenger’s concept is also interesting in the context of online seminars, since it focuses on what the participants are engaged in. To be a competent participant in a community of practice, one has to participate and contribute. Without contributing, the participant is simply not there at all, and this is one of the obvious differences between online and f2f seminars.

The core of “learning” in Wengerian terms implies becoming an increasingly central participant in the community. One analytical concept describing the initial stage of the process of becoming a competent participant was originally termed by Lave and Wenger (1991) as “legitimate peripheral participation.” Using this concept in our setting implies that legitimate participants (in the online seminar) through participation (contributing through seminar entries) gradually change their status from being peripheral to becoming more central and visible. Thus, learning in Wengerian terminology is not just a matter of mental storage and the adding on of new intellectual capacities; it is more like changing one’s identity; a process of becoming. This implies a recognition of the fact that participation also has much to do with issues of the quality contributions to collective practices. The participant is not just capable of delivering a certain number of written entries to satisfy course requirements, but s/he also learns, or appropriates, how and what to discuss in the community.

A similar way of understanding participation in online education is described by McConnell (2006) in his book “E-learning groups and communities.” From the very beginning of a Masters course, McConnell initiates the idea of working in groups, “learning sets”, where participants are encouraged to develop trust and openness. What is particularly interesting in McConnell’s approach is how he finds it necessary to delegate, or rather share, his authority as a tutor with the participants. Actually, he becomes more like a co-participant than an arbiter in the learning sets. As a consequence of the divided responsibility for what is going on, McConnell also shares the responsibility for assessment by using “peer assessment.” This is of course an extremely interesting development in which learning in online seminars may acquire some of the qualities of genuine scientific communication, where peer review is the accepted procedure for evaluation.

Quality of E-Learning

An issue that is often discussed in the context of e-learning concerns quality. The implicit question is: Is it just as good as “real” teaching, or is it more of an “Ersatz” activity? In our opinion, such questions are too general to be answered in a meaningful way.

Another issue when discussing education today concerns authenticity. Modern information technology, which allows for courses to be held fully online, blurs the sharp distinction between what is didactically laid out with predefined readings and assignments to be handed in to the tutor, and more spontaneous elements of collaborative learning activities in groups and communities in
which the tutor is more like a co-participant (McConnell, 2006). Authenticity is also a key concept in our course literature. In his book “Reality by Design” Petraglia (1998) claims that authenticity, as we use the concept in everyday language, is ill-defined. In his view, authenticity is a question of how various actors experience authenticity and not necessarily an absolute quality of the kind of activities people engage in.

The concept of authenticity is relevant for our account of the virtual seminar as well, and we are interested to see if, and how, the participants make the online activities into authentic learning situations in the Petraglian sense. From a didactic point of view this would – somewhat paradoxically – mean that the students involve themselves in authentic knowledge seeking activities that go beyond completing the mandatory assignments in order to obtain a pass.

As researchers in the field of learning, communication, and IT (which by the way is the name of the Masters course in question), we would not be satisfied with an explanation asserting that an online seminar is a way of doing what we have always done, except for the fact that students are working in a new environment. Even if the online seminar has many features in common with the traditional seminar, we believe that one generally tends to underestimate that participants must be socialised into learning how to act in online discussions (cf. Wegerif). People are not born with these kinds of insights, nor have they necessarily acquired them in their previous studies. Therefore, we should ask ourselves: How do people learn to become participants in such academic discussions, and how do they reflect on this way of discussing?

With such questions in mind, it is interesting to look for comments by participants in our courses on how they are socialised into academic communication and its particular rules of meaning-making. When and how do participants reflect, and perhaps meta-comment, on their experiences? As a basis for our continued attempts to develop a seminar culture in the mediated setting, we searched for such comments and reflections on how students perceive the process of becoming a seminar participant.

LEARNING HOW TO DO ONLINE SEMINARS: THE CASE OF THE IT UNIVERSITY OF GOTHENBURG

As evidence of insiders’ views of discussing online, we will take examples from the introductory course at the Masters level, “Introduction to learning, communication and IT.”

The Masters course attracts full-time working students with prior academic experiences. In most cases, though, the students have very little, or no, prior experience with online seminars. The programme consists of a set of mandatory (and lately also elective) courses and a final Masters project, which includes a written thesis. The online seminars to be treated in this chapter take place during the coursework, where literature is read and then discussed online. The observations that will be used to illustrate what has been described previously have been collected from archived sessions that we categorise as “seminar discussions.”

Introducing the Novice Student

We inform the students enrolled by regular mail that they are expected to attend an introductory meeting at the IT University, and since the students all live in Sweden within a radius of some 500 kilometres, it will be possible for them to attend the introductory meeting. Apart from practical matters, such as how to find the way there and the programme for the introductory meeting, we emphasise the necessity of regular online participation and provide some details about the software needed. Initially we also point out that part-time (50% of full-time) study requires the allocation of about 20 hours a week for the stud-
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ies. We also mention in a few sentences that the pedagogical arrangement with online discussions requires them to align with the timetable to make possible participation in online discussions, since the number of participants is relatively small. Each cohort of students numbers between 8 and 15. During the introduction, we present our LMS and the “study guide”, where background assumptions as well as a detailed outline of the course are presented. Usually we also manage to present an interesting lecture on a relevant topic to the students.

For the account presented in this chapter as an illustration of how online seminars are practiced, we have picked out one section of the introductory course which is built around Joseph Petraglia’s book “Reality by Design”. The study guide introduces this book as follows (our translation):

“In the second thematic part of the course you will study Reality by Design by Joseph Petraglia. A central theme in Petraglia’s book concerns the concept of authenticity, and how it has been applied in discussions of learning. In this part of the course you should:

- Use the introductions to Petraglia’s book supplied in the LMS
- Read the entire book
- Write a seminar entry based on your reading of the book
- Discuss the contributions published by the other participants in your group. The group moderator surveys the contributions and sees to it that a meaningful discussion is initiated
- Each participant is required to respond to each seminar entry in the group on at least one occasion.”

A seminar entry should not be too long; we usually recommend the equivalent of about two printed pages to encourage succinctness and not to deter readers from thorough reading. Furthermore, the entry should not just summarise the content of what has been read. Rather, it should focus on some issue or make a claim, which can be pursued in an interesting discussion. Thus, this is one element of trying to induct students into an online seminar culture: learning how to make a claim of a relevant kind that can serve as a productive trigger for seminar discussions.

Since we considered “Reality by Design” a quite demanding book, we did not quite trust that the students would be able to digest it without some assistance. The difficulty of the substance of the book must also be seen in the context of the fact that it is in English, which will cause difficulties for some of students. Even though they will be quite proficient in English, this genre of text is challenging. Therefore, the course tutor had produced an eight-page guide for the students. The guide is written in Swedish, which is the native language of most participants. Support for the studying of this thematic area is also given in the introductory part of the course, where some researchers belonging to our university discuss various ways of conceptualising learning in video clips.

Initial Confusion and Organisational Issues

If we turn our attention to the start of the course, there are often many general questions raised. One of the very first questions in the forum read:

Am I in the right course? It’s the same every time I start a new course! (Aug 30)

The course management might find it quite obvious how to find a course and how to navigate there, but for the new participant the technological setting may pose problems, which are not simplified by the fact that feedback is normally delayed. Joining an online seminar is evidently different from knocking on a classroom door to check out who is in there.
Normally we do not supply the course literature because the number of participants is relatively small, but also because they are geographically spread out which makes it impractical to use local bookstores. Instead we take it for granted that this matter will be solved through individual initiatives. However, not all students are familiar with buying literature online, and many need guidance. A dialogue in the online forum between some students and the tutor illustrates the problem:

Hi, someone who knows where to buy the book? I was in Stockholm last week and tried to buy it at the [bookseller]. It didn’t work! Someone who knows of an Internet store which can deliver quickly? (Oct 1)

Hi, [name] have you checked out the [name].com? (Oct 1)

Hi [name] and all others (tutor enters the discussion) I found the book for 290 SEK on the [another bookseller].com today! (Oct 5)

The aforementioned examples may seem trivial, but they illustrate issues that have to be taken care of in order to establish a seminar activity. For the tutor practical matters as those mentioned previously can take a lot of time. So, even if we take pains to be very explicit in the study guide, there are always practical matters of this kind to attend to. What we consider important, though, is that the participants attempt to solve practical matters, preferably in cooperation with fellow students. For this reason, it is important that the tutor strikes a balance between being willing to help and letting the students help each other. An example of how students can handle practical matters is demonstrated by the participant who helps a fellow participant who cannot find out how to upload a written contribution:

Where and how can I upload what I want to write in its proper place? It takes all my time to worry about this? (Sep 14)

I think you should stop worrying. We will solve this together. To the left you have the folder [for the particular theme] in it you will find the group folders. I have seen the grouping of the students and you belong to group E. In that folder you should publish your contributions and then react to the others’ contributions. (Sep 14)

It is interesting to note that the student asks the question to the shared forum and not to the tutor, which had been more likely had we not been online in a shared space. Another kind of responsibility for the common activities is demonstrated by the participant who asks:

According to the time table it’s getting near to the time when we should upload our seminar entry. I can’t find any folders for the groups to upload the documents. Are we supposed to create the folders ourselves? (Sep 27)

Obviously the folder is missing. In this case, the tutor deliberately encouraged the participant to take care of creating the folder so that the uploading could start. It seems to be a feature of online learning that students become more involved in asking for help as well as helping each other. These strategies also fit into a larger pattern of online behaviour in which individuals form communities on the Internet in order to pursue particular interests or to seek information on various issues.

The Online Seminar Enacted

To follow, we present excerpts from the activities in two of four study groups (A and B). First we focus on signs of how the students manage the situation. After that we focus on how the groups identify and elaborate cognitive issues. Thus, we will follow our initial plan to investigate how “low level” (i.e., practical matters) as well as “high level” issues interplay in the constitution of the online seminar.
Managing the Setting – Comprehending, Coordinating, and Moderating

Group A consists of three female and three male students; group B consists of one female and two male students. The participants in both groups have produced one seminar entry each. Furthermore, they have made responses to the seminar entries of the others. The discussion threads we will concentrate on in both groups are typical discussions involving the entire group and an appointed moderator. In group A the common discussion thread received 13 postings, whereas group B produced 70 postings.

In both groups there are frequent comments on the book, i.e., not specifically on the author's elaboration of the content but how the participants experience reading it. The examples to follow illustrate some of the problems reported.

I say, this is deep, a book which is so loaded with difficult expressions that you will get stuck even on the author's name! This book is heavy reading! How do you manage in the group? I think it would be interesting to start this work with a socio-constructivist approach in which we take into consideration our varying experiences. I think we can learn much more if we start out from what we have appropriated. (Oct 3)

Well, my goodness ... it was a severe test ... luckily I can use [an online dictionary] ... in addition you are supposed to grasp the meaning of it too ... [smiley inserted] ... unfortunately I didn't read the tutor's guide in advance ... (Oct 8)

At last, I've turned the last page yesterday ... it remains some kind of synthesis then! That's something that I have problems with, I've noticed ... someone asks what was the movie X about? Eh, eh, ... it had nice colours, good music *sigh* I think it is a gigantic problem to come up with this “summary”. (Nov 7)

I had the same problem (response to previous entry). However, I wrote commentaries on a separate pad when I read the book, and they were useful when I was done with the book. Actually, it helped me finding out what was meaningful for me. (Nov 7)

It is a quite demanding task to write a short seminar entry on the entire book. Some participants, who are not accustomed to either studying online or writing in public, apparently experience this to be somewhat stressful. It can also be inferred that initially their understanding of the topics presented in the book will be somewhat rudimentary. However, as mentioned in the first entry, applying a socio-constructivist approach (even if few of them would use these words) sharing their various experiences, the session will most likely qualify as an opportunity for learning, and it yields a more thorough understanding of the topics presented in the book. The sharing of problems in public might also affect the feeling of shared experiences, perhaps uniting the group more closely; it is a well known fact that groups will unite when facing external pressure. It is also an interesting question of where the context for this kind of commentary would be in the traditional f2f setting. Most likely, comments of this kind would be given outside the learning context among the students and not be part of the public discourse.

A second topic which frequently surfaces in the discussion concerns the coordination in time. Bereft of the immediate feedback and turn-taking in the f2f seminar, the participants in the online seminar need to manage this issue by explicit and conscious action. The examples to follow illustrate this.

Hi, group! [Name] seems to be the only one who is aligned with the time-table on this theme! How about you others? I haven't even got the book. I have planned to be so impudent as to skip this theme for the moment and go on with the CSCL theme instead. (Oct 4)
Hello [name] and others. I struggle with the book and I am nearly finished. /.../. I will really try to keep up. The book is interesting and it contains English words that I haven’t met before. Accordingly, I extend my vocabulary, too. (Oct 4)

I agree, it will be mixed up in the folder if we don’t upload our contributions in due time. It will be kind of an ill-structured problem if I may say so. /.../. Saying this I don’t want to say that learning could be left without structure and synchronisation. /.../. (Oct 5)

I got the book today! To you who have had the opportunity to read some ... are we supposed to read it through or can we concentrate on a certain chapter to be able to take part in the discussion? (Oct 11)

From these quotations one can infer that the participants feel a need and a responsibility to coordinate their activities. When a participant has not read the book for whatever reasons, this results in explanations aimed at showing that they really care about the group, and that they hold themselves accountable for not contributing as expected.

Following the positive results reported by Ashcroft and McAlpine (2004), the tutor appointed one moderator in each group. The task is voluntary, and therefore the consent of each candidate is asked for in advance. Both candidates are also given some hints on how to moderate the discussion (introducing, asking questions, encouraging participation, and summing up). In group A, a male student is asked to moderate. He approves and turns to his group:

[Tutor’s name] has asked me to moderate the discussion. After some thinking the last days I decided to accept the challenge. The book is difficult but if each of you contributes with what you have appropriated (bold in original) we might produce a text which can mediate the core of what Petraglia wants to convey. Well, what are your thoughts, apart from the difficult language? Could we start building a list of difficult concepts? (Oct 14)

Evidently the moderator intends to take the discussion a step beyond the previous lamenting. He also tries to make use of the theoretical concepts (appropriate, mediate) introduced earlier. It is also interesting to see how the student moderator takes on the responsibility for solving such practical problems that are traditionally handled by the tutor. This dialogue with another student illustrates this:

Hi, I still have problems finding our group’s discussion entries. Please, make clear what is expected from us with this document (the common document mentioned above). Are we expected to work with different concepts from Petraglia’s book? (Oct 18)

In less than two hours the moderator answers:

You are expected to write a contribution based on your reading of the book. After that you are expected to take part in our discussion by writing at least one response to each participant’s contribution. It is the total number of discussions which represents the group discussion. What is important for you is that you respond to another participant. (Oct 18)

The moderator is echoing the study guide in his directions. Since he is a student with experiences from earlier courses, he is not only a more capable peer but also a community participant who can guide the peripheral participant to a more competent participation.

The dilemmas and questions linked to authenticity are pointed out in the tutor’s supporting document mentioned previously. In his book Petraglia discusses the ambition to help the students understand by attempting to link the instructional content to their experiences. Accordingly, educa-
tors in various educational contexts try to adapt contents to what is considered authentic for the student, pre-authentication, in Petraglia’s words. Linking pre-authentication to the vague definition of authenticity, and to the idea of the individual (or social) construction of knowledge characteristic of constructivism, Petraglia describes a dilemma for instruction: you cannot really make something authentic to someone whom we consider capable of constructing knowledge. Our interest here is how the students will elaborate this rather complicated issue in an online seminar. The moderator initiates a discussion on pre-authentication and gets an answer almost two weeks later:

I have been struggling with “pre-authentication”. Someone’s got a good explanation? In my view it is about creating a pedagogical setting which engages and makes theory real without connecting it to reality. What do you think? (Oct 14)

Nope! [moderator’s name] That’s not my interpretation. I interpret pre-authentication to be about creating a learning situation in advance and that this in turn will lead up to authentic learning. Petraglia claims that this is more or less impossible according to constructivism, since it says that each individual constructs his own reality based on previous experiences. Actually, it is an example of biting one’s own tail. (Oct 30)

Thank you [name]! Now the pieces fit into their places. As a matter of fact, it is in accordance with reality – you can seldom plan a lesson in advance and at the same time invite the students’ experiences into your plan. (Oct 31)

These are, however, all the arguments in the common discussion. In this case the responding participant came up with a reasonable explanation so that the moderator could revise his somewhat imperfect understanding. Even if the discussion thread probably was beneficial for the rest of the group, it is still possible to evaluate the common discussion as not too successful since it faded out. There were 13 discussion entries responding to the moderator’s initial call, but only the three previously stated entries were focused on the elaboration of pre-authentication (or any other theoretical issue). The rest of the discussion reverted to practical matters and excuses for not having read yet.

However, the online seminar gives the participants a second and a even third chance so to speak, since time is not fixed to one single occasion. In the traditional seminar, the students will have just one opportunity to show their knowledge, since it is not likely that there will be further occasions to discuss the same topic. In a virtual seminar, the postings are there to read and respond to. The issue in a sense stays open. In case there are no postings at a specific point in time, the participant can give a reason for this and tell when a contribution may be expected. A public promise is in most cases a strong incentive to deliver.

In the B group, the female student who was asked to moderate the discussions also accepted the task.

Hi group B! [Tutor’s name] asked me if I could moderate this part and I accepted. Hope you all have plodded through Petraglia so that we can begin a discussion in this forum. What do you find most interesting in Petraglia? What would you like to discuss here? Perhaps someone wants to discuss the issue of arguing and persuading as being foundational for all kinds of teaching? How do you tell the difference between a teacher and a seller? Hear you [smiley inserted]? (Oct 8)

To get the discussion going, she suggests some points to start with. The discussions in group B immediately attract participants from the other groups (there are other groups than those described here) because of the interesting discussions going on.
Excuse me, I am from group C but I thought [name’s] discussion thread was so interesting I simply had to write. (Oct 14)

The moderator welcomes the newcomer and invites more people to write “in here.” She soon has her invitation honored.

This is interesting [participant from another group]! Seems there are more people in B who are at it …! (Oct 14)

Finally we want to point to attempts at making the discussion as effective and fluent as possible. The moderator invites the participants to reflect on the contribution, and she gets a positive response from a participant:

Does it necessarily have to be superficial when we exchange thoughts and ideas in CSCL? I have noticed that when we write short contributions to each other the dialogue becomes faster, more vital and more lively. /.../ A lengthy contribution contains so many thoughts and so much information that the person who reads it might answer just as lengthy and this in turn is likely to end up in extended monologues and accordingly the debate will fade out. What do you think? (Oct 29)

I have also thought about what you describe [moderator’s name]. I believe that also brief contributions will lead to knowledge and that they are necessary to keep the dialogue and the “life” going. If we believe that CSCL be like a real spoken dialogue with turn taking then I believe in short contributions. (Oct 30)

On the issue of how “low level” problems are attended to by the students, we have pointed to the following contributions: First we noticed the sharing of experiences from the reading of the book. We inferred that students had a shared problem and that sharing has positive effects for building rapport and a sense of belonging. By saying this, we also acknowledge that a certain amount of social talk is beneficial for team building and for developing a sense of common purpose. Secondly, we noticed the efforts to synchronise activities. In fact, the overall pedagogical strategy requires that the participants comply with the idea of sharing ideas and postings in due time. Without sharing, whether one is unable to join in at the appropriate time or one feels uncomfortable going public, the idea of having productive seminars will fail. Thirdly, we noticed the need for participants to “simulate” a f2f discussion by way of limiting the length of postings in order to facilitate the turn taking, thus getting a feeling of being involved in dialogues rather than monologues. Put differently, some small talk will be beneficial for the future life of the discussions (Molinari, 2004). This is not too different from what applies to successful f2f discussions.

Elaborating Cognitive Issues in Moderated Discussions

We mentioned, the invitation to discuss “pre-authentication” was not particularly successful, and that the discussion soon turned out to be about practical matters. It might be fair to say (as shown previously) that practical matters generally are more explicitly focused on in a virtual seminar building on textual postings as compared to what happens in the f2f seminar. But, if this is so, does this fact reduce the possibilities of the virtual seminar to promote knowledge building in a manner that comes close to f2f seminars? We might postpone that judgement until we have followed how an uploaded question unfolded into some very productive discussions.

An initial question from the moderator of group B invited the participants to reflect on the responsibility for tutoring in their virtual discussions. The question read:

A question that lies near to hand is who is actually the teacher in this kind of CSCL environment. In
our course we have a tutor, but perhaps we are all tutors in a way. We might also be our own tutor; each one of us must take on a great responsibility to ensure that learning occurs. Is it, accordingly, a task for all of us in the course to practise arguing and persuading? (Oct 12)

Sorry, I am from [another group]; I thought the question was so interesting. I just had to write: I rather think it is about giving and taking in order to appropriate new concepts in a context. In other words, you cannot create knowledge on your own. You always create together with someone else. (Oct 14)

Quickly she had her request responded to when a participant objected to the idea of learning together in a posting entitled “The devil’s advocate”:

It is possible to pose a counter-argument based on rationalism ... that you are a cool person and that your knowledge is a result of your own reasoning. Furthermore I think people have been sitting alone (I presume) reading Petraglia’s book which has resulted in quite advanced synthesis, analyses and conclusions; all of these you have accomplished by reasoning by yourself? And not by reasoning with another? /.../ I am prepared to claim that the main knowledge does not arise from dialogue. /.../ What I really want to say is that the learning process can be understood as an internal dialogue which is quite invisible for others. /.../ And how about knowledge that you cannot verbalise? (Oct 14)

The third quotation represents a rather elaborate view of collaborative learning; on the one hand s/he cannot disregard the experiences of sitting alone with the book trying to make meaning from the text, and, on the other hand, s/he resolves the dilemma by saying that reading also qualifies as an internal dialogue with the text, even if such an argument seems to be at odds with the rationalist perspective s/he refers to in the opening of the posting. At the end of the posting, s/he also opens up for the subsequent discussion of the concept of tacit knowledge. However, another participant becomes fascinated by the idea of having dialogues with the author of a book and holds on to the dialogue theme, which is elaborated somewhat further.

It’s strange! Imagine that you can have a dialogue with an author who is dead a long time ago! Accordingly, you would learn from the dead! (Oct 14)

I don’t think you have a dialogue with someone who is dead, since a dialogue requires that the one you have a dialogue with can answer and explain. I’d rather see the book as a tool which mediates what someone has thought. Then it’s up to me, in a real dialogue (as we do in the course) to create meaning and eventually appropriate a knowledge. I can’t create this knowledge sitting alone on my chamber; I need a context. (Oct 14)

I think Petraglia’s book is an excellent example of knowledge one can read about without understanding until one gets the opportunity to mediate it in writing or talk with someone else. Not until then is it possible to talk about knowledge. (Oct 14)

I experience a dialogue with the authors of the books I read, in a way. However, in this dialogue I might learn, sometimes more, sometimes less. Some authors I don’t agree with until later. (Oct 15)
perhaps the most distinguishing feature of constructivism... is its emphasis on argument, discussion and debate. Comparing Petraglia’s ideas with the lively exchange of opinions in our group I think we can say that we have been working in a constructivist mode. (Oct 26)

A characteristic of postings in an online forum is a somewhat corrupt turn-taking pattern. The different turns in a dialogue do not always follow the typical “action-reaction” pattern that most (but not all!) f2f dialogues do. However, even if the turn-taking is somewhat strange compared to traditional f2f discussions, the discussion entries remain in the forum and can be returned to at times even when most participants discuss another theme. With these considerations in mind, we can now return to the issue of tacit knowledge which was alluded to in an aforementioned discussion thread but which was temporarily abandoned for the discussion about the conditions of dialogue and collaborative learning.

... but you slipped away from my question about tacit knowledge? (Oct 14)

In my view tacit knowledge is something you learn in a context – situated cognition – together with someone else. You see what the “master” does and then you can try yourself. Petraglia uses the concept “cognitive apprenticeship”. /…/ Do you call that tacit knowledge? (Oct 14)

Well, what is tacit knowledge really? Is it the same as knowledge you don’t practise? Or is it that knowledge you can’t express in words? Does is exist for sure? (Oct 15)

This direct question received an elaborate answer from a former student. We have not mentioned this in our account thus far, but to support the students in their various needs, we appointed two former students to act as mentors in the course. The mentors, thus, are “more capable peers” in Vygotskian terms and free to take part in the course whenever they want to or when their support is required.

This is a much debated issue, I couldn’t help cutting in here. The concept originates from Michael Polanyi and is meant for knowledge which can’t be articulated, often as something built on experience or something that is acquired in practice. /…/ The concept has been interpreted in two different ways: the first one treats tacit knowledge as what can be taken for granted in a particular situation and therefore it need not be expressed; the other interpretation says that it is knowledge which can’t be expressed; you know how to carry out a certain task but you can’t describe what, how, and why you do it. (Nov 9)

In this section we have given examples of some topics discussed: tutoring responsibility, collaborative learning, and tacit knowledge. These are all examples of “high level” issues which each one could have been made into topics in a f2f seminar as well. How, then, may the value of the discussions be judged? Do the participants really have a chance to get a good grasp of these issues? We hope we will be able to give at least some help to anyone interested in testing and further developing the online seminar in our next section where we point out what we consider to be essential qualities in the kind of online learning we have presented. First we keep close to practice, and then we finish the section with a somewhat more conceptual description. What we consider to be keywords in online seminars are in italics.

RECOMMENDATIONS FOR ONLINE TEACHING

In our course the students were introduced through a meeting IRL at the campus. If such a meeting can be arranged without too much inconvenience for the students, it is advisable to
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have it. However, we do not consider the meeting IRL indispensable.

What is absolutely indispensable, though, is the study guide. In the study guide the students should be given all relevant information about the course. Hopefully, many practical problems can be anticipated and thus avoided in the future. We strongly recommend course managers and tutors to produce such a detailed study guide. One can think of the study guide as a deputy teacher.

The interactive course model is presented in the study guide, but once the course has started it is necessary to encourage and remind the students that they are supposed to interact with each other and not just with the tutor, which might be their initial idea of distance education. Therefore, it is necessary to encourage a certain amount of social talk not particularly focused on the cognitive course content.

We have also seen that even if the online course model presented in this account allows for some flexibility in the uses of time, it is still necessary to coordinate the activities in order to be able to interact with the fellow participants. Thus, it must be made clear that course activity is more than handing in the assignments as in traditional distance education.

As far as our experiences go, it is wise to involve students as much as possible in the running of the course. We have already mentioned that it is necessary to strike a balance between being willing to help and letting the students help each other. In the previously discussed example, we also had students moderating the group discussions. In passing we also mentioned that we are experimenting with student mentors. Even if it is on a very small scale (two mentors), and not yet systematically evaluated, we can see that a mentoring programme can be very useful for the students and also relieve the tutor of some practical problems.

We will also give recommendations for the tutor role in online teaching. We mentioned the introduction and the preparation of a study guide. To that must be added that careful preparation of various kinds of instructional material for the students is vital. When the actual online studying starts, the tutor should frequently log on to the LMS to answer questions from the participants but also to take part in the discussions. Here, however, and as mentioned previously, it is important that the tutor does not take over the initiative from the participants so that they get used to being evaluated for every contribution or that they develop the habit of directing the postings to the tutor as in traditional distance education. In our experience the tutor must not withdraw from leadership but, as we have mentioned, strike a balance between what we would call aligning and evaluating; aligning with the students in their discussions but also stepping into the role of course leader on appropriate occasions.

Table 1. Ten recommendations for online teaching

| Organisational | 1. Prepare a detailed study guide for the students |
| 2. Arrange an introductory meeting IRL if possible |
| 3. Involve students in the solving of practical matters |

| Interactional | 4. Encourage a certain amount of social talk |
| 5. Require of participants to coordinate and contribute in due time |
| 6. Let students act as moderators in the online discussions |

| Instructional | 7. Tutors should log on to the course area regularly |
| 8. Tutors should be present but NOT constantly available |
| 9. Tutors should encourage student initiatives |
| 10. Tutors should take part in discussions but NOT withdraw from leadership |
Summing up our experiences of the online seminar, an important characteristic of such a seminar is the explicit sharing of practical problems in public. As we have seen, a lot of seemingly trivial issues are brought to the surface, and, accordingly, they must be explicitly talked about. We have illustrated how the participants join forces to sort out problems together. The asking, talking, and sharing are all instances of the significant activity of context creating. In the terms previously used, they are appropriating high level knowledge in the sense that they learn how to make relevant contributions and claims through sharing their skills and insights. In other words they gradually become virtual seminar participants, which in our view is more of an ontological issue than an epistemological one (Packer & Goicoechea, 2000).

FUTURE TRENDS

To follow, we point out three very broad areas which most certainly will have an impact on learning and teaching. The first broad strand concerns technology.

1. The LMS used in our course might be quite innovative compared to snail mail and even to email. However, if we look around on the Internet we do not find people using learning management systems. Instead we find applications for communication, sharing, collaboration, and online gaming. The majority of these systems are free for the user and can be used according to personal preferences. A significant characteristic of these applications in comparison to traditional Web pages is that the user becomes a subject and not just some object to inform or teach. Moreover, we are rather traditional in that we read text and write discussion and seminar entries. However the obstacles for communicating in modes like audio and video are decreasing. The obstacles are no longer technological, and we foresee an increase in use of complementary modes. An obvious trend is that the distinction between campus- and distance education becomes increasingly blurred.

2. Today some universities let people access their course content for free, which means that content is no longer a commodity that can be withheld from the world. Other developments in similar directions concern open educational resources, free software, and Creative Commons. Through such efforts it is possible to disseminate learning resources without commercial interests. In future, people who study either at a university or elsewhere will require access to contents online, and it will be necessary for educational institutions to meet this demand in order not to lose students.

3. Even if e-learning as presented here is different from what we have labelled traditional distance education in which students mainly interact with course management, we still hold on to the didactic format where content is presented as mandatory assignments for the students. Even if somewhat blurred in this account, there is still a distinct separation between tutor and student roles, respectively. The student should stay as a student and be evaluated by the tutor. At least with Masters level students, it might be advisable to inquire further into how the relations between content, course participants and tutors can be developed.

CONCLUSION

The online seminar, in most cases, provides an adequate, and in many cases, even better context for learning than the f2f seminar. At any rate, it can be seen as an attractive complementary form of intellectual deliberation that has a place in
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academia. Discussing asynchronously gives each participant time to reflect on high level issues. The discussions documented previously went on for almost exactly one month (first posting Oct 8th; last posting Nov 7th). Compared to f2f seminars, the online seminar definitely has an advantage when it comes to time for reflection.

Writing is a powerful tool for the development of thinking, since it can be interrupted, resumed, edited and so on. Writing is also a cognitively more demanding activity than speaking since it requires explicit articulation and formulation of ideas. Even though participants might feel uncomfortable writing in public, a similar problem is present in oral discussions where it might be even more difficult for the inexperienced seminar participant to raise his or her voice when the floor is dominated by eloquent speakers.

From our aforementioned examples there is nothing contradicting that the participants’ experience the virtual seminar as an authentic activity – whatever definition used. In our opinion, they are seriously involved in knowledge seeking. Interestingly, they also see their own activities as matching what the book is about; constructivist learning through collaboration. Actually, their activities give them a good chance to practice what they read. As cited by a participant: “Comparing Petraglia’s ideas with the lively exchange of opinions in our group I think we can say that we have been working in a constructivist mode.”

Our last reflection concerns rapport, trust and relations with the participants. One might think that e-learning is a fairly anonymous undertaking for students as well as tutors, and it certainly can be. Traditional distance learning, where participants hand in standardised assignments to anonymous tutors (who may shift during a course) without any contact or interaction either with fellow participants or tutors, surely may have its merits, but not for creating the type of interaction and rapport necessary to develop a seminar culture. Contrary to what one might think, e-learning courses, as the one described in this account, tend to be quite personal undertakings. As a tutor, one feels acquainted with the participants because of direct communication, but also because of the possibility of reading all the postings not specifically directed to the tutor. The course structure, with recurrent seminar entries, the prolonged interaction and familiarity with the students in these kinds of e-learning courses, will almost entirely eliminate the risk for plagiarism which is so much debated today. We assume that our Masters students really want to learn, since they have chosen to take the course. But, to anyone who would not trust such an idealised view, we claim that it would be virtually impossible to have someone else write the seminar entries and continuously participate in the discussions with the others involved in the course.

REFERENCES


**ENDNOTE**

1 The moderator of group A has been attending courses previously and therefore we can assume some familiarity with what is expected.
Chapter IV

Is E–Learning Used for Enhancing Administration or Learning?
On the Implications of Organisational Culture

Stefan Hrastinski
Uppsala University, Sweden

Christina Keller
Uppsala University and Jönköping International Business School, Sweden

Jörgen Lindh
Jönköping International Business School, Sweden

ABSTRACT

The transition from learning on campus to e-learning presents many challenges. One of the key challenges is the organisational culture, which may enhance or hinder e-learning implementation. In this chapter, we describe how the organisational culture shapes e-learning use at universities. We compare a School of Business and a School of Health Sciences. It is argued that strategies for e-learning have played a key role in shaping the organisational culture, which in turn shapes how e-learning is being used. The School of Business regarded efficient administration as the key driver while the School of Health Sciences regarded collaborative learning as the key driver for e-learning. We introduce the concepts of administration-centered and learning-centered e-learning culture to pinpoint the difference identified. A challenge is to develop an e-learning culture that values both how e-learning can be used to enhance administration and learning.
INTRODUCTION

E-learning, which we define as learning and teaching facilitated online through network technologies (Garrison & Andersen, 2003), has been increasingly adopted to support higher education. The transition to e-learning presents new challenges as expectations and roles of staff and students evolve (Bennett & Lockyer, 2004). Implementation of e-learning environments is a complex phenomenon, comprising many influencing factors. Keller (2007) found that organisational factors, more than student attitudes or technological factors, explained differences in success in e-learning implementation. Newton (2003) suggests that the most prominent e-learning barriers are: 1) increased time commitment; 2) lack of extrinsic incentives and rewards; 3) lack of strategic planning and vision; 4) lack of support; and 5) philosophical, epistemological and social objections. Notably, these barriers are mainly organisational, rather than being due to negative student attitudes or failure of technology. This finding is in accordance with earlier studies claiming that e-learning implementation should not be viewed as a technological phenomenon, but as a process with cultural consequences (Cech & Bures, 2004), which includes negotiation between different organisational cultures (Demetriadi et al., 2003).

The aim of this chapter is to analyse how the e-learning culture shapes e-learning use and development. In doing this, the chapter is of primary interest for those who manage e-learning, which includes the development of policies and strategies. More specifically, we compare and aim to explain why two schools are characterised by different e-learning cultures, which value different uses of e-learning. For this purpose, the results from a larger study at two schools, a School of Business and a School of Health Sciences, are compared. First, we present a review of current literature. Then, we present the underlying research method and the results of the study. This is followed by a discussion, where two very different types of e-learning culture are identified, and how these cultures shape the use and development of e-learning. Then, we suggest implications for practice, i.e., suggestions on how a supportive e-learning culture can be built. Finally, we discuss future trends and put forth our main conclusions.

BACKGROUND

Organisational culture is defined in various ways in the literature. Alvesson (2002) defines it “as collectively shared forms of for example, ideas and cognition, as symbols and meanings, as values and ideologies, as rules and norms, as emotions and expressiveness, as the collective unconscious, as behavior patterns, structures and practices, etc.” (p. 3). Watson et al. (1994) provide a complementary definition and say that organisational culture is “the beliefs, values, norms, mores, myths, and structural elements of a given organisation, tribe, or society”. It consists of shared, commonly held and relatively stable beliefs and norms that influence behavior, actions taken and decisions made (Fiol & Lyles, 1985; Williams et al., 1993). The norms inherent in the organisational culture influence the behavioural and cognitive development that the organisation can accomplish. Hence, the organisational culture can become a severe obstacle in implementation of information technology. Leidner and Kayworth (2006) have categorised different types of conflicts that could emerge between values of the organisational culture and the implementation of information technology in an organisation; among them system conflict and contribution conflict. System conflict is a conflict that surfaces when the values implicit in a specific information technology contradict the values held by the users. For example, technologies of e-learning implemented in an organisational culture embracing campus education could cause a system conflict. Contribution conflicts refer to the disagreement between
users’ general values and how they perceive the contribution of information technology in their work. One example of a conflict is that teachers may perceive e-learning as useful for university administration, but not for enhancing the quality of learning.

In order to decide to accept or reject e-learning technology, individuals go through an adoption process. Adoption is defined as “a decision to make full use of an innovation as the best course of action available” (Rogers, 1995, p. 21). Adoption of e-learning technology in higher education is a complex issue. Rogers has labeled the process through which an individual passes from knowing about an innovation to a decision to either adopt or reject it an innovation-decision process. The innovation-decision process in organisations consists of two broad activities: initiation, defined as the entire information gathering, conceptualising and planning for the adoption of an innovation, and implementation, all of the events, actions and decisions involved in putting an innovation into use. Initiation is divided into two stages, agenda-setting and matching, while implementation comprises the three stages of redefining/restructuring, clarifying, and routinising. Agenda-setting occurs in the innovation process when a general organisational problem that may create a need for an innovation is defined. During this stage a performance gap, a discrepancy between an organisation’s expectations and actual performance, is defined.

How university teachers perceive the e-learning innovation is highly dependent on how the performance gap is defined. If the gap is described in terms of lack of effectiveness in administration or lack of quality in learning, it influences if and how e-learning technology will be adopted. During the matching stage, the e-learning technology is tailored to solve organisational problems and fill the performance gap. The first stage of the implementation is redefining/restructuring, when the e-learning technology is re-invented to accommodate the organisational needs more closely. Clarifying occurs as the e-learning technology is put to a more widespread use and the meaning of the innovation becomes clear to the organisation’s members. Routinising marks the end of the innovation process, as the technology becomes an incorporated part of the organisation and ceases to be an innovation. The innovation process in organisations is depicted in Figure 1.

Rogers (1995) argues that certain attributes of the innovation affect the rate of adoption. Among these attributes are compatibility with values and beliefs of the organisation and complexity of the innovation. To be adopted fast at a university, an e-learning technology should be compatible with the university culture. As e-learning technologies comprise both administrative tools and learning tools, the university teachers will primarily take on the tools which are most compatible with the organisational culture. Complexity refers to the degree to which the e-learning technology is perceived as relatively difficult to understand and use. The higher the degree of complexity, the lower is the rate of the adoption of the innovation. Applied to a university e-learning context, the administrative tools of e-learning technology would be adopted faster than the learning tools. The reason for this is that administrative tools are less complex than learning tools. The administrative tools are generally easier to understand and use, fulfilling discrete tasks like assignment submissions and the registration of grades. The learning tools, e.g., features of interaction and collaborative learning are, on the other hand, complex and require a higher degree of systematic

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**Figure 1. The innovation process in organisations (Rogers, 1995)**

<table>
<thead>
<tr>
<th>I. Initiation</th>
<th>II. Implementation</th>
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<tbody>
<tr>
<td>1. Agenda-setting</td>
<td>3. Redefining/restructuring</td>
</tr>
<tr>
<td>5. Routinising</td>
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planning and anticipation to make them work in different pedagogical settings.

Drawing on the theoretical assumptions of Leidner and Kayworth (2006), and Rogers (1995), organisational culture undoubtedly contributes in shaping the image of e-learning and affecting the rate of adoption of e-learning in universities. Furthermore, Keller (2007) found the organisational culture of the university the most important in influencing the acceptance of e-learning among university teachers. Therefore, we propose the concept of e-learning culture, and intend to analyse how it shapes e-learning use and development. This is done by a survey study at a Swedish university.

THE SCHOOL OF BUSINESS AND THE SCHOOL OF HEALTH SCIENCES

In this section, the results from a larger study at two schools, a School of Business and a School of Health Sciences, are compared. First, we describe the underlying research method and then the results of the study are presented.

Method

The results that are presented in this chapter are a summary from a study conducted during 2006 at a Swedish university. We have decided to focus on two of its schools to illustrate two very different organisational cultures and how these shape the use and development of e-learning. We will refer to the schools as the School of Business and the School of Health Sciences. The School of Business uses an in-house developed e-learning environment whereas the School of Health Sciences uses PingPong, a commercial e-learning environment.

We distributed a questionnaire with the purpose of investigating e-learning use and development at the schools. The questionnaire was distributed to all teachers who spent at least ten percent of their time teaching. The questionnaire comprised eleven closed questions, blending multiple-choice responses with responses on Likert scales. The key issues focused in the questionnaire were: 1) the general attitude of the university teacher to the use of e-learning to support education; 2) purposes of e-learning; 3) perceived driving factors and barriers towards e-learning; and 4) the perceived occurrence and importance of e-learning strategies at the university. To be able to analyse the impact of individual and organisational factors on the responses, background factors of gender, age, academic subject and affiliation to the specific school, were measured.

Data, collected via the questionnaire, describing the respondents is displayed in Table 1. The table reveals that a majority of respondents from the School of Health Sciences were females and fifty years or older, while the respondents from the School of Business were more equally distributed across gender and age. Response rates were 52% for the School of Business (57 out of 110 employees responded) and 37% for the School of Health Sciences (40 out of 109 employees responded). Baruch’s (1999) review of response rates in journals of social science research suggests that these are reasonable rates, even though we would, of course, have preferred to have received more responses.

<table>
<thead>
<tr>
<th>School</th>
<th>Males</th>
<th>Females</th>
<th>50 years or older</th>
</tr>
</thead>
<tbody>
<tr>
<td>The School of Business (n=57)</td>
<td>53%</td>
<td>47%</td>
<td>23%</td>
</tr>
<tr>
<td>The School of Health Sciences</td>
<td>35%</td>
<td>65%</td>
<td>67%</td>
</tr>
</tbody>
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Table 1. Gender and age structure of the respondents
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Results

The first question of the survey aimed to measure teacher attitude towards e-learning. The respondents’ attitudes toward the use of e-learning in support of education were rather similar for the two schools (see Table 2), with the university teachers of the School of Health Sciences being slightly more positive.

We identified both similarities and differences regarding perceptions of how and why e-learning technologies were used. A majority of the respondents at both schools used e-learning to distribute course material, communicate with students and improve flexibility. However, as displayed in Table 3, doing this was more common at the School of Health Sciences. In other aspects though, there were major differences regarding how and why e-learning was used at the two schools. While the School of Business emphasised the importance of improving efficiency, the employees at the School of Health Sciences felt that e-learning was important for attracting geographically dispersed students and to support collaborative learning.

When asked whether there was a strategy for future development of e-learning, the responses differed considerably between the two schools. The teachers at the School of Health Sciences agreed that a strategy existed to a higher extent than teachers at the School of Business. At the time of the study, the School of Health Sciences has had an e-learning strategy for a number of years, while the School of Business did not have an e-learning strategy.

From Tables 2, 3 and 4, we have learnt that the School of Health Sciences was slightly more positive towards e-learning, used e-learning for attracting geographically dispersed students and supporting collaborative learning, rather than focusing on efficiency per se and were in greater agreement that a strategy for e-learning existed, as compared with the School of Business. In search of explanations for these findings, we explored the more detailed questions of the survey. There is an important difference in how e-learning strategies are established at the two schools. At the School of Business, it is mainly the individual

<table>
<thead>
<tr>
<th>Table 2. General attitudes towards using e-learning to support education (rating of attitude on a scale from 1 to 5)</th>
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<tr>
<td>School</td>
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<tr>
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<tr>
<td>The School of Business</td>
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<td>The School of Health Sciences</td>
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<th>Table 4. Agreement on whether there is a strategy for future development of e-learning (rating of agreement on a scale from 1 to 5)</th>
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<td>School</td>
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<th>Table 3. How and why e-learning is being used</th>
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<tbody>
<tr>
<td>Distribution</td>
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<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Distribute course material</td>
</tr>
<tr>
<td>Communicate with students</td>
</tr>
<tr>
<td>Improve flexibility</td>
</tr>
<tr>
<td>Collaborative learning</td>
</tr>
<tr>
<td>Attract students</td>
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<tr>
<td>Improve efficiency</td>
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<th>Table 5. Levels at which e-learning strategies are decided</th>
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<tr>
<td>Level</td>
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<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>University management</td>
</tr>
<tr>
<td>School management</td>
</tr>
<tr>
<td>Department management</td>
</tr>
<tr>
<td>Subgroups in department</td>
</tr>
<tr>
<td>Individual level</td>
</tr>
<tr>
<td>There is no e-learning strategy</td>
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</table>
that decides how to use and develop e-learning, while the School of Health Sciences commonly discusses such issues at the University, school and department management levels (see Table 5).

In Table 6, incentives for using e-learning are displayed. A slightly higher number of teachers at the School of Health Sciences felt they were expected to use e-learning as part of their teaching. The staff of both schools, especially the School of Health Sciences, did not feel encouraged by management. However, there is one major difference between the two schools: The School of Health Sciences encourages e-learning use and development of e-learning through project funding while this does not occur at the School of Business.

**DISCUSSION**

The aim of this chapter was to analyse how the e-learning culture shapes e-learning use and development. When looking back on Table 3, it seems that strategies for e-learning have played a key role in shaping the organisational culture, which in turn shapes e-learning use and development. In Table 7, characteristics that illustrate the differences between the e-learning cultures at the two schools, i.e., teacher attitudes, their views on the usefulness of e-learning for efficiency, are compared. The table shows that the School of Business regarded efficient administration as the key driver while not acknowledging the importance of e-learning for enabling collaborative learning. The School of Health Sciences, which was slightly more positive towards e-learning, regarded collaborative learning as the key driver for e-learning while not acknowledging the importance of making administration efficient. We introduce the concepts of learning-centered and administration-centered e-learning culture to describe these two very different organisational cultures, which shape e-learning use and development. There are, of course, benefits and limitations of both these cultures, and an ideal e-learning culture probably combines the culture of the School of Business and the School of Health Sciences: The ideal organisational culture should value how e-learning can be used to not only enhance efficiency but also student learning.

In order to better understand how the organisational cultures shapes e-learning use and development, we also searched for explanations for why the School of Health Sciences was characterised by a learning-centered e-learning culture and the School of Business was characterised by an administration-centered e-learning culture. We have identified a number of key dif-

<table>
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<th>Table 6. E-learning incentives</th>
<th>The School of Business</th>
<th>The School of Health Sciences</th>
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<tbody>
<tr>
<td>Expected as part of your teaching</td>
<td>45%</td>
<td>58%</td>
</tr>
<tr>
<td>Encouraged through project funding</td>
<td>0%</td>
<td>58%</td>
</tr>
<tr>
<td>Not encouraged by management</td>
<td>38%</td>
<td>53%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
<td>0%</td>
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<th>Table 7. Characteristics of two e-learning cultures</th>
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<td>School</td>
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<td>-------------------------</td>
</tr>
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<td>The School of Business</td>
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<td>The School of Health Sciences</td>
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</table>
ferences between these two schools. First, time and money are needed if a school is to succeed with the e-learning initiatives as they are complex and encompass organisational, administrative, instructional and technological challenges (Jones & Gregor, 2006). The School of Health Sciences encouraged e-learning use and development of e-learning through formalised project funding, while this was did not occur at the School of Business. E-learning implementation projects at the School of Health Sciences seem to have supported them in establishing a learning-centered e-learning culture. Second, e-learning strategies need to be established on university, school and department levels, rather than on the individual level, if striving towards achieving shared e-learning goals. If the agenda-setting and matching (Rogers, 1995) of the e-learning technology is made in formal implementation projects, the chances of achieving common goals and values of e-learning increases. An innovation which is compatible with the values and norms of the organisational culture is adopted faster than innovations that oppose organisational culture. Being a Business School means holding values of effectiveness highly. This is probably also one reason why the administrative e-learning culture of the Business School has emerged.

**IMPLICATIONS FOR PRACTICE**

In this chapter, we have described two very different types of e-learning cultures. We suggest that the reader should reflect on the e-learning culture in their organisation and how it may be improved in order to enhance both efficiency and student learning. To follow, we give examples of implications derived from our study.

*The organisational culture that exists at a school when teaching is campus-based still exists when e-learning is implemented. The shared values of the organisational culture are relatively stable. Thus, they do not change at the same pace as development of new educational technologies, i.e. when e-learning is being introduced. Drawing on the conclusions of our study, it was evident that the shared values of efficiency at the School of Business were mediated to the context of e-learning. This was also the case at the School of Health Sciences, where the collaborative, student-centered culture had a strong impact on how e-learning was used.*

*University management plays a key role in encouraging how to use e-learning. The attitude towards e-learning was slightly more positive at the School of Health Sciences. At this school, a strategy for e-learning development had existed for several years at the time of the study. The support from the management of the school eventually led to collaborative support among colleagues involved in e-learning development. Support from others, social influence, has been found to be one of the most important factors in influencing acceptance of e-learning positively (Keller, 2007). Lack of support is also one of the most important barriers to e-learning development, identified by Newton (2003).*

*Benefits of e-learning are often not apparent for university teachers. Improving efficiency is an apparent benefit of e-learning but it is more difficult to understand how e-learning can be used to support collaborative learning. Narmaala (2004), in a study of the impact of e-learning in higher education, found that e-learning technologies were mainly used as tools for completing tasks and making administration easier. In particular, the teachers of the School of Business regarded e-learning as an administrative tool, which implies that the contribution conflict (Leidner & Kayworth, 2006) regarding the possibility to enhance student learning was stronger at this school. At this school, e-learning was associated with increases in productivity and efficiency, more than as means for enhancing student learning. To change the shared values of what e-learning represents within an organisation, we suggest that teachers need to be supported in understanding*
that e-learning is not only useful for improving efficiency but might also be useful for enhancing student learning.

To make educational benefits of e-learning tangible, formal e-learning implementation projects are needed. To take on the notion of e-learning being an effective means of administration is easier than to take on the notion of e-learning being a tool for learning. The gains of more effective course administration, for example, by making it possible to submit assignments electronically, are easy to understand. On the other hand, to make e-learning a useful tool for learning takes time. It also requires technology literacy skills and a change in educational practice (Georgina & Olson, 2008). To achieve this, e-learning technologies must be integrated among university teachers in tangible implementation projects. These projects should aim at creating learning communities among university teachers, as current research states that the most effective training occurs when it incorporates peer-to peer-training. Ultimately, it is the perceived effectiveness of e-learning as an educational tool that determines whether it will be used or not (Georgina & Olson, 2008; Keller, 2007).

**FUTURE TRENDS**

In this section, we discuss future trends and more specifically the impact these trends may have on administration-centered and learning-centered e-learning cultures. E-learning is a rather new phenomenon and has emerged as the Internet has become more widely used, especially during the recent decade. The past decade has been a time of rapid change as e-learning has increasingly complemented traditional learning methods. The future will surely be shaped by many emerging e-learning innovations. Networked cell phones and the widespread use of palm pilots and laptop computers are opening new opportunities for education and learning, such as mobile learning (Wiberg, 2005). Some researchers argue that the role of the teacher has dramatically changed because of the emergence of e-learning, while others maintain that the role of the teacher has not changed much (Ljoså, 1998). Essentially, the role of the teacher is still to organise education and stimulate learning. We challenge the reader to reflect on the practice of their university to make sure that both types of e-learning culture are supported.

E-learning is becoming more popular partly because of the rapid improvement in technology and increasing bandwidth and access in most parts of the world (Kinshuk & Chen, 2006). A recent study showed that students of varying age and nationality were positive towards e-learning (Lindh et al., 2008). Commonly, institutions of higher education are compelled by the idea of being able to enrol a large number of students for economic reasons. This view is in line with the administration-centered e-learning culture. There is a danger that e-learning is viewed as a means of simplifying administration and increasing profit rather than focusing on how to successfully enhance student learning. E-learning is gaining popularity in various subject disciplines. Generally, research has focused on traditional academic disciplines, especially educational science. However, various subjects, including vocational schools, and courses on, for example, cooking and basket weaving may be studied online (Aranda, 2007). Future research can potentially play a key role in giving an understanding of how such emerging subject disciplines can succeed in developing learning-centered e-learning cultures.

In the future, where educational institutions will operate in an increasingly competitive environment, we believe that institutions will need to be conscious of how to enhance their e-learning culture. An administration-centered e-learning culture may lead to economic benefits in the short term, but the key players of e-learning in the long run will be those that are guided by an e-learning culture in which the enhancement of learning is viewed as essential.
Our plan is to continue the research within this area by doing a follow-up study conducted in spring 2009 in order to further validate the findings of the study documented in this chapter. At that time, three years have passed since the first investigation, and we think it is an appropriate time to conduct a follow-up study. To be able to compare the results from the two investigations, we plan to construct the questionnaire in a similar way. This will give us a good opportunity to compare data and analyse changes over a three years period. Though, to better understand the complexity of differences in how e-learning strategies have been established at the two appointed schools, and the evolving e-learning cultures at each of them, we will need to add questions to the questionnaire that builds on what we have learnt hitherto. We also anticipate a need to perform in-depth interviews with the staff, which is a limitation of the study presented in this chapter.

We are currently also conducting studies on how national culture shapes e-learning. Attitudes, purposes, driving factors and barriers of using e-learning at an Argentinean and a Swedish university have been compared (Lindh et al., 2008). A striking finding is that the responses from Swedish and Argentinean teachers were similar. However, some differences emanating from national culture were discerned. Argentinean teachers stated communication with students and active student participation as more important driving factors than Swedish teachers. Lack of incentives and appreciation were stated as more important barriers among the Argentinean teachers. These findings are hypothesised to be due to the more collectivist and masculine culture of Argentina. From our studies so far, it seems like organisational culture may be more influential than national culture in our ever more globalised society, a hypothesis that needs to be further examined in future research.

CONCLUSION

In this chapter, we have illustrated that the organisational culture shapes how e-learning is being used and developed. The School of Business regarded efficient administration as the key driver whereas the School of Health Sciences regarded collaborative learning as the key driver for e-learning. We introduced the concepts of administration-centered and learning-centered e-learning culture to identify the difference. A challenge is to develop an e-learning culture that values both how e-learning can be used to enhance administration and student learning, which none of these schools succeeded in doing. Hopefully, the implications for practice suggested can help universities move towards developing an e-learning culture, which takes advantage of more of the benefits of e-learning.

REFERENCES


Chapter V
Advancing E-Learning
Policy and Practice:
Influences on Academics’ Adoption, Integration and Development of Multimodal E-Learning Courses

Dawn Birch
University of Southern Queensland, Australia

Bruce Burnett
Queensland University of Technology, Australia

ABSTRACT

Tertiary education is increasingly a contested space where advances in Information Communications Technologies and their application to technology-mediated e-learning environments have forced university administrators and educators to dislocate themselves from traditional correspondence modes of student engagement. Compounding this paradigmatic shift within the traditional sphere of distance education pedagogy are multiple and conflicting pressures on academics to develop flexible, engaging, cost-effective and sustainable interactive learning resources that incorporate both multimedia and hypermedia. This chapter reports on a study that examined factors that influence educators’ decision to adopt and integrate educational technology and convert traditional print-based distance education materials into interactive multimodal e-learning formats. Although the broader study was conducted in a single Australian university and investigated pedagogical, institutional and individual factors, this chapter restricts its focus to solely the pedagogical motivations and concerns of educators. It is argued that findings from the study have significance at the institutional level, particularly in terms of developing an underlying pedagogical rationale that can permeate the e-learning culture throughout the university, while at the same time, providing a roadmap for educators who are yet to fully engage with the e-learning format.
INTRODUCTION

Advances in Information Communication Technologies (ICTs) and their application within e-learning have forced the university distance education sector to increasingly dislocate itself from traditional correspondence modes of student engagement. This transformation is multifaceted and has occurred not only in reaction to paradigmatic shifts in pedagogical and technical orientation, but has also occurred as a result of broader neoliberal economic adjustments that have seen e-learning increasingly commodified and interpreted within the narrow confines of flexibility and cost-effectiveness. This chapter centres on the experience of a major Australian distance education provider, the University of Southern Queensland (USQ), where in 2003, academics commenced the process of converting traditional static print-based distance education materials into multimodal courses that were heavily—though not solely—reliant upon e-learning technologies. This chapter examines this conversion process, and discusses factors that have influenced educators’ exploration and integration of new technologies within USQ’s distinctive distance education environment.

By analysing what influences academics’ adoption, integration and development of multimodal e-learning courses the chapter helps focus discussion on e-learning and its relationship to pedagogy. Explicitly, the chapter taps into individual educators’ understandings of pedagogy and tracks how such understandings are linked to the critical decision to integrate and embrace multimodal e-learning. Clearly the focus of the chapter is of benefit to practicing educators, however, the chapter has also been written in the hope it can be of use to policy makers who may be charged with the task of bringing onside resistant educators who remain sceptical about the benefits of e-learning. In line with these goals, the chapter can be used by educators to better contextualise their teaching within e-learning environments while also providing guidance for e-learning at the institutional policy level.

The chapter is based on an in-depth review of e-learning within the context the USQ, an institution that has historically been heavily reliant upon the provision of distance education. This institution’s transition from a predominately print-based distance education provider to its current blended format of virtual, print and face-to-face modes of delivery provides a unique window through which to view policy and pedagogical transformation. The qualitative study on which this chapter is based identified a range of pedagogical stimuli that influence academics’ development of multimodal courses including: catering to the learning needs of different students; improving learning outcomes, retention and progression rates; challenging students to become learner-centred, self-directed, resourceful and independent learners; replicating aspects of the on-campus experience; engaging students in the learning experience; revitalising the curriculum; and providing a rich learning environment for e-learning students.

CONTEXT AND BACKDROPP TO THE RESEARCH

The research that serves as the focal point of this chapter examined factors influencing academics’ development of multimodal e-learning courses at USQ, which is a major Australian provider of distance education courses. Yearly enrolments at the university exceed 26,000 students with students from over 120 nationalities and approximately 20 percent of enrolments being international students (University of Southern Queensland, 2007). In 2007, USQ offered more than 300 accredited programmes (comprising approximately 1000 courses) across five faculties. A typical undergraduate degree programme comprises 24 courses with each course usually involving 15 weeks (165 hours) of study. Students studying with USQ choose to study in one of three modes:
on-campus (equivalent to traditional face-to-face teaching mode), external (equivalent to traditional distance or correspondence teaching mode) or Web (equivalent to online or e-learning mode). Approximately two-thirds of the University’s students choose to study in distance education mode as either an external or Web student (University of Southern Queensland, 2007). Such external students receive hard copies of study materials, either in print or CD format, with each course being supplemented with an online course homepage. Web students access all of their course materials and resources online. Traditionally, distance education courses at USQ have been delivered via static, print-based packages typically comprising an introductory book, a study guide and a book of selected readings. This print-based package may be supplemented by audio or video cassettes, an optional one-week residential school and/or telephone tutorials. Since 2000, each course has been supplemented by an online Web-based ‘course homepage’ where teaching team members can post announcements, upload course content, facilitate discussion forums, provide hyperlinks to external learning resources and develop online assessment items.

THE CHANGING NATURE OF DISTANCE PEDAGOGY

An increasingly competitive distance education market, combined with advances in educational and communications technology, has placed enormous pressure on traditional print-based or ‘correspondence’ models of pedagogy (Bates, 2006; Taylor, 2004). Given distance education now operates within a truly global market, it is possible to observe a range of new influences such as fluid cohorts of techno-savvy students/clients, many of whom are working full-time while studying part-time, and who increasingly demand more flexible, mobile and convenient learning options (see for example the work of Buckingham & Willett, 2006; Hartman, Moskal & Dzuiban, 2005; Jafari, McGee & Carmean, 2006; Oliver & Goerke, 2007). The importance of this fundamental change in market expectations has not been lost on institutional policy makers as evidenced by the widespread strategy of converting traditional print-based distance courses into a range of hybrid print/digital or purely digital e-learning formats.

While at the institutional level the repositioning of e-learning within the distance sector has been couched in notions of improved pedagogy and increased market share, there has also been a critical, yet often silent subtext of cost cutting, particularly in the areas of reducing printing and distribution costs. Thus, it was in these circumstances in 2003, that the management of the Distance and e-learning Centre at USQ identified an opportunity to convert their print-based distance education study materials into a hybrid CD/online format. As aforementioned this change in policy direction was not unique to USQ, as similar policy has been mirrored across distance education providers worldwide.

Since 2003, many courses at USQ have taken advantage of new educational technologies such as video-conferencing and broadcasted lectures, and in recent times, workshops and trials of other educational technologies such as Camtasia, ALIVE, Elluminate Live, Wimba and virtual education tools such as Second Life, have been conducted at the university. Generally, distance education courses at USQ comprise a printed introductory book and an interactive CD, and are supplemented, to varying degrees, by an online course homepage hosted on the University Learning Management System. The interactive CD houses most of the course resources and includes introductory information, study modules, assessment items, readings and other useful resources. The multimedia enhancements on the CD may include video and audio introductions, recorded lecture presentations, interactive audio-enhanced diagrams and simulations, interactive quizzes.
Advancing E-Learning Policy and Practice

and crosswords, video and audio content and graphics. Technology-mediated delivery allows the embedding of links to useful Websites and hyperlinked examples and activities including links to the course textbook Website, educational Websites that have been specifically developed to assist students with assessment, generic university resources (e.g., library, handbook, student services) and online course homepages.

A number of e-learning courses at USQ have moved well beyond the basic hybrid model in that they are both interactive and multimodal and use technology in ways that mediate the student’s learning experience. It is important to stress that such multimodal courses at USQ have been developed on the premise that material presented in a variety of presentation modes (i.e., multimodal) appeal to different sensory modes and may lead learners to perceive that it is easier to learn and improve attention rates, thus leading to improved learning performance, particularly for lower-achieving students (Chen & Fu, 2003; Fletcher & Tobias, 2005; Moreno & Mayer, 2007; Zywno 2003). The literature supports this position with Sankey & St Hill’s (2005) examination of on-campus and e-learning students’ perceptions of multimodal courses revealing 73 percent of students found information presented using multiple representations (both visual and aural) helpful for their learning. The notion that multimodality is beneficial to both the delivery and pedagogy has been corroborated by Birch and Gardiner (2005) in an investigation of 117 distance education students’ perceptions of two multimodal undergraduate marketing courses. In this study, Birch and Gardiner found that students not only enjoyed engaging with the technology-mediated course content, but agreed that the multimodal format assisted their performance and facilitated use and navigation. In short, the literature suggests the benefits of multimodal courses range from improved pedagogy through to improved student satisfaction both in terms of course resources as well as students’ learning experience and perceptions of performance.

THE RESEARCH PROJECT

The exploratory case study that forms the foundation of this chapter examined factors influencing how academics engage with multimodal e-learning courses at USQ. Although the broader study analysed engagement within the context of institutional, individual and pedagogical influences, this chapter limits its analysis to those findings connected to pedagogy. The primary source of data within study was a series of in-depth, semi-structured interviews with fourteen academics from various disciplines across three faculties. These academics ranged in their experience and are referred to as pioneers (those first to engage with multimodal e-learning), early adopters (the second wave of users) and later or non-adopters. In addition to the fourteen academics, three instructional designers were also interviewed. Other sources of data included the contents of a number of relevant university documents, informal interviews with two managers from the University’s Distance and e-learning Centre, and examples of interactive multimodal technology-mediated e-learning education courseware provided by interviewees. Analysis of the interview transcripts was conducted with the assistance of NVivo 7 software, which allowed the researcher to identify key themes and issues from the interview data.

Discussion of Findings

There are clearly a wide range of factors that impact upon the timing, manner and depth in which educators choose to engage with e-learning in their teaching. For many, it is simply a pragmatic reaction to policy edicts that require teaching and learning material be migrated to an institution’s Learning Management System such as Moodle or WebCT. There are however, many others who have made a conscious decision to explore and use new technologies within their teaching. It was this group of educators that was of particular interest to the study, for it would appear that there is
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seldom a singular ‘road to Damascus’ conversion where an educator suddenly decides to embrace new technologies in their teaching. In contrast, what emerged from the study is the suggestion that the impetus to convert courses into e-learning formats is a much more incremental process, where an educator’s philosophic orientation shifts as a result of perceived benefits that, in many cases, connect e-learning to improved pedagogy. The following section discusses several of the most significant factors in this incremental process that advances pedagogy as a critical motivating factor in the decisions to support multimodal e-learning formats.

Multimodality

The notion of multimodality within the study is significant for it was often cited as a key factor that influenced a participant’s decision to embrace e-learning. Put simply, multimodality within the context of this study refers to situations where technologically enhanced learning, through the provision of multiple representations of content, is able to target and appeal to a variety of learning styles or modalities (Birch, 2006; Sankey & St Hill, 2005; Solvie & Kloek, 2007). Fleming’s (2001) VARK typology is one of many examples used to suggest learners may have a preferred learning modality (visual, aural, read/write or kinaesthetic) with many learners being multimodal. Within this context, e-learning, and in particular electronic multimedia, is argued within the literature to provide for a range of multimodal learning elements, and thus afford a more diverse and inclusive curriculum that potentially appeals to different learning styles and modal preferences (Grensing-Pophal, 1998; Karakaya et al., 2001; Roth, 2002; St Hill, 2000). Along similar lines to the argument that e-learning supports multimodal learning, is the suggestion within the literature that e-learning also provides a more engaging and interactive learning environment, and thus holds the potential for improved student learning outcomes including cognitive and social outcomes (Capobianco & Lehman, 2004; Eastman & Owens Swift, 2001; Ebersole & Vorndam, 2003; Sankey & St Hill, 2005; Zwyno, 2003).

Issues linked to multimodality were frequently raised during the interviews along with the linking of multimodal e-learning to an overt desire to provide more equitable and inclusive learning packages. Here the e-learning ‘package’ was interpreted by the majority of pioneers and early adopters as being able to cater for students with different learning styles and modal preferences as well as different cohorts of students including Generation Y (born 1981-95), English second language (ESL) and disadvantaged students. It is possible to see overlap between interview responses and issues raised in the literature in regard to how multimodal e-learning courseware facilitates student learning by allowing “multiple representations” of content in more than one sensory mode (i.e., dual-coding) (Ainsworth & Van Labeke, 2002; Clark & Paivio, 1991; Mayer, 2003; Moreno & Mayer, 2007). The majority of pioneers and early adopters expressed a strong conviction that when material is presented in a variety of presentation modes, learners perceive that it is easier to learn and pay greater attention to the content which ultimately leads to improved learning performance (Chen & Fu, 2003; Fleming, 2001). A point raised by several interviewees was that aural explanations of more difficult concepts or assessment items appear to be valued by students with an auditory modality. Hence, the majority of pioneers and early adopters included video and audio elements in their courses, and a minority also developed interactive diagrams that utilised visual, verbal and aural explanations of key concepts.

Catering for Diversity

Both pioneers and early adopters indicated a desire to use e-learning to cater more effectively to the learning needs of student cohorts such as
Generation Y (Gen Y), students with disabilities and English second language (ESL) students. In terms of ‘Gen Y’ students there was a shared understanding of the need to reduce the amount of reading material, while in terms of providing inclusive learning packages for students with a physical disability, there was acceptance of the advantages of providing aural explanations for the visually impaired and transcripts of audio elements for the hearing impaired. Another factor raised was the desire to cater more effectively to the needs of ESL students who may comprehend content more successfully from both hearing and seeing the subject matter (Flowerdew, 1994). Early adopters perceived that ESL students “want to hear it and see how it works”, and thus, particularly appreciated the audio explanations of assessment items. One of the pioneers observed that ESL students can listen to the audio “as many times as what they want”, and along similar lines, an instructional designer stressed the benefit to ESL students of “hearing how the words are actually put together, even pronunciation of terms and jargon within that particular content area”.

**Repositioning the Learner**

Another commonly cited aspect raised by both pioneers and early adopters was that technology-mediated learning resources are more easily used in student-centred, independent approaches to teaching and learning, and hence such resources lend themselves to a constructivist paradigm (Cowan, 2006; Jonassen, 1999; Laurillard, 2002; Markel, 1999; Salter & Hansen, 2000; Solvie & Kloek, 2007). In addition to the well-traversed Vygotsky and Piaget derived theoretical standpoint that positions constructivist learning paradigms as encouraging students to discover principles for themselves, be resourceful and take greater responsibility (i.e., Bruner, 1990; Jonassen, 1999), was the suggestion that e-learning, and in particular new applications of technology such as Web 2.0, facilitates the social construction of knowledge and encourages multiple modes of representing knowledge (Anderson 2007; Hirumi, 2002; Wilson, 1996). In order to gain the greatest benefit from multimodal e-learning courses, it was suggested that students need to understand their own learning style. One pioneer found that “constant reminders to the students about how they learn, actually improves their assessment outcomes”. Hence, he communicated to students which elements on the interactive multimodal e-learning course would best suit their learning approach. Another pioneer also perceived “it was important to get through to them (students), early on, about establishing what modal preference they had” because some students appear to gain most benefit from viewing the lecture presentations while others may gain greatest benefit from the interactive diagrams and quizzes. It would appear critical that students self-select those elements that will best assist them to learn, for as one pioneer explained, when students understand their learning modality, they can use “the study materials to support that modality”. In direct response to this issue, another pioneer stated that early in the semester, he encourages his students to access the online VARK learning styles questionnaire (Fleming, 2001) to determine their dominant learning style(s).

**Improving Learning Outcomes**

A fundamental component raised in both the literature and by participants in the study was the linking of e-learning to improved student learning outcomes (Birch & Gardiner, 2005; Capobianco & Lehman, 2004; Sankey & St Hill, 2005; Zwyno, 2003). E-learning environments were positioned by both pioneers and early adopters as allowing students to explore the learning resources in their own time and at their own pace, and interact with the various elements housed within these learning environments (Buchan et al., 2005). Moreover, depending upon the students’ predominant learning style, it was felt that students may self-select
those learning objects or representations within an interactive multimodal technology-mediated course that best suit their modal preference (Sankey & St Hill, 2005).

In line with the literature, instructional designers interviewed in the study observed that academics involved in the development of interactive multimodal technology-mediated courses were motivated by the opportunity to “increase or improve the level of learning that goes on in the students’ minds”. For example, one early adopter believed the recorded lecture presentations “keep the attention span focused”, while another pointed out the ability to “emphasise some of the content that was important”. The notion that educational technology facilitates improved student inquiry and the development of higher-order and critical thinking skills (Capobianco & Lehman, 2004; Kandlbinder, 2004; Tan et al., 2006) was supported by several pioneers and early adopters who acknowledged the link between e-learning, higher order thinking and improved student learning outcomes. Importantly, these same respondents also expressed the desire to assist lower achieving students and thus improve student retention and progression rates. While one of the pioneers reported that, since converting his course, “high distinctions and distinctions (grading parameters) are basically unchanged” and there had been a marked improvement in the lower grades, with fewer failures. This finding was in keeping with the findings of a previous study on the use of hypermedia instruction which revealed benefits for lower achieving students, especially at the lower levels of cognition, including comprehension and application (Zwyno, 2003). Interestingly, Solvie and Klock (2007) found that lower achieving students tend to have a strong learning preference, whereas high-achieving students do not, and thus this may explain differences of performance with multimodal courseware, which caters for a wider range of learning styles.

The desire to challenge students to become more learner-centred, self-directed, resourceful and independent learners was raised by a number of the interviewees. This point is worthy of note, especially given multimodal e-learning courses in general reflect a constructivist approach to both teaching and learning (Cowan, 2006; Jonassen, 1999; Laurillard, 2002; Markel, 1999; Salter & Hansen, 2000; Solvie & Klock, 2007). Instructional designers observed that academics who have converted their print-based distance education courses to interactive multimodal e-learning format appear to have changed their “approach of traditional teaching into a more learning-centred style and into one that really includes the students and engages the students in a different way”. For example, one pioneer sought to get students to become “very much the independent learner” and “more exploratory in the way they learn”. His aim was to “challenge the existing paradigm of how students approach the learning process”. To this end, he had removed a lot of the textual content and “spoon-feeding” from his course and set students the “challenge of finding equivalent material on the Internet”. He encouraged students to conduct “adequate research of their own to understand the principle and to be able to apply it”. Likewise, an early adopter discussed his desire to challenge students to “get out of their comfort zones”. Yet another early adopter emphasised the importance of a more “participative education model” with students taking greater “ownership” of their learning, while another observed that her students were “becoming more independent learners and more confident”.

E-Literacy and Student Retention

The need for students to be able to engage with computer technology, communicate effectively in the electronic environment and become competent with the use of multimedia is both raised within the literature (Buchan, et al., 2005; Eastman & Owens Swift, 2001; Maguire, 2005) and supported by respondents within the study. Indeed, one of the pioneers had moved to a multimodal
e-learning format because she wanted her distance education students to experience new technologies for themselves. Likewise, a number of those interviewed, including non-adopters, identified the need for graduates to be able to better use technologies and be comfortable and competent operating, searching for information and communicating in an electronic environment.

Issues of student retention and progression were high on the agenda for the University due to the fact that USQ is a regional university whose funding is based partially on levels of retention and student progression. Thus, it was not surprising to see that pioneers and early adopters were highly motivated to reduce their failure and drop-out rates, and reported that since developing their interactive multimedia technology-mediated course, they had been successful in achieving both goals.

A major issue raised by early adopters (particularly those who supported a multimodal approach), concerned the desire to overcome the limitations of the traditional print-based distance education package by using educational and communications technology to replicate, at least to some extent, aspects of the on-campus experience. Pioneers perceived that multimodal technology-mediated courses have the potential to make the “on-campus and off-campus less different” and thus “replicate the on-campus experience for the external students”. Interestingly, even those yet to fully embrace e-learning saw the benefits with one non-adopter suggesting this presented an opportunity to make “external offerings just as meaningful as the internal offerings”. Another pioneer observed that “technology has no boundaries between what is distance education and what is not”. Replication, where possible, of the on-campus experience for external students was perceived to be a question of equity with one early adopter arguing distance students should be treated in a much more equitable way than was currently the case.

**Personalisation and Interactivity**

The literature suggests that e-learning resources allow for greater personalisation of the learning experience for distance learners, and thus may facilitate high-quality instructor to student interactions (Buchan, et al., 2005; Waddoups & Howell, 2002). Importantly, the ability to use ICTs and multimedia to personalise the course and develop a social presence and closer relationships with distance students were identified as major benefits of multimodal e-learning distance education courses. For example, one pioneer observed that students “like to have a personal relationship with their lecturer”, and thus prepared video lectures believing his “students really enjoyed seeing their lecturer”, while another pioneer perceived recorded lectures allowed him to “personalise the instruction a little bit more”. Educational technology can be used to develop a social presence, which is especially important in creating a sense of connectedness and reducing the feelings of isolation that distance education students often feel (Birch & Volkov, 2007; Oliver & Goerke, 2007). In particular, the early adopters valued the importance of personalising information to develop a greater rapport with their distance education students, break down perceived barriers, and create a connection with students. Recorded elements were perceived as valuable by one of the non-adopters because students “know what your voice is like and they can see what you look like and the relationship is a bit closer”. One of the instructional designers explained that students “feel a bit more engaged with the materials because they’re actually hearing there’s a person involved with the course, not just a name and a photo”.

Interactivity was perceived by many of those interviewed to be a major benefit of the on-campus learning experience, and the desire to achieve a higher level interactivity for distance students was a key motivator for adopters of multimodal e-learning courses. In line with literature that
maintains interactive multimedia objects lead to greater retention of information and faster problem solving (Evans & Gibbons, 2007; Moreno & Mayer, 2007), are comments from pioneers and early adopters that they achieve greater interactivity by including learning objects such as interactive diagrams, simulations, drag and drop diagrams, quizzes and crosswords. Such resources it is argued allow students to control and manipulate content and, in some cases, gain immediate feedback. It was suggested that interactive diagrams and recorded lecture presentations encourage higher interactivity as students are able to control the learning environment by determining the pace and order of presentation of the material (Moreno & Mayer 2007). The majority of pioneers and early adopters indicated that they had also used the online Web-based elements of their course to encourage greater interactivity, in terms of developing dialogue. Online discussion boards encourage students to develop learning communities, collaborate and engage in active dialogue to construct knowledge through sharing and reflecting upon their experiences and perspectives, and provide feedback to one another (Wilson & Stacey, 2004). Similar to these findings, early adopters observed, that since developing their interactive multimodal technology-mediated courses, “discussion groups have a higher level of interactivity and a much more sophisticated level of activity than what they’ve had before”, and that distance education “students are talking to one another about issues and coming up with solutions”. Hence, when making recommendations for future adopters one pioneer suggested that academics “go with interactivity, rather than content, because content is something you can always change and they (students) can access in different ways”. Likewise, an early adopter agreed that distance education students “want more of an interactive environment and want to be stretched beyond just the lecture content”, which he argued they “can get anywhere, anyway”.

Strategies for engaging students and making learning more enjoyable and exciting included the use of humour, variety and colour. While humour can be achieved in print-based materials through the use of examples or illustrations, three adopters observed the enhanced opportunity to include humour in the recorded lecture presentations. For example, one of the pioneers, who had always used cartoons in his on-campus lectures, included these cartoons in his video-recorded lectures for his interactive multimodal technology-mediated course. He discussed how these humorous elements made the course more enjoyable and assisted with retention of information. However, another pioneer issued a word of caution on the use of humour, and the need to be culturally sensitive. He observed “because of my weird sense of humour, I have to be very, very careful not to add a flippant comment, because for some of the non-English speaking students they can be disconcerting”. Both pioneers and early adopters clearly used different media as a means of providing greater variety. One early adopter for example, used a variety of people for interview snippets on various topics, while another early adopter tried to make her course “more attractive” to her target audience by putting a “bit of a razzle-dazzle” on things”. According to one of the non-adopters, the variety that can be built into a multimodal e-learning course should “help keep student’s interest and keep them studying”.

In line with the literature that links e-learning to a more grounded, authentic and relevant curriculum (see for example Laurillard, 2002; Raider-Roth, 2004; Smith, 2001), was strong belief across both pioneers and early adopters that technology-mediated courses provide more up-to-date, relevant, and applicable content for students. This was stated candidly by one pioneer who wanted students to “relate to the material and be able to transfer that into where they are, what their values and attitudes are, what they’re planning to do with it”, while another pioneer stated
he wanted students to “relate it to their everyday experiences”. However, ‘more’ information/content was not necessarily interpreted as better with most of the interviewees expressing concern that the increased amounts of information provided in technology-mediated courses held the potential to overwhelm students and possibly lead to cognitive overload. Importantly, many pioneers and early adopters perceived the move from print to e-learning as an opportunity to rationalise and prioritise the content, and it is critical to note that, in many cases, the study revealed that there had been an overall reduction of the textual content.

**IMPLICATIONS FOR E-LEARNING POLICY AND PRACTICE**

A central aim of the chapter has been to reenergise dialogue surrounding multimodal e-learning and its relationship to pedagogy. The previous section has outlined how individual educators’ understandings of pedagogy provide the means by which a more seamless transition to multimodal e-learning can take place. The following section briefly summaries the key implications and recommendations stemming from the study in the hope the findings will be of practical benefit to practicing educators and policy makers alike.

**Develop a Clear Definition and Shared Understanding of the Terminology**

The study revealed clear benefits emerge when there are common understandings of what is involved in various e-learning courses and approaches. This point was particularly evident in terms of notions of multimodality and the use of multimedia and ICT to develop distinctive course resources that targeted different sensory modes and a variety of learning styles and modal preferences. Currently, e-learning within the distance sector can refer to printed materials that have simply been “dumped” onto a CD/online through to fully interactive, multimodal courses using a range of technologies. The study revealed that to ensure students have a consistent experience across their programme, a degree of standardisation is beneficial and should involve a set of minimum requirements and standards in terms of levels of interactivity and multimedia enhancements with common sets of language used in their description.

**Inclusive Learning Packages Lead to Improved Learning Outcomes**

Those pioneers and early adopters using multimodal e-learning in their courses perceived this approach as critical in delivering a more equitable and inclusive learning package. Those interviewed stressed this approach better caters for students with different learning styles and modal preferences (VARK) as well as different cohorts of students including Gen Y, ESL and those students with a disability. Given distance education materials have been traditionally presented in read/write format, it was not surprising that those interviewed in the study stressed the need for e-learning formats to radically reduce the volume of reading material and use alternative modes of delivery of content so as to better match the learning styles of the younger students, assist students with an auditory modality and support students with hearing or visual disabilities. Those interviewed also stressed the need for multiple representations of content to allow for dual-coding and to provide repetition and redundancy so as to maximise the impact of teaching material. Overall the findings revealed that by appealing to various learning styles and sensory modes and providing multiple representations of content, multimodal e-learning education courses may be particularly beneficial for lower achieving students and have lead to improved learning outcomes, retention and progression rates.
Encourage Student-Centred, Independent and Resourceful Learning

The findings indicate that multimodal e-learning courses can be used to challenge students to become more learner-centred, self-directed, resourceful and independent learners. To achieve this goal, pioneers and early adopters stressed the need to encourage students to take greater ownership of their learning and for educators to consider using technology in ways that encourage student-centred, independent learning.

Seek to Replicate the On-Campus Experience

A major finding of this research is that well-designed multimodal e-learning courses hold the potential to replicate, at least to some extent, valuable aspects of the on-campus experience including multimodal learning, social presence, interactivity and timely feedback. In addition to presenting content in multiple modes, educators have greater opportunities to personalise their course, break down barriers and develop a social presence, greater rapport and closer relationships with their students who often feel isolated and disconnected. In order to gain greater student interaction with the course content, instructors and other students, educators should focus on interactivity more so than content. In order to provide individualised and timely feedback, educators could include interactive quizzes or crosswords which allow students to undertake some self-assessment and gain instant feedback on their progress.

Revitalise the Curriculum

The move from print to e-learning formats provide a window of opportunity in terms of course renewal and the chance to review the way teaching material is designed and delivered. Effective e-learning course development requires careful planning and implementation. In particular, those interviewed stressed the need to consider what student learning objectives and outcomes educators wish to achieve and then, what multimedia mix will be most effective in achieving those learning objectives and desired outcomes. Educators need to identify the most important concepts within the course and then consider whether and how those concepts could be represented in different ways to cater more effectively to different learning styles.

Engage Students in the Learning

Multimodal e-learning courses hold the potential for a far more enjoyable and engaging learning experience through the use of dynamic, exciting and interesting materials. Strategies cited by both pioneers and early adopters for engaging students and making learning more enjoyable and exciting included the use of humour, variety and colour. While recorded lecture presentations should make the materials more engaging, the research revealed that due to the limited media presentation skills of some educators (as well as the limited attention span of students), it is recommended to keep recorded lecture presentations brief (about 12–15 minutes) by breaking the module material down into smaller chunks (topics) and thus presenting material in ways which are more in line with students’ study habits.

Create a Rich Learning Environment

Multimodal e-learning present educators with an opportunity to create a dynamic and rich learning environment by accessing a vast wealth of current, relevant, applicable and meaningful information from the Internet. However, the research revealed that academics need to be careful that students are accessing Websites which provide credible,
accurate and useful information. The findings also revealed that multimedia applications such as video and audio segments or interactive simulations can be used to develop engaging and interesting learning elements to facilitate situated learning, bring the subject matter to life and provide the basis of authentic assessment tasks based on real-life situations.

**Manage the Course Content**

The research revealed that the increased amounts of information and multiple representations of content that can be included in an e-learning course may be overwhelming for some students, leading to cognitive overload. Strategies for managing the course content of an e-learning course include rationalising and prioritising the content, providing manageable chunks of content, avoiding cognitive overload and providing students with direction in how to effectively use the course resources. To reduce the likelihood of information overload, the majority of pioneers and early-adopters underscored the need to cull information that is not as important or which students could easily access via a hyperlink to a credible site. Indeed, the research indicated that it is important to teach students to find relevant information rather than giving them everything. To retain student attention, reduce cognitive overload and improve learning outcomes, content should be divided into logical and manageable chunks.

**Add Value while Avoiding Cognitive Overload**

Multimodal e-learning allows educators to add a range of multimedia elements and provide multiple representations of content which was interpreted by pioneers and early-adopters to be valuable when it improves comprehension and create greater student engagement. However, the point was raised that too many “bells and whistles” can lead to cognitive overload due to the learning problems associated with limited working memory, split attention and cognitive overload.

**Provide Students with Direction**

Interactive multimodal e-learning clearly represents a new and different way of learning for continuing students who may be more accustomed to using traditional print-based packages. Both pioneers and early-adopters emphasised the need to educate students on how to use the pre-requisite technologies and to provide them with direction (“procedural scaffolding”) on how to most effectively use the resources in order to improve learning outcomes (McLoughlin, 2002).

**Sell the Multimodal e-learning Concept**

In order to gain student and staff acceptance of multimodal e-learning format and encourage more effective use of the resources, pioneers and early-adopters revealed that it is beneficial to “sell” the concept to students by explaining the pedagogical rationale underpinning the approach and promoting the benefits for students. In situations where the course is being taught by a team of educators, it is also clearly necessary to gain the support of the team by explaining the approach and drawing the teaching team’s attention to the various multimodal elements included in the course.

**FUTURE TRENDS AND ISSUES**

The previous decade has witnessed a radical and fundamental transformation of higher education equivalent to changes in the traditional university as a result of the enlightenment and the ensuing infatuation of modern institutions with searching for, and disseminating universal truth. The root cause of the present transformation is the focus of the collection of chapters in this book and is
tied to the emergence of ‘virtual’ in contrast to ‘material’ campuses and the collective rush by institutions to embrace and promote e-learning as a distinct and legitimate component within the academy. A core thread within this current chapter is the belief that the success of the virtual campus, rests in part on the need for academics to better understand the nexus between technology, pedagogy and content and how to use technology effectively to achieve desired learning outcomes. With this goal in mind, the chapter has argued for a reorientation of ‘thinking’ within the academy to positions where the current move from online delivery to online pedagogy can be properly articulated and debated. This chapter has provided a number of recommendations that touch upon the coordinated support required for this goal to occur. Support such as the provision of technical support to move large volumes of digital content across virtual spaces to unseen cohorts of students, while at the same time providing the instructional design support that ties technology to sound pedagogy. To date, many institutions have tried to strike a balance between policy directives that dictate the migration of content while at the same time providing some kind of professional development programme that disseminates of the experiences of pioneers and early-adopters. While this two pronged strategy has resulted in moderate success in encouraging educators to transfer content, the challenge remains one of producing new mechanisms that provide sceptical educators with a contextualised pedagogical understanding of the e-learning environment. This chapter, by discussing pedagogical factors that have influenced educators’ exploration and integration of multimodal e-learning, provides an alterative conduit for the dissemination of pools of collective wisdom concerning e-learning environments.

While the broad move by institutions to embrace e-learning is most commonly framed within notions of ‘Web-based’ or ‘online’ delivery, this chapter has illustrated that e-learning within the distance education section is better thought of as an amalgam of approaches that uses a range of technologies and varied modes of delivery. The chapter has pointed to the future need for institutions to more clearly articulate how e-learning and the associated technologies used, benefit students and staff while also acknowledging that there are no quick fixes or universal panaceas to provide decontextualised training and professional development.

The bureaucratic structure of the modern university makes policy a central vehicle through which programme-wide planning within the virtual campus can provide clear procedures and processes. Thus a major consideration for institutions with virtual campuses must be to generate sound policy that provides clear direction and holds the potential to address specialised and targeted training and support. It is critical to note that an area not yet adequately addressed in current policy is the impact of e-learning and Learning Management Systems on workload allocations. Central to this problem is the fact that most current allocation formulas are tied to outdated face-to-face models which fail to provide sufficient recognition from management for educators who have seriously engaged with e-learning. Yet another dilemma for distance providers remains the issue of how not only to manage the migration of content from print to electronic format, but also the issue of how to encourage all staff to engage with this new medium. Some staff such as pioneers and early-adopters, who have led the way in employing new technologies in their teaching and learning, require little or no encouragement. However, there remains a body of educators who continue to resist the move towards e-learning and it is hoped this chapter will be of benefit to this group.

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Chapter VI
Flying Under the Radar: The Importance of Small Scale E-Learning Innovation within Large-Scale Institutional E-Learning Implementation

Gill Kirkup
Open University, UK

ABSTRACT

This chapter argues that e-learning innovation is best done in an environment that allows for small scale experimentation and development and that this can be made more difficult in an environment that prioritises large-scale e-learning systems (i.e., virtual learning environments and content management systems). These larger systems tend to function more as systems for the control and regulation of knowledge production and management, as well as being very resource hungry. The chapter discusses e-learning activities in the Open University (UK), in particular those of the MA in Online and Distance Education programme in the Institute of Educational Technology. This is a case study of e-learning innovation in what has been described as an industrial production model of university education.

INTRODUCTION

This chapter begins with a discussion of performativity in higher education, and the role that technologies and e-learning play. It describes two ways that e-learning is used for different aspects of performativity: a) to support the control of knowledge production, and b) to enable learners and teachers to innovate and challenge hegemonic systems. It discusses in detail the use of learning technologies over a period of time at the UK Open University (OUUK), and the particular case of the MAODE programme in the University’s Institute of Educational Technology (IET). Based on evidence from this programme the chapter argues that such relatively small programmes are key sites for innovation, and have an impact proportionally much greater than their size might predict. Yet because they experiment with methods and technologies out with large-scale institutional systems,
they have to find ways round these: effectively they must fly under the institutional radar. The chapter concludes by arguing that institutional innovation in e-learning could be blocked by a concentration of resources in large-scale virtual learning environments (VLEs) and content management systems (CMSs). Policy makers and managers must avoid too rigid a focus on compliance with institution-wide systems because this closes the spaces available to innovators who want to trial technologies. The adoption of innovation depends on the freedom of innovators and early adopters (Rogers, 1995) to experiment.

PERFORMATIVITY, UNIVERSITIES AND E-LEARNING

The title of this collection implies that e-learning is a key driver for the transformation of universities. However, it is only one driver: e-learning often appears to be adopted as a tool for other drivers, and in particular the driver of performativity. Performativity has been a concept applied to universities since Lyotard (Lyotard, 1984) argued in the 1980s that, in post-modern societies, knowledge had become commodified, and universities were part of this commodification process. Universities may once have seen themselves as semi-autonomous bodies (collegial organisations) that aimed to pursue knowledge and scholarship for its own good; places where the academic workforce could call on the concept of ‘academic freedom’ to justify their personal authority to decide what they researched and what they taught. Students joined this community as ‘novices’ and left as ‘masters’. However, argued Lyotard, in post-modern societies students are reconceived as customers and knowledge is a commodity (‘goods’) purchased by them and the State; the operation and control of this he called ‘performativity’. This analysis is generally accepted as accurate, whether one supports it or not. David Kirp sums up very well this changing role of universities in the twentieth century in the two quotations he puts in the introduction to his book on the marketing of higher education:

The University is a community of scholars and students engaged in the task of seeking the truth. – Karl Jaspers, The Idea of the University (1946)


Economies, organisations and individuals depend on commodified knowledge and universities are a vital link in the commodity exchange chain. Consequently those who fund universities want to measure the performance of the institution in its creation and exchange of knowledge, and look for ways to increase institutional efficiency. The rise in the use of performance indicators such as retention data, student satisfaction surveys, and research assessment exercises as the tools of performativity is an indication of this change (Barnett, 1992; Cowen, 1996). Some have challenged the idea that universities really are post-modern institutions, arguing that the tools used for performativity measures are ‘a symptom of an excessive belief in rational systems, in objective knowledge and decisionism’ (Barnett, 2000, p. 320) and therefore part of late, industrial modernism (advanced Fordism); but there is wide consensus, however you model universities, that performativity has been the main driver of higher education since the 1980s. E-learning and knowledge media are now part of the processes of knowledge commodification; and also, through their ability to track users and measure and control user activity, part of the systems and tools of university performance management.

Lyotard argued that there are two possible ways that information technologies can be used in universities (Roberts, 1998): they can be used for the control and regulation of knowledge production, and/or they can be used by small groups to...
create their own knowledge through the production of localised narratives and understandings. Using information technologies (including those of e-learning) for the control and regulation of knowledge is usually identified with top-down managerial strategies, and for many individuals threatens disempowerment, de-skilling, and loss of control over work processes and products. This is why the rhetoric of institutional transformation based in implementing large-scale institutional e-learning systems is often viewed cynically by many staff. The second way in which information technologies – and e-learning - can be used is potentially empowering of staff, but can be uncomfortable for managers. It entails the experimental use of technologies and methods with small groups of students and staff who are allowed to define their own performativity measures as they attempt to create new ways to teach and learn. This kind of activity provides a base from which to challenge hegemonic and prescriptive performativity in an institution, and engage in different kinds of knowledge production.

These two ways of using information technologies are usually seen as contradictory, implying that it is necessary that institutions opt for one rather than the other. However, universities are complex and contradictory organisations, and include within them a number of contradictory ideologies and practices. It is possible for them to contain, and make creative use of the mutual challenges of both these uses of information technologies (and e-learning). This chapter uses a case study from one UK university which describes a situation where both these engagements with e-learning are happening concurrently. However, the second kind of activity; that of the small group challenging larger institution-wide systems is, I will argue, likely to be more successful at achieving the transformational aims, without crushing the potential of staff and students to be innovatory within their own contexts. But such an activity involves a constant struggle against the constraint of institutional practices that attempt to integrate all elearning developments into one platform. This chapter is also a particular example of one other aspect of performativity: reflexivity: “the constant monitoring by individuals and institutions of themselves as they are situated in a postmodern world of complexity” (Bloland, 2005, p. 147)

**THE OPEN UNIVERSITY AS AN INDUSTRIAL SYSTEM**

The e-learning discussed in this chapter is located in a national distance teaching university, which gives it a particular educational, technological, and ideological context. The Open University UK (OUUK) has been described by a past Vice-Chancellor as one of the first of the ‘Mega Universities’ (Daniel, 1996): that is a university with a very large student population (100,000 or more), widely distributed geographically, and which uses variety of media and methods (knowledge media) to support and teach its students. Daniel uses the term: ‘knowledge media’ to encapsulate all those information and communication technologies: synchronous and asynchronous, which in the 1990s were being incorporated into universities to help achieve educational expansion and flexibility. Daniel expressed his conviction that technology is ‘central to university renewal’ (from the introduction to the 1999 edition: p. xv). His argument resonated with a world-wide enthusiasm for the potential of knowledge media, so much so that in the forward to the 1999 edition of the book he noted: ‘I now find myself calming the more extreme enthusiasts!’ (p. xv). Research has suggested that e-learning has not fulfilled many of its early promises either to engage the majority of staff – the later adopters on the innovation cycle (Rogers 1995) or achieve increases in efficiency (Zemsky & Massy, 2004a; 2004b). Yet educational policy makers and managers remain, sometimes zealously, committed to the implementation of a virtual campus.
The OUUK was established at the end of the 1960s as one of the first national distance education universities in the world. Its distance teaching system uses methods of mass course production and delivery including a variety of broadcast media (which have changed over time) supported by limited personal contact between students, and between students and their personal tutors. At the same time that Lyotard was arguing that traditional universities were now in a post-modern era of knowledge commodification enabled by knowledge media; the OUUK was being described as an example of modernist industrial production methods applied to higher education (Peters, 1983). In the 1990s Evans (Evans, 1995) argued that the OUUK could be described as a 'post-Fordist' model of educational provision. However, as an institution it still (in 2008) exhibits many of the attributes of traditional 'Fordist' production: mass produced commodities (knowledge objects), production and service delivery methods designed for economies of scale, and relative inflexibility to respond quickly to changes in market demand. These apparent inconsistencies suggest that there is a limit to how useful it is to try to categorise universities in this way. At the time of writing it would be easy to identify aspects of the OUUK that fit a description of a modern, post-modern and even pre-modern organisation, as well as both a Fordist and post-Fordist one. What is interesting for this chapter is the impact of e-learning systems when they are incorporated into an institution which is operating in a variety of organisational modes simultaneously. Consequently the way e-learning systems are implemented and used, and for what purpose, will be different in different part of the institution.

The OUUK is not a virtual university per se, nor does it aim to be one. It describes its pedagogy as 'supported open learning' (Open, 2008). Students are supported both online and in face-to-face and telephone communication by a variety of staff with different roles, but in particular with a local tutor who they are likely to meet at a face-to-face event. However, many aspects of what would be provided in a geographically located ‘campus’: library facilities, social spaces, lectures and presentations, are available online, and in the past were delivered via other media such as print, postal mail, and broadcasting. The OUUK has always attempted to provide a virtual campus for its distanced students, and staff, by using technologies available to it at any time.

E-LEARNING AND ITS PRECURSORS AT THE OPEN UNIVERSITY

E-learning, also known as computer-enhanced or technology-enhanced learning is defined by HEFCE as ‘the use of technologies in learning opportunities’ (HEFCE, JISC, & HEA, 2005), and is used to cover a wide variety of activities. This is a definition that would enable the OUUK to argue that, through its use of broadcast and print technologies as well as limited networked computing, it has been an e-learning institution with a ‘virtual campus’ since 1970. However, for the purposes of this chapter the term e-learning is applied to those more recent interactive digital technology systems that students engage with directly in their studies, while keeping in mind the idea of a ‘virtual campus’ as a much wider concept. Using these became a significant institutional activity first in the late 1980s when personal computers became household technologies. Those early uses have been described elsewhere (Jones et al., 1993).

A focus on the explicit student learning experience can overlook the fact that the OUUK developed large-scale computer systems at a very early stage of its life: for example for student records, mailing systems etc. By the late 1970s a large-scale student survey system was in place which used paper data collection and computer analysis, in order to provide information for quality enhancement: to research, refine and improve...
course materials, delivery and student support. These kinds of digital systems construct how the University’s systems (and staff) see students, and consequently how it relates to them, which impacts on how a student sees the University. They underpin the architecture of any systems which create a sense of virtual campus. These digital systems are also key performativity tools which provide the basic data returns to government which generates the University’s annual grant. They can be a source of inflexibility. For example in 2007 the University began to move towards treating students as participants on programmes of study (rather than an individual course module); members of a discipline community (rather than a member of a student cohort); but the main University database defines students as ‘units’ registered for course modules and this definition of what constitutes a student drives internal resource allocation as well as lines of communication between the student and the University. Also, more problematically for the development of an integrated institutional virtual learning environment (VLE), these systems also define and limit how a student is modelled in relationship to the VLE. It is the significance of these systems in the operation of the University which led Peters and Evans to describe the OUUK in terms of manufacturing production systems.

Developments in student-based e-learning have had to progress slowly and carefully across the institution as a whole because of the University’s particular mission for open access. The University has a responsibility to deliver its courses in ways that minimise barriers to access. Unlike a campus university the OUUK can not provide computer technology for all its part-time distance education students and must rely on them gaining access to personal computing themselves. Consequently, while the use of large-scale internal computer management systems was well developed early in the University, the use of personal computers and e-learning by students has been implemented relatively gradually. Until recently it was easier for many OUUK students and part-time staff to access the University’s ‘virtual campus’ through non-digital media: print, telephone and broadcasting media. Initially the use of personal computers was a requirement only on those courses where the technology was an integral aspect of what was being studied, and it was offered as an optional communication facility (email and computer conferencing) for those students who had the technology and wanted to use it. Even at the time of writing (2008) there is no requirement for students on many OUUK courses to use a computer at all - this still remains optional. However, all courses/modules now have Moodle-based Websites and student forums and most courses allow for the optional submission of assignments electronically.

The adoption of e-learning tools was incremental across the University; starting with the adoption of a tool or activity for specific purposes on particular courses. This adoption was led by enthusiastic academics working with technical designers and programmers (who worked in a support unit called Learning and Teaching Solutions). These individuals fit the Rogers’ (Rogers, 1995) category of ‘innovators’. There are always only a small percentage (maybe 3%) of any population, who produce, and are first adopters of an innovation. They do not always produce innovations that work for others, but when they do the adoption diffusion path will be a familiar ‘S curve’ with rapid adoption by the majority and slower adoption (and in some cases resistance) by the sceptics and the ‘laggards’. Where a particular e-learning component had generalisable uses it was adopted by other members of the University, and quite rapidly became an institution-wide facility (as was the case with online student forums).

By the early 1990s many courses had elements of the course content delivered to students on CD-ROMs. Few students had good Internet access, so multimedia demonstrations; interactive software and large data bases of images and texts were delivered to students in this way. Students
were shown how to use generic ‘office’ applications such as word-processors, and databases as tools for study. As domestic dialup Internet connections became more widespread, asynchronous text conferencing was adopted, initially through a system called CoSy (first developed at the University of Guelph in Canada) and later through FirstClass® and was made available to all students. The particular needs of the OUUK for distributed systems that could be accessed by staff and students from any location in the world, led to the development in-house of a variety of tools: including an authentication system, an assignment submission system, an online multiple-choice quiz tool, a synchronous audio-conferencing system, and a simple ePortfolio system. These were all made available to students via an individualised Web portal known as the ‘eDesktop’. The eDesktop added a portal to the digital systems on the University and operated alongside, but without replacing, non-digital technologies.

By the early years of the 21st century some courses in the OUUK were adopting Web-based tools like blogs and wikis that enabled students, and staff other than expert course authors to produce user-generated content, individually and in groups. These tools were a combination of internally developed software, and the adoption of open source applications such as WordPress. This ‘bag of tools’ is also validly seen as a ‘component based’ virtual learning environment (VLE), but it was criticised from within the University as not constituting a proper VLE, and being in danger of developing interoperability problems. For some people, only integrated digital systems merit the label ‘VLE’, the multiple-media virtual campus of the OUUK did not fit the description. The criticism of ‘the bag of tools’ solution came from University staff, especially senior technical managers, rather than from students who were using it. Research with students, although very small-scale, suggested that they preferred their experience of the OUUK VLE made up of selected components to that of an integrated purpose built VLE (Weller et al., 2005) which exhibited some inflexibility.

Since 2006 the University has been developing and implementing an institution-wide virtual learning environment, and content management system, based on Moodle. The choice of Moodle was justified on technical grounds because none of the commercial VLEs available at the time were considered flexible enough for the University’s particular needs, and of the open source systems available Moodle was more attractive because of its wide user base, the quality of its documentation and the potential flexibility for future developments. An open source VLE was also a preferred ideological choice for many. Technical staff liked the possibility open source offered of being involved in creating new tools and functions. Non-technical staff felt that it was appropriate for the University to build on an ideology of ‘Openness’ - ‘Open to people, places, methods and ideas’ reads the University’s mission statement. Whether a one platform, integrated VLE- even an open source one- reduces the organisation’s openness to innovation remains an issue.

The choice to develop an integrated VLE, based on a programming architecture different from that of the e-learning components in use in the OUUK at the time, entailed a pragmatic decision not to continue development of the separate e-learning components presently in use. It was necessary for the University to develop a new programme of work which meant reallocating both people and resources to Moodle development and implementation, as well as bringing in outside experts. E-learning innovation done on a large-scale institutional level like this corresponds more closely to Lyotard’s first kind of use of technology: for the control and regulation of knowledge production; whereas the earlier innovator-led component development looks more like Lyotard’s second kind of use: experimental, small group, and self-regulated. It is the tension between these large-scale institution-wide e-learning systems and a ‘thousand flowers bloom’
model, and the question of whether a focus on the former necessarily restricts the scope of the latter, that is at the heart of this chapter.

THE MA IN ONLINE AND DISTANCE EDUCATION

One of the places where e-learning ‘flowers’ had been blooming was the University’s Institute of Educational Technology (IET). This is an academic department in the OUUK which houses experts in pedagogy and educational technology. Its role is primarily to support the other academic units in the University in their development and delivery of teaching. To do this, members of the Institute carry out research on teaching and learning, work as expert advisors within the University and to external organisations, and run development programmes in distance and online pedagogy to University staff and other external organisations. The OUUK was the first successful national distance teaching university in the world. It has been as a model for later institutions elsewhere in the world: e.g., the Allama Iqbal Open University of Pakistan (established 1974) and Open Universiteit Nederland (established 1984). Academics and educational administrators from across the world came to the OUUK for training in distance education methods and technologies. In the 1970s and 1980s the Institute found itself repeating seminars and training events to a constant stream of visitors. By the mid-1990s a decision was made that this workload could be reduced, and a larger number of potential participants could be reached, if the training and expertise that was being delivered in person could be turned into a high quality, post-graduate, distance learning programme: to effectively commodify and market IET expertise globally through an e-learning programme. In 1997 the Institute began offering a global online Master’s programme in online and distance education (MAODE) which covered both theory and techniques. This was directed at those educational professionals across the world who might have been participants at residential workshops run in the past.

The MA in Online and Distance Education (MAODE) is a flexible modular programme allowing people to register for only those modules that interest them, or study for two or three years part-time and gain a Masters qualification. The programme is fully online with all materials and student, tutor and course team interactions through a VLE and other associated online tools: forums, blogs, wikis, podcasting, audio-conferencing, and other experimental applications. All assessment is submitted online using a secure University submission system. All courses are designed as constructivist learning experiences with a great deal of asynchronous group activity and interaction. There is an active alumni mailing list, and many early graduates are now senior figures in the field of e-learning. The programme has maintained a healthy level of registrations on modules, with recent significant increases in student numbers. Completion data also suggest that over 80% of those who register on any module complete it successfully. These are excellent completion rates for courses with no face-to-face components. Table 1 shows the total number of module registrations since the first year of the program.

Since one of the main aims of the programme was to reach people from outside the UK, there has always been a concern to recruit international students. The overall percentage of students who

<table>
<thead>
<tr>
<th>Year</th>
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<tr>
<td>1997</td>
<td>61</td>
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<td>2006</td>
<td>246</td>
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<td>2007</td>
<td>305</td>
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come from outside Europe has been healthy, never falling lower than 10% and reaching over 20% on some years. The numbers of international students, especially from the developing world, is lower than the Institute would like. Both the high course fee and the need to have fast and reliable Internet access has been a disincentive in these areas of the world. Table 2 shows the percentage of non-UK students each year coming from Europe and other areas of the world. Although student numbers have doubled in the last two years there has been a reduction in the percentage of students who come from outside Europe.

These figures are impressive in a period when a number of dedicated global virtual universities have been established and failed. In the UK, the ‘UK e-University’ was established by government in 2002 and dissolved in 2004 because of its inability to recruit students globally, to create partnerships with private sector organisations, and because of the problems with its e-learning platform (Bacsich, 2005). One of the MAODE modules was developed with this organisation and survived its demise, running successfully with a small population within the MAODE programme for six years. Other global providers like the University of Phoenix appear to recruit internationally but mainly from US citizens who live in other countries. More recently successes in online course delivery have come from virtual campuses built as outposts of traditional universities (e.g., the Universities of Strathclyde and Edinburgh). They also deliver programmes that are particularly attractive to an international market.

### Table 2. Percentage of International students

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<tbody>
<tr>
<td>Europe</td>
<td>14.8</td>
<td>10.0</td>
<td>14.3</td>
<td>23.3</td>
<td>15.9</td>
<td>20.8</td>
<td>25.3</td>
<td>17.9</td>
<td>14.2</td>
<td>15.9</td>
<td>14.2</td>
</tr>
<tr>
<td>Rest of world</td>
<td>24.6</td>
<td>14.2</td>
<td>17.0</td>
<td>16.4</td>
<td>15.2</td>
<td>16.0</td>
<td>14.7</td>
<td>22.1</td>
<td>20.4</td>
<td>11.0</td>
<td>10.9</td>
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### The Power of Small Scale Experimentation to Produce Innovatory e-Learning

The success of the MAODE can be measured in ways other than those of student numbers: its graduates make up a significant body in the international field of technology-enhanced learning. It has also been a place for e-learning innovations which have had an impact on the rest of the OUUK and beyond, through both the experience of its students and through its contribution to research literature. What follows are brief descriptions of a range of e-learning innovations that depended for their success on being outside the general institutional practice of the time, in particular constructivist learning, mobile technologies, and learning objects.

#### Constructivist Online Learning

A group of post-graduate professionals is probably an ideal community to experiment with ‘content light’ constructivist online learning. Mason and colleagues developed one of the first credit bearing courses of this type in the world: a module called ‘Applications of Information Technology in Open and Distance Education’ (Mason, 1998). The issue it focussed on in particular was the potential of computer conferencing to provide an environment for group-work and constructivist learning. The course team developed the first OUUK conferencing system that operated from a Web browser rather than needing to install client...
software such as FirstClass® needed at the time. While the online debates and other interactions were very popular, the team had to take seriously the notion of ‘collaboration fatigue’, and look at ways of alternating online collaborative work with individual work so that students have ‘rest’ times as well as active times (Mason, 2000).

What was learned from that course, and disseminated through the large numbers of people who gained their training in running online debate and discussion through it, has influenced other courses both with the OUUK as well as elsewhere. However, the course could not have attempted what it did if it had stayed within the constraints of online activity that were in operation when it began in 1998.

Mobile Learning Technologies

Because student numbers on the programme modules were small it was possible to obtain money to buy a limited number of mobile devices to give to students to experiment with in their learning. Personal digital assistants (PDAs) were given to students and their use as devices for reading, interacting with course texts and preparing notes was evaluated (Waycott & Kukulska-Hulme, 2003). The authors were able to demonstrate that the PDAs available for use in 2002 had limitations which made them less useful as learning devices than had been expected. Later research with alumni (Pettit & Kukulska-Hulme, 2007), indicated that even educational professionals were able to make only limited use of PDAs and other mobile devices, and suggested that care should be taken before incorporating these devices into e-learning activities in any critical way. Research continues on mobile devices for use in learning, and both students and alumni remain keen participants.

Learning Objects (LOs)

A module called Learning in the Connected Economy was developed in partnership with the UK eUniversity. It was the first OUUK course to be developed using learning objects (LOs). Both the students and the course team felt that this form of design was flexible and easy to use (Mason et al., 2005). Learning objects have not become the technical standard for components in other programmes in the University, but this course provided the first practical implementation of the use of LOs in the design of OUUK courses. The fact that the module was produced in this way meant that it was possible to re-version learning objects from the module, have them translated into Chinese and offer them to academics from a federation of Chinese Universities to up-skill them in e-learning.

Other Experimental Technologies

Modules on the programme also experimented with a variety of other technologies, only some of which were part of the systems that the OUUK used institutionally. Students were introduced to blogging using MoveableType and WordPress systems. Research on MAODE students blogging has produced the first paper to propose a typology for course designers to use when considering incorporating blogging into e-learning (Kerawalla, et al., 2008). Students experimented with podcasting both as listeners and as creators of podcasts themselves. They used ePortfolios: both a commercial system called ePortaro, as well as the University’s version of a Moodle eportfolio called MyStuff. The MAODE has been the main proving ground for early versions of MyStuff with students using it for their assessment. Programme modules used an inhouse audio conferencing system called ‘Lyceum’ and a variety of an asynchronous text based collaboration systems including FirstClass, Moodle forums and ‘Rotisserie’ developed by Harvard University (Weller et al., 2005).

If the MAODE programme had been restricted only to those systems previously available as part of either the component based virtual campus, or the newer integrated Moodle based institutional
VLE, it could not have been the innovatory development and research platform it has been for the last ten years. Its existence remains insecure, as both the internal institutional environment, as well as the external one, has been challenging. OUUK control systems for course design and production can make small population courses (in OUUK terms this is less than 200 students) appear financially non-viable. These large-scale performance management systems are driven by resources flows: expenditure and income, not by the potential to develop, lead and test innovation.

**THE TYRANNY OF BUSINESS PLANS**

In comparison with the scale of undergraduate programmes in the OUUK, the MAODE is small in the number of modules in its programme and in the numbers of students registered on modules in any year. It has therefore had to live with production and presentation methods designed for a large-scale industrial model of course production and delivery, and an integrated VLE planned for a similar scale of operation. It is a minnow sharing an aquarium with whales. VLEs by their very nature tend to be monolithic, and different disciplines and academic levels have to work within them to achieve their particular learning objects. Yet research (Burge & Haughey, 2001; Stensaker et al., 2007) suggests that it is the local responsiveness of any e-learning development that determines its success.

Work by Bates (Bates, 1995; 2005) has shown that there are different actual and opportunity costs associated with any learning media. The costs of developing and implementing large-scale computer-based systems have been remarkably difficult to predict in all public sectors, and this applies to VLEs (Van Dusen, 2000; van Rooij, 2007). It is rare that an educational institution attempts to model the cost of every aspect of its teaching operation in the way that the OUUK does. However, costing models are only models and are constantly in danger of no longer modelling the actual – changing- activities they attempt to cost. Costing control models of large-scale complex activities in particular often make innovation that is out with the model appear very expensive, or if the innovators are lucky – make it invisible.

Every academic activity in the OUUK goes through a financial appraisal before it is approved to start. Because of the nature of OUUK courses, production and delivery (presentation) are modelled as two distinct activities, engaging different units within the University. The allocation of these costs is done via a process called ‘Inter Unit Planning and Coordination’ (IUPC), which both defines and determines the drivers of costs, and ensures that service units receive appropriate income. Because the OUUK operates on an industrial model, course related materials production activities, such as editing and mounting content onto the VLE, are carried out in service units of the University rather than within academic units. The nature of these activities and their costs is often a mystery to academics who design and write courses. In the first five years of the MAODE programme course developers got round the costs problem by using a server located within the Institute as well as tools created by Institute staff; so avoiding the large overhead costs of internal University systems. Doing this reduced and disguised costs but also kept Institute staff - the innovators- closely involved with the production and delivery of the programme. As student numbers and different kinds of online activity grew, it was no longer possible for the Institute to provide the technical support and back up it had previously done. The programme had to use University central support units and MAODE course proposal had to find ways to make the ‘books balance’ in business appraisal documents.

Although integrated VLE’s are seen as a technology which will increase performativity; reduce
costs and increase efficiency, the actual costs of producing an online course in a large industrial-scale organisation like the OUUK are very high. For example in 2007, editing and mounting on to the VLE 5 study hours of online course assets cost between £300 for ‘simple’ materials to £3,000 for ‘complex’. Costs for video production varied from £250 per minute to £1,500 per minute. Other costs for asset production for course components include the costs of copyright for third party materials, and the hourly rate for a Rights Department to negotiate these costs. It is easy to see how multiplying these hours into significant sized modules brings with it very large costs for technical and administrative input additional to the cost of academic input. When the course is delivered per student costs are also incurred for a variety of other activities such as enquiry and reservations services, for the administrative handling of each piece of assessment as well as for student support from local tutors and advisors.

The OUUK is an organisation built on a notion that economies of scale can be achieved in an industrial model of education delivery. Small-scale innovative and experimental courses by their very nature cannot achieve economies of scale. That is a stage that comes later in an innovation adoption cycle (Rogers, 1995). MAODE course designers who want to use experimental and innovative tools or pedagogy have had to engage in various kinds of creative accounting in order to get their proposed modules though business appraisal systems.

RECOMMENDATIONS

Models of technology innovation and adoption (Rogers, 1995; Venkatesh et al., 2003) suggests that it is important for institutions to create spaces for innovators and early adopters (both staff and students) who are willing to give additional time and energy to experiment with new technologies in the process of their work and study. This needs to happen in the context of real teaching and learning. These innovators are the people who test the water and encourage later adopters to jump in too. If innovation in e-learning is not to be crushed by the rigidity of institutional VLEs and business planning models which separate research and development from the design and practice of teaching and learning, universities must find ways to open up spaces in their virtual campuses, and provide resources for students and staff to ‘play’ in these spaces. This means that institutional managers have to reflect on the pressures on academic staff for increased efficiency and the achievement of performativity measures imposed from outside the institution. Institutional managers could do much to create spaces for innovation in the way institutional financial models are made to work.

FUTURE TRENDS

From my location in a global distance learning university, there appear to be two trends for virtual campus and e-learning developments. I am not sure that they are compatible.

One trend is for institutions to put even more effort and money into bedding down institutional VLEs. VLEs are proving to be very expensive and frequently have not delivered on the functionality promised when they were first adopted. This has led to many institutions behaving like serial monogamists, who are onto their second and third VLE partners. Divorce is costly and bigamy might have been a less expensive and more flexible solution.

While institutions struggle with VLEs, the most innovative teachers and students are experimenting with Web 2.0 applications outside the institution’s ownership and control: blogs hosted by non-institutional Websites, the exchange of content and conversations through social networking sites. The best way to incorporate these ever changing and developing tools into a virtual
campus is to envisage the system as a component based one, integrated through the minds of users rather than through digital systems architecture. However, a focus on requiring all teaching and learning activity to use institutional tools and be logged as institutional activity works against the users incorporating public Web-based tools into their learning and teaching. Commodification will have won over innovation.

**CONCLUSION**

There is a serious danger that the implementation of an integrated institutional VLE reduces the possibilities for learner and teachers i.e., those directly engaged in the pedagogic process, to innovate. This chapter has described one innovatory programme in a particular technology dependent university, and briefly described ways in which it led innovation in some aspects of e-learning in the University. Its activities have informed wider institutional developments, and had an impact external to the University. I have argued in this chapter that the OUUK has had a form of virtual campus since its inception in the 1970s. This virtual campus was supported by a variety of technologies both digital and non-digital, and was best described as a ‘component based’ virtual campus. The MAODE has always been ahead of the University’s virtual campus developments with respect to digital tools, but has paid the price of being early adopter. As single platform VLE’s become the system of choice of most institutions, the spaces previously available for e-learning innovation close.

This chapter began by addressing Lyotard’s assertion that universities have two options in how they use technologies to achieve their objectives. The first is to use them for the control and regulation of knowledge production, and this matches the way large-scale integrated VLEs and CMSs are often implemented. This way also creates expensive monolithic systems which make it difficult for small-scale experimental innovation to get started. The second option entails the experimental use of technologies and methods with small groups of students and staff who are allowed to define their own performativity measures as they attempt to create new ways to teach and learn and do research on the adoption of innovation.

**REFERENCES**


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**ENDNOTE**

1 A brief history of the OUUK, and up to date information about its activities can be accessed at the University’s Website: http://www3.open.ac.uk/about/
Chapter VII
Matching Technology, Organisation and Pedagogy in E-Learning: Looking for the Appropriate Balance Leading to Sustainability and Effectiveness

Albert Sangrà
Universitat Oberta de Catalunya, Spain

Lourdes Guàrdia
Universitat Oberta de Catalunya, Spain

Pedro Fernández-Michels
Universitat Oberta de Catalunya, Spain

ABSTRACT

This chapter presents the findings of an in-depth analysis through several qualitative research studies, pointing out the key issues in relation to succeeding in developing effective and sustainable institutional virtual campuses and E-Learning provision initiatives. An appropriate balance between the issues concerning technology, organisation and pedagogy, the TOP triangle model, is needed, although every higher education institution is different and develops its activity in a particular context. In addition, the design and implementation of a strategic plan for such initiatives is highly recommended.

INTRODUCTION

The general use of Information and Communication technologies (ICT) is having a clear social, political and economical effect and the field of education and training has not been spared. New social and learning needs and changes from the shift of Information and Knowledge Society have
made the universities consider ICT use as a driver of institutional change.

Dillman (quoted by Hanna, 2000) affirms universities must change in order to satisfy the new students’ needs, on the basis they are a public service. In the same way Bricall (2000) states that ICT is going to be “one of the main key factors for change in universities in the very next years” (pp. 237-249). Bates (2000) and Hanna (2000) translate the felt urge for an adaptation to new realities into concrete rationales for e-learning in Higher Education (Sangrà, 2003), most notably:

- To facilitate and increase the access to education and training to a wider range of people;
- To improve the universities’ economical expectations;
- To respond to the “technological imperative”;
- To improve the quality of education.

One of the ways in which higher education institutions are doing this is by developing virtual campuses and other e-learning solutions which are adapted to the needs of their social contexts.

IN SEARCH OF EFFECTIVENESS AND SUSTAINABILITY: THE ROLE OF STRATEGIC PLANNING AND FLEXIBILITY

Virtual campuses and e-learning provision from conventional universities implies necessary changes. These changes normally involve a whole strategic planning process with the redefinition of roles, the creation of new functions and departments, the conceptualisation of online teaching and learning, the reorganisation of administrative processes and routines, and the restructuring of educational design and production processes. Effective e-learning provision can only be understood within the context of a reconfiguration of the organisational and pedagogical characteristics of an institution in harmony with the new opportunities and limitations the technology provides. We therefore see technology, organisation and pedagogy as a triangle of factors that are closely interrelated in a symbiotic way. An in-depth review of representative experiences of e-learning provision leads to the understanding that sustainability and effectiveness are closely related to how the institutions configure the triangle of technology, organisation and pedagogy (TOP), on which they base their educational activities.

The three elements are interrelated in their function of contributing to the provision of a powerful environment in which teaching and learning can happen under clear and defined quality parameters. Despite the fact that each institution has its own particularities that lead to the need of customising the balance between the three factors depending on parameters such as target group, size, type of contents, social and educational context, it may be considered that the right balance between the three fields can not only hugely vary with different institutions, but it can be subject to necessary adjustments as needs and requirements change over a period of time.

We therefore consider the factor of flexibility and adaptability a key factor for success in e-learning provision. Collis & Moonen (2001) and Khan (2007) have already introduced the concept of flexible learning in this context. While Collis & Moonen focus on how technology and organisational factors of E-Learning are related to the learning process change, Khan attempts to show how it is possible to create a meaningful flexible learning environment by facilitating authentic and relevant learning activities and assessment, as well as authentic contexts that reflect the way the knowledge will be used in real life and therefore improve learning motivation. Also giving to the students access to expert advice in terms of guidance and coaching, collaborative work and the adoption of different roles and perspectives are examples to be in mind when flexible environments are being designed.
ANALYSIS FROM SEVERAL STUDIES: A SYNTHESIS TO IDENTIFY KEY ISSUES

In the recent years, some studies have been carried out in order to analyse the phenomenon of virtual campuses and e-learning. Most of them have a partial approach, focusing on particular issues, mainly educational, technological or economic. However, they are also complementary if you look at them from a systemic point of view. The studies were chosen based on the advice from competent experts and on the following criteria: an international approach, a sound research methodology and financing based on public funding.

In this context, an in-depth cross-sectional analysis has been conducted to identify which are the key issues that the research studies point to justifying or explaining their success or failure. To do so, the findings and conclusions of the different studies were used to extract several key issues that were classified under three emergent categories, namely technology, organisation and pedagogy. The considered studies are used to identify a number of key issues:

MEGATRENDS in E-Learning Provision (2007)

The European project “Megatrends in E-Learning Provision” identified 26 mega-providers of e-learning in 11 European countries and analysed the factors that lead to sustainable growth and successful e-learning provision in these institutions. The analysis was based on 25 hypotheses of success that were grouped in 5 main clusters, covering history, technology, courses, management and strategy and economy. The project produced four books (see http://nettsskolen.nki.no/in_english/megatrends/) that give an overview of large e-learning providers in Europe, offering case studies for each of the identified mega-providers, presenting and discussing a number of discontinued initiatives that failed in their attempt to grow into large providers of e-learning. In addition, the books offer recommendations about how to tackle the challenges of building a robust and feasible e-learning service based on a thorough analysis of the factors that have contributed to the success of the studied institutions.

HELIOS Yearly Report (2005-06)

Helios is an integrated research and development project, funded under the eLearning Programme of the European Commission. Its mission is to establish a sustainable observation platform to monitor the progress of e-learning in Europe and to forecast future scenarios of its evolution. The 2005/2006 Helios Yearly report analyses: a) how e-learning is contributing to increasing the access to learning, improving employability and fostering personal development; b) how it is evolving in Europe; and c) which could be the most significant future trends. It finally provides a number of recommendations to policy makers and practitioners involved in e-learning design, implementation and evaluation.


With the aim of gaining better understanding of e-learning practices and issues at an institutional level, the OECD Centre for Educational Research and Innovation (CERI) undertook a qualitative survey of practices in 19 tertiary education institutions from 13 countries. This study was complemented with the inclusion of quantitative data coming from the 2004 survey of online learning carried out by the Observatory on Borderless Higher Education (OBHE). The research raises a number of issues in an attempt to explain the relatively poor outcomes regarding e-learning implementation in tertiary
education within the studied countries, such as institutional strategies, pedagogical innovation, staff development and scaling up of faculty-led initiatives among others.


This project relates to research conducted and published by the UNESCO, which explores ICT policy (i.e., planning and management implications of several newly created institutions of education, virtual universities) as emergent models or reorganised institutions of higher education. Three basic chapters describe the context of the study, the trends and challenges and the impact of cross-border education. The main part consists of eight case studies from different countries and representing various institutional models that describe the situation of their development and relate decisions and results obtained during the process in order to offer a message regarding the lessons learned.

**MASSIVE (Modelling Advice and Support Services to Integrate the Virtual component in higher Education) (2004)**

The MASSIVE Project had the aim of designing a model of necessary support services for the implementation of e-learning programmes in traditional European universities. Besides other focal points, the project defined a conceptual model of virtualisation, and identified and classified good practices in the organisation of support services in relation to the implementation of virtual components. With this, the MASSIVE project supplied valuable information about the organisational aspects of the process of e-learning implementation and provision.

**FINDINGS**

The comparison of the findings reflected in the different project reports contrasted with other relevant literature, identified an interesting array of issues that can lead to effective and sustainable models of E-Learning design, management and delivery (Bates, 1995; Collis & Moonen, 2001; Garrison & Anderson, 2003; Hanna, 2000; Khan, 1997; Mason, 1998; Stephenson, 2001). Still keeping the structure of the previously mentioned triangle, concerning technology, organisation and pedagogy (TOP), we are now going to present these key factors in a synthesised way.

**Technology**

The current landscape in relation to the educational use of ICT within the context of e-learning provision, allows us to identify three basic ways of addressing the main problem regarding the technological approach, i.e., choosing the appropriate technology. This problem includes issues such as the development of a virtual teaching and learning environment (VTLE) ‘from scratch’, the use of commercial solutions and the use of open source and publicly licensed software.

Having overcome the situation when in the past, the pedagogical design seemed to be subordinated to the possibilities a particular technological solution could offer, we now find that technology is widely chosen, even created, to support existing pedagogical principles and guidelines. Nevertheless, an institution-wide adoption of online systems that aim to manage teaching and learning seems to be a difficult task to conduct. In 2005, the OECD/CERI Observatory reported a low impact of Content Management Systems (CMS) and Learning Management Systems (LMS) in providing tertiary education and a much more significant use of online systems in administrative services (i.e., admission, registration, fee payment) (OECD, 2005, p. 14-15).

Ideally an online teaching and learning system should be able to fully address the needs that
derive from the target group and the intended learning outcomes that determine the contents, the pedagogical approach and the overall management of the programme. It should also support the institutional or corporate identity reflecting its image, ethos, convictions etc., and give an impression of autonomy and control. But a system that can accomplish all these requirements holding a matching solution for everything can only be one designed ‘from scratch’, developed “without restriction on costs and staffing, and uninhibited by resistance to change from previous practices.” (Davis, 2004, p. 98). Many times this ideal solution fails when it is confronted with reality and its constraints, particularly regarding limited resources, that do not allow the continual updating of a technological solution in response the evolving needs.

The decision between in-house solutions, open-source systems and commercial offerings is therefore based on complex considerations that involve the pedagogical approach, the type of contents and the technology needed to deliver them, the available financial and human resources, legal and political constraints, and the compatibility with existing systems. The integration of ICT in an institution can have such a considerable impact that it can affect its strategic bases and therefore, has to be addressed from a strategic point of view (Mason, 2006). The best technical solution is obviously the one that fits into the space confined by the multiple factors that determine the specific nature of an institution and its related possibilities and needs of e-learning provision. Such a solution can only be found after thorough analysis of these factors and a strategic vision of the future evolutions.

Designing a Platform ‘From Scratch’: Examples and Implications

In the world of e-learning, and especially among the big providers of Web based education, the development of in-house virtual campuses is not unusual. The MEGATRENDS report (Paulsen, 2007) gives us some representative examples like the Open University of Catalonia, the NKI Distance Education in Norway, or the corporate providers LearnDirect (UK) and Élogos (Spain): in spite of the considerable costs and technical complexity, the development of a platform ‘from scratch’ held a number of strategic advantages that compensate for the significant challenges faced. These advantages are:

- Complete control over all functionalities of the platform, including advanced customisation;
- Perfect alignment with the current technical and pedagogical needs;
- Possibilities of further development and adaptation to new requirements;
- Possibilities to commercialise the platform itself, selling design and maintenance services to other institutions;
- Possibilities of integration with other technological systems like student management or other administrative issues.

It is obvious that the development of a complex technical solution and its maintenance can only be recommendable when an institution has a very clear vision about what it actually wants to offer and if and how it is going to achieve an acceptable return on investment. The design of a platform ‘from scratch’ is not something that should be done as part of an experiment with little expectations of success.

The OECD report (OECD, 2005) focuses the mentioned motivations for an in-house-solution in a more critical light that invites us to reflect on what is really of importance: the technological wrapping of an educational programme or the underlying pedagogical and organisational body. There is sometimes an over-expectation on what technology can bring to an educational solution in that the pedagogic impact and institutional take-up of new and prominent open source plat-
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Commercial Platforms: Examples and Implications

Choosing the services of a commercial LMS vendor means immediate relief on the technological side. Nothing needs to be developed. The platform and its functions are there, ready to use. Hosting services are easy to find or even included in the whole package. While development costs are no longer an issue, licensing costs can be considerable depending on the number of students that are going to use the platform. But licenses include technical support which is often a real advantage, especially in institutions that have neither an advanced technical department nor enough know how to be able to solve problems on their own.

Some of the big providers of e-learning studied in the Megatrends project used a commercial solution as their main virtual learning environment. Examples are the University of Tartu in Tallinn, Estonia, the Manchester Metropolitan University (MMU), the University of Staffordshire, the University of Leicester, the University of Ulster and the UNED in Spain (Fernández-Michels & Sangrà, 2007). All of these institutions use WebCT/Blackboard for their e-learning provision. Interestingly only one of them (Ulster) does not report difficulties in integrating the VLE with the rest of the ICT systems used in the university. All the others report some kind of problem when it comes to the integration of administrative issues such as student enrolment, certification etc. The MMU explains how scaling up from WebCT campus edition to WebCT Vista would help to solve integration problems and gives an example of how clients of commercial vendors depend on the stage of development of the product.

Upgrading or modification of commercial products is not always positive, as shown in the LMS Focus Group Report by the Instructional Technology Resource Centre of the Idaho State University (ISU) (2006). The ISU had been using WebCT in 1997 and was already running about 600 e-learning courses (and paying more than $35,000/year for the license) when the company decided to release a new version. This would have required a considerable shift in support and resource management. In addition to that, the acquisition of WebCT by Blackboard was imminent which made the character of future products uncertain. The ISU decided to undertake a thorough analysis and comparison between WebCT and two open source platforms, namely Sakai and Moodle with favourable results especially for Moodle.

The Open Source Philosophy: A Growing Phenomenon

Even though the OECD study considers “[...] the pedagogic impact and institutional take-up of new and prominent open source platforms [...] unclear” (OECD, 2005, p. 15), the Megatrends project (Paulsen, 2007) showed that a considerable number of institutions use these platforms very efficiently. Moodle appears as the most popular solution, but others like Ilias and Sakai also share a considerable part of the market. Some important institutions opted to integrate open source platforms in their set of technological solutions or even to replace existing commercial setups with open source software. Good examples are the Polytechnic University of Madrid and the Open University in the UK.

Open source solutions under public licence agreements are certainly an answer to two important problems. The first one is clearly an economical one. Times of significant budgetary constraints clearly encourage decision makers to look at assumable options, and the public licence offers have clear advantages in this sense. The second point is the possibility to customise the product in a way that it fits the institutional, pedagogical, administrative and technological context it has to be set in. In this sense, Moodle, Sakai and
all the others have only gradual disadvantages in comparison to in-house solutions that held as one of the strong points the adaptability to particular contexts.

The Polytechnic University of Madrid decided to use Moodle as the main system for the institution’s e-learning programmes after having analysed a large number of e-learning platforms. The final decision in favour of Moodle underpins the thesis that some open source solutions are beginning to be real competitors to commercial products regarding functionalities and reliability. The report on VLE evaluation by Britain & Liber (2004) as well as the independent evaluation source EduTools3, confirm this assumption and so does the reality reflected in the Megatrends report where a considerable number of large e-learning providers, such as the University of Las Palmas de Gran Canaria, the German consortium OnCampus and the Portuguese Universidade Aberta base their activities successfully on open source platforms4.

Weller (2006) considers the implementation of Moodle as a general VLE in the UKOU as the result of a natural process that starts with the preparation of the e-learning ground by pioneering the use of a number of commercial and in-house systems that covered different functions like discussion and conferencing (FirstClass), authentication, content delivery, blogging etc., and concludes with the integration of these tools in a general architecture. The open source character of Moodle allowed adapting the platform in a way that it could be integrated in the existing structure and, additionally, allowed to shortcut the development of some tools that are already provided by the VLE itself (Weller, 2006, p. 101). The Megatrends project’s Website holds revealing transcripts of the interviews held with the representatives of the selected institutions. Asking about the integration between the different IT-systems in the UKOU, the interviewee underpins the previously stated interpretation by mentioning Moodle as a solution to the difficult task of integrating the different systems used in the UKOU. Nevertheless it is also stressed that the use of a single VLE right from the beginning would have probably limited the institution’s pedagogic choices5.

The way people address and satisfy their learning needs is very much influenced by the access to generic technologies such as radio, television, mobile learning devices and especially the Internet with its latest possibilities to retrieve, edit, publish and communicate. It might be an interesting point to ask to what extent a virtual learning system should reproduce the existing possibilities within a hermetic context or rather allow the integration of or even the excursion towards external tools that can cover teaching and learning purposes.

As already seen, Weller (2006) looks at in-house, commercial and open source platforms in a slightly different light and points at the use of decentralised or personalised learning environments as the final stage of an almost natural, organic process. In his opinion, “The process of technology adoption in institutions is analogous to that of succession in plant communities, whereby successive generations of colonisers alter the environment, making it favourable for other species.” (p. 99).

Following this analogy, Weller highlights three important issues that point to the direction of a gradual superseding of commercial solutions by open source VLEs:

- The development of open standards that take away the only selling point of the commercial vendors;
- The convergence of systems in terms of functionality that leaves both options with only minimal differences that can be easily neglected;
- The increasing reliability of open source solutions that have become serious rivals, especially with products like Moodle, Sakai or Lams. (Weller, 2006, p. 99)
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Using Weller’s argument, Open source VLEs come into play when the presence of the first “colonisers” has finally transformed the environment and created a general acceptance of e-learning in organisational and pedagogical issues. The customisable character of open source products helps to match these new requirements and widens the possibilities of further development of a learner centred e-learning provision. Finally, and after the full establishment of open source solutions, the context would be ready for systems that require more profound changes, such as personalised learning environments with architectures that leave closed systems behind and open up to social networks, content co-creation by students and an increasing number of other tools and spaces provided by the Web 2.0 that can be used for training purposes.

Organisation

ICT integration can affect the organisation of an institution in many ways. As pointed out by the HELIOS report, there is a need of research on the impact of e-learning in organisational change (Aceto et al., 2006, p. 5). In the same way, the MASSIVE project states that “The evolution of higher education towards virtualisation will inevitably mean significant organisational re-engineering.”ICT has become one of the most important change drivers in the last decade in a number of institutions. Learning organisations are not different in this sense and they have inside some people reluctant to any change. E-learning, as a means of a total or partial distance education model, needs to have an organisational infrastructure that guarantees the achievement of the educational aims. The understanding of how the entire system of course development and delivery occurs, and how these systems link to services and other components are vital aspects of ensuring effectiveness and quality (Davis, 2004, pp. 97-98). The new technologies that are going to be used in the organisation often require changing the way in which people think and work.

The level of necessary changes certainly depend on the range technology is aimed to be used in. However, successful examples of e-learning provision seem to indicate several factors that are common in different institutions, such as the organisation of effective administrative systems that can deal with off-campus enrolments and services, the creation of specialised departments that accompany and advise faculty members in the use of technology, the way in which the process of course creation is designed and the support given by the management of the institution and its leadership.

The Importance of Technical and Pedagogical Support

Most of the organisations that decided to adopt e-learning based on certain expectations had faculty and trainers with little knowledge of online education. The nature and the extent of competences of staff has been highlighted as crucial for a successful e-learning organisation and staff and training development becomes a critical need (Paulsen, 2007, p. 88).

Thus, organisations need to face the creation of technical and pedagogical support unit to help the faculty and trainers to get the appropriate competences that will lead them to success in a new brand environment. Sometimes there is some reluctance from some people to modify and recreate their teaching models and to enhance ICT.

The Shift from On-Campus to Off-Campus Administrative Services

Administrative organisation of virtual campuses or e-learning initiatives needs a radically different approach than traditional on-campus systems. Some universities are proud of their administrative routines, and they want to unconditionally maintain them when embracing e-learning de-
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development. This brings a number of problems to the universities, even risking their traditional organisational reputation. Student administration is a complex task, and we always should take into account the different profile of our students. This profile is changing, and those who are used to managing information and queries in digital environments become demanding users of our systems that should not be approached from old bureaucratic conceptions. Paulsen (2007) states that effective administration is a very important factor to success and that institutions shifting to off-campus services may manage administrative issues in a different way, focusing on developing integrated, LMS-based systems that may provide more flexible and easier use.

The main challenge these institutions face is the need of automation. In fact, some universities declare that its main interest in integrating ICT to its regular work is to improve management processes (Sangrà, 2005). Universities should do their best to maintain, analyse, monitor and improve the management. The effectiveness of this process, however, will be checked by the students later. Even if sometimes people are reluctant to consider organisational administrative issues something completely independent from learning, in a VLE it is not. Students have to manage their valuable time very carefully in order to learn more effectively, therefore, efficient management and administrative procedures that save users’ time are viewed as playing a very important role.

Bottom-Up or Top-Down? Which Approach Matches Which Scenario?

Whereas in the beginning of the digital era, technology was prohibitively expensive and reserved to the very large and powerful institutions, nowadays platforms, tools and carriers are becoming so cheap that it must be a temptation even for very small companies to try things out and start the journey into ICT based training. However, making it available to everybody can bring up certain problems.

The OECD study criticises an inefficient use of e-learning due to a lacking framework “that would help shift e-learning to the mainstream and maximise its impact in the classroom.” (OECD, 2005, p. 19). According to the study the current situation shows a scattered practical and experimental knowledge of e-learning that is the result of a small scale implementation without having a general vision and a broad plan about what the institution as a whole really wants to do with ICT. Thus, “even successful practices and interesting experiences have limited impact and visibility.” (OECD, 2005, p. 19).

Bates (2000) comes to similar conclusions. This seems to indicate that the “bottom-up” strategy should always be based on a general framework. This framework provides smaller units with the necessary guidance to fit their efforts of implementing e-learning within their teaching and training programmes into a wider strategy that reflects the intentions and possibilities of the whole institution regarding e-learning. The creative power and flexibility of small units and faculties has to be made effective through a double action that consists in keeping the efforts within the general strategy and, at the same time using them as a generator of ideas and initiatives that can be integrated in this general strategy in case they contribute to necessary adaptation and renovation.

Interestingly, many of the large and successful providers of e-learning that have been studied in the Megatrends project show, at least in their initial phase, a mediated bottom-up strategy that consists in supporting small scale, even individual experimentation and development of e-learning with a structure that provides technical and pedagogical support combined with guidelines that reflect the institution’s general e-learning policy.

Some clear examples coming from the Megatrends Project are the Universidad Politécnica de Madrid, the Universidad de Las Palmas de
Gran Canaria, the UNED, but also the University of Staffordshire, the Manchester Metropolitan University, and others. Similar data comes from the MASSIVE Project where institutions like the Universities of Seville, Granada and Barcelona (UB) or the Universities of Potsdam and Erlangen-Nürenberg have been supporting e-learning implementation with specialised centres or departments that offer pedagogical and technical guidance to the teaching staff.

It can also be observed that there is a clear tendency towards centralised top-down strategies when we look at the pure distance education institutions or those that aim to develop an important and self-efficient e-learning infrastructure that is not subordinated to on-campus programmes or used as a complement to face-to face-courses. In the first group we can find the Open University of the Netherlands, the NKI-DE and the BI in Norway, Universidade Aberta in Portugal and the Open University of Catalonia in Barcelona. In the second group there are the previously mentioned Universidad de Las Palmas de Gran Canaria, Leicester University and the University of Ulster. Distance education institutions that shift towards ICT-based course delivery have a shorter distance to go than traditional universities that usually have to try to integrate a wholly new teaching and learning concept into their existing administrative, organisational and pedagogical frameworks, having to overcome old conceptions and the reluctance from their teaching staff that easily sees their prominent position threatened. These observations assume that there is no “one-size-fits-all” recipe and that the choice for one or the other strategy depends on the type of institution and the objectives this institution is trying to reach in the implementation of ICT based programmes. The MASSIVE Project distinguishes between four different models of implementation that could be matched with different degrees of bottom-up or top-down strategies. These models are (MASIVE, 2004):

**The Non-Structural Implementation of VLE (i.e., E-Learning)**

Where conventional universities are an experimental stadium of gradual transformation based on pilot projects, this model would certainly fit with a bottom-up strategy, mainly individual initiatives loosely supervised or guided by faculty in order to identify possibilities to consolidate the implementation process. It would be a way the Italian mega-provider SCUOLA IaD (University of Rome Tor Vergata) described as the “praxis-theory-praxis dialectics” that helped building competence and opened the way to sustainable and effective growth.

**The Model of Parallel Structures**

This relates to the scenario where alongside traditional structures an institution has little experience in the implementation of e-learning, but develops a strategic plan that promotes the integration of virtuality in teaching and research. We would probably still be talking about a bottom-up strategy due to the lack of general competence within the institution. But this strategy would already be supported by the conceptual framework that could help to scale the efforts up and turn individual

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### Table 1. Examples of centres/units supporting e-learning implementation

<table>
<thead>
<tr>
<th>University</th>
<th>Centre/Unit</th>
<th>URL Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universidad Politécnica de Madrid</td>
<td>GATE – Gabinete de Tele-Educacion</td>
<td><a href="http://www.gate.upm.es/">http://www.gate.upm.es/</a></td>
</tr>
<tr>
<td>Universidad de Las Palmas de Gran Canaria</td>
<td>Centro de Innovación para la Sociedad de la Información</td>
<td><a href="http://www.cicei.ulpgc.es/">http://www.cicei.ulpgc.es/</a></td>
</tr>
<tr>
<td>UNED</td>
<td>Centro de Innovación Desarrollo Tecnológico</td>
<td><a href="http://portal.uned.es">http://portal.uned.es</a></td>
</tr>
</tbody>
</table>
or sector based implementation initiatives into institutional projects with an important impact. The transcript of an interview with someone responsible for the e-learning implementation in the Polytechnic University of Madrid carried out within the Megatrends project reflects this model in a very clear way: “The competence in e-learning has basically developed by carrying out experimental projects, mainly initiated on an individual basis, that are analysed, evaluated and conceptualised by the GATE (Gabinete de Tele-Educación) in order to make them extensible for general use.”

The Mixed Mode Model
This relates to a conventional university that intends to change its whole organisation from traditional to dual-mode. This model is certainly the one we can find most frequently among the examples of large providers of e-learning presented in the Megatrends project. And it might not be wrong to presume that the mixed mode model can be the stage of development that follows an initial model of parallel structures. The integration of e-learning in the traditional structures of an institution affects the organisation as a whole. Administrative issues, certification, credit systems, cross institutional and cross country collaboration are only the most important areas that are affected by real implementation of e-learning as an essential part of an institution’s academic offerings. A bottom-up strategy does not seem to be applicable any longer as the task is to transform the organisation in a holistic way so that e-learning can grow within it as a substantial part of the whole body.

The Virtual University Model
This, as described in the MASSIVE project, is the case of distance education institutions the shift is only from one medium to the other, whereas the essential characteristics of off-campus course delivery remain basically the same. This last model can, however, be completed by the addition of the case of the creation of a virtual university ‘from scratch’. An example of this kind of institution is the Open University of Catalonia which has operated since its creation in 1995 as a wholly virtual higher education institution.

Course Design and Provision
The first agreement regarding this point is to implement a systemic approach for course design. This systemic approach should integrate all the elements of the learning process, jointly to the provision and delivery of the teaching. To implement this requires having an instructional design model that can give consistency and homogeneity to all the courses developed in a particular virtual campus. To have a well-defined homogeneous design model could become a key for the success of an online education study programme. An instructional design model for courses in virtual teaching and learning environments must provide patterns and guidelines that enable it to go from the content design to the design of rich learning environments for this specific purpose (Duffy, 2004). It is recommendable to base this model on the application of a widely accepted theory of instructional design (Stephenson, 2001). It is not easy to propose a valid model or pedagogical criteria for all learning situations, but it is necessary to take into account that a useful model or models of instructional design must be able to adapt to any design to the various educational contexts and systems. This is one of the key points in which more research should be conducted. However, some agreements emerge from the different reports. One of them is that the focus on asynchronous communication is widely accepted as a fact that contributes to the success of online distance education experiences. Asynchronous
communication is considered a possibility for flexible progression, whereas synchronous communication is seen as an impediment to flexibility (Paulsen, 2007, p. 64-75).

Another area of agreement is that more flexible systems are considered a basis for better learning outcomes, but when trying to achieve this, faculty and institutions have to face the fact that most of the online study programmes are embedded in traditional academic structures like credit systems, periodical exams, compulsory face-to-face practical sessions, etc. (Paulsen, 2007, p.71). It is important to take into account learning expectations and needs before introducing an instructional intervention. An educational intervention requires change. Change finds difficulties when it disregards the target audiences’ perception and concerns. The gap generated between the desired level and the current level in knowledge, skills and attitudes should be also considered during the instructional design process in order to implement the change successfully (Armstrong, 2004).

On the other hand, one of the recurrent problems in course design and provision is that some of the models and processes currently used are sustained by a system based exclusively on the creation, provision and distribution of standardised contents, which underlies an industrial teaching model conception. Such models are based on the implicit assumption that the fundamental element of an educational model is the content and who has the best content will be in a better position to offer the best education (Sangrà et al., 2007). However, the mentioned authors agree with Hanna (2000) when he says that this approach is abandoned when it is realised that production and content publication is one thing, and a complete educational experience that guarantees its users good learning outcomes, is something quite different. To run away from this industrial content production model should be highly recommended. Another recurrent problem is the well known phenomenon that online courses create a considerably increased workload to the teaching staff in that there is evidence that both the development of online materials and the tutoring of students online are more time consuming for academics than the traditional lecture (Mason, 2006).

It is not surprising that it needs time to adapt to a new technical environment and to get used to the virtual medium where many aspects of traditional face-to-face (f2f) teaching and learning change dramatically or disappear completely. But it might also be interesting to consider that part of the increase in hours needed to conduct online courses could often be the consequence of the conservation of an inadequate teacher role and the replication of organisational elements that belong to conventional teaching and learning contexts. In an environment where students’ possibilities of communicating with their peers, with the tutor and even with external experts have multiplied, the conservation of a traditional teacher role in the sense of the only gatekeeper of knowledge that has to be contacted for help, assistance and guidance can easily result in an unbearable amount of requests and is at the end of the day a strategic and methodological mistake.

Online courses have to be designed in a way that they take advantage of the students’ capacity of self conducted learning in combination with effective social learning activities that gradually turn the students themselves into the driving force of creating knowledge. The shift towards student centred models of course provision certainly contributes to a more balanced distribution of activities in the virtual teaching and learning environments. In the context of large-scale online course provision it is certainly useful to consider the distribution of tasks in the sense that course design, resource supply and course delivery can be each carried out by different individuals, teams or departments, separating design from tutoring and administration.

When organised through multidisciplinary teams, where trainers or teachers, instructional designers, programmers, editors and experts in the discipline develop a course from its conceptu-
alisation to its production and evaluation, online instructors are not often involved from the very beginning. Thus, it is of great importance to establish reference models and tools that facilitate the instructors’ task, not only at the beginning but also during the training process and until its completion (Sangrà et al., 2007).

**Pedagogy**

While evaluating the pedagogical model that underlies virtual campuses and e-learning in higher education, we always have to take into consideration the important influence of the models that range from simple support of traditional f2f learning to fully developed e-learning (Bates & Poole, 2003, p. 127). However, pedagogically we can identify a clear shift from teacher-centred models or models with a clear stress on technology and contents towards a convergence between these different approaches under the general conviction that it is the adult and self-directed student who should be in the centre of all educational effort.

Preparing our learners to live in the knowledge economy and learn in a digital environment we must focus on giving opportunities for autonomous, not heteronymous learning, make an effort to apply an interactive, pupil-oriented pedagogy, affording the opportunity for learners to manage and regulate themselves and be self-sufficient (Peters, 2004). Peters contrasts this with the pedagogy that has predominated for centuries, the pedagogy of teaching by exposure and receptive learning. In the new environment that many are adopting, the teacher will no longer be the source of all information; their role will become that of guide and facilitator. This entails a fundamental change from a culture of teaching to one of learning. In this digital learning environment, the goal will be that learners plan, organise, control and evaluate their learning.

In this sense Collis & Moonen (2001) note that flexibility brings with it more independence but also the need for more self-direction and more self-motivation and these aspects are not automatic in many learners. But the same authors describe an approach considering the balance between four components (technology, pedagogy, implementation and institution) in order to challenge more flexible learning, offering more advantages than barriers. In terms of pedagogy they propose to work through the following dimensions:

- Pedagogical approach (there are many, one of them consists of analysing a course in terms of components – organisation, instructors, mentoring, self-study, readings, activities, assignments, evaluation, and communication);
- Pedagogical models (acquisition model - more predetermined, and the participation model - learning from the community and contributing);
- Contribution-oriented activities (the need of participation and contribution rather than acquire a predetermined knowledge without interaction depending on the context and needs);
- Flexibility Activity framework (depending on the context, higher education for example should be situated in a different dimension of the framework, as a product of more flexibility and more contribution of the learner).

However, the meaning of flexibility in learning is different depending on the different stakeholders (Khan, 2007; Nunan, 1996). It is also important to distinguish between openness, a technical matter and flexibility: a design matter (Khan, 2001). In this sense he describes a framework for flexible learning with 8 categories, where the pedagogical one is considered teaching and learning, concerning issues as content analysis, audience analysis, goal analysis, medium analysis, design approach, organisation, and learning strategies (Khan, 2007, p. 9).
There are a wide range of research studies investigating alternative models of teaching and learning that show that many universities have experimented with the development of “authentic” learning environments. These environments must provide an authentic context and activities that simulate the use of knowledge in a real life, access to expert advice and the modelling processes, multiples roles and perspectives, collaborative construction of knowledge, opportunities for reflection, also for articulation, coaching and scaffolding and authentic assessment (Herrington et al., 2007). This model described the philosophy of constructivism based on situated learning as a trend in online education towards pedagogy that reflects a student-centred pedagogy. Current learning theories also suggest that collaboration is a key to effective learning and that online tools help teachers to design real communities in order to define meaningful learning environments with a lot of social interaction (Mason, 2006).

Taking Advantage of the New Potential

The development and implementation of e-learning in higher education is generally perceived as a means to foster a renewal of pedagogy in order to better prepare tomorrow’s citizens for the emerging knowledge society. Until now, distance education models have been considered as an alternative option for students, but this attitude is changing rapidly, as a result of over the last decade many online educational experiences are demonstrating their efficiency and their quality in terms of providing an opportunity to change classical learning and teaching strategies in order to improve education.

Another aspect to be taken into account is the potential of ICT to increase the opportunities of informal learning, but paradoxically most of the technology enhanced learning research and policy has concentrated on reproducing more formal teaching environments as supported by Aceto et al., (2006). It is a challenge to build up a new learning model taking advantage of all the potential e-learning offerings: “E-Learning has not really revolutionised learning and teaching to date. Far-reaching, novel ways of teaching and learning, facilitated by ICT, remain nascent or still to be invented.” (OECD, 2005, p. 14).

New Roles: Facilitate Learning Instead of Teaching Facts and Skills

Many experts try to define the role of the teacher in the new scenario through the description of the competences they have to address in order to be good online teachers (Goodyear et al., 2001). The International Board of Standards for Training, Performance and Instruction (IBSTPI) is leading instructor competencies in terms of standardisation. In this sense, Klein et al., (2004) proposed a number of standards for f2f, online, and blended settings as a result of a large research study undertaken in the professional and academic fields around the world.

The teacher’s role is to facilitate the student’s learning process. To achieve this there are a number of strategies and techniques that have to be applied. In this sense, the teacher’s role has to be seen as related to their ability to facilitate the student in reaching clear learning outcomes. This means that we have to move from a model that seeks the transmission of knowledge, to one that promotes the critical thinking competence of the student, individual and collaborative knowledge construction, communicative competences, autonomy and self-management, among others. Barr & Tagg (1995) state that we must not mix up the means and the aims, and that the teacher’s role is to ensure that students learn using the procedures that best fit each situation.

An e-learning model should ask for the student to be more active, more committed and more responsible. Participation has to become a predominant attitude over the whole process of learning. The student must not become a passive element, waiting for input and information com-
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ing from the teacher. They have to be part of the interaction that is created between all the elements and agents that constitute the training process. In this sense, course design becomes crucial. Beyond the organisational aspects, the lack of pedagogical background of most teachers is an issue. Mason (2006) states that designing a course for the Web is quite a challenge for most academics as compared to preparing a series of lectures. Online courses, programmes and resources do not always offer sufficient interactivity and collaboration between the students, the teachers and the resources (Bonk, 2004). Building capacity on facilitating learning and course design are essential for teacher training policies in the future.

Sustainability vs. Common Interest: How Cost Effective Can Education Be?

Both higher education institutions and the corporate sector are trying to decrease costs in their educational and training delivery models. E-learning seemed to be the panacea to reach this goal, but there is no evidence that e-learning per se could become a saving strategy if the main aim is to develop a high quality standard of e-learning delivery.

As Mason (2006) highlights, only the corporate sector is occasionally decreasing the costs based on training delivery by using technology enhanced training. When talking about universities, ICT usually increases the costs. On the one hand, universities don't normally cancel previous delivery models: they usually integrate ICT and it becomes an additional cost. Companies more usually substitutes one system for other.

On the other hand, the mission of both organisations is quite different. Universities deal with sustainability of their programmes, and companies work for profit. NYU, Fathom and the British Government both lost large amounts of money by developing initiatives that didn't succeed because a lack of a sustainable pedagogical approach (Ruth, 2006).

Mason (2006) and also Keegan et al., (2007) state that it seems to be easier for virtual universities to start ‘from scratch’, because they can find cost saving areas more easily by avoiding unnecessary implementations. Economic considerations are important for e-learning development, but to be “flexible and able to adapt the changing environment seems to be the key.” (Paulsen, 2007, p. 114).

In 1995, Bates developed the ACTIONS model. ACTIONS is the acronym for the seven main criteria that Bates proposed for selecting a learning technology: access, cost, teaching and learning implications, interaction, organisational issues, novelty and speed. Nowadays the model is still valid if the institutions that are implementing online education want to try and ensure that the investment is justified.

RECOMMENDATIONS

After analysing many reports and studies outlined in this chapter, a number of key recommendations can be made in relation to the sustainability and effectiveness in E-Learning initiatives.

Be Strategic

E-learning integration should be made in an explicit, planned and systematic manner, involving the organisation as a whole and its members individually and collectively to take full advantage of its potential benefits. Strategic planning is very important in achieving a significant and solid process of integration. Deciding which technological solutions to adopt, in terms of when, where and how by applying an efficient and effective methodology is a key recommendation.

Be at the TOP

Technology, organisation and pedagogy are three elements that combined in an appropriate way are
the main factors contributing to the development of a successful initiative. They are usually taken into consideration, but independently, but the TOP triangle model (as shown in Figure 1) considers that there is an intrinsic correspondence and influence from one to the other. Therefore, successful virtual campuses or e-learning initiatives should be based on a strong link between these three main vertexes, which creates the appropriate context to develop a sustainable E-Learning environment leading to effectiveness, through an institutional-wide strategy.

**Be Aware of the Profile of the Managers**

In relation to the three vertexes of the TOP triangle, it is important to reflect on the profile that e-learning managers and administrators should have. A strong capability of implementing a very particular strategic plan in which they should manage organisational and economic issues as usual is very important, in addition to having a high level of understanding of the technological issues within the context of a suitable pedagogical approach.

**FUTURE TRENDS**

A number of future trends can be highlighted in terms of identifying future challenges that E-Learning initiatives are likely to face.

**The Power of the Achievable Technology**

Technology is evolving in terms of the increasing number of well designed, publicly licensed tools available over the Internet that foster collaboration, social networking, creation and exchange of high quality content. The increased possibilities for an active, interactive and creative use of the Web without the need of high costs and investment in the technology and training or capacity building are going to make Internet-based teaching and learning experiences increasingly more attractive. The new tools already facilitate easy and effective organisation in learning communities, work groups or shared repositories that are going to need pedagogical and organisational backing in order to support successful and ongoing learning.

**The Design of New Learning Contexts**

Contexts that take into account the need of student-centred approaches and self-conducted learning and autonomy and flexibility as well as new opportunities opened up by Web 2.0. This will enable the exploitation of the positive aspects of social constructivism and collaborative learning respecting, the special needs of mainly adult learners in a changing society, but also combined with strong support systems that guarantee the competent development of the teaching staff, enabling them to use Web 2.0 tools, to provide meaningful learning experiences and to adapt to the new roles.
The Research into Learning Styles of the New Generation of Students and Web 2.0

Some recommendations on further research should also be given. There is a need for new studies and research that takes into account the new generation of students (Oblinger & Oblinger, 2005; Premsky, 2001) in terms of how they learn, where they learn and to what extent the characteristics and possibilities of Web 2.0 and other social tools may actually help them to learn more effectively.

The Search for the Meaning of Quality

Quality in E-Learning is a complex, multidimensional concept which means models of instructional design must be able to adapt to the various educational contexts and systems. This is one of the key areas in which more research should be conducted in terms of analysing the impact on students’ learning outcomes.

CONCLUSION

To conclude, this chapter can be summarised in terms of highlighting the point that ICT-based education and training is a growing phenomenon. The emergence of virtual campuses is no longer a small area with limited scope. This growth is supported by the appearance of more easily available tools and platforms and new opportunities brought about by Web 2.0 that enables people to create their own powerful and attractive learning environments and communities. The increased technological opportunities make organisational and pedagogical intervention even more necessary as is has been observed that the mere exploitation of technology by itself, does not lead to sustainable and pedagogically meaningful experiences. The TOP model offers an initial framework to be applied strategically to the processes of integration of ICT. However, it should be analysed and tested in order to ascertain its potential in being developed into a consulting tool for organisations that intend to create sustainable and powerful ICT-based learning systems.

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ENDNOTES

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Chapter VIII

E-Learning and Virtual Campus Development: From Innovation to Sustainability

Irene le Roux
University of Pretoria, South Africa

Karen Lazenby
University of Pretoria, South Africa

Dolf Jordaan
University of Pretoria, South Africa

ABSTRACT

The University of Pretoria (UP) implemented a virtual campus in 1999. The measure in which and rate at which the virtual campus environment was adopted in the institution, was substantial. To accommodate the expected growth the University decided in 2004 to upgrade the learning management system in order to provide more stability and better integration with the student information system. However, the more complex integrated environment resulted in more points of failure and a less stable environment. Higher user frustration levels led to a decline in the number of users. The chapter discusses four key variables that influence growth and sustainability in an e-learning environment: Management, Training and Support, Measurement, and Technology strategies. We argue that additional resources required in Information Technology Services (ITS) were not adequately provided for. We give suggestions for future directions.

BACKGROUND

The adoption rate of the virtual campus and e-learning environment at the University was such that Bonk (2004) refers to this growth as being “monumental” (p. 23). Zawacki-Richter (2005) used the University of Pretoria in a case study and states: “The example of the University of Pretoria
was selected for a case study because learning and teaching with new media was introduced here with impressive effect and great success”. At the Blackboard BbWorld European Conference in Nice, February 2007, the implementation strategy UP followed for Blackboard Vista was showcased as best practice (Chasen, 2007). The success in e-learning at UP can largely be contributed to the development of an integrated virtual campus.

The virtual campus of the University of Pretoria is an example of organisational innovation (Lazenby, 2003). The ‘S’-curve empirical prediction cycle is often used in the technology and innovation environment (Porter et al., 1991). The chapter identifies the key variables that impact on the sustainability of the virtual campus and the e-learning environment: Management, Training and Support, Measurement and Technology strategies. We argue that progressive integration with legacy systems, as well as dependence on Information Technology Services (ITS) (over a period of ten years) poses a threat to the sustainability of the virtual campus. In this light that we contend that current management structures at executive level within the institution as well as at operational level within the Information Technology Services should be revisited. These managerial changes must be supported by a stable Information Communication Technologies (ICT) infrastructure to ensure sustainability. We also hope that a new enterprise systems renewal project will be sufficient innovation to create a new ‘S’-curve, supported by high level dedicated strategic leadership and policies to provide direction for academic technology.

**Context**

The University of Pretoria is one of the largest residential universities in South Africa. It is ranked as one of the top five hundred universities in the world (Shanghai Jiao Tong, 2007). The academic offerings are organised into nine faculties, i.e., Engineering, the Built Environment and Information Technology; Law; Education; Humanities; Economic and Management Sciences; Health Sciences; Veterinary Science; Natural and Agricultural Sciences; and Theology. The university offers a total of 1,802 programmes, including 341 undergraduate and 1,461 postgraduate programmes to approximately 53,400 students. Of these, about 14,000 students are traditional paper-based distance education students (University of Pretoria, 2007b, pp. 13-18).

A virtual campus was implemented in 1998/1999 consisting of a learning management system (WebCT) and wrap-around portals for students and lecturers. The virtual campus was deployed on an institutional scale and provides seamless access to the learning and student administration environment (Lazenby, 2003). Within the context of this chapter, the term virtual campus will be used for portals that provide administrative functions to lecturers and students through the portals, and the term e-learning environment for the learning management system and other technologies used for teaching and learning.

**Adoption Rate**

By the end of 1999, 12,700 students used the student portal – Student Online Services – and close to 1,600 students were enrolled in WebCT-supported modules (Lazenby, 1999). Currently, close to 42,000 students use Student Online Services and more than 30,000 students have access to Web-supported modules. A total of 2,231 staff members use Lecturers Online, of which 1,039 lecturers use WebCT to support face-to-face teaching and learning.

During 2005, WebCT merged with Blackboard. Due to the ambiguous nature of the name “Vista”, and the desirability of moving away from trade names, it was decided to name the learning management system “clickUP”. Figures 1 and 2 illustrate the growth in the number of clickUP modules and the growth in the number of students who use clickUP.
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Although the growth is substantial, it seems to be following the pattern of the ‘S’-curve. The 2007 data could indicate a downward trend, i.e., that the curve is flattening, which points to the need to introduce a new ‘S’ – curve. There is still a huge potential for growth, as the University offers in the region of 3,000 undergraduate and 2,600 postgraduate modules.

The following outlines the strategies that have been used in the implementation and maintenance of the virtual campus and e-learning environment with regards to Management, Training and Support, Measurement and Technology.

KEY VARIABLES THAT INFLUENCE SUSTAINABILITY AND GROWTH

We identified four key variables that influence growth and sustainability in an e-learning environment: Management, Training and Support, Measurement, and Technology strategies. These variables correlate closely with elements listed in the MIT90s strategic framework: the external environment, individuals and their roles, structures to support the application, technology and the management processes (Coen & Nicol, 2007).

Management

The importance of strategic vision and leadership strategies for new learning environments is well published. The Alliance for Higher Education Competitiveness (2005) recommends that: “Leadership in the form of clear priority setting and investment of resources must come top-down, but in a way that includes nurturing and support of existing grass roots elements.”

Some of the University of Pretoria’s management strategies for the virtual campus and e-learning environment were the following:

- The University of Pretoria realised in 1997 that the e-learning environment could change the way in which higher education institutions will function and that a virtual campus and e-learning strategy should be part of an institutional strategy. The Department for Education Innovation (EI) was founded and tasked to lead, facilitate and actively participate in actions aimed at educational innovation, with a focus on establishing flexible learning environments.
- An institutional education innovation plan was developed and accepted by Senate in May 2003. In this plan targets were approved for the use of WebCT, namely to have 50% of undergraduate modules and all taught postgraduate programmes supported by...
WebCT. This supported the “middle-up-down” approach (Mohr, 2007; Nonaka & Takeuchi, 1995) or bipolar strategy, which combines top-down initiatives with bottom-up involvement, supported by a centralised unit.

- The strategic plan of the University of Pretoria for 2007-2011, priority objective 6: ‘Providing excellent support services: information technology’ has as an achievement plan: ‘Ensure that clickUP (WebCT) is implemented successfully for all modules in the University’ (University of Pretoria, 2007a, p. 16).

Clear strategic intent and support was given by the executive of the institution. It is, however, questioned whether the increased need for resources in Technology was envisaged and adequately provided for. This is in accordance with Cowburn’s (2005) statement that ‘problems of implementation are as much to do with the formulation of plans themselves as with the practicalities of how they are, or are not, subsequently executed’ (p. 104).

Training and Support

Lecturers

Initially, in 1999, the strategy was to empower lecturers to design and develop their own courses, with support from Education Innovation. Two types of training courses were offered to lecturers, namely an orientation course and a development course. A total of 143 lecturers were trained. The specific version of WebCT was, however, not considered to be user friendly. Fewer than 10 lecturers eventually developed their own courses in WebCT (Lazenby, 1999).

According to the adoption theory of Moore (1991) the early majority need extensive support. As the e-learning environment grew, Education Innovation increased the number of instructional designers to help with the development of courses. Over the years this team grew to the current complement of 15 instructional designers, including more project managers. A team approach to instructional design was followed and the team could involve a project leader, lecturer or programme coordinator, project manager, lecturer (subject matter expert), instructional designer, educational consultant, information specialist, graphic designer and other media experts. The team decided on the combination of instructional methodologies to be used within the flexible learning model. The information specialist provided, amongst others, information regarding copyright procedures and principles. The instructional designer then designs, develops and delivers a range of learning materials, utilising the most effective media and technologies for the specific learning purpose (Education Innovation Annual Report, 2003).

Until 2006, instructional designers supported lecturers assigned to them on an individual basis. Instructional designers were often requested to do very basic administrative functions. An E-support office and system were subsequently established with the aim of supporting lecturers with administrative tasks. Just-in-time training is also done by this office. An e-administrative course was developed that covers all aspects of administrative functions in the e-learning systems to enable these staff members to support lecturers. This strategy contributed to moving the responsibility for the creation and management of an e-learning environment to the lecturers. Instructional designers are now able to provide instructional design input at higher levels, both in designing Web-supported modules and in creating multimedia support.

Although instructional design support is provided, training remains a high priority and the training strategy is frequently evaluated and adapted based on technological changes and lecturer needs. The current training strategy is to equip lecturers to address their needs to integrate the e-learning environment into their teaching
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strategy either as Web-supported, Web-enhanced or Web-dependant.

Depending on their needs, lecturers can attend basic (Web-supported), intermediate (Web-enhanced) and advanced (Web-dependant) courses. These courses are focused on promoting best teaching and learning practices in an e-learning environment and aimed at enabling lecturers to take full control of the development and maintenance of their online courses. The other focus is to equip academic staff for the facilitation of online learning. The emphasis is on the pedagogy of teaching online. A course to address this was developed in 2003 and consists of both online and face-to-face components (University of Pretoria, 2004).

The implementation of clickUP in 2006 required a change in the training strategy as lecturers had to be retrained. Lunch time sessions were scheduled to address this need. This change management strategy was most successful and was supported by the development of an extensive help Website developed to provide just-in-time support and a self-help tool for lecturers.

Students

The University of Pretoria provides access for students to computers in controlled and open labs, as well as in student residences and in open spaces through wireless connections. Despite the provision of this access there is still an increasing demand for access to computers. All registered undergraduate students need to complete a Computer Literacy and Information Literacy course. Education Innovation developed a comprehensive student CD to provide students with general information about the campus, essential downloadable software and self-help manuals on how to use clickUP. Orientation is offered to all first-year students during their first week of orientation and on-demand training is also provided. Information Technology Services implemented a student help desk in 2004.

Measurement

Student satisfaction in the e-learning environment is measured each semester by surveying students on various aspects of the e-learning environment via the online clickUP Experience Survey. This instrument probes the quality of the overall Web-supported learning experience in terms of technical adequacy, educational support, the affective domain, the use of communication tools and the extent of perceived learning. Student satisfaction and frustration indices are computed on a regular basis to enable long-term monitoring of these measures (Fresen, 2005). The results are disseminated to management and project leaders to reinforce the importance of student views, needs and experiences and to enable lecturers to continuously improve their practice of e-learning (University of Pretoria, 2004). The 2006 survey indicated that a high proportion of respondents (84%) have access to computers, either at work or at home, and 33% of respondents still find it difficult to access a computer on campus when they need one. Eighty-five percent of respondents found the opportunities for ‘anywhere; anytime’ learning on the Web to be convenient (University of Pretoria, 2006). This is also evident in the adoption of e-learning at the University.

Lecturer satisfaction surveys were conducted on small samples of lecturers by Lazenby (2003) and Fresen (2005). The Department undertook a survey in 2007 to establish how academic staff involved in e-learning experience the use of clickUP as a learning management system. It was clear from this survey that there is an ongoing need for training and that lecturers have a need to integrate clickUP in their existing teaching and learning models. This need varies from providing study material to students to promoting student-to-student communication.

Education Innovation also developed a holistic, formal, online Quality Management System (QMS) focussing specifically on the instructional design process in the e-learning unit (Frensen &
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The QMS was accepted for publication in a book of case studies published by CEN/ISSS, the European Committee for Standardisation/Information Society Standardisation System.

Technology

Selim (2007) emphasises the importance of a rich, reliable and capable IT infrastructure. This is of critical importance to the success and student acceptance of e-learning. The IT infrastructure includes network bandwidth, network security, network accessibility, Internet availability and a learning management system. According to Selim e-learning will not succeed if the technical support is lacking. The challenge UP faced was how to provide stable infrastructure without losing the innovative drive. According to Katz (in Waggener et al., 2007) “there is deep literature that makes the case that on balance, decentralisation approaches are best suited to organisations where innovation is the primary objective, whereas centralisation is best where efficiency (capturing economies of scale and scope) is paramount” (p. 52). In the following sections we will indicate how the move to a centralised approach seems to have stifled innovation and growth.

Initial Developments

The virtual campus project team conducted an in-depth comparative study in collaboration with two other local universities to select a learning management system and to plan its integration with legacy administration systems. The learning management system WebCT (WebCourseTools) was selected and implemented at the University of Pretoria in December 1998 (Lazenby, 1999).

At the time of implementation of the first version of the virtual campus in 1998/1999 ITS had not yet standardised the University’s IT architecture. There was also little expertise in learning management systems and no expertise in enterprise portals. Furthermore, the architecture was not robust enough to enable real-time data flow from the mainframe systems to the Web. Education Innovation appointed a dedicated programmer and this approach allowed for rapid development that gave the University of Pretoria a competitive advantage.

Portals for students and lecturers were developed by Web-enabling student services around WebCT, creating responsiveness to needs and creativity. The portals and online application-for-study system were developed in Perl script and MySQL. It was based on a data warehouse architecture principle, showing information in distributed legacy Natural Adabas databases via a Web interface. The information was updated daily and customised to an individual student’s profile. The support of ITS mainly entailed providing batch information from the legacy systems (Natural Adabas) to the virtual campus environment. Only the online application-for-study system was integrated with the mainframe.

Fuller Integration with Legacy Systems

In 2003 the virtual campus portals and online application system were redeveloped in Java. A virtual campus administration portal was designed to enable Education Innovation to automatically create modules and give access to lecturers and students. The administrative portal was a unique innovation that enables the seamless management of the e-learning environment. Single sign-on and the automatic update of class lists contributed to the ease of use. It did, however, require considerable integration with legacy systems and as a result, an increase in Web services calls.

In 2004 the lack of a relational database structure in WebCT 4.1, and other limitations such as a lack of a user-friendly interface and a lack of scalability, led to a task team evaluating various options for further development and sustainability of the e-learning platform. After considering various alternatives – including an open source solu-
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The task team recommended a move to the enterprise system WebCT Vista (Le Roux, 2004). Despite substantial cuts in government funding and resulting budget shortfalls, management approved the substantial amount required.

Education Innovation realised that to move from the WebCT 4.1 single server architecture to an enterprise system which included an Oracle database, load balancing and much more complex database structures would require major inputs from ITS. They were asked to be part of the planning and to provide a project manager for the project. Due to capacity constraints in ITS, the project management function for the implementation of the new Learning Management System remained within Education Innovation. Consequently, the Education Innovation project manager follows matrix project management principles in order to manage the project. The lack of the project manager line management functions within ITS hampered effective project execution.

High Demand Challenges

During 2005 it became evident that the mainframe and related systems were not able to support the increase in virtual campus and click-UP users. Major system failures were recorded in 2005. Due to the complexity of the integration of click-UP with mainframe systems, the points of failure increased manifold. In order to have better control over the e-learning and virtual campus environments, Information Technology Services insisted that the programmer appointed in Education Innovation be moved to fall under their line-management. Since 2005 the main activity in Information Technology Services regarding click-UP and other virtual campus applications has been to stabilise the mainframe and other related systems. All new developments in the virtual campus have been put on hold and only small incremental changes in Student Online Services have been made.

This resulted in the termination of the My Careers database, where students could upload their CVs onto a database that was searchable by companies. The Client Service Centre, as the department that coordinates the virtual campus with specific responsibility for graduate recruitment, had to outsource this function to an external company. This has led to a fragmented environment because the database is hosted outside of the University and students have to cross the firewall to access the site. Another functionality that has been available since 1999 and has become dysfunctional is the timetable/roster.

The online application-for-study system is a portal for all prospective students to apply to the University. Whereas a third of all new applicants applied to the University online between 2001 and 2004 (as opposed to paper-based application), only one-fifth of applications for 2008 were online applications. This downward trend in the adoption rate is a concern, as the new generation of students are more computer literate.

External Challenges

The pilot phase of clickUP was conducted during 2006 and the system was fully implemented in January 2007. Towards the end of 2006, it became clear that the merger of WebCT and Blackboard had a much bigger effect on clients than was originally expected. Some of the WebCT designers left the company following the closing down of the WebCT office in Vancouver. These events had a direct influence on the support provided by and the national and international confidence in Blackboard.

2007 was one of the most difficult years in terms of the e-learning environment. The instability of the Blackboard system as experienced internationally and local technology factors contributed to the problems experienced. The clickUP system is more bandwidth-intensive than the previous version of WebCT. Increased student access to clickUP and national bandwidth demand became a crisis in May 2007 when students and lecturers from off-campus locations found access to clickUP
very slow and sometimes impossible. The problem was exacerbated by a national Internet problem, experienced by all local universities.

Another factor that may threaten the adoption rate of clickUP is that students and lecturers are starting to use “peripheral” applications such as Facebook. Based on anecdotal evidence this trend is because of problems experienced with clickUP, and because both clickUP and Student Online Services do not provide the rich social community that a Web 2.0-application such as Facebook provides, especially to students. This poses a threat to the adoption rate of clickUP.

External Investigation to Find Solutions

Because of the integration with legacy systems, the real cause of access problems to clickUP is not clear. The risk to innovative teaching and learning is high, as clickUP is a mission critical system in many modules. Funding has been made available to source an expert to do troubleshooting.

Systems Renewal Project

The risk of the University’s legacy systems has reached a point where an entire systems renewal project has been embarked on to replace all enterprise systems with Oracle/Peoplesoft modules. Some of the enterprise applications will replace certain functionalities. Those applications and functionalities that will not be replaced, such as clickUP and the online application system, will be integrated with the new applications. We hope that the systems renewal project will create a more stable environment to allow for sufficient innovation to create a new ‘S’-curve.

REFLECTION

Although the University has a clear strategic vision and good management processes and support structures for lecturers and students, both the technology itself and technology support are impacting negatively on the sustainability of the environment. It seems that the resources and capacity in ITS do not match the vision and strategic goals for e-learning, and have caused deterioration in the functionality of the online application system and Student Online Services. This is contrary to the University’s aspiration to be a world-class university with state-of-the-art technology infrastructure. It is also contrary to the Client Service Centre’s strategy of expanding self-services via technology to prevent students from accessing services face-to-face.

The fit between internal configuration and the external environment is important (Coen & Nicol, 2007). As discussed, the Blackboard system requires broadband technology and this is not readily available in South Africa. This could indicate a mismatch between the internal configuration and external environment. The impact of the WebCT/Blackboard merger was also more serious than was anticipated. At the same time, the previous WebCT version was not scalable to meet the demand and the University does not have the capacity for open-source development.

It seems that the turning point in the ‘S’-curve was around 2005 when the virtual campus and e-learning environment systems were integrated with legacy systems and Information Technology Services adopted a more centralised approach. ITS infrastructure and resources could not meet the increased demand for services. Hites and Waggener (in Waggener et al., 2007) argue that there is more to the debate than a choice between centralised and decentralised IT services, but that a reinvention is needed to meet the exploding landscape of supply options. Austin (2007) supports the creation of different teams to develop centrist versus market-oriented approaches and contends that “creativity most often flourishes in the heat of combat between the two approaches, not in the search for consensus” (p. 26). At UP this debate on which ITS structures would best serve client needs is ongoing.
FUTURE DIRECTIONS

The virtual campus and e-learning environment at UP has been adopted as an integral part of the core business of teaching and learning within the institution. Salmon (2005) emphasises that core technologies must be maintained in order to make provision for any new innovative technologies in learning. We recognise that the IT systems at UP need to be stable in order to accommodate any further innovative technologies, such as Web 2.0.

We suggest that the management model for academic technology at the University of Pretoria needs to be rethought and clarified. The need for new leadership roles in the management of IT and innovation is widely recognised. It has been argued for some time that chancellors and top level executives need to be involved in the decision-making process (Ward et al., 2003).

The fragmentation of academic technology at UP, and the inadequacy of ITS to provide dedicated managerial and operational support to the virtual campus and e-learning environment, have resulted in a diffusion of leadership for academic technology. As Coen and Nicol (2007) state: “E-learning is more likely to be embedded where all the elements are co-ordinated and are all pulling in the same direction, i.e., where there is a ‘goodness of fit’” (p. 26). To achieve the benefits of e-learning requires a high level of co-ordination across different operational areas and stakeholder groups within an institution. A centralised Academic Technology position may be required to initiate and manage new radical innovation. This position must lead efforts in directing academic technology, organise and coordinate the different services and support units, manage human resources and the integration of technology in teaching and learning processes of the institution. Such a centralised position can then provide strong, well-informed, dedicated leadership in facilitating the application of technology to meet the institution’s academic goals (Albright & Nworie, 2008). The result of such a new management model could be decentralised management over dedicated ITS resources in the virtual campus and e-learning environment.

CONCLUSION

The implementation of the virtual campus and e-learning environment was perceived to be a successful innovation with a good adoption rate. With the envisaged growth in mind, the virtual campus and e-learning environment moved to ITS architecture supported by ITS. This, however, led to less control by the business owners and much higher complexity in the systems with more points of failure. External factors such as bandwidth limitations and the problems experienced with Blackboard exacerbated the frustration levels of users. Lack of ITS resources to support these environments led to decline in functionality and less stability in the environment. This led to a decline in the number of users of these systems. Although management strategies were in place, the resources required in ITS were not envisaged and allocated. It is vitally important that the Management, Training and Support, and Quality Assurance and Technology strategies be aligned and resourced to provide for a sustainable virtual campus and e-learning environment. An external investigation of the environment might lead to clearer direction in terms of allocations of resources. It is also proposed that a centralised position be created that can provide leadership in the application of technology in academic computing.

REFERENCES


Section II
Virtual Campus Best Practice Experiences
Chapter IX
An Analysis of European Megaproducers of E–Learning:
Recommendations for Robustness and Sustainability

Morten Flate Paulsen
The Norwegian School of Information Technology, Norway

ABSTRACT
This chapter presents an analysis of 26 European megaproducers of e-learning which had more than 100 courses or 5000 course enrolments in 2005. The focus is on distance education provision, not on e-learning for on-campus students. Among the megaproducers, which represent eleven countries, there are eight distance education institutions, 13 universities and university consortia, and five corporate training providers. Five institutions started e-learning in the eighties, ten in the nineties and eleven after the turn of the century. The largest provider, Learn Direct, claimed to have 400,000 course enrolments in 2005. However, only six of the 26 reported to have more than 20,000 course enrolments. Among these six top ranked institutions none are universities, only corporate training providers and distance education institutions. The chapter concludes with the 27 recommendations extracted from the analyses to help institutions obtain robustness and sustainability in online education.

INTRODUCTION
This chapter is a product of the European Leonardo da Vinci project “Megatrends in e-learning provision” (www.nettskolen.com/in_english/megatrends/the_project.html). The project was carried out from 2005 to 2007 and headed by NKI Distance Education in Norway. The six other project partners were: European Distance and E-Learning Network, Distance Education International in Ireland, The Open University of Catalonia in Spain, Estonian Information Technology Foundation in Estonia, Norwegian Opening Universities in Norway and Budapest University of Technology and Economics in Hungary.
An Analysis of European Megaprodviders of E-Learning

The objective of the project was firstly, to identify the megaprodviders of e-learning in the European Union which have achieved robustness, sustainability and critical mass. The second objective was to carry out case studies of the megaprodviders to identify how and for what reasons they had successfully achieved maturity. The third objective was to identify recommendations from the megaprodviders for the benefit of e-learning institutions and practitioners in Europe.

BACKGROUND

The project set out to identify the European megaprodviders of e-learning using strict criteria for qualification. The outcome was that 26 institutions were identified as megaprodviders, and in-depth interviews and case study articles were written for these institutions. The project then analysed the 26 megaprodviders on the causes of their robustness, sustainability and achievement of critical mass. The megaprodviders were primarily identified through:

- The development of 26 country reports;
- Major European networks for e-learning;
- The researchers’ personal networks;
- A nomination form at the project’s Website.

The country reports developed by the partners are available in the 95-page document “The provision of e-learning in the European Union” (Arneberg et al., 2007). The reports were primarily based on available documentation, contacts with ministries of education, official e-learning officers and leading e-learning experts in Norway and the 25 members of the European Union.

The three important European networks for e-learning, EDEN (www.eden-online.org), EADTU (www.eadtu.nl), and EADL (www.eadl.org) were all approached. Requests for nomination were distributed to the EDEN members through the EDEN Newsflash in November 2005 and as an EDEN Request in September 2006. The participants at the EDEN conferences in Helsinki (2005), Castelldefels (2006) and Naples (2007) were also invited to nominate potential megaprodviders. An invitation to submit nomination was emailed to the EADTU secretariat and the preliminary project results were presented at the EADTU annual conference in Tallinn (2006). A request for nominations was also distributed via the EADTU newsletter in the autumn of 2006.

Further, a number of individual experts on online education were asked to suggest potential megaprodviders. The experts were identified and chosen based on the researchers’ personal networks developed through many years of work with online education. The nomination form that was available on the project’s Website was used to nominate several of the confirmed megaprodviders as well as the six unconfirmed megaprodviders listed in Table 3.

The project findings have continuously been published at the project Website with an invitation for readers to contribute with corrections, precisions or commentaries. Many have done so and their contributions have been included in the project findings.

CRITERIA FOR NOMINATIONS

The project identified, surveyed and analysed 26 European megaprodviders of e-learning. The criteria for qualification were:

- It concentrates on e-learning situations with more than 5000 course enrolments per year or more than 100 courses on offer at any one time;
- It does not include corporate e-learning from a base outside Europe;
- It focuses on distance education and does not include the use of e-learning for on-campus students. At least 51% of a programme must be online to qualify.
The last criterion was controversial and difficult to administer, because institutions and governments do not gather statistics that reflect the required data. It was included for two reasons:

- Firstly, this is a distance education research project with partners that have in-depth knowledge about distance education.
- Secondly, it made the project possible. If this criterion were not included, the project would be impossible as there would probably be hundreds of institutions qualifying and the dimensions would be unmanageable.

OVERVIEW OF THE MEGAPROVIDERS

This chapter presents some results from the analyses of the 26 European megaproviders of online education listed in Table 1. Among them, there are eight characterised as distance education institutions, 13 as universities and university consortia, and five as corporate training providers. Most of the case studies are based on interviews with at least two individual representatives from the institutions.

Table 1 shows that the chapter includes case studies from eleven European countries. It is interesting to observe that there are six institutions from the United Kingdom, five from Spain, and four from Norway. The dominance of institutions from these countries may indicate that these countries provide good conditions for megaproviders to prevail. It may also indicate that the researchers have especially good knowledge of, and connections to these countries.

The institutions have experience with e-learning ranging from three years (Dennis Gabor College) to more than 20 years (NKI and Sør-Trøndelag University College). Five institutions started e-learning in the eighties, ten in the nineties and eleven after the turn of the century. It is interesting to observe that four of the six institutions with the longest e-learning experience are Norwegian. One may argue that it is too early for Dennis Gabor College and Universidad de Las Palmas de Gran Canaria to claim that they provide sustainable online educations since the institutions only have provided e-learning for three and five years. Table 1 further shows that there are 18 public megaproviders (12 universities or university consortia, five distance education institutions and one corporate training providers) and eight private megaproviders (one university, three distance education institutions and four corporate training providers). It is also interesting to observe that among the six top ranked institutions there are none universities, only corporate training providers and distance education institutions.

Table 2 shows that three providers (Learn Direct, CrossKnowledge and UNED) claim that they had more than 100,000 course enrolments in 2005. Only six of the twenty six claim that they had more than 20,000 course enrolments. There are six providers with less than 5000 course enrolments and qualify as megaproviders only since they have more than 100 online courses.

The number of online courses range from 1000 (The University of Leicester and Manchester Metropolitan University) to 54 (BI). There are three providers with less than 100 online course enrolments and qualify as megaproviders only since they have more than 5000 course enrolments. Table 2 also shows that the number of enrolments per course range from 833 to five. This is an interesting number to study in more detail for example related to cost effectiveness.

INSTITUTIONS THAT WERE NOT INCLUDED

Initially, the project partners expected that the EADTU - European Association of Distance Teaching Universities was the most likely association to contact in order to find European
Table 1. Megaproviders sorted by number of years the institution has offered e-learning

<table>
<thead>
<tr>
<th>Rank</th>
<th>Institution name</th>
<th>For short</th>
<th>Country</th>
<th>E-learning since</th>
<th>Years with e-learning</th>
<th>Category*</th>
<th>Public or Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NKI</td>
<td>NKI</td>
<td>Norway</td>
<td>1985</td>
<td>22</td>
<td>D</td>
<td>Private</td>
</tr>
<tr>
<td>2</td>
<td>Sør-Trøndelag University College</td>
<td>HiST</td>
<td>Norway</td>
<td>1986</td>
<td>21</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>3</td>
<td>Open Universiteit Nederland</td>
<td>OUNL</td>
<td>Netherlands</td>
<td>1987</td>
<td>20</td>
<td>D</td>
<td>Public</td>
</tr>
<tr>
<td>4</td>
<td>NKS</td>
<td>NKS</td>
<td>Norway</td>
<td>1987</td>
<td>20</td>
<td>D</td>
<td>Private</td>
</tr>
<tr>
<td>5</td>
<td>The Open University</td>
<td>OUUK</td>
<td>UK</td>
<td>1988</td>
<td>19</td>
<td>D</td>
<td>Public</td>
</tr>
<tr>
<td>6</td>
<td>BI</td>
<td>BI</td>
<td>Norway</td>
<td>1990</td>
<td>17</td>
<td>U</td>
<td>Private</td>
</tr>
<tr>
<td>7</td>
<td>Universitat Oberta de Catalunya</td>
<td>UOC</td>
<td>Spain</td>
<td>1995</td>
<td>12</td>
<td>D</td>
<td>Public</td>
</tr>
<tr>
<td>8</td>
<td>Manchester Metropolitan University</td>
<td>MMU</td>
<td>UK</td>
<td>1995</td>
<td>12</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>9</td>
<td>University of Tartu</td>
<td>Tartu</td>
<td>Estonia</td>
<td>1995</td>
<td>12</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>10</td>
<td>Hungarian Telecom</td>
<td>T-Com</td>
<td>Hungary</td>
<td>1996</td>
<td>11</td>
<td>C</td>
<td>Private</td>
</tr>
<tr>
<td>11</td>
<td>Staffordshire University</td>
<td>Staffordshire</td>
<td>UK</td>
<td>1997</td>
<td>10</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>12</td>
<td>Oncampus, Fachhochschule Lübeck</td>
<td>Oncampus</td>
<td>Germany</td>
<td>1997</td>
<td>10</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>13</td>
<td>The University of Ulster</td>
<td>Ulster</td>
<td>UK</td>
<td>1997</td>
<td>10</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>14</td>
<td>Scuola IaD, Università di Roma Tor Vergata</td>
<td>ScuolaIaD</td>
<td>Italy</td>
<td>1998</td>
<td>9</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>15</td>
<td>Learn Direct</td>
<td>Learn Direct</td>
<td>UK</td>
<td>1999</td>
<td>8</td>
<td>C</td>
<td>Public</td>
</tr>
<tr>
<td>16</td>
<td>CrossKnowledge</td>
<td>CK</td>
<td>France</td>
<td>2000</td>
<td>7</td>
<td>C</td>
<td>Private</td>
</tr>
<tr>
<td>17</td>
<td>UNED</td>
<td>UNED</td>
<td>Spain</td>
<td>2000</td>
<td>7</td>
<td>D</td>
<td>Public</td>
</tr>
<tr>
<td>18</td>
<td>ÉLOGOS</td>
<td>ÉLOGOS</td>
<td>Spain</td>
<td>2000</td>
<td>7</td>
<td>C</td>
<td>Private</td>
</tr>
<tr>
<td>19</td>
<td>Virtuelle Hochschule Bayern</td>
<td>BVU</td>
<td>Germany</td>
<td>2000</td>
<td>7</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>20</td>
<td>University of Liège</td>
<td>Liège</td>
<td>Belgium</td>
<td>2000</td>
<td>7</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>21</td>
<td>Universidad Politécnica de Madrid</td>
<td>UPM</td>
<td>Spain</td>
<td>2000</td>
<td>7</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>22</td>
<td>The University of Leicester</td>
<td>Leicester</td>
<td>UK</td>
<td>2000</td>
<td>7</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>23</td>
<td>EDHEC Business School</td>
<td>EDHEC</td>
<td>France</td>
<td>2000</td>
<td>7</td>
<td>C</td>
<td>Private</td>
</tr>
<tr>
<td>24</td>
<td>Universidade Aberta</td>
<td>Aberta</td>
<td>Portugal</td>
<td>2001</td>
<td>6</td>
<td>D</td>
<td>Public</td>
</tr>
<tr>
<td>25</td>
<td>Universidad de Las Palmas de Gran Canaria</td>
<td>ULPGC</td>
<td>Spain</td>
<td>2002</td>
<td>5</td>
<td>U</td>
<td>Public</td>
</tr>
<tr>
<td>26</td>
<td>Dennis Gabor College</td>
<td>GDF</td>
<td>Hungary</td>
<td>2004</td>
<td>3</td>
<td>D</td>
<td>Private</td>
</tr>
</tbody>
</table>

*D = Distance education institution, U = University or university consortium, C = Corporate training provider

megaproviders. It turned out that several of the megaproviders are members of EADTU, but it is also worthwhile to notice that several prominent EADTU members do not seem to qualify as megaproviders. This seems to be the case for:

- Centre National d'Enseignement à Distance (CNED) in France
- FernUniversität in Hagen, Germany
- Network per l'Universita Ovunque (Nettuno / UniNettuno) in Italy
<table>
<thead>
<tr>
<th>Rank</th>
<th>Institution name</th>
<th>Country</th>
<th>URL</th>
<th>Course enrolments</th>
<th>Online courses</th>
<th>Enrolments per course</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learn Direct</td>
<td>UK</td>
<td><a href="http://www.learndirect.co.uk">www.learndirect.co.uk</a></td>
<td>400 000</td>
<td>400 full-time, 19 part-time</td>
<td>133 000</td>
<td>465 full-time, 19 part-time</td>
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<td>2</td>
<td>CrossKnowledge</td>
<td>France</td>
<td><a href="http://www.crossknowledge.com">www.crossknowledge.com</a></td>
<td>250 000</td>
<td>250 full-time, 19 part-time</td>
<td>150 000</td>
<td>400 full-time, 19 part-time</td>
</tr>
<tr>
<td>3</td>
<td>UNED</td>
<td>Spain</td>
<td>www慕名.es</td>
<td>100 000</td>
<td>100 full-time, 19 part-time</td>
<td>50 000</td>
<td>800 full-time, about 115 part-time</td>
</tr>
<tr>
<td>4</td>
<td>Open University of Liège</td>
<td>Belgium</td>
<td><a href="http://www.ulg.ac.be">www.ulg.ac.be</a></td>
<td>20 000</td>
<td>20 full-time, 19 part-time</td>
<td>12 000</td>
<td>12 full-time, 19 part-time</td>
</tr>
<tr>
<td>5</td>
<td>EUC</td>
<td>Belgium</td>
<td><a href="http://www.euc.org">www.euc.org</a></td>
<td>12 000</td>
<td>12 full-time, 19 part-time</td>
<td>12 000</td>
<td>12 full-time, 19 part-time</td>
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<tr>
<td>6</td>
<td>Universidad Politécnica de Madrid</td>
<td>Spain</td>
<td><a href="http://www.upm.es">www.upm.es</a></td>
<td>12 000</td>
<td>12 full-time, 19 part-time</td>
<td>12 000</td>
<td>12 full-time, 19 part-time</td>
</tr>
<tr>
<td>7</td>
<td>Virtuelle Hochschule Bayern</td>
<td>Germany</td>
<td><a href="http://www.vhb.org">www.vhb.org</a></td>
<td>10 000</td>
<td>10 full-time, 19 part-time</td>
<td>10 000</td>
<td>10 full-time, 19 part-time</td>
</tr>
<tr>
<td>8</td>
<td>Manchester Metropolitan University</td>
<td>UK</td>
<td><a href="http://www.mmu.ac.uk">www.mmu.ac.uk</a></td>
<td>8 000</td>
<td>8 full-time, 19 part-time</td>
<td>8 000</td>
<td>8 full-time, 19 part-time</td>
</tr>
<tr>
<td>9</td>
<td>University of Tartu</td>
<td>Estonia</td>
<td><a href="http://www.ut.ee">www.ut.ee</a></td>
<td>6 000</td>
<td>6 full-time, 19 part-time</td>
<td>6 000</td>
<td>6 full-time, 19 part-time</td>
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<tr>
<td>10</td>
<td>ÉLOGOS</td>
<td>Spain</td>
<td><a href="http://www.elogos.es">www.elogos.es</a></td>
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<td>5 full-time, 19 part-time</td>
<td>5 000</td>
<td>5 full-time, 19 part-time</td>
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<td>Staffordshire University</td>
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<td><a href="http://www.staffs.ac.uk">www.staffs.ac.uk</a></td>
<td>4 000</td>
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<td>4 000</td>
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<td>12</td>
<td>University of Ulster</td>
<td>UK</td>
<td>campusone.ulster.ac.uk</td>
<td>3 000</td>
<td>3 full-time, 19 part-time</td>
<td>3 000</td>
<td>3 full-time, 19 part-time</td>
</tr>
<tr>
<td>13</td>
<td>The Open University</td>
<td>UK</td>
<td><a href="http://www.open.ac.uk">www.open.ac.uk</a></td>
<td>2 000</td>
<td>2 full-time, 19 part-time</td>
<td>2 000</td>
<td>2 full-time, 19 part-time</td>
</tr>
<tr>
<td>14</td>
<td>University of Tartu</td>
<td>Estonia</td>
<td><a href="http://www.upt.no">www.upt.no</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
<tr>
<td>15</td>
<td>Hungarian Telecom</td>
<td>Hungary</td>
<td><a href="http://www.g%E5%91%BC%E5%92%8C.com">www.g呼和.com</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
<tr>
<td>16</td>
<td>The University of Ulster</td>
<td>UK</td>
<td><a href="http://www.open.ac.uk">www.open.ac.uk</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
<tr>
<td>17</td>
<td>Dennis Gabor College</td>
<td>Hungary</td>
<td><a href="http://www.dennisgabor.edu">www.dennisgabor.edu</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
<tr>
<td>18</td>
<td>EDHEC Business School</td>
<td>France</td>
<td><a href="http://www.edhec.com">www.edhec.com</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
<tr>
<td>19</td>
<td>Sør-Trøndelag University College</td>
<td>Norway</td>
<td><a href="http://www.hist.no">www.hist.no</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
<tr>
<td>20</td>
<td>The University of Ulster</td>
<td>UK</td>
<td><a href="http://www.open.ac.uk">www.open.ac.uk</a></td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
<td>1 000</td>
<td>1 full-time, 19 part-time</td>
</tr>
</tbody>
</table>

*The number represents student enrolments, not course enrolments. The number of course enrolments may be higher.
Further, as shown in Table 3, the project received several interesting nominations which the partners followed up to determine whether they qualified as megaproviders. However, the partners were not able to reveal enough information about or establish the necessary contacts with these institutions to include them in the study. However, the institutions may be interesting cases for further studies.

The project also received information from several sources indicating that the two private distance education providers Leidse onderwijsinstellingen (www.loi.nl) in the Netherlands and Markkinointi (www.markinst.fi) in Finland should be on the list of megaproviders. The institutions did however firmly decline requests to provide information to the researchers. So, one may speculate whether these private institutions consider this information as confidential information which they will not make available for their competitors.

**PRESENTATIONS OF THE MEGAPROVIDERS**

The research comprises 26 case study articles based on interviews which are available at the project Website. In-depth analyses of the interviews are available in a separate report entitled ‘Analyses of European megaproviders of e-learning’ (Keegan et al., 2007). The 26 megaproviders represent quite a large range of different institutions. All of them are briefly introduced in the following sections according to this list:

- Eight providers of distance education
  - Three private providers
  - Five public open universities
- Thirteen universities or university consortia
  - Two public university consortia
  - One distance education centre at a private university
  - Ten public universities
- Five providers of corporate training
  - One public provider
  - Four private providers

**Distance Education Institutions**

Eight of the 26 megaproviders are categorised as distance education institutions. They have been established for the purpose of providing distance education. The two Norwegian providers, NKI Distance Education and NKS and the Hungarian Dennis Gabor College are private institutions, the remaining five are public open universities.

<table>
<thead>
<tr>
<th>Institution name</th>
<th>Country</th>
<th>URL</th>
<th>Course enrolments</th>
<th>Online courses</th>
<th>Enrolments per course</th>
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<td><a href="http://www.bitmedia.cc">www.bitmedia.cc</a></td>
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<td>Czech Republic</td>
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Private Institutions

NKI Distance Education

NKI was established in Norway in 1959. It was originally a Norwegian branch of a leading Swedish correspondence school. NKI Distance Education (NKI Fjernundervisning) provides courses and study programmes at higher education level, upper secondary level and within the vocational training field.

The survey shows that NKI initiated its e-learning activities around 1985, which is earlier than all the other megaproviders. The first complete online distance education course was conducted through NKI’s self-developed learning management system in 1987. Since then, a gradual development has made online delivery increasingly important.

Figure 1 shows that online students for the first time outnumbered correspondence students in 2006. NKI expects that in the future all courses and programmes will be based on online teaching. NKI reported to have 470 online courses and 12,217 enrolments in these courses in 2005. It further reported to have 65 full-time and 400 part-time employees.

The analysis found that these factors are seen as vital for NKI’s success and survival as a megaprovider of online education:

- Flexible employment which makes it possible to adapt to a changing market – NKI is not tied to providing courses within specific subjects, because academic competence is not kept in house but is bought on an open and flexible market from teachers and course designers elsewhere.
- Flexible employment which balances expenses with incomes – teachers are paid per student rather than per course or hour to ensure this.
- Highly specialised staff for different functions within the organisation contributes to cost effectiveness.
- A large number of courses and programmes gives stability over time as market interest changes between course and programme areas.
- Highly integrated computer systems provide effective workflow of and easy access to information.

Figure 1. More distance students become online students
An Analysis of European Megaproviders of E-Learning

NKS

NKS is a Norwegian provider of distance education that started as a correspondence school in 1914. For decades, operations were based on correspondence teaching. Around 1987/1988, NKS launched a project using the Portacom computer conferencing system for e-learning at a distance. Ordinary use of the Internet started in 1997 when some of the courses were made available on the Web. The first Learning Management System, Luvit, was introduced in 2000. The recent growth in NKS enrolment figures is due to online students. The institution handles correspondence students as well as 104 online courses and 2,200 enrolments in online courses with 16 full-time and 60 part-time employees. The analyses identified these factors as vital for the success and survival of NKS:

- Long tradition and high competence in correspondence teaching facilitated establishment of e-learning based distance education because the two forms share several basic features;
- Integrated (although not perfectly so) technical systems which allow NKS to handle large numbers of students effectively;
- Close monitoring of the market to identify courses that should be developed and terminated;
- Flexible employment of teachers which makes it possible to develop courses within a range of subjects (and thus act on market trends) and control staff costs according to market changes;
- Good marketing to recruit large numbers of students.

Dennis Gabor College

The Dennis Gabor College is a private school founded in 1992 and one of the oldest institutions in the field of distance education in Hungary. It provides BSc and higher level vocational education. The roots of the college reach back to paper-based correspondence education. It has only provided e-learning since 2004 and is therefore the institution with the shortest experience among the megaproviders. One could argue that this is not long enough to prove that it provides robust and sustainable e-learning.

There are some important driving forces that are worth highlighting from the analysis of the Dennis Gabor College:

- Based on the distance education nature and long history of the college, the management has always supported innovation, encouraged the increasing use of ICT and transformed traditional distance education into online education;
- As a private institution, the college has predictable financial income from tuition fees. In addition, it is gradually reducing the course content creation and delivery costs by the introduction of e-learning;
- The administrative tasks are carried out efficiently;
- E-learning plays a major role in geographical areas where running local education centres with part time personnel would be more costly.

Public Open Universities

Open Universiteit Nederland

Open Universiteit Nederland, the Dutch Open University, was established in 1984. It is the youngest university in the Netherlands. It is an independent government funded institution for distance learning at university level. From the beginning it was active in distance education and online education. In 1987 it introduced Studienet, its first online learning environment. The institution offers 270 online courses and reported 44,432 enrolments in online courses. The institution has 585 full-time and about 115 part-time employees.
The Open University of the United Kingdom

The Open University of the United Kingdom (OUUK) was established in 1969 to deliver high quality distance education to students and developed its supported open learning model which is based on involvement of local tutors, feedback on assignments and centrally produced course materials. The OUUK is the UK’s largest university, teaching 35% of all part-time undergraduate students in the UK each year. Nearly 21,000 OUUK students study outside the UK. The institution reports that it has 4000 employees and 375 online courses. With 11,000 enrolments in online courses, it is worthwhile to notice that it ranks only as number 14 of the European megaproviders. It seems clear that, side by side with its acknowledged excellence in traditional distance education, the Open University is building its expertise in online distance education as well.

Universitat Oberta de Catalunya

The Catalan government created Universitat Oberta de Catalunya (UOC) as the Open University of Catalonia in 1995. It is a fully accredited distance education university with its headquarters in Barcelona. The UOC has developed in partnership with key stakeholders in Catalonia from both the public and private sectors. The institution was created with the aim to complement the Catalan university system in the sense that it made university studies available to everybody, regardless of work, residence, age or other factors, by offering flexible courses and study programmes through technology based distance teaching and learning. The UOC intends to provide the highest quality university education delivered via the latest information technologies. It is reported to have 500 permanent staff and 1700 part-time counsellors and tutors. It offers 950 online courses and reports 94,000 enrolments in online courses.

UNED

The UNED is currently Spain’s largest university with almost 180,000 students and about 8000 lecturers and tutors. Starting its activity in the early seventies with traditional distance education, the UNED has experienced a spectacular growth in geographical presence and student numbers. The figures led to an increasing use of ICT and consequently to the installation of a virtual campus in 2000. It reported to have 500 online courses and 100,000 enrolments in online courses. It also stated that all compulsory courses are online, but the figures are somewhat complicated and the project does not really have a clear insight how much of the virtual offer is taken on and how compulsory it is. The project partners do not know how much the online courses are applied in the conventional distance education.

Universidade Aberta

Universidade Aberta was founded in Portugal in 1988 and started its activities as a distance education university using traditional technology such as video, audio and print material in the year 1989/1990. The increasing number of students led to the first virtual course offer in 2001. In 2006 the university provided more than 60 fully virtual courses to about 1400 students. Since it has less than 5000 course enrolments and less than 100 courses, it does not qualify as a megaprovider. It is however a major provider of distance education in Portugal, and according to the information provided by the Pro-rector for Innovation in Distance Learning, Universidade Aberta will become a megaprovider of e-learning in the near future.

Universities and University Consortia

There are thirteen megaproviders in this category. The two German institutions, The Bavarian
ian Virtual University and OnCampus, can be characterised as public university consortia. The Norwegian School of Management (BI) is a private university with a distance education centre. The remaining eleven institutions can be characterised as public universities.

**Consortia**

In a separate report (Keegan et al., 2007), the Megatrends project identified and analysed ten conspicuous discontinued e-learning initiatives. The report includes the following critical statement about consortia:

*Online education consortia are often not sustainable. It is easy to find good reasons for collaboration between educational institutions, but in real life individuals and institutions usually are much more committed to themselves than to the consortium. In general, one may suspect that a consortium of prestigious institutions hardly can be whole-hearted. A relatively weak external consortium secretariat could easily be overlooked or opposed by powerful factions within the institutions. There is also a chance that individual institutes, departments, and even institutions could compete with the consortium in bids for external contracts. This is obviously not a viable environment for a consortium. (Keegan et al., 2007, p. 7)*

However, the project also found the following two German consortia among the successful megaproviders.

**Bavarian Virtual University**

Bavarian Virtual University (Virtuelle Hochschule Bayern) is a German institute set up by all nine state universities and all 17 state universities of applied sciences in Bavaria. A further ten universities in Bavaria outside the jurisdiction of the Bavarian Ministry of Higher Education have also become members. The VBH was founded in May 2000. Its emergence was the result of the work of promoters of e-learning in the Bavarian universities as well as the decision of the Ministry of Higher Education that these efforts should be co-ordinated in the best possible way. VHB reported to have 150 online courses and 20,000 course enrolments. The secretariat had 12 full-time and one part-time employees.

To achieve its present position, the VHB has concentrated on the following key factors:

- Continuous improvement of courses and of administrative processes in order to reach maximum user-friendliness;
- Strict orientation to the demand of the member universities;
- Cost-effectiveness;
- Priority given to quality, not quantity;
- Close cooperation with universities and the ministry;
- Drawing upon the competence in the member universities, using their infrastructure as much as possible;
- Transparency in all decisions, especially in funding;
- Lean organisation, simple structures;
- Flexibility with regard to the development of the course programme, to the development of personnel and to the use of teaching and learning software.

**OnCampus**

OnCampus is the e-learning department of Lübeck University of Applied Sciences (LUAS) in Germany. The history of online education at LUAS is based on large third party projects dealing with online distance education. The aim has been to gain more target groups for higher education by part-time study programmes. Close cooperation with universities is one of the main success factors. LUAS started the activities 1997 as the lead partner in the German national flagship project “Virtual
An Analysis of European Megaproducers of E-Learning

University of Applied Sciences” (VFH). Within a consortium of universities the aim was to implement complete online distance study programmes in engineering and computer science (Bachelor and Master level). At this stage, the Oncampus methodology of 80% online teaching and 20% presence was decided. All e-learning activities of LUAS and all activities with relation to the consortiums VFH and BSVC are bundled under the name “Oncampus”. Oncampus reported to have 119 online courses and 9,386 course enrolments. They also reported to have 35 full-time employees, plus administrators and about 150 authors and lecturers at the universities.

The success of Oncampus mainly derives from structural factors. On the one hand, e-learning was used as methodology to attract new target groups for higher education. For this purpose its online programmes were integrated as regular university programmes. On the other hand the collaboration in networks is one of the lifelines of Oncampus, because it provides manageable effort for all activities incurred. In this context, win-win situations for all partners ensure sustainability, based on sophisticated business models. One additional important factor was the establishment of Oncampus GmbH, a subsidiary company of LUAS. This provides continuous legitimation of e-learning activities, independent from the authority of faculties. Last but not least, the success of Oncampus has strongly been propelled by some self-motivated individuals, and the activities have reached high political reputation.

Distance Education Centre at Private University

The Norwegian School of Management

The Norwegian School of Management (BI) is a non-profit private institution offering higher education programmes and vocational training. Its Distance Education Centre has provided distance education since 1989. The first group in 1990 was in many ways early adapters of modern distance education, since electronic communications was an integrated part of the study concept. Thus, BI Distance Education has not had a period with distance education based on a traditional correspondence school model. Rather, it went straight to a technology-based model. BI has about 340 academic staff members. A considerable number of these teach at BI Distance Education, which has about 8,500 course enrolments per year.

These factors are seen as vital for the success and survival of BI Distance Education:

- Early start with online teaching, which was possible because of high technological competence in-house;
- High degree of integration of different IT systems, which has been possible because many of the systems have been developed in house, is important for efficient operation of procedures and thus contributes to cost effectiveness;
- Teaching is monitored closely for quality and the teachers know this. This is seen as important for keeping quality of teaching at a high level;
- Teachers are paid according to their work load. This is seen as important for having motivated teachers;
- Being part of a large and well known (in Norway) institution contributes to stability in recruitment of staff and students;
- Market orientation and continuous revision of study programmes to keep them up-to-date with the latest research;
- Continuous development of technology for online teaching.

Public Universities

The public universities are primarily serving traditional face-to-face students, and provision of e-learning to distance students is not as important for these institutions as it is for the other
megaproviders. Still, there are ten megaproviders in this category. However, it should be pointed out that it could be difficult to distinguish between the e-learning these universities provide to their on-campus and distance students.

The Virtual Campus of the University of Liège

At the University of Liège in Belgium, the Institute for Training and Research in Higher Education is in charge of the university’s virtual campus. It reported 178 online courses and claimed that all the 15,000 students of the university are involved in e-learning. The online courses complement the traditional course offering, and the students respond positively to e-learning. The teaching staff trains themselves and acquires competence in critical pedagogical reflection in addition to their disciplinary expertise. They develop teaching practice and are more and more conscious of the interest that the virtual campus represents for their students.

University of Tartu

University of Tartu is a national university in Estonia which provides flexible learning and continuing education programmes through its Open University. The year 1995 may be considered to be the beginning of e-learning at the university when the first email based course was delivered to the students in the Faculty of Mathematics. In 1998 the first Web-based course in the WebCT environment was developed and delivered. Since then, the number of Web-based courses has continuously increased. About 135 distance education courses can be more or less fully completed online, and the university reported to have about 5000 enrolments in these courses.

At the end of 2005 University of Tartu approved the e-learning strategy 2006-2010 which aims to have Web-based support for all Open University courses by 2010. The prevailing factors of success in online education at the University of Tartu are:

- Very well developed ICT infrastructure, high digital literacy and readiness to use online learning among the target groups;
- Support and centralised services offered by the Estonian e-University consortium;
- The university is not solely dependent on the success of its online initiatives, thus providing flexibility and quick decision-making;
- Skilled support personnel.

Scuola Istruzione a Distanza (IaD)

Scuola Istruzione a Distanza (IaD) is a distance education academic department operating within a face-to-face educational environment at the University of Rome Tor Vergata. Scuola IaD arised in 1996 formerly as CoFoDi, a multi-discipline Committee set up with an exclusive quality-control purpose. In 1998 IaD launched its first online course, and it reported to have 120 online courses and 5000 enrolments in online courses in 2005.

Sør-Trøndelag University College

Sør-Trøndelag University College (HiST) is a dual mode publicly financed higher education institution with several departments. Large-scale e-learning has mainly been handled by the Department of Informatics and e-Learning (AITeL), which has provided distance education as e-learning since 1986. From 1986 to 1990, HiST had major activities in developing and supporting the Winix learning management system. The institution claims that Winix was the first learning management system in the world with a graphical Windows interface that offered services like e-conferences, email with attachments and several other functions based on Unix services. The courses became very popular, and by the year 2001 AITeL had 5,745 enrolments.
These factors are seen as vital for the success and survival of AITeL as a megapprovider:

• Governmental funding of a large project was important for establishing a model for large-scale e-learning based distance education;
• Research has been and still is important for developing efficient models for e-learning based distance education;
• Integrated technical systems allowed the institution to run operations with a high degree of efficiency. Now the institution is experiencing the flip side of this. The integrated systems have been abandoned and replaced with less efficient (and not integrated) systems designed for on campus operations. This has lead to loss of efficiency and may threaten survival of the large scale operations;
• Moderate prices on courses contribute to recruitment;
• Teachers are paid per student and are helped by student assistants if needed. This ensures that teachers have manageable workloads and this is important for motivating them to work with online education. It also contributes to cost effectiveness in the organisation by balancing expenses with incomes.

Universidad Politécnica de Madrid

Universidad Politécnica de Madrid (UPM) was established as a public university in 1971, but its origins are much older. It is the result of merging several technical colleges and science institutes in Madrid. The analysis focuses on GATE (Gabinete de Tele-Educación), a department attached to the Vice Presidency of New Technologies and Web Based Services. The GATE was created in 1991 in order to integrate ICT in the UPM’s educational programme. The main activities of the cabinet are to coordinate the e-learning courses offered in the university and to give support and training to teachers and staff that wish to provide online teaching to their students. The institution reported to have 20 employees handling 110 online courses with 14,000 enrolments.

The important factors for UPM’s success and survival as a megapprovider are:

• The mediated bottom-up approach which leads to an online course provision that meets the real needs of the institution and involves teachers actively in the design and implementation processes improving motivation and skills;
• The pedagogical approach based on communication and collaborative learning activities which helps to keep interest and motivation on a reasonable level and avoids student isolation in self-learning contexts that could lead to a higher drop-out rate;
• The use of an open source VLE which allows adapting the system to the specific needs of the institution at a very low cost;
• The strong support given by management;
• An efficient evaluation system which provides clear information for constant improvement.

Universidad de Las Palmas de Gran Canaria

Universidad de Las Palmas de Gran Canaria (ULPGC) is one of Spain’s 48 public universities. Online education in the ULPGC rose to a higher level in the academic year 2001-2002 when the institution offered its first full online degree. Since then online course provision has grown and become an important factor in the university’s academic programme.

The university reported to have 450 online courses with 12,237 enrolments. It has only five years of experience with e-learning, and one could argue that this is not long enough to prove that it provides robust and sustainable e-learning.

These factors are seen as vital for the ULPGC’s success:
An Analysis of European Megaproviders of E-Learning

- Being a young university created on a strong social demand;
- Institutional support and planning based on a top-down approach;
- Early experiences with online learning platforms and an early set-up of e-administration tools and procedures;
- High competence in technical issues;
- The need to reach the level of the more veteran universities as quickly as possible;
- The opportunity of not having to make the same mistakes as others;
- The fact of not being tied to a consolidated team;
- The fact of being located on islands with the need of distance education.

Manchester Metropolitan University

Manchester Metropolitan University (MMU) is a major university in the city of Manchester in the North West of England. The university has over 30,000 students and over 4000 staff. MMU is not a distance education institution. It is blended learning that has come to the fore and e-learning is an important part of the blended learning package. It offers distance education courses but they are not a driver of e-learning. Its leadership in e-learning is supported by its Learning and Teaching Unit. Competence in e-learning has grown organically and over a long period since the first initiatives taken in 1995. MMU has 1000 online courses and 15,000 e-learning students.

The project’s criterion that students enrolled should be distance education students has proved difficult to administer, because many institutions do not usually collect such statistics. The partnership is not confident that the statistics given for Manchester Metropolitan University are accurate, since the distance education students, either from the United Kingdom or from overseas, may be somewhat less than indicated.

Staffordshire University

Staffordshire University has a long history of providing vocational courses to its local communities as well as to regional, national and international students. It does not have much of a history of distance education, but it has delivered distance education courses, especially computing courses, overseas with partner organisations in places like Hong Kong and Singapore. The university’s history of e-learning dates back to 1997. The Geographers were under threat as not many people wanted to do a degree at a ‘New University’ in Geography. Now they have many hundreds of Masters degree students at a distance by e-learning.

The university reports to have 700 course modules online on its Blackboard Learning Management System. These courses are either e-learning for blended learning or e-learning for work-based learning or pure distance education. The university has between 5000 and 6000 e-learning students of whom 600-800 are pure distance education students.

The University of Leicester

The University of Leicester is one of the older universities in the United Kingdom and claims to be UK’s largest provider of distance education after the Open University. Distance learning at the University of Leicester began in the faculties of management and law (MBA, MA Law) as an additional revenue earner. It flourished in post graduate courses and professional development courses for 14 years. Most e-learning has been in on-campus courses. It was a question of encouraging academics to participate. Nearly 100 percent of the university’s courses are online, and the university policy is to embed e-learning throughout all relevant university departments. The university reports to have 7000 course enrolments in 1000 online courses, which in average are only seven enrolments per course.
The University of Ulster

University of Ulster is situated on four sites in Northern Ireland. Its involvement in distance education was low key until 1998. In the period 1997-1999 there were a number of e-learning initiatives especially in Biomedical and Education. In 1999, a new Vice Chancellor brought the initiatives together and gave e-learning a new priority as a key initiative. E-learning was brought in to meet Biomedical and other demands, and a virtual learning environment (VLE), WebCT, was installed. The Institute of Life Long Learning was founded in 2000 with a special responsibility to support e-learning. The University of Ulster is the megaprovider with the least number of course enrolments (1,300), but it is included in this study since it reported to have 222 online courses.

CORPORATE TRAINING PROVIDERS

The megaproviders in this category are large and quite diverse. Except from Learn Direct, they are all private institutions, and except from EDHEC, they focus on vocational training courses. Learn Direct, CrossKnowledge, and ÉLOGOS are all among the six institutions having most course enrolments.

Learn Direct

Learn Direct is the brand name of the University for Industry (Ufi) in the United Kingdom. The Ufi was set up by the United Kingdom government in 1998. It is of special interest since it with its 400,000 course enrolments and 500 online courses is the largest megaprovider in this study. The institution has 465 full-time and 19 part-time employees. Businesses, voluntary organisations, colleges and community centres run Learn Direct centres on behalf of Ufi. There are centres in shopping malls, schools, colleges, football clubs and prisons. The Learn Direct network works alongside further education colleges, with many centres providing a place to learn for people who are reluctant or unable to attend their local college.

Learn Direct had no background in distance education. It was a new foundation that came straight to e-learning. It got a lot of help from government and many of the staff had a good background in distance education skills and this helped a lot.

One factor, which has contributed to success, includes successful lobbying with government. The Learn Direct brand is also vital for success. It is the second biggest educational brand in the United Kingdom after the Open University. Research shows that 82% of the UK population recognises the Learn Direct brand. The Learn Direct marketing department is composed of retail brand people and Learn Direct advertises online, on news programmes and on TV and uses brand positioning. The goal is always to get students who have never successfully studied before into e-learning.

CrossKnowledge

CrossKnowledge is an international company founded in France. It was established in 2000 and has had an 80% annual growth rate since. It has passed through 3 stages: Learning portals from 2000 until 2002; blended learning from 2002 until 2005; and distance instructor-led training from 2005 until 2007. It provides remote development of managerial skills using new technologies. With 120 employees, 300 courses and 250,000 e-learning students in 2007, it is one of Europe’s absolutely largest providers of e-learning.

EDHEC Business School Lille-Nice

EDHEC Business School Lille-Nice (École De Hautes Études Commerciales du Nord) launched its first e-learning modules in 2000 for 40 stu-
An Analysis of European Megaproducers of E-Learning

dents and 10 professors in its Executive MBA programme. Since 2001 all the programmes and all the students took on e-learning. The school reports that it has 294 employees, 903 online courses and 4157 students.

With the creation of the Nice campus in 1991, EDHEC needed to guarantee its pedagogical identity with regard to courseware, evaluation and methodological processes. The professors, the administration and the students quickly got the habit of exchanging and sharing information by e-mail and Intranet links. In 1999 the head of the Executive MBA programme wanted to encourage cooperation at a distance between students and professors. In 2000, EDHEC launched its first e-learning modules. In 2001, the institution wanted to facilitate the integration of students returning directly to their second year at EDHEC after obtaining a university degree or diploma. EDHEC therefore developed new e-learning modules for them, as soon as their enrolment was confirmed. There were online course supports, foundation courses by e-learning, revision packages and self evaluation packages. The important factor for success is that EDHEC’s e-learning strategy allows EDHEC to improve its learning processes.

ÉLOGOS

ÉLOGOS is a private company in Spain that offers training and e-learning consultancy, training outsourcing and development of e-learning courses, technical know-how and solutions, a virtual learning platform (Educalogos), instructional design services and a considerable variety of online courses. ÉLOGOS entered the field of distance education more than 15 years ago. From the beginning it has succeeded in keeping its position as a leading e-learning company in Spain. The total annual e-learning market was €143 millions in 2006. ÉLOGOS had about 20% of this market. It has more than 250 employees and reports to have 605 online courses and 22,700 course enrolments.

Hungarian Telecom

Hungarian Telecom started experimenting with e-learning in 1996 by introducing WebCT services rented from an external LMS provider. By 2005, the Hungarian Telecom had above 8000 enrolments for about 150 courses, and between 20 and 40 online teachers. Presently, the time-wise distribution of online and face-to-face courses taken by the company’s learners is about 50-50%.

ANALYSES OF IMPORTANT SUCCESS FACTORS FOR ROBUSTNESS AND SUSTAINABILITY IN ONLINE EDUCATION

The search for success criteria started with the success factors presented in the book: Online Education and Learning Management Systems (Paulsen, 2003). The hypothesis of the Megatrends project was that it is possible to detect specific conditions that increase the possibility of success and sustainability of e-learning programmes. Sustainability was defined as programmes being offered on a continuous basis and not phased out after a defined project period or after specific subsidies are terminated. The work undertaken within the partnership in the project application hence suggested the first important factors for robustness and sustainability. These factors were discussed and refined at the Megatrends project partner meeting in Barcelona, April 2006, and finalised at the project partner meeting in Budapest, September 2006, according to the experiences with the first case studies.

The final list of 25 factors for robustness and sustainability in online education are included in Table 4. The list includes:

- Four historical factors;
- Four technical factors;
- Four course factors;
An Analysis of European Megaproducers of E-Learning

- Nine factors related to management, strategy and attitudes;
- Four economical factors.

The project partners expected that the factors could be hard to measure. The factors therefore were transformed to a set of interview questions that was used in an interview guide. In that way, the list of factors was used in the interview guide and as hypotheses in the further analyses of the megaproducers. The results of the in-dept analyses are published in a separate report (Arneberg et al., 2007).

The analyses are based on the interview transcripts, which are available in full via one of the project’s Web pages (www.nettskolen.com/in_english/megatrends/workpackage4.html). All the interview transcripts have also been edited into case study articles and published in the book, *Megaproducers of E-learning in Europe* (Paulsen, 2007).

The project also developed a rating scheme in which three independent researchers read all the interview transcripts and rated each of the factors on a scale from 5 = very much true to 1 = very little true. The result from the rating process is shown in Table 4.

The rating shows that all factors are not equally important for all institutions, so obviously it is possible to become a megaproducer without focusing on all the 25 factors. However, the variations in ratings are relatively small, so the 25 factors that were originally chosen seem to be well informed choices.

**RECOMMENDATIONS FOR ROBUSTNESS AND SUSTAINABILITY**

The ratings presented in Table 4, the analyses of the interview transcripts, and the concluding discussion among the researchers resulted in 27 recommendations (Arneberg et al., 2007) for robustness and sustainability in online education. The recommendations are listed according to the corresponding factors in the following:

**Recommendations Based on Historical Factors**

1. Learn from institutions with a long history and tradition of dealing with distance education.
2. Build high competence and tradition in online education.
3. Focus on evolutionary step-by-step development and scalability.
4. Promote continuing research and evaluation related to online education.

**Recommendations Based on Technical Factors**

5. Develop high competence in information and communication technology (ICT).
6. Use standard and widely-used technologies; widely-used technologies enable students to apply the software and hardware they have at their disposal with little need to buy and install additional equipment.
7. Acquire well integrated ICT systems that support online education.
8. Develop effective administrative systems.

**Recommendations Based on Course Factors**

9. Provide a wide range of subjects and levels that are attractive to students and lead to employment.
10. Select a wise choice of topics, courses, and programmes that are onlineable.
11. Weigh the potential benefits of flexible start-up and progression against the advantages of being able to work with stable groups in virtual classrooms.
An Analysis of European Megaplayers of E-Learning

1. Long history in online/distance/flexible education
2. High competence in online education
3. Evolutionary development
4. Continuing research
5. High competence in ICT
6. Based on standard technologies
7. Well integrated ICT systems
8. Effective administrative systems
9. Wide range of subjects and levels
10. Wise choice of topics
11. Flexible student start-up and progression
12. Focus on asynchronous communication
13. Support from top management
14. Enthusiastic employees
15. Strategies that support online education
16. Focus on quality
17. Effective administrative routines
18. Predictable and manageable teacher workload
19. Collaboration with other institutions
20. High credibility with the government
21. Some sort of industrialization
22. Cost-effectiveness
23. Stable and predictable sources of income from operation
24. Pressure on the necessity to change
25. Contracts with part-time tutors & course developers

Table 4. Mean value of ratings provided by three independent researchers

<table>
<thead>
<tr>
<th>Factor</th>
<th>OUNL</th>
<th>OUUK</th>
<th>NKI</th>
<th>UOC</th>
<th>NKS</th>
<th>UNED</th>
<th>GDF</th>
<th>Aberta</th>
<th>Distance Education institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Long history in online/distance/flexible education</td>
<td>4.3</td>
<td>5.0</td>
<td>5.0</td>
<td>3.5</td>
<td>5.0</td>
<td>3.3</td>
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<tr>
<td>2. High competence in online education</td>
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<td>4.7</td>
<td>5.0</td>
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<td>3. Evolutionary development</td>
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<td>4. Continuing research</td>
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<tr>
<td>5. High competence in ICT</td>
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<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
</tr>
<tr>
<td>6. Based on standard technologies</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
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<td>7. Well integrated ICT systems</td>
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<td>4.0</td>
<td>4.3</td>
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<td>4.3</td>
<td>4.0</td>
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<tr>
<td>8. Effective administrative systems</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
</tr>
<tr>
<td>9. Wide range of subjects and levels</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<tr>
<td>10. Wise choice of topics</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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</tr>
<tr>
<td>11. Flexible student start-up and progression</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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</tr>
<tr>
<td>12. Focus on asynchronous communication</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
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</tr>
<tr>
<td>13. Support from top management</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
</tr>
<tr>
<td>14. Enthusiastic employees</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
</tr>
<tr>
<td>15. Strategies that support online education</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<td>4.3</td>
</tr>
<tr>
<td>16. Focus on quality</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<tr>
<td>17. Effective administrative routines</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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</tr>
<tr>
<td>18. Predictable and manageable teacher workload</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
</tr>
<tr>
<td>19. Collaboration with other institutions</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<tr>
<td>20. High credibility with the government</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
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</tr>
<tr>
<td>21. Some sort of industrialization</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
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<td>4.0</td>
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<tr>
<td>22. Cost-effectiveness</td>
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<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<td>4.3</td>
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<tr>
<td>23. Stable and predictable sources of income from operation</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.0</td>
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<tr>
<td>24. Pressure on the necessity to change</td>
<td>4.3</td>
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<td>4.3</td>
</tr>
<tr>
<td>25. Contracts with part-time tutors &amp; course developers</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
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<td>4.3</td>
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<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Each factor is rated on a scale from 5 = very much true to 1 = very little true. Ratings are not available for the Virtual Campus of the University of Liège.
12. Focus on asynchronous communication. Students’ time flexibility leads to asynchronous communication and little focus on synchronous communication technologies.

Recommendations Based on Management, Strategy and Attitude Factors

13. Make sure to receive support from top management.
15. Develop strategies that support online education and make sure that the employees are loyal to the strategy.
16. Focus on quality.
17. Develop effective administrative routines.
18. Focus on predictable and manageable teacher workload.
19. Consider collaboration with other educational institutions.
20. Strive for high formal and informal credibility with the government and public administration.
21. Establish some sort of industrialisation such as division of labour, systematisation, automation, rationalisation, and work flow management.

Recommendations Based on Economical Factors

22. Focus on cost-effective courses that give much learning for the money.
23. Secure stable and predictable sources of income from operation of online education.
24. Utilise the pressure on the necessity to change as a means to be flexible, to stay in business and to adapt to the changing market.
25. Prefer contracts with part-time tutors and course developers that allow flexible employ-ment and use of staff to adapt to changes in markets.

Recommendations Based on Additional Factors

26. Develop high competence and good practice in marketing.
27. Treasure well known brand names.

FUTURE RESEARCH

The Megatrends project identified several potential megaproducers that the partners for various reasons were not able to investigate. Further research could be conducted to study these and additional megaproducers in Europe or elsewhere. In addition, it could be interesting to study the development of the identified megaproducers after a few years.

The project also identified and analysed conspicuous e-learning initiatives, which did not reach targeted goals. However, further research could be conducted on such initiatives. The project partners found that data on discontinued initiatives was difficult to collect. Some key individuals refused to be interviewed and others would not be referred to. Important documentation was not made available, and Websites were quietly closed down. However, one may expect that one may learn much from analyses of failed and discontinued e-learning initiatives.

The analyses of the megaproducers showed that it was important to secure stable and predictable sources of income from operation of online education. The analyses also showed that e-learning operation was financed in various ways. There are obvious differences between countries, between private and public institutions, and between universities and corporate providers. The preliminary results of the discontinued initiatives also show that a lot of public money
An Analysis of European Megaproviders of E-Learning

seems to have been wasted on dubious e-learning initiatives. Further research should therefore be conducted to investigate the cost effectiveness of e-learning megaproviders.

CONCLUSION

The Megatrends project identified and analysed 26 successful European megaproviders of e-learning. It focused on distance education provision and did not include on-campus e-learning. The analysed megaproviders had more than 100 courses or 5000 course enrolments in 2005. The megaproviders represent quite a large range of different institutions. They represented 11 European countries and included 8 distance education institutions, 13 universities and university consortia, and 5 corporate training providers. There were 8 private and 18 public megaproviders.

From a sustainability perspective, it is worthwhile noting that some megaproviders have offered online education for more than 20 years. Five of them started e-learning in the eighties and ten in the nineties. The largest provider, Learn Direct, claimed to have 400,000 course enrolments in 2005. It is also interesting to realise that among the six top ranked institutions there are no universities, only corporate training providers and distance education institutions.

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. The project partners identified 25 potential factors for robustness and sustainability that were used as a framework for the analyses of the megaproviders. The analyses concluded with 27 recommendations to help institutions obtain robustness and sustainability in online education. These recommendations could be useful for decision makers who would like to provide robust and sustainable online education in the future.

REFERENCES


Chapter X
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

Mark Stansfield
University of the West of Scotland, UK

Thomas Connolly
University of the West of Scotland, UK

ABSTRACT

This chapter will outline a set of guiding principles underpinning key issues in the promotion of best practice in virtual campuses. The work was conducted as part of the “Promoting Best Practice in Virtual Campuses” (PBP-VC) project that is aimed at identifying underlying issues and examples of best practice in providing a better understanding into virtual campus development and sustainability. The PBP-VC project was a two year European Commission Education Audiovisual and Culture Executive Agency (EACEA) co-financed project running from March 2007 to February 2009. The PBP-VC project team have worked with key stakeholders from virtual campus projects across Europe and globally in identifying and exploring key issues relating to best practice. The importance of developing a practical set of guiding principles for identifying, evaluating and promoting best practice in virtual campuses and e-learning can be demonstrated by the significant number of high profile e-learning and virtual campus failures that have occurred over the last decade both within Europe and globally at great financial cost. This chapter will highlight key enablers and inhibitors to success, provide a description of the different elements comprising the guiding principles in the promotion of best practice, as well as describing a tentative four level model aimed at illustrating different levels of virtual campus maturity in the achievement of sustainability and organisational transformation.
INTRODUCTION

Within the context of the European Union, over the last 5 years there has been a significant increase in the growth of virtual campus projects and initiatives that have been co-financed by the Education Audiovisual and Culture Executive Agency (EACEA). In total there have been more than twenty virtual campus related projects covering areas such as virtual mobility, teacher training, the economics of e-learning and the reuse and sharing of e-learning courses. Whilst there is no universally accepted definition of the term ‘virtual campus’, the EACEA (2006) consider a virtual campus to encompass cooperation among a number of higher education institutions in the field of e-learning in relation to the design and development of joint curricula that are based on online and traditional learning methods. A virtual learning environment by itself or the provision of an e-learning programme within a single higher education institution would not be defined by the EACEA as a virtual campus. To qualify as a virtual campus, the initiative would have to include a number of partners which could comprise higher education institutions, as well as other teaching and learning related organisations who through a partnership agreement, cooperate in the development and implementation of joint curricula based on e-learning or blended learning delivery. Although virtual campus projects and initiatives may differ in terms of their model of delivery, e-learning issues such as those relating to e-learning technology and e-learning pedagogy play a key role in the development and delivery of joint curricula provided by a virtual campus (EACEA, 2006).

In terms of e-learning and virtual campus-related initiatives more generally, at both European and global levels there have been a number of problems and weaknesses that have beset high profile initiatives that have led to their ultimate failure. Keegan et al., (2007) identify several high profile e-learning initiatives across the world that received significant external funding but failed to reach their targeted goals. Such initiatives included the UK E-University which ran from 2000-2004 with an expenditure of £50 million, the Alliance for Lifelong Learning (US and UK) that ran from 2000-2006 with an expenditure of $27 million, and the Competence Network of Norwegian Business and Industry (NKN) that ran from 2000-2002 with an expenditure of €7-9 million. Common issues that led to the downfall of such large-scale initiatives were identified by Keegan et al., (2007) as including overly ambitious plans in relation to the potential student market, a lack of financial planning in relation to revenue and expenses, and a lack of planning in relation to the management of both education and business activities.

In relation to European Commission co-financed virtual campus related projects, the EACEA (2005) identified certain key issues that they consider influence a successful outcome. It was felt that virtual campuses generally have very little contact and interoperability with each other due to a lack of awareness about other virtual campuses, as well as a lack of self-promotion/dissemination activities by virtual campuses. As a result it was recommended that more support be provided for a systematic critical review of existing virtual campuses and a greater sharing of knowhow, particularly in supporting the dissemination of replicable solutions for establishing virtual campuses and bringing together a community of decision-makers involved in setting up virtual campuses. It was with these recommendations in mind that in 2006 the ‘Promoting Best Practice in Virtual Campuses (PBP-VC)’ project was developed and subsequently received co-financing from the EACEA.

THE PBP-VC PROJECT: PROMOTING BEST PRACTICE IN VIRTUAL CAMPUSES

The PBP-VC project is a two year European Commission EACEA co-financed project running from
March 2007 to February 2009 which was aimed at providing a deeper understanding of the key issues and critical success factors underlying the implementation of virtual campuses, as well as a published practical framework to help guide the process of creating best practice in virtual campuses. In addition, the project is also aimed at publishing examples of best practice, case studies and use case scenarios, and raising awareness of the issues and approaches to creating successful and sustainable virtual campuses. The project was coordinated by the University of the West of Scotland (UK) and involved partners from the University of Cassino (Italy), University of the Peloponnese (Greece), Sociedade Portuguesa de Inovação (Portugal) and Institut National des Telecommunications (France). The project involved working with key virtual campus and e-learning stakeholders throughout the European Union, as well as globally in order to investigate best practice within the context of virtual campuses. The ultimate goal of the project is to help key stakeholders at governmental, institutional and project level.

TOWARDS THE DEVELOPMENT OF A FRAMEWORK FOR PROMOTING BEST PRACTICE IN VIRTUAL CAMPUSES

In order to identify issues relating to best practice within the context of virtual campuses and e-learning, detailed secondary research was conducted into previous EACEA co-financed virtual campus projects, virtual campus and e-learning projects and initiatives not co-financed by the EACEA, as well as those outside the European Union. The secondary research involved investigating papers, reports and Web-based content highlighting specific instances of good practice as well as looking for specific problems or limitations that might have been identified. In addition, the secondary research, several detailed face-to-face knowledge elicitation sessions took place with experienced virtual campus stakeholders that included project coordinators, learning technologists, researchers, tutors, developers and consultants. The sessions were aimed at identifying qualitative aspects of promoting best practice within virtual campuses from a more interpretive context. The knowledge elicitation sessions involved working with virtual campus projects and initiatives that included the eLene Network which has three successful virtual campus projects in the EACEA eLearning programme (eLene-TT – Teacher training and the innovative use of ICT in higher education, eLene-TLC - Preparing universities for the ne(x)t generation of students and eLene-EE - economics of eLearning). The eLene Network is considered to be an example of best practice and sustainability. Other European level virtual campus projects also included e-move which is based on the operational concept of virtual mobility.

In addition to knowledge elicitation sessions, online questionnaires were also used to identify and investigate key issues relating to best practice in virtual campuses. The online questionnaires were aimed at e-learning/virtual campus experts that included researchers, tutors and developers. Responses were received from several virtual campus projects and initiatives across Europe that included the VCSE (Virtual Campus for a Sustainable Europe), E-Urbs (European Master in Comparative Urban Studies) and eduGI (Reuse and sharing of eLearning courses in Geographical Information Science education). As a result of the studies a number of key enablers and inhibitors to virtual campus success were identified and shown in Table 1.

Important areas highlighted in terms of contributing to a successful virtual campus initiative, not only in the short term but also in the long term, primarily focus on having a clear understanding of the market, meeting the needs of the learners using the most appropriate technologies and learning content, as well as the having a sound business model in which costs are fully controlled,
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

Table 1. Examples of key enablers and inhibitors to virtual campus success

<table>
<thead>
<tr>
<th>No.</th>
<th>Key Enablers to Success</th>
<th>Key Inhibitors to Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Strong leadership and clear vision</td>
<td>Lack of leadership and direction</td>
</tr>
<tr>
<td>2.</td>
<td>Detailed understanding of market scope and potential</td>
<td>Overestimation of market demand and potential revenue</td>
</tr>
<tr>
<td>3.</td>
<td>Transparent business model</td>
<td>Failure to control costs</td>
</tr>
<tr>
<td>4.</td>
<td>Adopting a user centred design approach to development in meeting learner needs</td>
<td>Failure to understand learner and stakeholder needs</td>
</tr>
<tr>
<td>5.</td>
<td>Maximising resource potential by reuse of e-learning materials</td>
<td>Failure to develop virtual campus and e-learning materials in a cost-effective manner</td>
</tr>
<tr>
<td>6.</td>
<td>Clear and effective strategy for dissemination, promotion and commercialisation</td>
<td>Failure to plan beyond initial external start-up funding</td>
</tr>
<tr>
<td>7.</td>
<td>Engaging directly with key stakeholders in meeting real needs</td>
<td>Failure to develop future market opportunities</td>
</tr>
</tbody>
</table>

Figure 1. A summary of key virtual campus success factors

revenue streams are fully utilised and potential markets are fully explored. These success factors are summarised in Figure 1 as being money, markets and learner needs.

In relation to the identification and evaluation of good or best practice within e-learning and online learning, there has been some significant work that has been undertaken in this area. Within the UK, the Quality Assurance Agency for Higher Education (QAA, 2004) have published a code of practice for collaborative provision and flexible and distributed learning (including e-learning) that provides a code in terms of a statement of good practice which has been endorsed by the higher education community within the UK. The code covers area such as policies and procedures, written agreements, academic standards, student issues, e-learning issues and learner support. Other work includes Wright (n. d.) who provided a detailed set of criteria for evaluating the quality of online courses that includes areas such as accessibility, language, layout, course content, learning resources and evaluation. In addition, Wright (2006) also provides specific questions that serve as guidelines for selecting online course development and delivery platforms that cover areas such as instructor and student perspectives, technical issues and cost of ownership. Connolly and Stansfield (2007) also identify a number of guiding principles for the development of stimulating and challenging online constructivist learning environments to enhance e-learning based on problem-based learning in which learners can reflect not only on the structure of a problem, but on structuring their approaches to the problem, thereby attempting to generate alternative, more productive strategies. Phipps and Merisotis (2000) from the Institute for Higher Education Policy in the US, in association with Blackboard and the National Education Association conducted a study which established a list of 24 benchmarks that were considered most essential to the success in Internet-based distance education, covering areas
such as institutional support, course development, teaching/learning, and course structure.

Within the context of European Commission co-financed projects, a number of guidelines relating to the successful completion of projects have been produced. For example, Bienzle (2001) produced a survival kit for European project management that provided guidelines and advice in areas including project planning, project organisation, contractual and financial management and evaluation and dissemination that are relevant within the context of e-learning and virtual campus projects and initiatives.

In terms of exploring issues relating to the identification and promotion of best practice in e-learning and virtual campuses, as a result of the knowledge elicitation sessions and questionnaires conducted by the PBP-VC project, an initial set of key issues identified by the virtual campus stakeholders were grouped under six the main headings of:

- Pedagogical issues relating to developing appropriate and stimulating educational experiences that are linked to the effective use of ICT;
- Technological issues largely focusing on the setting up of appropriate ICT platforms and tools which form the basis of the virtual campus;
- Learner/user issues relating to identifying and responding to learner and user (e.g., staff) needs and requirements;
- Financial issues relating to using appropriate financial tools and methods in providing effective and realistic cost/benefit analysis;
- Operational issues relating to the running of the virtual campus project in terms of its management;
- Sustainability issues focusing on long term stability of the virtual campus once the initial period of external funding has ended.

The six key issues will be explored within the context of identifying and promoting best practice in virtual campuses through the identification of a number of guiding principles which were highlighted as being important from the knowledge elicitation sessions and questionnaires, as well as highlighting those relevant to virtual campus projects identified within the context of the e-learning/online education literature. The authors are not proposing that the guiding principles provide an exhaustive or definitive account of all the possible key issues relating to best practice within the context of e-learning and virtual campuses. The value of the guiding principles lies in their ability to highlight key issues that can generate debate among relevant stakeholders and interested parties. In addition, there does not appear to be a great deal of published literature that reflects upon best practices within the context of virtual campuses and e-learning, as well as providing practical models and frameworks within which to plan, develop and implement virtual campus and e-learning projects and initiatives.

Pedagogical Issues

A number of key guiding principles underpinning pedagogical issues have been identified and are shown in Table 2 which are considered to be important to identifying and promoting best practice within the context of virtual campuses and e-learning. A number of principles relate to the development of appropriate learning materials that not only take into account the background and profile of the learners, but also follow good practice in relation to the structuring, relevance and layout of learning materials. Wright (n. d.) identified a number of detailed criteria in relation to the structuring and layout of materials in the evaluation of online learning content that are also applicable to the design and development of learning materials within the context of virtual campuses. Within the context of collaborative provision and flexible and distributed learning,
the Quality Assurance Agency for Higher Education (QAA, 2004) highlight the importance of appointing a suitably qualified and experienced external examiner capable evaluating the quality of a programme being delivered across a partnership. Within the context of virtual campuses, a number of stakeholders from large-scale projects highlighted the importance of appointing an external evaluator who is able to provide an impartial, fresh perspective in terms of whether the goals and deliverables are being achieved, as well as highlighting areas of possible enhancement.

Connolly and Stansfield (2007) have proposed a number of guiding principles relating to the development of online learning environments that are based upon constructivist principles that they consider to provide a firm pedagogical basis for the development of virtual campuses. According to Connolly and Stansfield (2007) whilst traditional education has been guided by the paradigm of didactic instruction (viewing the learner as passively receiving information), there is now an emphasis on constructivism as a philosophical, epistemological, and pedagogical approach to learning. Constructivism asserts that people learn more effectively when they are engaged in constructing personally meaningful artefacts, thus learning is viewed as an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so (Piaget, 1968). Many researchers have expressed their hope that constructivism will lead to better and more effective education software and learning (e.g., Brown et al. 1989; Jonassen, 1994). These guiding principles are particularly relevant within the context of virtual campuses, in which ensuring that the learning environment motivates, engages and challenges the learner, as well as enabling reflection and the opportunity to appreciate other perspectives from learners and teachers from different cultural backgrounds, was identified as being important by several virtual campus stakeholders who participated in the knowledge elicitation sessions.

One area highlighted by virtual campus stakeholders during both the knowledge elicitation sessions and from the questionnaires was the importance of reusing and sharing course content both between partner institutions and across other programmes of study where considered appropriate. This was viewed as a useful means of maximising the benefits and use of the course materials, as well as reducing costs of developing new materials elsewhere ‘from scratch’.

**Technological Issues**

In relation to technological issues, a number of guiding principles have been identified and highlighted in Table 3 that centre around a number of key areas in relation to the selection, development, adaptation, implementation and evaluation of the technologies upon which a virtual campus might be based. In relation to the selection of an appropriate technology platform, important decisions have to be made whether to use open source or propriety software in which decisions have to be based on a sound evaluation of the pros and cons of different options, as well as conforming to recognised standards (Wright, 2006). During the knowledge elicitation sessions and from the questionnaires, a number of stakeholders identified the usefulness of open source software in terms of providing lower cost and more flexible solutions. However, such decisions need to be balanced against a need to provide sufficient learner/user documentation, adequate multilingual support, as well as compatibility issues with other systems such as student records and accounting systems across a virtual campus partnership.

In addition to the selection and development of appropriate technologies across a virtual campus partnership, key decisions must also be taken in relation to ensuring the functionality and user interface are compatible with the profile of the
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

Table 2. Guiding principles underpinning pedagogical issues in the promotion of best practice in virtual campuses

<table>
<thead>
<tr>
<th>No.</th>
<th>Guiding Principles Underpinning Pedagogical Issues in the Promotion of Best Practice in Virtual Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Course materials take into account the background of the learners, their profile and their ability/competency levels.</td>
</tr>
<tr>
<td>2.</td>
<td>The layout and structure of all course and learning materials is logical, appropriate to the subject area and needs of learners, and the functions of all buttons, icons are clearly explained and learners can find key information quickly. The content of courses has been checked for technical accuracy (Wright, n. d.).</td>
</tr>
<tr>
<td>3.</td>
<td>Course objectives, learning outcomes, key tasks, skills, competencies are clearly articulated to the student and their significance to the real world subject of study (e.g., engineering, language skills, teacher training etc) is clearly explained.</td>
</tr>
<tr>
<td>4.</td>
<td>Essential course elements are clearly identified to the learners and delineated from those that are supplementary and links to external sources and course elements have been tested and are current.</td>
</tr>
<tr>
<td>5.</td>
<td>Opportunities for learners to use self tests and automated testing and scoring are provided, particularly when learning remotely.</td>
</tr>
<tr>
<td>6.</td>
<td>Where appropriate, a suitably experienced and qualified external examiner or assessor has been appointed to ensure that the quality of the learning materials and teaching, fairness of assessments and quality of student work produced is consistent with the level of similar courses and learning experiences provided elsewhere (QAA, 2004).</td>
</tr>
<tr>
<td>7.</td>
<td>An agreed set of formal quality standards and principles is produced that all partners must adhere to in the production of all learning materials, teaching and assessments.</td>
</tr>
<tr>
<td>8.</td>
<td>A variety of appropriate learning activities and styles are adopted to promote interactivity and collaboration (e.g., learner-learner, learner-teacher, learner-system) through online discussions, online conferencing, collaborative assignments (Connolly &amp; Stansfield, 2007).</td>
</tr>
<tr>
<td>9.</td>
<td>Opportunities are provided for learners to experience and appreciate other perspectives with learners and teachers from different cultural backgrounds (particularly useful within the context of transnational virtual campus projects and initiatives) (Connolly &amp; Stansfield, 2007).</td>
</tr>
<tr>
<td>10.</td>
<td>Learners are encouraged to reflect on their activities both during a project/activity and after completion – enabling both group-based and individual-based reflection. Opportunities are provided for debriefing, feedback and evaluation at the end of the course/project (Connolly &amp; Stansfield, 2007).</td>
</tr>
<tr>
<td>11.</td>
<td>The learning environment motivates, engages, and challenges the learner. The environment should support the cognitive preference of the learners (Connolly et al., 2007).</td>
</tr>
<tr>
<td>12.</td>
<td>For group-based work, there must be ‘group goals’ and ‘individual accountability’ for effective collaborative learning (Slavin, 1989).</td>
</tr>
<tr>
<td>13.</td>
<td>Learners are encouraged to take responsibility for their learning and to be aware of the knowledge construction process (Connolly &amp; Stansfield, 2007).</td>
</tr>
<tr>
<td>14.</td>
<td>Integrated assessments are provided that are clearly linked to learning outcomes.</td>
</tr>
<tr>
<td>15.</td>
<td>Constructive, relevant and timely feedback is provided to learners in which their grades are clearly explained and areas for improvement clearly identified.</td>
</tr>
<tr>
<td>16.</td>
<td>Where appropriate, support and opportunities are provided for course content reuse/sharing across the virtual campus partnership in order to maximise the benefit and reduce the costs of designing and developing course materials and content.</td>
</tr>
</tbody>
</table>

During the knowledge elicitation sessions most virtual campus stakeholders highlighted the importance of providing sufficient guidance and support to learners/users and providing them with full information in terms of technology requirements, learner support and online security policies etc. A number of stakeholders noted that it was often staff who appeared to have the greatest difficulties, as well as the most negative attitudes to learning new technologies and applications. The importance of adopting a user centred approach to the design and development of a virtual campus was also highlighted by many stakeholders. It was
considered vital that developers provide functions and features that enhance learning and also meet with the needs of learners. Sometimes functions and features that the developers think might be the most popular with learners/users might not always be the case. By adopting a user centred approach, the development of unnecessary and potentially costly functions and features can be avoided in providing affordable and sustainable technological solutions.

Learner/User Issues

In terms of learner/user issues, a number of key guiding principles have been identified in relation to best practice and are shown in Table 4. Underpinning many of the principles is the important need of keeping learners/users closely informed in terms of how to interact online, what is expected of them as learners, how and where to access important course-related information, as well as details of virtual campus privacy and security policies. In addition, an important responsibility of a virtual campus is to ensure that users such as tutors and support staff have been adequately trained on how to interact with learners online in their tutoring or support role, as well as how to interact with learners from diverse cultural backgrounds. It is vital that learners feel that they are adequately supported and that staff are fully able to address their needs which may also include learners with special needs and requirements.

Within the context of collaborative provision and flexible and distributed learning, the Quality

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**Table 3. Guiding principles underpinning technological issues in the promotion of best practice in virtual campuses**

<table>
<thead>
<tr>
<th>No.</th>
<th>Guiding Principles Underpinning Technological Issues in the Promotion of Best Practice in Virtual Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Decisions on the selection of appropriate technology platforms and software (e.g., open source or propriety) have been based on detailed investigation across the virtual campus partnership and take into account independent reviews, experiences of other institutions as well as access to trial versions. Suppliers are reputable and recognised in the field (Wright, 2006).</td>
</tr>
<tr>
<td>2.</td>
<td>Technology adopted conforms to recognised standards (e.g., SCORM, IMS) and is compliant with common web technology and enables suitable adaptation/modification and future development (Wright, n. d.).</td>
</tr>
<tr>
<td>3.</td>
<td>Maintenance agreements have been finalised and suitable multilingual technical support is available when required.</td>
</tr>
<tr>
<td>4.</td>
<td>Infrastructure and server will handle anticipated maximum number of learner/users across the virtual campus partnership.</td>
</tr>
<tr>
<td>5.</td>
<td>The virtual campus platform has been rigorously tested to ensure that it is reliable and secure, with suitable antivirus and security measures agreed and implemented by all virtual campus partners.</td>
</tr>
<tr>
<td>6.</td>
<td>A user centred design approach to the development of suitable learning technologies has been agreed and implemented.</td>
</tr>
<tr>
<td>7.</td>
<td>Functionality and user interface are compatible with learning styles adopted, aims and objectives of courses, as well as the profile and needs of the learners.</td>
</tr>
<tr>
<td>8.</td>
<td>Consideration and enabling support is given to learners/users with special needs and learning challenges (Wright, n. d.).</td>
</tr>
<tr>
<td>9.</td>
<td>Sufficient learner/user documentation and instruction guides are available.</td>
</tr>
<tr>
<td>10.</td>
<td>Adequate contingency plans have been developed and tested in the event of a system failure both at local, national and transnational level across the virtual campus.</td>
</tr>
<tr>
<td>11.</td>
<td>Learners/users are informed of special technology requirements needed to effectively use the virtual campus platform (e.g., minimum hardware specification, software required and versions, browser specification etc.).</td>
</tr>
<tr>
<td>12.</td>
<td>Learners/users are directed to a Frequently Asked Questions section within the virtual campus platform that provides information on technical and learner support, online security policies such as virus protection and firewalls.</td>
</tr>
<tr>
<td>13.</td>
<td>As far as possible, any Content/Learning Management Systems adopted are compatible with other systems used by partner institutions such as student records, accounts, student support etc to provide more effective and seamless administration.</td>
</tr>
<tr>
<td>14.</td>
<td>The technology adopted provides a cost effective means of enhancing learning experiences and providing opportunities to learners that is both affordable and sustainable.</td>
</tr>
</tbody>
</table>
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

Assurance Agency for Higher Education (QAA, 2004) highlight the importance of having adequate procedures in place to ensure that learner entry requirements are met in terms of the recognition of overseas credits and qualifications and prior learning. This is particularly relevant in relation to many virtual campus projects and initiatives where learners registered on a particular course may originate from institutions across a number of transnational boundaries and from different cultural backgrounds.

Other guiding principles underpinning learner/user issues include providing all learners with the opportunity to participate in both informal and formal feedback in relation to how the virtual campus meets their needs and how improvements might be made. Such feedback can be generated from online questionnaires, discussion boards and meetings. As well as gaining the views of learners, it is also important to gain feedback from staff as well who are also users of a virtual campus and may have important points to raise as well as suggestions for improvement.

Financial Issues

A number of guiding principles in relation to financial issues have been identified and are shown in Table 5. Within the context of e-learning and virtual campuses very little work appears to have been conducted into establishing the full costs and benefits of providing e-learning courses and running a virtual campus. It is all too easy for a virtual campus or an e-learning initiative to overestimate the potential revenue that might be generated and underestimate the costs of developing stimulating learning content (Keegan et al., 2007). In order to be able to closely track the costs of developing a virtual campus with partners across transnational boundaries, it is important to

Table 4. Guiding principles underpinning learner/user issues in the promotion of best practice in virtual campuses

<table>
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<tr>
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<th>Guiding Principles Underpinning Learner/User Issues in the Promotion of Best Practice in Virtual Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Administrative tools enable learners/users to be registered on courses, details amended and course monitoring across the virtual campus partnership in a clear and effective manner.</td>
</tr>
<tr>
<td>2.</td>
<td>Learners receive clear explanations and guidance in terms of learning styles adopted and what is expected of them as learners.</td>
</tr>
<tr>
<td>3.</td>
<td>Clear guidelines are provided to learners on how to interact online with other learners and staff in terms of appropriate behaviour and language (Wright, n. d.).</td>
</tr>
<tr>
<td>4.</td>
<td>Easily accessible and clear information is provided to learners in relation to the availability of online and offline support in terms of technology and learning.</td>
</tr>
<tr>
<td>5.</td>
<td>Staff providing both learning and technology support have been adequately trained and have the necessary skills and experience in dealing with learners and users from diverse backgrounds and cultures (QAA, 2004).</td>
</tr>
<tr>
<td>6.</td>
<td>Learners and staff have the necessary access to relevant course related documentation in relation to learning outcomes, schedule of delivery, assessment methods etc.</td>
</tr>
<tr>
<td>7.</td>
<td>To assist those learners/users who use screen readers, descriptions of all non text elements (e.g., images, graphics, audio, video) are available as a detailed text equivalent (Wright, n. d.).</td>
</tr>
<tr>
<td>8.</td>
<td>All learners/users are given the opportunity to provide both informal and formal feedback in relation to their experiences in participating in the virtual campus through a range of appropriate feedback mechanisms (e.g., online surveys, local learner online support groups, discussion boards (private and public), face-to-face learner/staff liaison meetings).</td>
</tr>
<tr>
<td>9.</td>
<td>Adequate procedures across an initiative are in place to ensure that all learner/user entry requirements are met, as well as areas such as overseas credits and qualifications, prior learning and cultural backgrounds of learner/users are recognised as considered appropriate (QAA, 2004).</td>
</tr>
<tr>
<td>10.</td>
<td>Learner/user tracking features are available (e.g., when/how long they have been logged on, pages visited etc.).</td>
</tr>
<tr>
<td>11.</td>
<td>All learners/users are informed of the virtual campus privacy policy in relation to what information is stored about them, who has access to it and circumstances under which their submissions to online forums are made accessible and shared with others.</td>
</tr>
</tbody>
</table>
develop a transparent business model with clearly understood financial reporting system, as well as all necessary financial documentation used by all partners (Bienzle, 2001). In addition, it is important that detailed financial risk management is conducted at regular intervals and that adequate contingency plans are developed to counter any external or internal events that might adversely affect the continuation of the virtual campus in providing its courses and services. In relation to the knowledge elicitation sessions and questionnaires sent to virtual campus stakeholders, the continued provision of a virtual campus once the period of external start-up funding had expired was considered to be very challenging mainly due to financial considerations and the ability to generate sufficient income, which was often less than what was originally forecast.

Organisational Issues

Important guiding principles underpinning organisational issues are highlighted in Table 6. Organisational issues include the development and implementation of operational procedures that guide the everyday running of a virtual campus such as having clear and detailed plans outlining roles and responsibilities, as well as legally binding agreements and contracts that cover areas such as copyright, intellectual property rights, as well as having an agreed set of procedures and principles for dealing with potential areas of conflict. In addition, it is important to have clear and effective systems of communication that provide easily understood procedures for reporting (Bienzle, 2001). In key areas such as evaluation a number of virtual campus stakeholders highlighted the importance of adopting a peer review approach within the project, as well as having an external evaluator to provide a different perspective.

Of particular importance to the success of a virtual campus project are the actual partners themselves and the different skills and knowledge they possess, as well as the development of effective teamwork that helps bind the collaboration together. A number of virtual campus projects identified a particular ‘ethos’ or ‘team spirit’ that provides them with a certain sense of identity and is recognised across the partnership, having evolved over a number of years. In relation to the organisation of a virtual campus project, one of the key success factors identified by nearly all stakeholders was having a strong and experienced leader with a clear vision and able to implement

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Table 5. Guiding principles underpinning financial issues in the promotion of best practice in virtual campuses

<table>
<thead>
<tr>
<th>No.</th>
<th>Guiding Principles Underpinning Financial Issues in the Promotion of Best Practice in Virtual Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Appropriate costing methods have been adopted in relation to evaluating costs (e.g., technology, pedagogy, staffing, administration etc.) both in term of direct costs and indirect costs.</td>
</tr>
<tr>
<td>2.</td>
<td>Appropriate sources of external and internal funding and potential revenue streams have been identified and secured.</td>
</tr>
<tr>
<td>3.</td>
<td>Formal agreement has been secured in terms of how external funding and revenue will be divided among virtual campus partners.</td>
</tr>
<tr>
<td>4.</td>
<td>A clear, efficient and transparent financial reporting system has been identified and agreed by all partners (Bienzle, 2001).</td>
</tr>
<tr>
<td>5.</td>
<td>All necessary financial documentation is clearly understood and implemented by all partners in the reporting and documenting of all financial issues (Bienzle, 2001).</td>
</tr>
<tr>
<td>6.</td>
<td>Detailed financial risk management has been conducted before the development of the virtual campus and is conducted at regular intervals (e.g., quarterly) across all areas.</td>
</tr>
<tr>
<td>7.</td>
<td>Contingency plans and procedures have been developed and agreed upon by all virtual campus partners in relation to reporting and addressing any areas of potential financial mismanagement or malpractice across the virtual campus partnership (QAA, 2004).</td>
</tr>
</tbody>
</table>
a pro-active approach to managing the project, as well as dealing with the cultural diversity through promoting inter-cultural dialogue across the partnership.

In addition, many participants highlighted the importance of not only leading the project team but also establishing effective partnerships with internal and external stakeholders associated with the virtual campus throughout the project lifecycle. In order for a virtual campus project to meet the real needs of learners/users and the wider community (e.g., potential employers), then strong partnerships with external stakeholders must be established from an early stage. This is particularly important within the context of conducting clear and detailed market research in order to avoid overestimating the potential size of a market and the amount of income that might be generated (Keegan et al., 2007).

**Sustainability Issues**

A number of key guiding principles underpinning sustainability within virtual campuses are highlighted in Table 7. Implementing sound dissemination, marketing and commercialisation plans and activities are vital in securing the long term future of a virtual campus or e-learning initiative. Sustainability was viewed by many of the virtual campus stakeholders as being a key activity that should be addressed throughout the development and implementation of a virtual

### Table 6. Guiding principles underpinning organisational issues in the promotion of best practice in virtual campuses

<table>
<thead>
<tr>
<th>No.</th>
<th>Guiding Principles Underpinning Organisational Issues in the Promotion of Best Practice in Virtual Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Virtual campus partners are well matched and provide a range of diverse as well as complimentary and compatible knowledge and skills that one partner cannot provide alone.</td>
</tr>
<tr>
<td>2.</td>
<td>A formal and legally binding agreement/contract sets out the roles and responsibilities of the virtual campus partnership that is signed by a legal representative from each partner that also covers issues relating to copyright, intellectual property rights and ownership of materials.</td>
</tr>
<tr>
<td>3.</td>
<td>Clear and effective systems and lines of communication have been agreed and established throughout the partnership that provide easily understood procedures for reporting (Bienzle, 2001).</td>
</tr>
<tr>
<td>4.</td>
<td>Clear and detailed project plans outlining areas of work, roles, responsibilities, deliverables, milestones and areas of evaluation among the virtual campus project.</td>
</tr>
<tr>
<td>5.</td>
<td>A clear and rigorous system of evaluation that is agreed upon and adopted in terms of the evaluation of all aspects (e.g., financial, management, pedagogy, technology, learner/user) of the virtual campus initiative. Evaluation is carried out through different means such as peer review among project partners, an experienced external evaluator or evaluation team, learner/user representatives etc.</td>
</tr>
<tr>
<td>6.</td>
<td>An agreed set of procedures and principles that deal with any potential areas of conflict and crisis management among the virtual campus partnership and any third parties (e.g., suppliers), in terms of termination and mediation.</td>
</tr>
<tr>
<td>7.</td>
<td>The virtual campus initiative is led by an experienced and strong leader with a clear vision. The project leader has the recognition, approval and respect of all project partners and is able to implement a pro-active approach to management.</td>
</tr>
<tr>
<td>8.</td>
<td>A sense of team spirit is developed across the entire virtual campus partnership that all members can relate to and provides the partnership with a sense of identity that can be used to motivate its members and promote its activities.</td>
</tr>
<tr>
<td>9.</td>
<td>Recognition and management of cultural diversity across the entire virtual campus initiative through providing clear inter-cultural dialogue and drawing upon the strengths and opportunities that cultural diversity provides for both students/learners, as well as staff and project members to learn from each other and experience different ways of thinking, managing and carrying out tasks.</td>
</tr>
<tr>
<td>10.</td>
<td>Detailed and effective market research is conducted to determine the extent and scope of local, national and transnational markets in terms of potential learners/students/users of a virtual campus, most appropriate subject areas and the potential level of income that might be generated (Keegan et al., 2007).</td>
</tr>
<tr>
<td>11.</td>
<td>Formation of strong partnerships with both internal and external key stakeholders such as among academic institutions, business/industry, government and professional institutions.</td>
</tr>
</tbody>
</table>
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

campus project, particularly at the planning stage, rather than just being an area for consideration once a virtual campus had been implemented, when many potential opportunities may have been overlooked. A number of virtual campus stakeholders, particularly those at project leader or manager level highlighted the importance of engaging closely with key external stakeholders in ensuring that a virtual campus continues to meet the real needs of learners/users and explores potentially new and profitable markets. A number of virtual campus projects and initiatives highlighted the need to gain accreditation from professional bodies relating to their particular subject area in order to attract wider recognition of their courses and services, as well as attract sponsored or fee paying learners.

Several experienced virtual campus project leaders and coordinators highlighted the need to identify best practices within their projects and use these as a key selling point to both decision-makers within their institutions, as well as external decision-makers. This was viewed as important in embracing the e-learning environment and embedding best practices developed from virtual campuses into more ‘mainstream’ physical campus based activities, thus contributing to wider organisational development and transformation, in securing the longer term future of the virtual campus. Having a project champion at senior decision-making levels both within institutions and externally was also seen as being important in helping secure the future of a virtual campus.

SUSTAINING BEST PRACTICES IN VIRTUAL CAMPUSES

As a result of the knowledge elicitation sessions and questionnaires conducted with a range of virtual campus stakeholders across Europe as well as globally, a number of different phases of

Table 7. Guiding principles underpinning sustainability in the promotion of best practice in virtual campuses

<table>
<thead>
<tr>
<th>No.</th>
<th>Guiding Principles Underpinning Sustainability in the Promotion of Best Practice in Virtual Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The development and implementation of a dissemination strategy at an early stage that targets key internal and external stakeholders and target groups in addressing their key needs.</td>
</tr>
<tr>
<td>2.</td>
<td>The early development and implementation of a marketing and commercialisation plan aimed at generating interest and potential revenue for the products, courses, services and expertise of a virtual campus partnership that enables continued development in the future.</td>
</tr>
<tr>
<td>3.</td>
<td>The use of questionnaires and focus groups in reaching key stakeholders and target groups in ensuring that their current and future needs can be met, as well as identifying potential new trends and potential markets.</td>
</tr>
<tr>
<td>4.</td>
<td>Ensure that all virtual campus project partners play a key role in dissemination, marketing and commercialisation activities which can often be local, national and transnational in their scope.</td>
</tr>
<tr>
<td>5.</td>
<td>Before commercialisation plans are implemented, issues of copyright, patents, ownership, intellectual property rights, confidentiality have been addressed and agreed upon among all project partners.</td>
</tr>
<tr>
<td>6.</td>
<td>The development of plans for dissemination, marketing and commercialisation are updated and refined throughout the implementation of the virtual campus project to take into account changing internal and external circumstances and new developments and trends in relation to key stakeholder and target groups.</td>
</tr>
<tr>
<td>7.</td>
<td>An ability to identify best practises and new trends and explore them in providing new and improved courses, products and services that stand out in local, national and transnational markets – developing a reputation as a centre of excellence.</td>
</tr>
<tr>
<td>8.</td>
<td>Maximise the potential for embracing best practices and innovation within e-learning and virtual campuses by introducing them within more ‘mainstream’ physical campus based courses within the partner institutions, thereby contributing to wider organisational development and transformation.</td>
</tr>
<tr>
<td>9.</td>
<td>Continue to conduct detailed market research to determine changes in demand for courses, products and services, as well as identifying potential new markets that might be worth exploring (Keegan et al., 2007).</td>
</tr>
</tbody>
</table>
maturity could be distinguished in terms of their planning, development, implementation, evaluation and sustainability. Virtual campus projects and initiatives that had been successful in securing external funding over a period of several years appeared to demonstrate high levels of development and maturity in relation to many of the guiding principles highlighted in the previous sections. As a result of investigations conducted with a range of stakeholders involved in the several virtual campus projects and initiatives, a number of levels in relation to virtual campus maturity could be distinguished. The levels are shown in Figure 2, which uses a diagrammatic way of representation that has certain similarities with Salmon’s (2002) E-tivities 5 stage model.

**Level 1: Virtual Campus Planning and Development**

This is at the very earliest stages of virtual campus planning and development where project teams have been recently formed and initial work is commencing on developing the pedagogical and technical infrastructure that will form the basis of the virtual campus. Many ‘teething’ problems may be experienced during this phase of development as transnational teams become familiar with each other’s working practices, as well as differing bureaucratic and administrative structures. Having a virtual campus initiative that is guided by a strong leader/coordinator is essential in making sure that transnational teams work effectively and any areas of potential dispute are dealt with quickly. During this particular phase in its lifecycle, a virtual campus would usually be heavily dependent upon external sources of start-up funding to resource the project. There is usually a substantial learning curve that might have to be experienced as new project teams learn new technologies as well as different learning environments. It is also during this phase that issues relating to sustainability have to be considered.

**Level 2: Virtual Campus Evaluation and Refinement**

During the implementation phase of a virtual campus it is vital that rigorous evaluation takes place before, during and after different groups of learner/users have worked their way through the different courses, programmes and services. It could be the case that what works for one group of learners/users might not necessarily be the case for other groups. The cultural diversity of transnational groups of learners/users has to be addressed. Therefore, it might be expected that refinements to the technical infrastructure, teaching methods, assessment methods and learning materials would take place as a result of detailed feedback from staff, students and other stakeholders. Issues such as having clear and effective lines of communication are vital in ensuring the inclusion of all stakeholders, as well as having both formal and informal opportunities for providing feedback. Utilising the services of an external, impartial evaluator or an evaluation group is important in providing a fresh perspective in addressing key issues and evaluating the success of a virtual campus project.

**Level 3: Virtual Campus Integration**

At this level of maturity, a virtual campus project should have well-developed plans for sustainability in order to continue once the initial start-up funding had expired. It is vital that the virtual campus has a clear, effective and realistic business model upon which to continue its activities. Therefore, costs have to be controlled through for example, reusability and interoperability of pedagogical and technological components, and sources of revenue need to be secured. It is important that a virtual campus is able to focus on its strengths and selling points to the wider community. Best practices need to be identified and promoted so that the virtual campus can evolve into a centre of excellence in a particular area that external
Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses

stakeholders such as industry/commerce and educational institutions may wish to utilise and contribute to financial stability in terms of fees for courses and services.

**Level 4: Organisational Transformation**

At this level of maturity a virtual campus will be financial self sustainable in terms of being able to operate without the need for further start-up grants and will have received widespread recognition and support from senior decision-makers both at an internal organisational level and externally (e.g., business, education, government). In addition, best practices established during the development of the virtual campus can become embedded within a wider organisational context, in that they are used within more ‘mainstream’ education contexts. Thus, the virtual campus, rather than being viewed as a separate project within an organisation, is viewed more as contributing to wider organisational transformation in terms of providing more innovative and stimulating experiences to wider groups of learners than would have previously been thought possible. For example, e-portfolios, wikis and blogs that a few years ago might have been limited to smaller groups of students participating in specific pilot projects, are now being embraced within more ‘mainstream’/traditional courses to larger groups of students.

It is not assumed that all virtual campus projects and initiatives will reach Levels 3 and 4. It might be that a virtual campus project runs for the duration of the external funding period that might be 2 years and then discontinues which does not allow it to continue to Levels 3 and 4.

**FUTURE DIRECTIONS**

In terms of future work and direction, the guiding principles underpinning key issues in the promotion of best practice in virtual campuses will be developed further into a more detailed practical evaluation framework that can be used by virtual campuses in identifying not only areas of particular strength and best practice, but also areas of weakness that need to be addressed. The
PBP-VC project will be working closely with several European level virtual campus projects, as well as researchers and stakeholders at global levels in refining and further developing the guiding principles. In addition, a number of case studies and use case scenarios will be developed that will be aimed at illustrating actual real world examples of best practice. The importance of investigating and gaining a better understanding of best practice can be illustrated by other projects such as Re.ViCa - Reviewing (traces of) European Virtual Campuses (http://revica.europace.org/) which is a project focusing on analysing the critical success factors for virtual campuses that is aiming to provide a manual with guidelines, best practices and recommendations, as well as a project wiki which will be made public at the end of the project.

CONCLUSION

The guiding principles underpinning key issues in the promotion of best practice in virtual campuses illustrate the importance of addressing a wide range of important factors that can have an influence on the success and sustainability of a virtual campus. The guiding principles that have been identified both in the literature relating to e-learning/online education, as well as primary research are not put forward as an exhaustive or definitive account of all possible issues and scenarios. The guiding principles are meant to represent a starting point and platform upon which further debate and exploration can take place. It is only through engaging in debate in relation to important issues with key stakeholders such as educators, technologists, policy-makers, learners and representatives from industry and commerce that best practices can be identified and explored so that the real needs of key stakeholders can continue to be met. In addition, it enables practical frameworks, models and approaches to be developed and refined to help virtual campus researchers, developers and tutors evaluate their activities and progress, as well as adopt best practices in working towards greater success and sustainability of virtual campus projects and initiatives.

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Guiding Principles for Identifying and Promoting Best Practice in Virtual Campuses


Chapter XI

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

Helena Bijnens
EuroPACE ivzw, Belgium

Ilse Op de Beeck
EuroPACE ivzw, Belgium

Johannes De Gruyter
AVNet – K.U.Leuven, Belgium

Wim Van Petegem
AVNet – K.U.Leuven, Belgium

Sally Reynolds
ATiT, Belgium

Paul Bacsich
Matic Media Ltd, UK

Theo Bastiaens
FernUniversität in Hagen, Germany & Open University of the Netherlands, The Netherlands

Anna-Kaarina Kairamo
Helsinki University of Technology, Lifelong Learning Institute Dipoli, Finland

Grégory Lucas
University of West Hungary - Faculty of Geoinformatics, Hungary

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 TOVIRTUAL 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
Reviewing Traces of Virtual Campuses

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 enable learning and teaching to happen.

- **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:
• 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 that 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; Bijnens, 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 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 (the first two International Advisory Committee Meetings have taken place at the EDEN Annual conference in Berlin, December 2008; the third one will take place at the ICDE World conference, Maastricht, June 2009). 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 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 multicampus 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. This project systematically
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reviews virtual campuses of the past decade and formulates guidelines that can be applied by decision-makers to enhance the realisation of future sustainable virtual campus initiatives.

ACKNOWLEDGMENT

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REVE – Real Virtual Erasmus web site: http://reve.europace.org


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Chapter XII
Virtual Campus Development on the Basis of Subsidiarity: The EVS Approach

Ron Cörvers
Open University of the Netherlands, The Netherlands

Joop de Kraker
Open University of the Netherlands, The Netherlands

ABSTRACT

The main objective of this chapter is to highlight the importance of subsidiarity in the development of a virtual campus. Subsidiarity is the principle that matters ought to be handled by the lowest competent authority. In our view, subsidiarity is crucial to sustainable approaches in virtual mobility. We support this view by two case descriptions: the development and implementation of a very successful virtual course - European Virtual Seminar on Sustainable Development (EVS) and the project to expand from this single course to a virtual campus - Virtual Campus for a Sustainable Europe (VCSE). We conclude that the factors determining the viability and uptake of international online learning initiatives, such as virtual campuses, are a bottom-up approach enabled by the availability of inexpensive ICT, an educationally driven need for virtual mobility, and interdependence within the international partnership.

INTRODUCTION

Physical mobility of students and teachers, who may spend a period of time abroad to study or teach at another university, has become a familiar phenomenon in many European countries over the past decades. For over 20 years, the European Commission has been stimulating physical mobility in its member states through the Erasmus programme. The objectives of this international exchange programme range from promoting a sense of European citizenship and the competence to cope with cultural diversity, to improving access to high quality education throughout Europe and improving the quality of higher education through international collabora-
tion and competition. The Erasmus programme can be considered a success, given that more than 1.5 million students have participated since 1987 (European Commission, 2006). In fact, however, in each academic year, less than 1% of the total European student population take courses at a university in another member state (Bijnens et al., 2006). The European Commission is currently aiming for a major increase in student mobility by 2012 (European Commission, 2008), but it appears that these targets will not be achieved by physical mobility alone. Even if the campaign is successful, the large majority of students will not be internationally mobile, due to a variety of social, organisational, administrative, financial and physical barriers. It is for these students that an alternative has been suggested in the form of virtual mobility, i.e., ‘using information and communication technologies (ICT) to obtain the same benefits as one would have with physical mobility, but without the need to travel.’ (eLearningEuropa.info, cited in: Bijnens et al., 2006). A recent best practice manual and review of European virtual mobility projects distinguishes four main types of virtual student mobility: virtual courses, virtual study programmes, virtual student placements and virtual support activities to physical mobility (Bijnens et al., 2006). A virtual campus, the topic of this chapter, is a web-based platform to deliver either a collection of virtual (e-learning) courses or an entire virtual study programme. In addition to teaching and learning functions, a virtual campus usually includes administrative support services, such as web-based enrolment, and sometimes also social functions, such as a web-based ‘cafeteria’ (chat rooms). In the context of virtual mobility in the European Union, a virtual campus is based on international cooperation between higher education institutions, involving formal or informal agreements on quality assurance, entrance requirements, transfer of credits etc. (cf. European Commission, 2007).

The main objective of this chapter is to highlight the importance of subsidiarity in the development of a virtual campus. Subsidiarity is the principle that matters ought to be handled by the lowest competent authority (Wikipedia). This concept is a fundamental principle of European Union law. The basic idea of subsidiarity is that a central authority should have a subsidiary function, performing only those tasks that cannot be performed effectively at a more immediate or local level. The principle is applicable in fields of government and business management, but also in education. In our view, subsidiarity is crucial in sustainable (i.e., viable) approaches to virtual mobility. This view is supported in this chapter by two cases, the development and implementation of a very successful virtual course and the project to expand from this single course to a virtual campus. Before discussing these two cases, we first briefly explain the motivation at our institution to integrate virtual mobility elements into the curriculum. The chapter concludes with our view on the factors determining the viability and uptake of international online learning initiatives, such as virtual campuses.

VIRTUAL MOBILITY AND LEARNING FOR SUSTAINABLE DEVELOPMENT

Recent reviews of virtual mobility initiatives list many actual or potential advantages and benefits at student and teacher as well as institutional level (Bijnens et al., 2006; Brey, 2007). These range from better Europe-wide access to courses for students, to an enriched, internationalised work environment for teachers, and a cost-effective expansion of the number of courses being offered for universities. In our context, which is that of the Bachelors and Masters Degree programme in Environmental Sciences at the Open University of the Netherlands (OUNL), educational objectives set by the teaching staff were of prime importance in the decision to integrate international virtual courses into the curriculum. One of the
major objectives of these Bachelors and Masters programmes in Environmental Sciences is the development of competencies that enable the graduates to contribute significantly to sustainable development (so-called ‘learning for sustainable development’, UNESCO, 1997). A prominent feature of the concept of sustainable development is the many different ways in which it is interpreted. This diversity of perspectives seems inevitable, given the global scale and complexity of sustainability problems and the many uncertainties that surround them. In an increasingly globalised, open and pluralistic society, a key competence for scientists supporting sustainable development processes is therefore the ability to think, communicate and work across the boundaries that divide the various perspectives (De Kraker & Cörvers, 2006). Major examples of boundaries to be crossed in this respect are those between disciplines, ideologies and nations or cultures. We refer to the ability to cross such boundaries as ‘transboundary competence’ (De Kraker et al., 2007a).

To determine how transboundary competence can best be developed in the context of higher education, we applied the insights of competence-based learning experts into the elements that constitute powerful learning environments. Powerful competence-based learning environments are those that combine actual practice (‘learning by doing’), and explicit reflection on what and how to learn from this practice (‘learning by reflection’) (Könings et al., 2005). Based on these principles, the ideal learning environment for sustainable development, fostering transboundary competencies, would provide students with actual experience in interdisciplinary, international or intercultural project work in teams (De Kraker et al., 2007a). In a traditional university setting, such a learning environment with cross-boundary contexts and group work as major ingredients is difficult to achieve. It would require a high level of international student mobility to bring students from different disciplinary, national and cultural backgrounds frequently together at the same time and in the same place. Virtual mobility, using computer-supported collaborative learning (CSCL) environments, provides an innovative and almost ideal solution to this problem, as these learning environments allow communication and collaboration, independent of time and place, between internationally dispersed student teams at low cost (Cörvers et al., 2007, De Kraker et al., 2007b, Ivens et al., 2007). An added advantage of virtual learning environments is that they provide better opportunities for structured group discussions as well as reflection processes, both individually and collectively (Barth, 2007).

Thus, although it might seem somewhat counter-intuitive, virtual learning environments appear to be well-suited to develop the transboundary competence required to effectively contribute to sustainable development. In addition to ‘learning for sustainable development’, international virtual learning environments are also major instruments in preparing students for the rapidly internationalising labour market and for new ways of working, such as Internet-based collaboration in geographically dispersed teams. These educational considerations were the major reasons to develop the European Virtual Seminar on Sustainable Development (EVS), which is discussed in the next section. In turn, the success of the EVS course and the ambition to expand the number and diversity of similar courses in the curriculum formed the basis of our institution’s support for the subsequent development of the Virtual Campus for a Sustainable Europe (VCSE).

THE EUROPEAN VIRTUAL SEMINAR ON SUSTAINABLE DEVELOPMENT (EVS)

The idea for a European Virtual Seminar on Sustainable Development (EVS) originated in 2000 at the Open University of the Netherlands (OUNL). At that time, the OUNL was a partner...
in a worldwide alliance of universities offering the Global Seminar on Environment and Sustainable Systems (see Global Seminar website). In the Global Seminar, students from different parts of the world engage in ‘live’ discussions about sustainable development issues during frequent video conferences (Cörvers et al., 2007). The encouraging experiences gained during the Global Seminar were used to develop a European version, but it was decided to use computer conferencing rather than video conferencing – a much cheaper approach – to be able to operate without substantial external funding. Enthusiastic teaching staff at several institutions of higher education in different European countries joined the initiative, and as early as 2001, an EVS pilot seminar was offered to students from the participating institutions. Since then, the EVS has been organised each year and the partnership has gradually expanded, especially in its early years (see Table 1).

At present (2008), the EVS network consists of 10 universities in 8 European countries. It is expected, however, that the network will expand again in the near future because of the integration of EVS into the Virtual Campus for a Sustainable Europe (VCSE), which is discussed in the next section. The present section focuses on the educational format underlying the EVS (computer-supported collaborative learning in geographically dispersed student teams) and its organisational model (a bottom-up network approach with distributed responsibilities, operating without external funding). Whereas these basic features have remained unchanged, EVS is not a static design but rather a dynamic process of recurrent cycles of evaluation and improvement, driven by the users (staff and students) as well as educational researchers. Since the 2001 pilot seminar, the EVS has been widely acknowledged at institutional (OUNL, 2003), national (Cörvers, 2003; Jager, 2005; Schoonenboom et al., 2004; Werkgroep SALDO, 2004) and international level (Bijnens et al., 2006; Brey, 2007; Brouwer et al., 2006) as a successful model and ‘best practice’ in inter-institutional e-learning. Recent external quality assessments of educational programmes in environmental sciences in the Netherlands and Belgium explicitly commended the EVS as an excellent example of internationalisation (QANU, 2007; VLIR, 2007). A detailed description and discussion of the EVS can be found in Cörvers et al., (2007; EVS website: http://www.ou.nl/evs). A summary of its educational and organisational aspects is presented in the sections below.

**Educational Format**

The term ‘seminar’ traditionally refers to a study group working under the guidance of a teacher. An advantage of a ‘virtual’ seminar, using modern ICT and the Internet, is that it enables communication, independent of time and place, between the students and their teacher, and – even more importantly – between the students themselves.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of institutions</th>
<th>No. of countries</th>
<th>No. of student groups</th>
<th>No. of case studies</th>
<th>No. of students enrolled</th>
<th>No. of students passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>9</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>59</td>
<td>43</td>
</tr>
<tr>
<td>2002</td>
<td>11</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>2003</td>
<td>15</td>
<td>9</td>
<td>11</td>
<td>5</td>
<td>61</td>
<td>37</td>
</tr>
<tr>
<td>2004</td>
<td>18</td>
<td>11</td>
<td>13</td>
<td>5</td>
<td>78</td>
<td>41</td>
</tr>
<tr>
<td>2005</td>
<td>12</td>
<td>9</td>
<td>10</td>
<td>5</td>
<td>68</td>
<td>41</td>
</tr>
<tr>
<td>2006</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>36</td>
<td>20</td>
</tr>
</tbody>
</table>
Virtual Campus Development on the Basis of Subsidiarity

In the EVS, students with different national and disciplinary backgrounds work together on case studies in sustainable development. The heterogeneous student groups in EVS represent an excellent learning environment to develop the transboundary abilities discussed above, as the students experience differences of perspective in a very direct way, and have to develop a joint solution to the problem presented in the case study. The ultimate goal of the EVS is to create a dialogue—in which students question each other to understand the ideas underlying their statements—between a learning community of geographically dispersed students. The educational format for EVS should therefore support collaborative learning, which is an educational approach in which students work in small groups to achieve a common goal. This is a new type of learning practice for most students and teachers, however, and differs considerably from face-to-face meetings, where all participants are present in the same place at the same time (Kreijns, 2004).

The educational format for EVS consists of the following components (Figure 1):

- A learning community of geographically dispersed student teams, their tutors and subject matter experts;
- Learning content that consists of topical scientific or societal problems triggering collaboration between students;
- A learning process that supports collaboration between students of different nationalities and from different cultural and disciplinary backgrounds;
- Learning technology, based on modern ICT and the Internet, facilitating collaboration, communication and interaction between students.

**Learning Community**

The target group of EVS is broadly defined, consisting of students from different nationalities and disciplines who are interested in sustainable development, willing to perform group work, able to read and write in English, able to spend the required amount of time on the seminar, having access to a computer with an Internet connection, and having some prior experience with e-learning. The student groups are responsible for their own learning process in EVS. They are responsible for keeping the process going and delivering high-quality products by the deadlines set. Our experience is, however, that the student groups also need coaching from a tutor, as well as in-depth knowledge input from an expert, which is what they normally receive from their teachers. For this reason, staff play a vital role in EVS. Each student group is coached and monitored by a tutor, whose task it is to solve any problems in the student group as quickly as possible, and to find the right balance between managing a group and allowing the group to manage itself (under the tutor’s guidance). Yet, tutoring in EVS can be difficult, because not all students might have experience of working in an electronic learning environment, nor may they be familiar with self-guided group work (i.e., doing group research). To support the tutors, a set of guidelines was developed, as well as a strategy for collective action in the event of problems in a group (e.g., caused by intercultural friction or free riders). In addition to the tutor, each student group has access to an expert, i.e., the author of the case study on which the group is working. Compared with the
Virtual Campus Development on the Basis of Subsidiarity

tutor, the expert plays an essentially passive role. Although the students are free to contact him or her for information or advice about the case study, they are also encouraged to find external experts or stakeholders who are relevant to the case. A student group in EVS consists of 4-6 students from different institutions, who are in the late stages of a Bachelors programme or the early stages of a Masters programme at their home university. Experiments with relatively large groups (10 students or more) were unsuccessful due to the presence of free riders, coaching and monitoring difficulties, delays in communication, etc. Small, heterogeneous groups were found to work very well for collaborative learning.

Learning Content

The EVS is open to all disciplines contributing to the process of societal change towards a more sustainable Europe (e.g., economics, natural sciences, agronomy and technology).

A typical characteristic of sustainability problems is that they are ‘wicked’ (i.e., complex and difficult) rather than ‘tame’. This type of problem requires the selection and assimilation of information from a multitude of sources, domains, discussions and argumentations, thus maximising the potential benefit of collaboration. The students are challenged to address these wicked problems by using all the expertise and perspectives available among their group members. The assumption is that a student group can perform an in-depth analysis of the problem, and come up with a refined problem definition, as well as a proposal for solving the problem. This is why the student groups in EVS are highly heterogeneous, in terms of nationality, discipline, institution and gender. The basic idea is that each group member cooperates with the others and contributes to the group activities from the perspective of his or her own cultural and disciplinary background. In EVS, sustainability problems are presented to the students in the form of case studies. When registering for EVS, students are asked to state their case study preferences, and these preferences are taken into account when the student groups are formed. An EVS case study is an open problem description that consists of background information, a general assignment, sources and web links. The case studies are supplied by experts from the participating institutions. A set of writing guidelines has been developed to make sure that the case studies are well-written and more or less similar in format. Topics of case studies in 2007 were Decoupling Environmental Pressure from Quality of Life, Implementation of the European Water Framework Directive in the Danube basin, and Strategies for Communicating the Concept of Sustainable Development.

Learning Process

The learning process in EVS differs greatly from that in traditional education. There are no lectures, students have to work in international, multidisciplinary groups, the group members cannot organise face-to-face meetings, and all collaboration, interaction and social processes depend on the use of modern ICT and the Internet. Furthermore, the learning process is spread over a relatively long period (i.e., 14 weeks) so as to create the best possible conditions for virtual collaborative learning and to allow the students to participate in the EVS alongside their regular study programmes. The study load of EVS is 120 hours (5 ECTS - European Credit Transfer System), and students are required to spend 8-10 hours a week on the seminar. To support such an ‘exceptional’ learning process, the EVS is divided into four stages.

The first stage consists of several individual activities that help students acquire basic skills in working in the electronic learning environment of EVS. To facilitate collaboration in the next stage, they have to fill in a template, called pEXPi (personal expertise information), with information about themselves (see Box 1). Students who
successfully complete the individual activities in the first stage are allowed to enter the next stage, whereas students who do not are excluded from further participation. This procedure for separating active from inactive students is quite effective in reducing the dropout rate in the following, ‘collaborative’ stages of EVS. Whereas we originally thought that ‘dropout’ was mainly due to the complexity of EVS, involving international, multidisciplinary, virtual, collaborative learning, we found out later that the majority of dropouts never really started at all. The main reasons for this are probably that they underestimate the intensity of EVS (they quickly discover that it involves much more than sending a message to fellow group members once a week) and that some partner institutions fail to use a strict intake procedure and check if their students meet the requirements.

In the second stage of EVS, the student groups are composed by the central EVS coordinator, and the process of group formation and community building begins. The students start working on group activities that require communication and interaction between the group members. Each group has to define sustainable development, specifically from a European perspective, and make sure that the definition applies to the topic of their case study. The students formulate a definition on which all or – if this is not possible – most group members agree, using the group discussion board. This allows them to comment on the views of other group members and formulate an ‘enriched’ definition of sustainable development. Furthermore, the group has to discuss the objectives of the case study they will be working on during the EVS run, as well as their knowledge of the subject (see Box 2). In addition to the asynchronous communication via the discussion board, the tutor – and in next stages also the students – initiates ‘live’ chat sessions to discuss the case study, planning and task division, and to socialise.

**Box 1. Fostering trust**

A problem in newly-formed student groups is that students do not know what expertise and input to expect from their group members. To overcome this problem, one of the first activities for students in EVS is to fill in a profile with static and/or dynamic information about themselves (pEXPi). The aim of this activity is to foster trust in situations where students do not know each other and do not have a chance to meet, but need to collaborate. Educational research has found that, according to both students and tutors, a pEXPi does indeed contribute to the emergence of a sense of community in the start-up phase of the group work (Werkgroep SALDO, 2004). It proved that the pEXPi profiles especially contribute to building a mental picture of one’s peers and lowers the threshold to contacting each other. Rusman et al., (2009) showed that the implementation of the pEXPi initially helps students to form an impression of each other, and that after this initial period, students base their impression on factors like the quality of work-related contributions, behaviour during collaboration (e.g., responsiveness) and communication style. Brouns et al., (2007) concluded on the basis of these two studies that the use of pEXPi helps to kick-start the learning interaction and collaboration in the EVS. They therefore proposed to use pEXPi – combined with portfolio information – as an incentive mechanism to enhance participation and contribution in communities, building on the notion that trust is a result of relationships between people and can only arise when people get to know each other. Together with other incentives and policies for online communities, this should enhance sociability in a ‘learning network’ and thereby have a beneficial effect on learning (Brouns et al., 2007).

**Box 2. Grounding**

One of the problems that students face in collaborative work is ‘grounding’, a term referring to the interactive process by which students establish common ground, i.e., mutual knowledge, understanding and assumptions. Grounding in international student groups can be supported by using collaboration scripts, which is a set of rules for structuring dialogues. Schoonenboom (2008) studied the effect of a collaboration script on grounding in EVS student groups, i.e., on establishing common goals and acquiring an understanding of each other’s knowledge, skills and motivation. The script divided grounding discussions into three phases, the input phase, the discussion phase and the consensus phase, and was implemented in two ways: as a textual instruction (in a Word document) or as a pre-structured discussion board (in Blackboard). The study showed that the script led to more orderly discussions and more and longer contributions. In the groups that worked with the pre-structured discussion board, the effect of the script was even larger than in the groups using the textual instruction. This greater focus on grounding discussions resulted in the script having an impact on the awareness among group members of each other’s knowledge and of differences in expertise between members (Schoonenboom, 2008).
The third stage of EVS involves writing a group research proposal for the case study. The basic input for the proposal derives from the previous stage. In this stage, however, the groups have to translate their tentative research plans and learning objectives into a coherent group research proposal. An outline research proposal is provided to give all student groups a clear picture of what is expected at the end of this stage. The first draft of the group research proposal will be commented upon by the expert (i.e., the author of the case study), who usually asks the students to redraft the proposal accordingly. After publishing the approved research proposal, the group enters the fourth stage.

In the fourth and final stage of EVS, the student groups research their case study, and publish their results in the form of a group report and policy summary. The research builds on the group research proposal produced in the previous stage. In order to implement the research project, the students divide tasks and often roles between group members (e.g., project leader, English language editor, etc.). The students are required to make full use of the members’ different cultural and disciplinary backgrounds in analysing the problem presented by the case study and finding a sustainable solution. Experience with the EVS shows that some groups produce comprehensive high-quality reports based on detailed discussions and contributions reviewed by all group members, while other groups deliver reports consisting of no more than a series of individual contributions. The latter groups appear to practice cooperative learning rather than ‘true’ collaborative learning, with an emphasis on efficient allocation of tasks within the group rather than shared knowledge construction (see Roschelle & Teasley, 1995). The assessment procedure in EVS is relatively intensive (see Box 3), as it involves two staff members (tutor and expert) and takes individual contributions, group processes and group products into account. A student’s final mark is a combination of the mark for the group products (which is allocated by the expert and determines 50% of the final mark), the mark for the group process (which is allocated by the tutor and determines 25%) and the mark for the individual contribution (which is allocated by the tutor and determines 25%).

Learning Technology

The backbone of EVS is the use of modern ICT and the Internet. The electronic learning system used is Blackboard. When EVS was launched in 2001, no in-depth analysis was performed of the best systems or tools available to support virtual collaborative learning. Blackboard was selected on account of its user-friendliness and the experiences gained with the system by a number of partner institutions. All EVS course materials (case studies, individual and group activities, assessment criteria, timetable, guidelines for students and staff, etc.) are accessible via Blackboard. More important, however, are the tools for communication and interaction, such as discussion.
Virtual Campus Development on the Basis of Subsidiarity

boards, email and chat facilities, and a tool for file exchange between group members. The emphasis in EVS is on asynchronous communication, using pre-structured group discussion boards. An advantage of discussion boards is that it gives students time to think about the meaning of a message or to reflect on the collaborative process (Barth, 2007; Schoonenboom, 2008). The risk of long delays in communication between students has been minimised by adopting a clear set of rules of conduct for students (check the group discussion board at least twice a week, reply as soon as possible to questions or messages from your group members, inform your tutor immediately if any problems arise within the group, etc.). In addition to the discussion board, there are real-time chat sessions between group members and their tutor (using Blackboard or Skype).

Reflection and Evaluation

A characteristic of EVS is that students reflect on their learning process, both individually and as a group, at various points during the course of the seminar. The individual and group reflection reports are rich sources of information that can be used to improve the educational format. This data is supplemented by formal evaluations using end-of-course questionnaires and educational research. Finally, an annual staff meeting is organised after each EVS run. This meeting provides an opportunity to evaluate the seminar, and gives the tutors and experts an opportunity to share experiences, discuss group products and award formal marks to student groups, discuss potential improvements to the EVS, and, last but not least, to socialise. One of the great advantages of EVS is definitely that staff members also learn from each other about tutoring in an electronic learning environment, writing a case study, new ICT options, etc.

Organisational Model

The organisational model for EVS is a bottom-up network approach with distributed responsibilities, operating without formal, top-down institutional arrangements or external funding. The institutions participating in EVS share their expertise and invest staff time and other resources, such as server space to host the electronic learning environment. The distribution of tasks and responsibilities over the partners is differentiated, as institutions can become partners in an EVS run at three different levels: (1) providing students and an institutional coordinator; (2) providing one or more tutors in addition to (1); and (3) supplying a case study and providing an expert in addition to (2). The idea is that a new EVS partner starts at the first level before – hopefully after positive experiences – moving on to level two, and finally, to level three. It is up to each institution to decide at which level it wishes to start, and when it wants to switch to a different level of participation, becoming either more or less involved in the EVS. However, a core of active and experienced partner institutions is needed to sustain the EVS. The central EVS coordinator (OUNL) is responsible for the overall management and control of the development of EVS, as well as for maintaining the electronic learning environment. The other partners tutor and assess the student groups, develop case studies, implement EVS at their institutions (as a compulsory or optional course, or as part of an existing course), and recruit and select students. Each participating university appoints an institutional coordinator who is responsible for the management and administration issues for his/her EVS students (intake procedure, student details, credit points etc.). At three points during the seminar (i.e., at the start, halfway through and at the end), the institutional coordinator organises a face-to-face meeting with the students from his or her institution to discuss the educational format and learning process, and to give the students (who are members of different student groups)
an opportunity to share ideas and experiences. Since students participating in EVS continue to be regular students of their home universities, no formal enrolment at a foreign university is necessary. Neither do they have to pay any extra fees for participating in EVS. The collaboration between the partner institutions can be described as a joint process of ongoing development of the EVS in educational and organisational respects.

**Lessons Learned**

Our evaluations show that the large majority of students who complete EVS are enthusiastic about their experience of international and multidisciplinary learning, and appreciate its value in learning for sustainable development. Another strength of EVS for competence-based learning is the authenticity and openness of the learning environment. The students deal with open, real-life case studies, and in their research of the problem, they interact with the ‘real world outside’ (external sources, experts, stakeholders, etc.). A good example is the case study on the Hateg County Dinosaurs Geopark in Romania, where students have to come up with creative ideas about sustainable development of the geopark, and for which they have to contact specialists involved in geopark management (in Romania and at European level), as well as local authorities and stakeholders in the vicinity of the geopark. Such a realistic learning environment is generally acknowledged as a major requirement for effective competence development. These two features of EVS – international, multidisciplinary student groups working in a realistic learning environment – can only be realised through intensive interuniversity collaboration in development and implementation. Thus, the organisational model of EVS, which makes this type of cooperation possible, is almost by definition a strength. The bottom-up approach based on network principles guarantees flexibility, and makes it easy for new partners to join. Distributed responsibility and the absence of reliance on external funding have been critical factors in sustaining the EVS since its start back in 2001. In the opinion of the staff, the innovative learning experience that the students can be offered by sharing expertise, staff time and resources definitely outweighs the relatively large time investment this cooperation requires due to differences in educational paradigm, institutional policies, etc.

Obviously, the EVS requires specific skills from the educational staff involved, such as teaching in an intercultural context, dealing with other educational paradigms, using modern ICT, communicating without face-to-face meetings, etc. The role of the tutor in particular is difficult yet crucial under these conditions. Most staff are not trained to operate in such an electronic learning environment. In the EVS, this problem is dealt with by approaching the repeated implementation of EVS as a joint learning process. The annual staff meetings after each EVS run in particular are a major mechanism to exchange experiences and initiate improvements. The EVS is a new learning method not only for the staff, but maybe even more so for the students. The heterogeneity of the student groups is a strength from an educational perspective, but also creates difficulties in communication (as regards the English language and cultural differences). As effective communication between students is crucial in collaborative learning, this is a major issue for further improvement (Barth, 2006). The fact that communication and collaboration in EVS takes place via the Internet makes it even more complicated than in face-to-face meetings, because facial expressions, body language and social awareness are missing, and all social processes depend on computer technology. In the current format of EVS, the ‘personal expertise pages’ (pEXPi, Box 1) are an important tool to facilitate socialisation. Yet, the lack of live dialogues and visual communication is a major drawback of computer conferencing. Therefore, we hope that in the not-too-distant future the use of webcams and other ‘social software’ tools can be integrated as a standard option in EVS.
SCALING-UP: FROM A VIRTUAL SEMINAR TO A VIRTUAL CAMPUS

Inspired by the success of the European Virtual Seminar on Sustainable Development (EVS), a consortium mainly consisting of EVS partners has devised a project to expand from a single joint course to a joint virtual campus on Sustainable Development. The first phase involved the design of the virtual campus and the development of e-learning courses as its building blocks. This phase, which ran from 2005 to 2006, was funded as the ‘Virtual Copernicus Campus’ project by the European Commission’s eLearning programme (European Commission, 2004). The next phase, funded by the same programme as the ‘Virtual Campus for a Sustainable Europe (VCSE)’ project (2007-2009), involves the implementation of the virtual campus website, running the e-learning courses, and active expansion of the VCSE and dissemination of its virtual campus model to other interdisciplinary fields of study (see VCSE website: http://ww.vcse.eu).

The design philosophy of the VCSE is based on the features that made the EVS so successful, in the sense that it has been running uninterruptedly since 2001, almost without external funding. Just like the EVS, the VCSE is organised as an open and flexible network with distributed responsibilities, offering high-quality e-learning opportunities on interdisciplinary topics which are ideally taught and learned in an international educational setting. This point, the relationship between the field of study (sustainable development) and the educational format, has already been elaborated earlier. This section focuses on the educational, organisational and technological aspects of the implementation of the virtual campus, and in particular on the distribution of responsibilities between the individual partners and the partnership (or consortium).

A major decision taken by the consortium at the start of the virtual campus development was to drop the original ambition of creating a joint European Masters Degree programme in Sustainable Development. First of all, this removed the necessity of creating a coherent and comprehensive set of courses. More importantly, this made it possible to organise the virtual campus in a much more decentralised and informal way. The perceived advantages motivating this decision are the following:

1. The effort spent on bureaucratic arrangements, problems of institutionalisation, official agreements and formalities can be minimised. This greatly enhances the motivation and commitment of the educational staff involved, whose primary interest is in content and e-learning aspects of the virtual campus.

2. It was expected that a joint Masters programme would not attract large numbers of new students, and that it might even directly compete with Masters programmes offered by the individual partners. The option of taking just a single course in the virtual campus, however, greatly expands the target population of students and, at the same time, makes the Masters programmes of the individual partners more attractive.

3. The operational costs of running the virtual campus can be kept low, which reduces the financial risks considerably and enhances its sustainability after the lifetime of the (externally funded) project.

4. The virtual campus partnership is more accessible to new members and the selection of courses offered can more easily be expanded when they are not tied to a joint, accredited Masters programme.

In organising the virtual campus as a flexible network, subsidiarity has been the leading principle, as indicated in the introduction to this chapter. Following this principle, as many as possible of the tasks involved in operating the virtual campus are the responsibility of the individual partners.
Only those issues for which a joint approach is considered essential are handled at the level of the partnership. Table 2 presents an overview of the various educational and organisational aspects of the virtual campus, and the level at which these are handled.

Table 2. Handling level of educational and organisational issues in the Virtual Campus for a Sustainable Europe (VCSE)

<table>
<thead>
<tr>
<th>Type of issue</th>
<th>Handled by individual partner</th>
<th>Handled by Virtual Campus partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- language of instruction</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- academic level</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- size of courses</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- entrance requirements</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- course evaluation</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- general course topic</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>- specific contents</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- learning objectives</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- didactic model</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- protocols &amp; guidelines</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Organisational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- student registration</td>
<td>x ('host')</td>
<td></td>
</tr>
<tr>
<td>- assignment of grades</td>
<td>x ('host')</td>
<td></td>
</tr>
<tr>
<td>- certificate of completion</td>
<td>x ('host')</td>
<td></td>
</tr>
<tr>
<td>- pre-registration selection (enrolment)</td>
<td>x ('home')</td>
<td></td>
</tr>
<tr>
<td>- post-registration selection (exclusion)</td>
<td>x ('host')</td>
<td></td>
</tr>
<tr>
<td>- attracting students</td>
<td>x ('home’)</td>
<td></td>
</tr>
<tr>
<td>- fees</td>
<td>x ('home’)</td>
<td></td>
</tr>
<tr>
<td>- local recognition of credits</td>
<td>x ('home’)</td>
<td></td>
</tr>
<tr>
<td>- integration in study programme</td>
<td>x ('home’)</td>
<td></td>
</tr>
<tr>
<td>- distribution of responsibilities and tasks within partnership</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- promotional activities</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- selection of new partners</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- scheduling of courses</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>- evaluation of virtual campus</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

Educational Issues

Educational issues handled jointly by the partners include the choice of the language in which the courses are offered (English as a common language), the academic level of the courses (late Bachelors or early Masters level), the approximate size of the course (in European Credit points), the entrance requirements for the students (basic skills in English and ICT, access to computers with Internet connection, basic understanding of sustainable development), and course evaluation (comparable pre- and post-course questionnaires). ‘Intra-course’ aspects, such as the specific contents and learning objectives, the didactic model and protocols or guidelines for students and teachers, are discussed by the partnership but are the responsibility of the partner offering the course. The didactic model includes not only the sequence of learning activities, but also the learning approach (e.g., self-study or collaborative work), the learning technology employed (type of e-learning platform, learning materials and communication tools) and type of assessment (e.g., emphasis on process or product, knowledge or skills). The general topic of the course is an aspect that involves both levels of decision-making: an individual partner proposes one or more topics and the partnership accepts or chooses to ensure complementarity both within the selection of courses offered by the virtual campus and with the curricula of the individual partners.

This distribution of responsibilities results in a rich diversity of topics and approaches at course level (see Table 3), which has advantages for both the students and the teaching staff. The students are provided with a wide choice of courses which are clearly distinct in terms of content and competence objectives. This allows them to choose a course with a clear added value as compared to the courses offered by their home universities. For the teaching staff, this diversity creates the opportunity to learn from each other. This mutual learning process is promoted by giving all teachers
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access to all courses offered by the virtual campus and presenting and discussing course evaluations at the level of the partnerships. In time, this might well result in convergence regarding certain aspects, such as the e-learning platform and ICT tools used and the assessment protocols.

Organisational Issues

The responsibilities for organisational issues are distributed in a similar way as those for the educational issues (Table 2). The individual partners can adopt different roles in this respect. Following the terminology of the Erasmus programme, they can be ‘host universities’, offering a course, or ‘home universities’ for their own students who take courses from another university. As host universities, the individual partners handle administrative issues that directly concern the course(s) they are offering, such as student registration, assignment of grades and issuing certificates of completion. Exclusion of inactive students, which is necessary in collaborative learning-based courses such as the EVS, is also the responsibility of the host university (after consulting the students’ home university). As home universities, the individual partners are responsible for attracting students to the virtual campus, enrolment in the sense that they must decide which students (or groups of students) are allowed to choose which courses, course fees, local recognition of credits awarded by a host university, and integration of international courses into the study programmes, either as compulsory or optional courses.

A number of organisational issues must be handled at the level of the partnership, for reasons of effectiveness and efficiency. These concern the distribution of responsibilities and tasks within the partnership, e.g., maintaining the technical facilities of the virtual campus, managing the content of the website, hosting meetings etc. Other issues requiring a collective approach are promotional activities for the expansion of the partnership, selection of new partners, formal agreements, scheduling of the courses in the academic year and regular evaluation of the virtual campus.

Table 3. Core partners and courses offered in the Virtual Campus for a Sustainable Europe (as of March 2008)

<table>
<thead>
<tr>
<th>Partner</th>
<th>Course title</th>
<th>Course topic</th>
<th>Didactic model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open University of the Netherlands (NETHERLANDS) School of Science</td>
<td>European Virtual Seminar on Sustainable Development</td>
<td>Case studies on sustainability issues in Europe</td>
<td>Collaborative, computer-supported project work in international, multidisciplinary student teams</td>
</tr>
<tr>
<td>Leuphana University Lüneburg (GERMANY) Institute for Environmental &amp; Sustainability Communication</td>
<td>Syndromes of Global Change</td>
<td>Systems approach to complex global change issues</td>
<td>Collaborative, computer-supported team work, combined with self study of source texts on theory and methodology</td>
</tr>
<tr>
<td>Charles University, Prague (CZECH REPUBLIC) Environment Center</td>
<td>Critical Approaches to Globalisation</td>
<td>Multidisciplinary lecture series on globalisation</td>
<td>Self study of lecture texts and exercises for critical thinking and writing skills, combined with student peer review</td>
</tr>
<tr>
<td>University of Macedonia, Thessaloniki (GREECE) Social and Economic Sciences</td>
<td>Corporate Sustainability and Natural Resources</td>
<td>Lecture series on environmental management in the context of sustainable development</td>
<td>Self study of lecture notes and presentations, group discussions, individual and group case studies</td>
</tr>
<tr>
<td>Karl Franzens University, Graz (AUSTRIA) Institute of Geography and Regional Science</td>
<td>Sustainable Spatial &amp; Regional Development</td>
<td>Lecture series on spatial and regional planning in Europe in the context of sustainable development (concepts and cases)</td>
<td>Self study of lecture materials (PPT, videos, podcasts), individual exercises, group discussions in chat</td>
</tr>
</tbody>
</table>
Virtual Campus Technology

The technological aspects of the VCSE have not been discussed thus far, but merit some explicit attention. Important features of the VCSE virtual campus web are attention to the social dimension of a campus, the facilitation of collaboration between the educational staff of the partner institutions and the use of open-source software (see VCSE website: http://www.vcse.eu). The social dimension is addressed, for instance, by providing space for informal communication (‘cafeteria’), by displaying portraits of discussion forum participants and by including a personal information page for each teacher or student. Collaboration between educational staff is facilitated through an intranet, with extensive communication, collaboration and database options. The use of open-source software (Moodle, TYPO3), not only allows each partner to contribute to the continuous improvement of the virtual campus web, but also enables the dissemination of the VCSE’s virtual campus web solutions to other fields of study. A fully equipped e-learning platform in Moodle is available and is used for VCSE courses. However, partners may prefer to offer their courses on the e-learning platform used by their university. In that case, the virtual campus web functions as a portal to these other learning platforms. For instance, EVS makes use of Blackboard.

Sustainability of the VCSE Virtual Campus Model

We expect that the distribution of responsibilities following the principle of subsidiarity as outlined above will result in a sustainable virtual campus model. The success of the EVS, which was organised on similar principles, may serve as some kind of proof here. The pillars of durable success will not be the top-down obligations arising from formal high-level agreements, but bottom-up assurance of educational quality, financial viability and accessibility to teachers and students.

Educational quality is assured through various mechanisms. The core group of five VCSE partners selects and invites promising potential new partners to central demonstration workshops, and, based on an evaluation of their presentations and course offerings, invites them to join the VCSE. It is the responsibility of the teaching staff at the home university to decide which VCSE courses they offer to their students. They can base their decision on their personal evaluation of all VCSE courses offered, as they have full access to these courses. For each VCSE course, the participating students fill in evaluation questionnaires, and the outcome is discussed by the partnership and used for course improvement.

The VCSE organisational model minimises out-of-pocket costs by following a ‘quid pro quo’ approach, based on an exchange of courses, students and know-how on e-learning. External subsidies are only needed to get the virtual campus started, that is, to develop the concept, to form a core group of partners, to develop the virtual campus web and to attract new partners. In principle, the partners are expected to strike a certain balance between incoming and outgoing students and to prevent an excessive teaching or tutoring load, e.g., by setting a maximum to the number of foreign students per course. However, this balance will probably not be maintained very strictly, as in many of the courses offered, foreign students are not seen as a burden, but as a necessity to create internationally mixed student teams.

The original VCSE core group of five partners actively pursues expansion with new partners to broaden the choice of courses offered and allow courses to run with a sufficient number and international mix of students. To this end, the VCSE organises demonstration workshops and has prepared a wide range of information resources (see VCSE website: http://www.vcse.eu). Joining the VCSE is facilitated by allowing new partners different levels of participation (observer, partly active member, full member), which may change in time. For instance, a new partner may
start as an ‘observer’ (with staff access to current courses), become a full member the next year (offering a course, bringing in students), and – due for instance to a temporary shortage of available staff time – participate as a partly active member a year later (only bringing in students). By handling course and student-related matters as much as possible at the local level of the host and home universities, respectively, formalities at the level of the virtual campus partnership can be kept to a minimum, which enhances the accessibility to new university partners as well as to students.

An accessible virtual campus, offering high quality courses without the need for external funding, has a good chance of being sustainable. It will only be so, however, if it fulfils a need among students and teaching staff that cannot be better fulfilled by other means. In this respect, too, the VCSE has a strong point with its focus on sustainable development, an interdisciplinary field of study requiring an international and intercultural approach in teaching and learning.

FUTURE TRENDS

Education is on the move, worldwide. New technologies will offer us new opportunities for e-learning and virtual mobility that we cannot even imagine at present. However, innovations in educational models and technologies are initiated by committed teachers and active students, and do not originate in board rooms. It is especially in the field of e-learning that developments are fast and diverse (emergence of social software, Web 2.0 technology). These cannot be handled in a top-down manner, but require the flexibility and responsiveness of a bottom-up approach. Such an approach to virtual mobility is made possible by the current widespread availability of inexpensive ICT tools. In EVS, experiments with new ICT tools are often initiated by the students. For instance, it was they who introduced the use of Skype telephone conferencing software, and switched to communication through MSN when the Blackboard server had temporarily broken down.

Thus, developing new, useful and significant educational, technological and organisational models requires ‘experimental gardens’ allowing for a bottom-up approach, as in EVS and VCSE. Mainstreaming of the new models is expected to occur when in due time these bottom-up initiatives connect with top-down efforts aiming at institutionalisation.

CONCLUSION

The two cases described in this chapter both underline the importance of subsidiarity in the development of virtual mobility activities. In practice, this means a bottom-up approach, in which many educational and organisational issues are handled by the individual partners, and partnerships are organised as open, flexible networks. As indicated in the above description of EVS and VCSE, the advantages of such a bottom-up approach are manifold. In summary:

- Access to virtual mobility activities for students and for new partners can be maximised, without being dependent upon high-level formal agreements that may take many years to materialise;
- The educational staff will be more motivated to learn the new skills and invest the extra effort required for international e-learning activities, as they will have ownership, where top-down imposition could easily result in unmotivated staff or even passive resistance;
- Quality assurance can be left in the hands of ‘peers’ (educational professionals), instead of bureaucrats with unwieldy quality control systems;
- Perhaps most importantly, innovations in educational models and technologies stem
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from committed teachers and active students. It is especially in the field of e-learning that developments are fast and diverse and cannot be handled in a top-down manner, but require the flexibility and responsiveness of a bottom-up approach.

In addition to the importance of a bottom-up approach, two more important principles emerge from the virtual mobility cases we have described. The first is ‘educational necessity’. Formal, high-level policies and agreements or technological opportunities alone will not be sufficient to drive the development of joint international courses or virtual campuses. Students and teachers are much more likely to become supportive when high priority is placed on educational objectives that can best be achieved in international e-learning environments. This is true, for example, if the aim is to ‘learn for sustainable development’, to acquire intercultural skills or to gain experience with working in geographically dispersed teams. Of course, to be effective, these learning environments should be based on appropriate learning theories and didactic models, which differ considerably from those underlying traditional lecture hall teaching (Bélisle, 2008). Only when virtual courses make optimal educational use of their specific features, can virtual student mobility outgrow the stigma of being just a watered-down version of physical mobility.

The second principle is ‘interdependency’, and is directly tied to the principle of educational necessity. Universities simply depend on partner institutions in other countries (and vice versa) to create the international e-learning environments needed to achieve major educational objectives. Furthermore, if no or limited external funds are available, the partners strongly depend upon each other’s contributions in terms of learning resources and staff time. Yet another aspect in which there is interdependency is the diversity of approaches in e-learning often found in a partnership. This diversity creates welcome opportunities for the exchange of experience and expertise in the rapidly developing field of e-learning.

To conclude, it is our view that virtual campus initiatives are only viable and will only be adopted at a larger scale when the distribution of responsibilities is based on subsidiarity, when there is a clear educational necessity to create international e-learning environments and when there is interdependency between the participants. We expect significant transformation of higher education institutions (‘mainstreaming’ of virtual mobility) to occur when, in due time, these bottom-up initiatives come to connect with top-down efforts at the level of policy makers aiming at institutionalisation of international virtual student mobility through high-level, formal agreements. This could, for instance, take the form of a comprehensive ‘Virtual Erasmus Programme’ legal framework (Bijnens et al., 2006; REVE, 2006). However, the actual need for formal agreements will have to emerge from concrete experiences gained in projects like the European Virtual Seminar and the Virtual Campus for Sustainable Europe.

ACKNOWLEDGMENT

Thanks are due to all our collaborators in the EVS and VCSE.

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ENDNOTES

1 The term educational as used in this chapter refers to the ‘primary process’ of teaching and learning. In the literature on virtual mobility, the term ‘pedagogical’ is often used with the same meaning.

2 The name ‘Copernicus’ refers to the Copernicus University Charter for Sustainable Development (Geneva, 1994), signed by over 300 European universities, see: http://www.iisd.org/educate/declarat/coper.htm
Chapter XIII
From Virtual Mobility to Virtual Erasmus: Offering Students Courses and Services without Boundaries

George Ubachs
European Association of Distance Teaching Universities, The Netherlands

Christina Brey
European Association of Distance Teaching Universities, The Netherlands

ABSTRACT

In higher education, international student mobility has become increasingly important for learners as well as for institutions. But today’s mobility schemes are first and foremost aimed at physical mobility. This approach covers the majority of students, but does, however, not take into account the needs of the lifelong learners who are not mobile due to family or work commitments, or who are constrained by disability, or do not have the financial means for traveling abroad during their academic education. The need to offer all students in higher education the possibility of an international experience and the European strategy of boosting student mobility requires new and alternative mobility concepts in addition to physical mobility. The European Association of Distance Teaching Universities (EADTU) initiated an operational analysis of virtual mobility under the e-move project. Different models of virtual mobility have been developed, analysed and put into practice. This chapter will explore how a particular virtual mobility scheme can be put into practice and what is required from an organisation to implement this model and incorporate it into its own curriculum.
INTRODUCTION

In the political and societal discourse of the developments in higher education, students’ (and teachers’) mobility has become increasingly important. But talking about student mobility usually means talking about physical mobility. You will immediately think about students in the beginning of their twenties packing up a suitcase and spending several months abroad. It means living and learning in a foreign country and sending postcards back home. But what about the growing number of students older, engaged in family and work life, the handicapped, less well off who cannot get a room in L’Auberge espagnole? What about the lifelong learner everyone is talking about?

For most people their (academic) education is not a solid or limited phase in their life after graduating from high school and before entering a career on the same job until retirement, anymore. What Florida has described for the labour market:

*The most notable feature of the new labour market [...] is that people don’t stay tied to companies anymore. Instead of moving up through the ranks of one organization, they move laterally from company to company in search of what they want. The playing field is horizontal and people are always on the roll.* (Florida, 2002, p. 104)

- is also valid for the path people take in their academic education. It has become a dynamic strategy for professional and personal development throughout their whole life (e.g., Stehr, 1994, p. 408).

This societal and individual development towards mobility as part of people’s educational and professional reality is accompanied by political efforts to enhance student mobility. Since 1987, the Erasmus programme has been running. Also other initiatives on the international and national level have a long tradition in facilitating and funding international student mobility. They accompany the efforts on the European level to motivate and enable more students for spending time at a foreign university during their academic education. But the current focus lies, almost exclusively on physical mobility. This does not fit to the reality of today’s education system nor does it reflect the needs of today’s students. A supplement to the current forms of international student mobility is needed, especially considering the needs in lifelong learning.

The objective of this chapter is to introduce virtual mobility as this supplement to the present types of international student mobility in higher education, providing its very own profile and legitimacy, neither being superior or inferior to physical mobility, but sometimes complementing and reinforcing it. As the main thrust of this chapter, the e-move project, as well as the International Course Exchange are described as best practices of in virtual mobility. The reader will gain valuable insights into the set-up of virtual mobility schemes in general and the International Course Exchange in particular. Thus they will get useful information and advice on how to realise the International Course Exchange or related model at their own institution.

This chapter is divided into three main sections. The first section describes current developments and selected initiatives on student mobility, the second section introduces the key characteristics relating to the concept of virtual mobility as promoted in the e-move project and the International Course Exchange, highlighting best practices, and the third section highlights future developments in student mobility in general, and current initiatives aimed at turning virtual mobility into Virtual Erasmus, a mainstream application next to the physical Erasmus scheme. This chapter is based on the work and the activities of the European Association of Distance Teaching Universities (EADTU) and its members, providing their expertise and input into e-move and various other projects relating to virtual mobility.
INTERNATIONAL STUDENT MOBILITY IN EUROPE: A SUMMARY

The growing importance of international student mobility is embedded in the context of the changing landscape of higher education worldwide and can eventually be conceived as a result of three developments on a broader societal level. In a globalised world, people's lives are less-and-less constrained by geographic proximity (Baumann, 2000; Stichweh, 2003). The world has become smaller and travelling as well as meeting people from foreign countries has become a regular routine for many of us. In the process of individualisation, traditions and institutional regulations have eroded and in a “multiple-options society” (Gross, 1994) people can and have to make choices in all spheres of life, including their education, career and professional development (Beck, 2004).

Finally, knowledge has become the major capital and creative force of today’s society. In a knowledge society knowledge has become a factor of production and labour is increasingly based. (Böhme, 1997; Gibbons 1995; Stehr, 1994; Weingart, 2003). Student mobility is mainly characterised by two objectives: a) to gain international experience and competence and b) to approach other, often more specialised study opportunities (Rivza & Teichler, 2007).

International mobility as part of a student’s academic education is conceived as an asset when it comes to learn about other cultures, languages and academic systems as well as for one's personal development. Another reason which has become increasingly important over the last decade is that an international study experience can provide easier access to the job market, in particular but not only regarding international job assignments (Bracht et al., 2006, p. xvii). On the institutional side high inflows of students boost the academic reputation of institutions and their competitiveness on a global scale (Rivza & Teichler, 2007; Verbik & Lasanowski, 2007).

Political initiatives on promoting international mobility of students go back as far as the late 1940s when the Fulbright Program was established. Since then many other national and international bodies have taken up activities in promoting international student mobility in higher education, among others the United Nations Education, Science and Culture Organisation (UNESCO), the Council of Europe and several initiatives by private as well as political foundations. Likely the most well-known initiative on the European level is the Erasmus programme. Since its launch in 1987, the programme has been running for more than twenty years and has become a household name within European Academia. Until now, more than 1.7 million students have participated in the programme.

The mobility programmes in existence are aimed at physical mobility - either long term, i.e., a student studies an entire degree in a foreign country – or short-term, as in the Erasmus programmes². On the strategic level one of the most significant statements on student mobility by the European Commission has been made in the Bologna Declaration in 1999 with the “[promotion] of mobility by overcoming obstacles to the effective exercise of free movement [...] for students, access to study and training opportunities and to related services” (European Commission, 2002). In the 2001 Prague Communiqué the horizons of the higher education sector were extended to the adult population as a whole. “Lifelong learning” was proclaimed as “an essential element of the European Higher education Area” (European University Association, 2001). Finally in the Lisbon Declaration from 2005 the objective was formulated to create a European Higher education Area and enhancing student mobility up to 10% by 2010 (ibid). In the communication from the Commission to the Council and the European Parliament “Delivering on the Modernisation Agenda for Universities: Education, Research and Innovation” in Brussels on May 10, 2006
the ambition for a fluid structure of mobility in Higher education was endorsed: “All forms of mobility should be explicitly valued as a factor enriching studies at all levels [...]” (European Commission, 2006). As a reflection of this new emphasis the Erasmus scheme was formally integrated into a broader structure. It became one element of the new European Union’s Lifelong Learning Programme 2007-2013 and was linked to several other programmes. In addition to this, the programme’s own ambitions were enhanced by setting the target of doubling the current cumulative figure to three million individuals participating in Erasmus by 2012.

Despite these new ambitions, the focus of the Erasmus programme (as well as other initiatives) was kept on physical mobility, not fully serving the needs of today’s and – more specifically the lifelong learner. The Lifelong Learning Programme in which the Erasmus programme is embedded, has as one of its ‘specific objectives’ the requirement to “contribute to increased participation in lifelong learning by people of all ages, including those with special needs and disadvantaged groups, regardless of their socioeconomic background” (European Commission, 2006, (2)). Comparing this objective against recent studies shows that a lot of work is still left to be done. Results of current surveys show that in 2005 only 14% of students reported their parents’ income status as being lower or considerably lower than average (Souto Otero & McCoshan, 2007, p. ii).

The Sussex Centre for Migration Research found in 2005 that most of students from the United Kingdom going abroad came from the elite pre-1992 universities. The study concluded that, “it is young people especially those with good educational backgrounds, who travel the most” (cited in: Vincent, 2007). These and further studies lead to the assumption that Erasmus and other programmes are likely attracting those already confident in their ability to move around Europe or other parts of the globe benefiting from former stays abroad such as vacation, high school years abroad or during gap years between school and university.

The statistics and the research carried out so far indicate the limits of what can be achieved through the current mechanism. Physical mobility is still a very costly experience and therefore only available to those students that can afford it, either by their own means or through a scholarship. Other restricting factors such as being engaged in family and/or work life, health or special needs are playing a major role for many learners as well. However, lifelong learning must be available to all, without restrictions.

Virtual mobility serves as an ideal supplement, more flexible and cheaper mobility scheme, fitting the needs of non-mobile students and lifelong learners. As a general term, virtual mobility means “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” (eLearning Europa, cited in Bijnens et al, 2006). Furthermore, virtual mobility “offers access to courses and study schemes in a foreign country and allows for communication activities with teachers and fellow students abroad via the new information and communication technologies.” (EADTU Task Force on Virtual Mobility, 2004).

Such a type of mobility appears to be the only way in which the ambitions of Bologna and the Lifelong Learning Programme related to international student mobility can be realised. It will not only contribute to the original vision of the Erasmus programme on a truly European scale, but also add a new flexibility and breadth to the ambition of European student mobility. Furthermore, it can offer more varied modes of study which can be shorter, time specific and place independent, as well as provide more personalised and more specialised opportunities for the student. One can imagine several dimensions of mobility in its virtual concept, including the creation of virtual learning communities, virtual projects and others. Within the EADTU and other European
networks, several initiatives and programmes on virtual mobility are already running. These activities have shown the profit of virtual mobility next to physical mobility. They help to overcome its obstacles and mobilise students that are less likely or even excluded from participation in international studying. The following sections will examine a strategy of putting virtual mobility into practice by introducing the e-move project and the International Course Exchange as examples of existing best practice in this field.

**VIRTUAL MOBILITY IN PRACTICE: THE E-MOVE PROJECT AND THE INTERNATIONAL COURSE EXCHANGE**

The e-move project serves as an example for a combined approach of analysis of virtual mobility in higher education and its actual implementation into university structures. After introducing the project with its organisational set-up and findings, one of the pilots developed as part of the project, the International Course Exchange will be presented, giving an example of applying virtual mobility in higher education institutions.

**E-Move: An Operational Analysis of Virtual Mobility**

The project e-move: An Operational Analysis of Virtual Mobility was initiated by the members of the European Association of Distance Teaching University’s Task Force on Virtual Mobility. Based on its expertise and findings, the group developed a project whose main objective was to gain insight into the critical success factors of virtual mobility and to develop recommendations and procedures for wide scale applications.

Its target groups were the academic, administrative and technical staff of distance teaching (off-campus) and—in the long-term—conventional universities (on-campus) as well. An overview of possibilities, constraints and good practice within the implementation of different models of virtual mobility were the main result of the project. The models tested open new learning and mobility schemes for students who cannot be physically mobile over a longer period of studies abroad but who are open for mobility to acquire international experiences. e-move was funded by the “eLearning” programme of the European Commission and has been running from January 2006 to December 2007.

**Partnership and Organisational Set-Up**

e-move was co-ordinated by the EADTU and carried out in partnership with 13 distance teaching institutions from eleven European countries (see Table 1).

The project embraced two interrelated and parallel running action lines: observatory and implementation (see Figure 1). The observatory focused on the infrastructural, technological, pedagogical and organisational aspects of virtual mobility, analysed its constraints and potential, as well as related expectations and barriers. The

<table>
<thead>
<tr>
<th>Coordinating Organisation</th>
<th>European Association of Distance Teaching Universities (NL)</th>
</tr>
</thead>
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<tr>
<td>Partners</td>
<td></td>
</tr>
<tr>
<td>FernUniversität in Hagen (DE)</td>
<td></td>
</tr>
<tr>
<td>Tallinn University (EE)</td>
<td></td>
</tr>
<tr>
<td>Open Universiteit Nederland (NL)</td>
<td></td>
</tr>
<tr>
<td>Fundació per a la Universitat Oberta de Catalunya (ES)</td>
<td></td>
</tr>
<tr>
<td>The Open University (GB)</td>
<td></td>
</tr>
<tr>
<td>Universidad Nacional de Educación a Distancia (ES)</td>
<td></td>
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<tr>
<td>Danish Association of Open Universities (DK)</td>
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<tr>
<td>Consorzio NETTUNO (IT)</td>
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<td>Oscail – Dublin City University (IE)</td>
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<td>University of Paisley (GB)</td>
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<tr>
<td>Apertus Public Foundation (HU)</td>
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<tr>
<td>Wyższa Szkoła Humanistyczno-Ekonomiczna w Łodzi (PL)</td>
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<td>Johannes Kepler Universität Linz (AT)</td>
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implementation of virtual mobility was executed by two test-beds, the International Course Exchange and the Virtual Campus in Marketing as well as two case studies, the European Virtual Seminar and a study on Continuing Professional Training and Development, analysing running activities in virtual mobility.

Both action lines were closely interrelated. The findings and experiences in the different group were communicated regularly to all project partners by reporting in project meetings and on other events and used for further enhancement of the e-move project as a whole.

Activities, Main Outcomes and Added Value of the Project

Throughout the two-year project a number of activities were conducted. They lead to successful outcomes as well as valid conclusions and helped to further elaborate and facilitate academic international virtual mobility. To highlight a few of these activities and outcomes, in the theoretical concept of the e-move project and clearly reflecting down to the practical level, it was decided to set up firm definitions, first and foremost in regards to virtual mobility itself. Living in a world where “virtual” and “mobility” are prevalent but rather vague concepts, setting standards and developing a coherent and operational model for the implementation of virtual mobility in higher education was crucial. For e-move, the definitions of virtual mobility highlighted in this chapter did not seem sufficient and have therefore been supplemented with the following:

In academic international virtual mobility two or more higher education-institutions agree to offer their students the opportunity to acquire a number of ECTS [European Credit Transfer System] points either at one of the foreign partner universities or through a joint course/assignment of the partners. These ECTS points will then be counted towards the student’s degree at his or her home institution.

Within this definition the design of the virtual mobility schemes is rather flexible, e.g., concerning their length, academic level, mode of interaction and they can be adapted to various structural, institutional and individual needs. The key advantages of virtual mobility schemes designed according to this definition are that they enhance the quality of the student’s academic education, because it is not restricted to a specific period of time or space. This is crucial for

Figure 1. Organisational and communication set-up of the e-move project
any activity in lifelong learning. Supplementary courses offered through virtual mobility enable students to further individualise and specialise their portfolio. Studying only a portion of a degree at a foreign university through distance learning provides a relatively easy academic international experience, as long as this activity is based on firm agreements. On the institutional level this type of virtual mobility offers the possibility of internationalising the curriculum and staying competitive a global higher education market.

A precise definition like this seemed to be missing so far and worked as a great asset when e-move evolved. It served as a basis for the project partners to design the different models of virtual mobility and was a key element in introducing and discussing virtual mobility to/with external stakeholders. The two test-beds, International Course Exchange and Virtual Campus in Marketing were designed according to this definition and have been successfully implemented at different higher education institutions throughout Europe. They are currently available for students. Both pilots give insight into the academic and administrative setting necessary for virtual mobility, benefiting from the considerable experience gained in the third model, the European Virtual Seminar on Sustainable Development which served as a basis for the project.

Table 2. The International Course Exchange, the Virtual Campus on Marketing and the European Virtual Seminar by comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>International Course Exchange</th>
<th>Virtual Campus on Marketing</th>
<th>European Virtual Seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline</td>
<td>Disciplinary</td>
<td>Disciplinary</td>
<td>Multidisciplinary</td>
</tr>
<tr>
<td>Size</td>
<td>One module of a degree</td>
<td>Activity within a course</td>
<td>Joint Seminar</td>
</tr>
<tr>
<td>Activity</td>
<td>Studying a module @ a foreign university</td>
<td>Working on assignments in multinational groups</td>
<td>Working on case studies in a multinational and disciplinary group</td>
</tr>
<tr>
<td>Enrolment</td>
<td>Participating students formally enrol at the host university</td>
<td>Participating students stay regular students at their home university</td>
<td>Participating students stay regular students at their home university</td>
</tr>
<tr>
<td>International experience</td>
<td>Mainly through studying in a foreign language and a foreign academic system</td>
<td>Through communication and collaboration in an international study group</td>
<td>Through communication and collaboration in an international study group</td>
</tr>
<tr>
<td>Assessment</td>
<td>Virtual and/or face-to-face</td>
<td>virtual</td>
<td>Virtual</td>
</tr>
<tr>
<td>Credit Transfer</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Fees</td>
<td>Yes, regular fees of host university</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Access to library resources/course materials</td>
<td>@ host university</td>
<td>If needed via home university</td>
<td>Via Open Electronic Resources</td>
</tr>
<tr>
<td>Extra time to invest in teaching</td>
<td>None</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Extra time to invest in administrative support</td>
<td>Low - medium</td>
<td>Low</td>
<td>Medium - high</td>
</tr>
<tr>
<td>Partnership</td>
<td>Two and more Mainly Distance Teaching but also traditional universities</td>
<td>Three and more Distance Teaching and traditional universities</td>
<td>Three and more Distance Teaching and traditional universities</td>
</tr>
<tr>
<td>Institutional agreements needed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
case study. While all three models were mainly created by distance teaching universities they are not exclusively made for them and are applicable for many traditional universities as well. They are offering an international experience for all non-mobile students, no matter at which type of university they are enrolled. A summary of the three models are shown in Table 2.

The second case study, Continuing Professional Training and Development, added valuable information on the lifelong learner’s perspective on international virtual mobility to the project. One of the major tangible outcomes of the e-move project is a Virtual Mobility Web Portal, providing the user with extensive information on academic international virtual mobility, contacts and literature related to the topic. Part of the portal is also the Guide to Virtual Mobility, a manual for university staff on how to implement different models of virtual mobility. The guide is very practical and focused on the actual implementation without neglecting the complexity.

The portal includes a Library for Virtual Mobility which covers the role of libraries in virtual mobility and provides the user with Web-based information on issues like “How can I become information literate”, “How can libraries support virtual mobility” and “How to be inspired by good practice”. The library gives hands-on information on libraries and related topics in the context of organising virtual mobility. Including the Library for Virtual Mobility into the portal was important mainly for two reasons: a) setting up a virtual mobility scheme is usually more than just following the recommendations of a guide or learning from a best practice. It needs specific information fitting the individual requirements of a model, of an organisation and/or of a partnership. The Library for Virtual Mobility provides a more complex information structure surrounding the very practical Guide to Virtual Mobility for both users with only little previous knowledge on virtual mobility and those who are looking for specific and more in-depth information; b) In the university structure, courses and seminars are separate entities from libraries, but in learning these separate entities that belong closely together, e.g., when participating in a virtual mobility accessing and using a (virtual) library and information repository is an integral part of one’s studies. This has not been considered in virtual mobility projects so far and was therefore crucial to incorporate.

Furthermore, a Network of Experts has been established, sharing substantial knowledge of virtual mobility in general and also of more specific topics like the administration, information support or the international collaboration in distance learning. The experts come from different European countries, institutions and fields of activity in these institutions and are active participants in the theoretical and practical discourse on virtual mobility. The experts were coming from the partnering institutions of e-move and organised in the so-called Core Group of the Observatory. This group met two or more times a year and had close contact via e-mail discussing all relevant aspects of the research and results of the project. Thus, it was possible to reflect on the complex structure of a higher education institution at a project level and to guarantee a solid and valid knowledge base for the models and other results of e-move.

This approach was strengthened by different workshops. To provide models and information in line with the needs of the different target groups, it was crucial to actively involve also external stakeholders from different fields into the project and to have them review the pilots and other outputs at all stages. As part of e-move a series of six interrelated workshops with external experts and stakeholders were organised. Those experts and stakeholders were: deans and university teachers, administrative personnel and technical staff, employers and social partners and educational policy-makers at national and European level. In a collaborative approach the realisation of the two test-beds as well the Virtual Mobility
Portal and the Guide to Virtual Mobility were examined and further elaborated. The participants were invited to a one day brainstorming event that comprised project presentations and discussions. The workshops helped to gather important knowledge on those aspects of the research the Network of Experts did not have a solution for, as well as including aspects that had not been considered internally before.

In addition to this, Workshops with Students at four different Open and Distance Teaching Universities (FernUniversität in Hagen, Fundació per a la Universitat Oberta de Catalunya, Universidad Nacional de Educación a Distancia and Consorzio NETTUNO) as well as one traditional university (Tallinn University) were organised. The workshops were planned as one day events for approximately ten participants held in English. One or more project presentations by an e-move Core Group Members were given, as well as an introduction of the different virtual mobility models and a moderated discussion with the students. Finding out about the views of potential students was important for having a realistic design and successful improvement of the different programmes. The students shared their views on virtual mobility, the advantages and disadvantages of the different models and their level of interest in them.

One of the lessons learned when organising these student workshops was that it turned out to be more complicated than expected to find enough participants at the different host institutions, due to the fact that these – with the exception of Tallinn – were Open and Distance Teaching Universities. The workshops were planned as physical meetings at the different hosts, meaning that most of the invited students had to travel to the venue. While their expenses for travelling and accommodation were reimbursed no additional incentive for participating could be given (like receiving ECTS-points for example). As a consequence the number of participants was not always satisfying. Still, the project partners were able to meet with more than 30 students and gathered important input for the different virtual mobility schemes. Despite the sometimes very small groups and some language barriers the discussions were very lively, open and constructive and considered as a major asset to the project output.

The following section will introduce one of the e-move test-beds in further detail, the International Course Exchange. Of the three models that were part of e-move, it is the only one in which participating students have to formally enrol at another university. This has several implications that seemed of special interest when discussing virtual mobility in this context.

The International Course Exchange

The International Course Exchange can be conceived as a virtual version of the Erasmus scheme albeit without any funding for the participating students or institutions so far. The focus of the programme is on the international exchange of distance teaching course modules in the framework of a Bachelors degree in Humanities.

It has been designed by the members of the EADTU Humanities, Cultural and Social Sciences Network and was first offered in the summer/fall term 2007 at six Open and Distance Teaching Universities throughout Europe. In the programme, students can study one or several modules at one of the partnering universities. The ECTS (European Credit Transfer System) points acquired are then counted towards their degree at the home institution. The students get access to courses not available there, allowing them to build an individual academic portfolio, gaining specific scientific expertise and intercultural skills. This happens mainly through enrolling at a foreign university, adapting to a foreign academic system and studying in a foreign language. For the participating institutions, the International Course Exchange offers the opportunity to extend their curriculum up to the international level.
The International Course Exchange obeys the principle of subsidiary: all partnering universities accept that for the time participating in the programme, students from their institution are studying and being assessed according to the rules and regulations of their host university. Being part of the e-move project, the creation and set-up of the International Course Exchange was partly funded by the European Commission, Directorate-General for Education and Culture.

**Course Set-Up**

The basic set-up of the International Course Exchange is fairly easy: each partner university makes two or more of its already existing courses at Bachelors level in the field of Humanities and with a particular national expertise, available to students of the other partner universities. All courses have a size of 15 ECTS points, being the equivalent to the size of a module in the eligible degrees, or a factor of 15. The courses have not been adapted to an international audience nor have new courses been designed for it. This rather simple approach bears two major advantages: a) the realisation of the International Course Exchange in the partnership consisting of universities from five European countries with different national higher education systems, as well as traditions in teaching and learning seemed more likely than a set-up that demands many alterations; and b) the participants have a study experience that is truly international in the sense that they immerse into a foreign university system with all its different traditions, procedures and priorities. Therein the International Course Exchange very much resembles the current Erasmus scheme.

All offers are published in an International Course Pool which is linked to the partners’ Websites and accessible by potential participants. Interested students as well as academic and administrative staff can get all necessary information on available courses and procedures. Up to the present 22 courses from the partnering institutions have been made available for the International Course Exchange.

**Language**

The courses are taught in the national language of the partnering institution. In the current partnership students can study modules in Catalan, Dutch, English, German, Italian, or Spanish, depending on the university they decide upon. This is also valid for the course materials and tutorial support.

Having to study in a foreign language is one of the major challenges the participating students will have to face and the feedback from participants in the student workshops shows that this aspect is the major concern of most of them. For the majority of the participants not only less common languages like Italian and Dutch, but also studying in English was considered as a major concern and obstacle. Several options to assist students in mastering language difficulties are existing and under consideration: language classes could be offered as part of the study programme or in advance to prepare the participants; a language test could become a mandatory part of the enrolment procedure at the partnering institution to give students the security that they are on the appropriate level or a physical stay abroad to support more active language learning could be integrated into the programme. This was also suggested by several participants of the student workshops and although an interesting feature it could discourage those students that look for an international experience without having to travel.

The International Course Exchange, which is at a very early stage, has attempted to keep the general requirements for organising it, as well as language requirements, as basic and as close to the original Erasmus programme as possible. However, some of the partner universities decided to offer their exams in an alternative language to the national language. e.g., the Universitat Oberta de Catalunya (UOC) allows their students to take the exam not only in Catalan but also in Spanish.
or English. It is expected that this would motivate students who expect some language difficulties with Catalan to still opt for the courses because they are allowed to take the exams in a language that is more common to them.

**Enrolment**

Taking courses from the International Course pool requires formal enrolment at the offering institution. Participating students need to register and present all the necessary documents, follow the existing administrative path at their host institution and become regular members of the institutions student body. The actual enrolment procedure as well as the registration for courses is determined by the rules and regulations of the host university. This is a mandatory part of the programme and seen as an element of the cultural learning experience in the International Course Exchange. The students will learn the ropes of a foreign administrative structure and likely expand their communication and language skills. Within the partnership an agreement that all partnering institutions will accept students from any other partner – no matter what qualifications are regularly needed – has been made and the responsible staff at the respective student offices and/or departments has been informed about it.

The experiences so far show that this enrolment practice is effecting the possibilities for a quantitative evaluation of the programme and that measuring the acceptance of the International Course Exchange has a special trick to it. The students participating in the International Course Exchange are “invisible” in the administrative structure of the host university, making it impossible to track them. Only when they return to their home institution and ask for credit transfer there is a possibility to identify them, but even then rules of data protection at some partner universities might prevent that. Therefore, the evaluation of the number of participants and their experiences is at this point almost impossible. Some partners are monitoring the hits on the project Website as well as incoming questions concerning the International Course Exchange, but next to that, quantitative as well as qualitative data is lacking so far.

**Assessment**

The assessment of courses taken during the International Course Exchange is done according to the rules and regulations of the host institutions. While at some of the partnering universities doing a Web-based exam is possible, students at other universities currently have to travel and do a face-to-face exam. But in order to consider the needs of non-mobile students, alternative arrangements to mandatory traveling abroad for exams are discussed and elaborated within the partnership. One possibility that has already been exercised at a number of Open and Distance Universities is to offer tests at embassies/consulates or allow for oral examinations via video-conferencing. These options are currently under consideration at the partner institutions where face-to-face exams are currently still mandatory and that the problem of mandatory traveling would therefore become obsolete.

None-the-less, a general rule – next to the principle of subsidiary – has not been made so far. In case a participant of the International Course Exchange has serious problems to be present for an exam the partners are willing to look into individual solutions. Next to that it is expected that further developments in the ICT sector will make Web-based examinations more and more common at most Open and Distance Teaching Universities in the near future.

Each student successfully passing the examination gets the respective ECTS-points from the host institution. Those are then recognised towards the degree at the home institution. This recognition of credits is guaranteed to the participating students by binding agreements of all partners in the International Course Exchange. The arrangement is not only identical with the ERASMUS principle, but also one of the key elements of
the programme. In every student workshop and also in discussions with representatives from the European Student Union, guaranteed and easy credit transfer turned out to be one of the major concerns. On the structural level this formalised recognition of credits is a major step towards the formal mainstreaming of virtual mobility.

Fees
As regular members of the student body of the host university, the participants are obliged to pay the fees valid at that institution. The amount of fees within the partnership varies from university to university: whilst some students might have to pay lower fees than they do at their home university, participating in the International Course Exchange might be rather expensive for others compared to their regular study fees at home. The response from the participants of the student workshops on this was still positive. Considering the usual high costs of a physical mobility scheme, paying slightly higher study fees than usual for participating in the International Course Exchange seemed acceptable. However, institutions asking for relatively high fees, e.g., the Open University of the United Kingdom usually also offer extended tutorial support. This aspect is tied to the different traditions in teaching and learning throughout the European higher education area and should be communicated to the students. In addition, as an alternative to scholarships, mutual agreements to waive fees could be set up within the International Course Exchange or any other virtual mobility scheme where different fees are relevant. At the current stage these agreements could not be made in the partnership of the International Course Exchange as it is described here but it has been done in the Erasmus programme on the European-level and should be seriously considered when implementing this model in the future.

Access to Study Materials
The access to study materials in the International Course Exchange, like books, papers and other literature is not as easy as going to the library. The students are usually far away from any physical library and it is therefore important to organise the access to library resources carefully. Being formally enrolled at their host university, participants of the International Course Exchange have to use the library of that particular university. This is especially so when not all the study materials are available online and students rely on the possibility that the materials are sent to them they need to be carefully informed about this. A contact person at each library has been appointed that students can turn to in case they have questions or face any difficulties. In addition to this, the EADTU Library Group has provided a list with further recommendations on the access to study materials in the International Course Exchange12.

Administrative Support
The administrative support in the International Course Exchange is fairly easy: the participants become a regular student at the host university, following the same procedures every other student does – only that these are not yet familiar to them and more questions might arise. No special training for administrative personnel dealing with students participating in the International Course Exchange is foreseen. But in order to ensure a smooth cooperation of all personnel involved the administrative staff at all partnering institutions were informed about the programme, its concept, partners and offerings in advance. This strategy has been discussed with administrative staff from various European Open and Distance Teaching Universities participating in the expert workshops. They agreed that implementing the International Course Exchange into the university structure would not cause significant changes on the administrative level, mainly because of two reasons: a) no new procedure has to be introduced for the enrolment of the participants; and b) students living abroad are common at all participating universities. Therefore, the International Course
Exchange can be well integrated into the existing communication and support structure.

**Target Groups and Entrance Requirements**

The target group for the International Course Exchange are students of the Social Sciences, Cultural Sciences and Humanities at BA. level, as well as those students that can choose a certain number of courses freely within their academic programme, and that are interested in the courses offered in the programme.

The major entrance requirement is the language skills. Since the courses are offered in the native language of the host university the participating student needs to be able to read the relevant literature, write the exams, discuss and do orals in the language of the university they select. The administrative procedures, the communication and a lot of assignments are conducted through the Web. Therefore, access to a computer and the Internet as well as varying levels of computer skills are another important entrance requirement.

Additional recommendations are that the participating students should have a good knowledge of their own academic preferences and a high degree of self discipline/organisation. Since the enrolment follows the rules and regulations of the host institution, no additional entrance test has been set up in the International Course Exchange so far. Whether the students feel secure enough to study in a foreign language and in a foreign academic system is up to their own estimation.

This relatively informal set-up of entrance requirements is owed to two facts: a) distance students are usually older than students at traditional universities (25 years+) and well self-organised. It is expected that they have a good ability to estimate their own resources for their studies and are highly motivated. Therefore, it was decided to mainly leave it up to the individual potential participants to decide whether they would be eligible for the programme or not; and b) virtual mobility schemes like the International Course Exchange are rather new and not very well known concepts. In order to attract many students and give them a chance to join the programme the formal barriers for participation were set quite low.

Participants in the e-move student workshops clearly indicated their interest in participating in the programme, but stated that this would need careful preparation and planning ahead. Especially those who are not full-time students but also engaged in family or work life who usually plan their academic year well in advance. That means that despite a general interest in the International Course Exchange actual participation will likely be delayed to a later point in their academic education. Different from the Erasmus and other physical mobility programmes which are already well known at universities and among students, virtual mobility schemes are rather new and still lacking high profile. Therefore, students need to familiarise themselves with them and major advertising needs to be done.

**FUTURE TRENDS**

Physical student mobility has become more and more important over the last decades. An increasing number of students are spending part of their tertiary education in a foreign country or even doing a whole degree abroad. But student mobility is also increasingly losing its exclusivity in enhancing international competencies (Bracht et al., 2006). It is likely that trans-national and border-crossing mobility of study programmes as well as internationalisation at home will increase in the future at a more rapid pace rather than physical mobility of students. “Student mobility is likely to grow in the future, but in the wake of growing internationalisation of higher education in various respects, it is bound to loose some of its glamour.” (Rivza & Teichler, 2007, p. 474). While this diagnosis is valid for physical mobility, virtual mobility in higher education is only at a
very early stage. Different pilots have been tested among students, elaborated and put into practice. Virtual mobility is however still only found in several isolated projects and only available to a restricted number of universities and students. Therefore, the next step must be to make virtual mobility mainstream.

With the further development of new learning environments and new educational models, exploiting the full potential of ICT and making virtual higher education is likely to be one of the most important driving forces in the academic world in the next ten years, with virtual mobility playing a core role in the European learning space. The present developments are only a starting point for a wide deployment that will change the nature of national and international higher education. The technological means will further enhance and offer new ways of communicating and collaborating in a virtual space (e.g., Olsen, 2004; Van De Ven & Van Der Wende 2004). One of the key initiatives in bringing virtual mobility out of the pilot phase and enhancing it to mainstream level is the European Portal of International Courses and Services.

From Virtual Mobility to Virtual Erasmus: The European Portal of International Courses and Services

A major next step to be taken is the conversion of virtual mobility to Virtual Erasmus, in terms of evolving from the pilot phase towards mainstream provision of virtual mobility for all universities. An important part of this is the development of the supporting infrastructure, here introduced as the European Portal of International Courses and Services (EPICS).

The idea of EPICS is to have a centralised Web portal showing all distance/e-learning courses available to international students. Those looking for international courses can find a selection of them on their own university’s Website, provided from a central platform which is administered by the course providers. Universities will be given the possibility to offer a selection of courses made available for virtual mobility via a customised “window” to their students on EPICS. But only those international courses fitting and supplementing the offerings of that particular university will then be made accessible for their students. The student can take the available courses with the guaranteed recognition of credit points based on bi-lateral agreements amongst participating universities. As an additional option, students and universities will also be enabled to visit the full EPICS portal directly and view and select from all courses available. Thus EPICS provides a link between universities, students and courses all over Europe. Universities have the opportunity to share university courses and broaden the offerings to their students by international cooperation.

In addition to the database, the portal will also include on-line services for offering high quality guided independent learning and support in organising mainstream offering of virtual mobility in a Virtual Erasmus scheme. The focus in creating the portal is convergence not standardisation or uniformity. It will be built on the fundamental principles of autonomy and diversity and embodies the value of co-ordinated reforms, compatible systems and common action.

Next to setting up the EPICS portal several expert groups will be formed sharing their expertise and experience on relevant issues concerning virtual mobility. Their objective will be to institutionalise procedures and provide solid recommendations to common problems. Relevant topics will be - barriers and opportunities of the development of virtual ERASMUS; course availability as well as services online within the consortium; aspects of accessibility and its restricting factors like student admission, fee structures, credit transfer, assessment modes etc. These combined activities will support European universities in making their offerings internationally available and to solve administrative issues, currently preventing them from making their
courses available to international students. EPICS is the right strategy to transfer dispersed projects on virtual mobility into one joint approach by a large group of stakeholders, sharing expertise and forming it into a well arranged applicable and well tested set of recommendations. This will bring virtual mobility to a new level, were it can be labelled, become mainstream and be of optimal use for the lifelong learner.

CONCLUSION

Up until now, international student mobility is still mainly conceived as physical mobility, supported by a number of initiatives on the national, European and global levels. Societal changes in general and developments in higher education in particular require for new mobility schemes, also taking into account the needs of the lifelong learner. Virtual mobility qualifies as an adequate supplement to the existing physical mobility programmes. In the e-move project different virtual mobility models have been analysed and implemented at several universities throughout Europe. The experience, (e.g., the International Course Exchange) shows that the guaranteed recognition of credits is one of the main preconditions for the acceptance of virtual mobility by students. It should therefore have high priority for universities offering virtual mobility to their students. Further initiatives to turn virtual mobility into Virtual Erasmus and making it mainstream, like the European Portal of International Courses and Services have recently been started and will help to boost the position of virtual mobility in international student mobility.

REFERENCES


From Virtual Mobility to Virtual Erasmus


ENDNOTES

1 Please note that in other documents introducing and discussing the e-move project and best practices, the International Course Exchange is also termed as the Virtual Stay Abroad. While this is a general approach, the International Course Exchange is an example of it with specific features.

2 Reliable numbers on overall student mobility are hard to give, mainly because of the different forms of mobility and because a lot of students being mobile are not formally enrolled. Rough estimates show that one out of 40 European students decide to study an entire degree abroad. One out of ten European students spend a shorter period of time abroad, a number that has increased significantly over the last two decades. Less than one out of 30 students in Europe are coming from outside of Europe (all data taken from Rivza & Treichler, 2007, p. 462).
For further information on a selection of these projects please view the following links: e-move: an operational analysis of virtual mobility (http://www.eadtu.nl/virtualmobility/); REVE project: The Europace network of traditional universities in virtual mobility (http://reve.europace.org/partners/index.php); Venus: virtual and E-Mobility for Networking Universities in Society (http://www.venus-project.net/); VM-base: virtual mobility before and after student exchange (http://vm-base.europace.org); Sputnic: technology enhanced international educational cooperation (http://sputnic.europace.org); Net-Active: European network of Master courses by intercontinental virtual mobility with Latin America (http://www.net-active.info/); CSVM: Cross-Sector virtual mobility (http://www.eadtu.nl/csvm/).

Please note that the Virtual Campus on Marketing is not identical with the concept introduced in the chapter on “Virtual Campus Development on the Basis of Subsidiarity: The EVS Approach.”

To view the study please visit http://www.eadtu.nl/virtualmobility/ Background material Publications An investigation into virtual mobility in the context of continuing professional development.

To view the guide please visit http://www.eadtu.nl/virtualmobility/ Teachers and institutions Guide to virtual mobility.

To view the Library for virtual mobility please visit http://www.eadtu.nl/virtualmobility/ Teachers and institutions Library to virtual mobility.

For a detailed introduction to the European Virtual Seminar please view the chapter Virtual Campus Development on the Basis of Subsidiarity: The EVS Approach in this book. More information on the Virtual Campus on Marketing can be found at http://www.emove.org and in the Guide to Virtual Mobility.

This part of the chapter is based on the Guide to Virtual Mobility, an online manual published on the EADTU’s Virtual Mobility Portal at http://www.eadtu.nl/virtualmobility.

For a complete and updated overview of course offerings please visit http://www.eadtu.nl/academic-networks/humanities/offering.asp.

A lot of students at Open and Distance Teaching Universities are living abroad, many of them being expatriates. This means that a foreign address or any other transnational activity related to them is not an appropriate criterion to identify them.

For a list of further recommendations from the EADTU Library and Information Support group please check the Guide to Virtual Mobility at http://www.eadtu.nl/virtualmobility/.
Chapter XIV
Blending Virtual Campuses
Managing Differences through
Web 2.0 Experiences in
Transnational Cooperation Projects

Yuri Kazepov
University of Urbino “Carlo Bo," Italy

Giovanni Torrisi
University of Urbino “Carlo Bo," Italy

ABSTRACT

Starting from the increasingly widespread need to develop effective teaching in complex transnational settings, this chapter presents an innovative blended model with Web 2.0 collaborative learning strategies built in. The model balances pedagogical, technical and content related issues into an ad hoc institutionally designed 60 ECTS (European Credit Transfer System) curriculum of the European Masters in Comparative Urban Studies (E-Urbs). The chapter aims at disentangling the different dimensions involved in the curriculum delivery, highlighting the pros and cons of all dimensions of the model adopted. In doing so the chapter is divided into three sections. The first section addresses the challenges that effective teaching in complex transnational settings has to face, in particular it highlights the crucial need of managing differences. In the E-Urbs project we had 24 students from 14 countries, 5 continents, 6 disciplinary backgrounds, 32 scholars from 9 partner institutions in 8 countries. The second section deals with the way in which challenges and differences have been addressed and describes the dimensions of the blended model the authors adopted, arguing that a sound virtual campus arrangement should address the pedagogical, technical and content related dimensions in a balanced way considering the institutional setting within which they are embedded. The third section addresses the way in which
the blended approach has been enriched through a Web 2.0 perspective, promoting p2p (peer-to-peer) collaboration in the generation of knowledge. The main argument is that an increasingly fluid society generates and treats information differently and learning agencies should not only acknowledge these differences but should address them with balanced learning models which take advantage of the new 2.0 paradigms. The authors argue that the result of a balanced blended Web 2.0 approach helps to transform the challenges into a resource for each of the stakeholders involved (e.g., students, scholars, partners, institutions) providing an added value in each dimension of the learning process (pedagogical, technical, content related and institutional).

INTRODUCTION

This chapter proposes an innovative blended model in which Web 2.0 collaborative learning strategies have been coupled with a blended approach in order to cope with the difficulties normally faced by online courses such as declining attention over time and the potentially increasing social distance among participants. The model has been developed and implemented during the first year of E-Urbs, a European Master in Comparative Urban Studies1, funded within the virtual campus stream2.

The distinctiveness of the model is to provide a balanced system in which different aspects are calibrated in order to provide a 2.0 blended learning environment, based on a very strong tutoring activity. Pedagogical, technical and content related issues have been balanced to construct and sustain an ad hoc institutionally designed 60 ECTS curriculum. In the chapter, each dimension has been separately analysed, highlighting the potential problems arising from an “unbalanced” distribution of weights and priorities.

THE CHALLENGE OF EFFECTIVE TEACHING IN TRANSNATIONAL SETTINGS

During the last decade, E-Learning in its various facets has considerably grown (Fletcher, 2004; Waterfield, 2002). Industry, universities and professional schools have experienced the advantages and difficulties derived from this kind of learning arrangement. Some argue that this expansion of E-Learning models is due to the reduction in costs and infrastructure (Munro & Munro, 2004) in particular when compared to traditional face-to-face (f2f) arrangements. Others relate it to the possibilities that the new technology, including Web 2.0 and learning-object style of learning, gives to didactic innovation.

Universities are among the institutions that have used and experienced the most different E-Learning models, exploiting the benefits that virtual arrangements have on campus life (Bacsich, 2004). Increasingly, technology based solutions, including E-Learning and Web 2.0, are considered an answer to the Bologna process3 and the Europeanisation of higher education systems. The latter ask for new means by which students can experience innovative ways of studying and learning together in a truly European learning community. The European Commission considers this – according to the resolution of the European Council in Lisbon in March 2000 – as a necessary step in order to foster growth and competitiveness in a knowledge-based society (Kok, 2004).

The “virtual campus” becomes, therefore, a new organisational solution for enriching the transnational offer of universities where, thanks to the use of a LMS (learning management system), learning activities are completed either partially or completely online, with the distant/online assistance of the professor and tutors. Different from other kind of arrangements, the virtuality of these campuses facilitates the creation and
development of distant learning communities and research programmes. Thanks to technology, designing integrated European curricula becomes easier and virtual campuses might be one of the main instruments for it.

Virtual campuses, however, cannot be directly compared to traditional campuses. They are of a completely new kind, because they offer not only new possibilities of creating and disseminating knowledge for students, professors and tutors, but because they are qualitatively different. Among their main potential strengths we have their ability to unravel and process differences, whether they are cultural, linguistic or disciplinary. This is one of the reasons why they are regarded with much interest when dealing with the knowledge-based society that values information and differences. We are living in a society where information is ubiquitous, goods move incessantly, services are global and people continuously migrate. In the 21st century, society is more multicultural than ever. This is not because there are more cultural differences than in the past, but because these differences are endlessly confronted, incessantly related, instantaneously addressed and put in question. As Bauman (2000; 2005; 2008) would say, we are in a fluid-tachycardic society. In this fluid life, words change their meaning and competitiveness and speed become a priority: speed in gathering information, in dealing with complexity and managing knowledge. Universities and other knowledge producing agencies have to cope with this situation, implementing in the learning processes instant communication and new ways of teaching. Comparative studies, where differences are to be studied, valued and jointly analysed become also a fundamental means for competitiveness.

In this context virtual campuses and comparative studies might be seen as unavoidable milestones. But can virtual campuses be considered a possible (good?) answer in dealing with the complexity of a knowledge-based (Kok, 2004) multicultural society? Are virtual campuses well equipped in order to cope with the implicit difficulties that diversity and the need of comparative studies carry with themselves? Which are the main characteristics of the challenges that a virtual campus would need to manage? How is it possible to create and maintain a sense of learning community? And what are the main characteristics that a virtual campus like arrangement has to have in this context?

We will try to answer these questions on the basis of our experiences with the European Master in Comparative Urban Studies (E-Urbs), since:

- It is a virtual campus, as defined earlier;
- It deals with a multicultural and multi-linguistic cohort of students;
- It is organised by 9 different institutions, with different teaching and organisational traditions;
- It uses a comparative approach;
- It makes use of a Web 2.0 approach;
- It fosters a blended approach that relates online, p2p and f2f learning processes one another.

More specifically, E-Urbs strategically deploys the long lasting experience of the partners in comparative urban studies and in online teaching with the aim of institutionalising a truly European curriculum of 60 ECTS. Extensive online teaching (and tutoring) is aimed at encouraging and facilitating both physical and virtual mobility between higher education systems and institutions across Europe. This fosters the underlying principles of the Bologna process and the institutionalisation of a European Higher Education area through the use of an innovative E-Learning environment for higher education (Land of Learning). Moreover, it aims at monitoring the effects on the interactive process and the use of learning objects.

In short, the E-Urbs Master reproduces and intensifies learning processes within a multicul-
tural frame and uses new technologies in order to address differences. From this point of view, E-Urbs has been a laboratory in which the aforementioned challenges have been explicitly faced, in particular the following ones:

**Cultural Differences**

Twenty four students from 14 countries and 5 continents participated in various activities of the Master[^1]. Differences in customs and culture were considerable. Festivities and bank holidays were dissimilar both for the students and the professors involved, as well as their eating habits. Some uneasiness and prejudice was present at the very beginning in the interaction among some students attending the course, especially in relation to sensitive subjects as race, religion and social belonging. E-Urbs became from this point of view a unique laboratory for going multicultural in a technologically mediated (and relatively protected) environment.

**Linguistic and Age Differences**

A virtual campus involving people from all over the world needs to cope with the language and age differentiation. Our decision was to use English as a working language. All people had at least a basic knowledge of English. This, however, did not iron out the differences in linguistic competence among the students as none of them had English as their mother tongue. The issue became even more problematic when dealing with the writing of the intermediate and final papers where language skills were a crucial asset. As far as the age of the students is concerned, we can distinguish between two different groups. The first one includes students that just finished their Bachelor degree (average age 24). They were looking for a specialisation curriculum eventually to access a Ph.D. programme. The second age group (average age 30) includes mainly professionals. Some of them were working in public or private institutions and dealing with urban issues already, while others wanted to change their professional career.

**The Heterogeneity of Institutional Settings**

The Master has been organised by 9 different higher education institutions in 8 countries with different institutional constraints, such as, different admission requirements for students, tuition fees, administration habits, procedures that must be fulfilled in order to receive the diploma, a different understanding of the European Credit Transfer System and the Diploma Supplement. National bureaucracies make it difficult to implement common procedures. Often simple and unchallenged issues become insurmountable problems. Can scholars of one university teach in other university of the consortium and can their teaching load be considered as part of their duties? Would this guarantee the fulfilment of the accreditation criteria necessary to establish a Master course? Is it possible to issue a joint degree or a degree that would be recognised by all partner institutions involved? These basic questions heavily influenced the development of the Master course.

**The Background of Disciplinary Traditions**

Comparative urban studies use a multidisciplinary approach, as many other Master courses nowadays. Students taking part in the Master were coming from different disciplinary backgrounds, from psychology to planning, from sociology to architecture. This situation – despite the high motivation and interest in urban studies of all students – constituted a major challenge, since there was the need to share a basic knowledge on which to build a more specialised understanding of urban-issues.
Physical and Virtual Distance

Virtual-campus-like arrangements make it possible to organise multidisciplinary courses at a distance. This does not mean that distance issues are completely nullified. Keeping the class active and united with a sense of community, while people are scattered around the world has been a major challenge. If keeping a class interested is a challenge by itself in normal learning environments, when the same culture is shared, the language is easily understood and disciplinary background are somehow similar, it becomes a major challenge where these conditions are not given. Motivation seems to be the key issue in both cases, but the absence of a physical gathering and interaction adds further difficulties. As the literature shows, (e.g., Schifter, 2000) interest in forum, chats and traditional virtual methodology tend to weaken over time and the learning community tends to shrink as time passes by. New methodologies were needed in order to cope with these issues.

Psychological Sense of Community

Many of the differences listed earlier and in particular the physical distance among students, made it difficult to create and sustain a psychological sense of community. Living in different contexts, people tend to tie in with their physical environment more than with a virtual course. Nevertheless, a sense of community is a necessary condition in order to guarantee a successful learning context and traditional solutions for this problem are not directly applicable in a virtual campus.

Communication Technologies

Last but not least, the diversities listed earlier challenge communication technologies. In fact, not all the students had the same IT skills and network performances differed (and still differ) among countries. When the online platform had to be accessed from Cameroon, India or the Netherlands there was the need to guarantee light and user friendly solutions. Moreover, the differences listed earlier required innovative online solutions in order to be addressed adequately and our staff members, students and professors become the beta testers of a new learning software and methodology. For instance we developed co-opetitive (Brandenburger & Nalebuff, 1996; Lihui & Xiaowen, 2005) approaches to enhance distance learning efficacy. As the methodology was innovative and untested, it needed to be put in practice, used and assessed.

Most of the challenges described earlier are common to most virtual-campus-like arrangements and mainly relate to the need of managing differences in a knowledge-based society. In fact, new communication technologies provide us with the means to face the challenges that multicultural and diverse societies pose us in a way that would not have been possible before. Contemporary societies are extremely complex and fluid (Bauman, 2000; 2005; 2008) but they also show an incredible increase in possible ways to address this complexity.

BLENDING LEARNING: AN EFFECTIVE WAY TO MANAGE DIFFERENCES

Reducing the complexity, while keeping the added value of the existing differences, became a crucial objective in designing our learning model. In this second part of the chapter, we will address the challenges described earlier and illustrate how they have been dealt with, balancing the four dimensions of the model: 1) pedagogical; 2) technical; 3) institutional and 4) content. Their balanced mix, shifts the meaning of the challenges from being critical issues to becoming resources for a mutual enrichment and a “co-opetive” blended approach. In fact, in E-Urbs we addressed and analyzed the effects
Blending Virtual Campuses Managing Differences through Web 2.0

of specific pedagogical solutions in teaching and in the didactical organisation as well as the way in which technical solutions could be applied to content considering the countries’ existing institutional frames in dealing with diversity.

Our assumption is that the four dimensions we identified need to relate to each other in a flexible yet integrated and balanced way in order to be useful. Keeping this in mind, in the following we will address each dimension, showing how the E-Urbs MA integrated them in an articulated learning model (see Figure 1).

The Pedagogical Approach

The pedagogical approach we adopted in the design of the E-Urbs Master aimed at integrating three interrelated interaction strategies and tools in order to contrast the problems common in online courses such as the declining attention and the increasing social distance among participants. The three strategies and tools were: a) a blended approach; b) the creation of a spontaneous learning community; c) a co-opetitive behavioural frame.

A Blended Approach

The blended approach (for a critical overview see Voos, 2003) we adopted in the learning path design, integrates f2f and online learning activities and is based on the assumption that both greatly benefit and complement each other. The reasons for this choice are related to three main needs: 1) some disciplines are more complex when they are taught online than others; 2) a truly European curricula might require too much physical mobility; 3) some travelling and transnational exchange was considered vital.

As a solution to these needs, we organised the learning path into three main periods (see Figure 2): 1) a first period (w1-w4) of intensive f2f teaching for a total of 15 ECTS, during which professors, tutors and students met and worked on basic concepts and methods of comparative urban analysis. In this way all stakeholders involved not only developed a common knowledge base, but also a companionship that supported them during the whole curricula; 2) a second period (w5-w36) of intense online teaching and distant collaborative learning for a total of 27 ECTS; 3) a third period (w37-w49) for a total of 18 ECTS spent at one of the partner Universities where students could work on their thesis and take advantage of the scholarly competences available within the network. The final defence and award ceremony took place in Urbino (w52) and allowed students to physically meet each other again, receive their diploma and confront their research experiences and expectations.

In order to measure the learning effectiveness of the blended approach proposed and to monitor the overall learning process, a monitoring and assessment working group was established. One of its responsibilities was to submit different questionnaires to the students. These included also specific learning curve questionnaires, whose results were used as an indicator of the effectiveness of the learning processes during different periods.
The integrated blended approach adopted during the E-Urbs MA, helped to overcome many of the challenges that a virtual-campus-like arrangement normally has to face. Thanks to the f2f period – targeted to both the acquisition of a common background on comparative urban studies and homogenising the very different competences and interests among students – it became clear that the different disciplinary backgrounds constituted an enrichment with new potential perspectives through which to address urban issues, rather than a problem. The same applied to the age differences among participants. It was clear since the very beginning that the experiences of the older students were perfectly complemented by the more up-to-date studies and the enthusiasm brought in by the younger students. For this reason the management committee opened the Master course to both target groups (students and professionals).

Differences in culture were emphasised and stressed during the f2f meetings. Living together in Urbino, a small university town in Italy, allowed students to experience and to relate with people with very different cultural backgrounds. The small number of participants coming from the same cultural environment, encouraged a group formation dynamic based on other parameters than culture, such as disciplinary interest, personality or simply personal preference. Knowing each other helped substantially to overcome most of the inter-cultural classical stereotypes. This process brought about the rise of several multicultural groups inside the class that also helped to improve language skills, English being the only common language in all groups. Within this context, English was not just strictly used for learning purposes, but also for participating in social gatherings and to be part of the community. This mere fact improved motivation and the language skills of the group. During the first f2f period students had also the possibility to meet their tutors, who accompanied their learning experience during the whole Master programme. The learning community and companionship built during the first f2f month of activity continued and consolidated during the online teaching period. Thanks to this organisation, typical problems afflicting online learning, such as the lack of motivation, weak sense of learning community,
etc. (Irizarry, 2002) were substantially reduced. Distance induced difficulties both technical and motivational were weakened by the fact that people already knew each other and could easily compensate the informational gap, normally given in pure online activities, with the previously acquired knowledge of the group and its dynamics. Technical difficulties were also easier to solve thanks to the fact that students and tutors already had the possibility to experiment with the online platform when studying together in Urbino.

The third part of the E-Urbs MA included a f2f interaction. During this time students were asked to move to one of the partners’ institutions for their comparative thesis work. There, students experienced different institutional settings, procedures and uses, but at the same time they met scholars, tutors and classmates with whom they interacted online for almost half a year. In synthesis, the blended approach improved the creation and the maintenance of a (quasi)spontaneous learning community that revealed itself as a fundamental element for scholarship throughout the duration of the Master.

The Creation of a Spontaneous Learning Community

The creation of a stable psychological sense of community, which can be defined as the perceived sense of belonging to a specific learning community, played a very important role in overcoming many of the challenges of a virtual-campus-like arrangement.

The blended approach we used in designing the learning path was one of the pedagogical solutions we used in order to promote the creation and maintenance of the community. What we needed in addition, was a series of precise instruments in order to measure and monitor the processes involved in the construction of a learning community. The monitoring and assessment working group (Pigliapoco & Bogliolo, 2007) used two main indicators: the Classroom Community Scale, proposed by Rovai (2002) and based on a 20-item questionnaire and SCITT, and a scale introduced by Pigliapoco & Bogliolo (2007), based on a 6-item questionnaire. Both indicators take into account 4 dimensions:

- Spirit (friendship, cohesion, bonding among students);
- Trust (credibility, benevolence, confidence among students);
- Interaction (honesty in feedback, trust and safety among students);
- Commonality of expectations (commonality of the same learning goal).

The perceived sense of learning community was monitored twice, at the end of first f2f based period (see Figure 1, w5, PSoC) and at the end of the second online based period (see Figure 1, w37, PSoC), to see if there were important changes in the quantity and quality of relations related to the different teaching methods. Even if the psychological sense of community slightly decreased during online courses due to distance, it remained exceptionally high, as did the uniformity of feelings of all participants. Indeed, the quantity of relations among the students during the online teaching period were lower than during the f2f periods, while their quality, i.e., the intensity of friendship and interaction among students, was higher.

Co-Opetition

As we have already maintained, distance poses serious problems to the students’ motivation and the development of a psychological sense of learning community necessary to share knowledge in a virtual-campus-like arrangement. In order to foster interaction and engagement and making course-attendance more rewarding, we tried to overcome inhibitors like “forced participation” without interaction and decreased motivation by developing a co-competitive examination setting.
Co-opetition is a methodology that combines cooperation and solidarity with competition in the same given context. Co-opetition has been first developed in a business-market oriented context and it focuses on cooperation between actors in an imperfectly competitive situation (Brandenburger & Nalebuff, 1996).

In the E-Urbs MA we tried to apply the methodology to exams in order to enhance learning efficacy through the promotion of solidarity and competition between students, transforming in this way the differences present among them in a further opportunity to learn from each other. The system was structured in a way that points were given not just to the people who were answering their individual multiple-choice questions correctly, but also to students that were helping others in answering open-questions. Students were organised in small groups of about 3-4 students each and points were given for individual, cooperative and collective outputs with truly Web 2.0 techniques.

The Methodological–Technical Dimension

In order to be able to fully deploy the multifaceted pedagogical approach described earlier, we needed to have widely customisable technical instruments allowing us to organise the learning paths as they were developing. For this purpose we used ad hoc developed learning objects: a) OpenLol, an E-Learning platform; b) ePortfolio, a tool to promote self-reflection and strategic planning for students’ personal and professional development; c) the QMT, the question management tool developed at the University of Urbino.

Open Land of Learning (OpenLol)

The partnership with an IT company (MEC Informatica) in the development of an open Web 2.0 learning platform was a crucial starting point. OpenLOL7, a LMS based on Java and aimed at the delivery and use of broad and narrow-band Web 1.0 and 2.0 based services, was the result of several years of joint collaboration. The entire online environment has been localised in order to be used in several languages, giving everybody the possibility of integrating the familiar feeling of using one’s own language in the learning process while keeping a common working language and helping to solve language difficulties.

OpenLoL is based on open standards like linux, mysql and java, and it is a modular environment in which modules and learning objects can be used and/or developed as needed. Among the modules that have been developed and used for the E-Urbs Master we find: a) classroom, a shared repository, a forum, a visual lab, an ePortfolio and the Web 2.0 question management tools. The “Classroom” is based on an innovative concept of multi-layer interactive synchronous chat where courses or lessons can be held involving the interaction of professors, tutors, students, technicians and learning advisors, yet keeping narrow band compatibility. This easily allows the overcoming of technical connection problems that may arise when people connect from narrow band connections around the world, as the classroom works mainly through layered text-based communication protocols.

The Different windows of the classroom (see Figure 3) have different functions. In the lesson window (1) the content based interaction between scholars and students takes place. Tutors submit the questions asked by the students via the question window (2). The service window (3) is targeted to informal or service messages, while the private window (4) allows private p2p communication between participants. The coexistence of these parallel interaction layers reproduces a physical-like class arrangement and helps to booster the psychological sense of community and somehow to overcome the classical problems present in distance based courses such as fading motivation. At the end of a lesson, all text written in the lesson window is immediately available for download-
ing in RTF format, so that the participants may have the transcript of the relevant interaction. An interesting aspect of the classroom is the presence of a real-time blackboard on which users may draw graphs, write, paste pictures, slides, etc. The rest of the participants in the classroom are able to view and can interact on the blackboard in real time. This increases the efficiency of the interaction making explanations more visual.

The software includes other Web 2.0 features which have been used to foster collaborative learning strategies. Asynchronous interactions are taking place on thematic forums and a repository provides a virtual space where both the professors and the students can distribute teaching materials and share documents of any type. This repository becomes the central point of reference for sharing ideas, texts, data and information. Moreover, an online searchable database (called visual lab) helps with the organisation of multimedia content.

The ePortfolio

The ePortfolio is an educational tool used in many universities in Northern Europe and in the United States. It was developed as a methodology to address the growing demand for a personalisation of curricula, competence-focused learning and goal-oriented education. For this reason it is mostly applied in advanced courses, especially Master programmes. With the Portfolio, a student can critically decide according to his/her goals to attend one particular course and, on the basis of this decision, build a structured archive of the most relevant materials collected during the course. Portfolio is, in synthesis, a methodological frame for self-reflection and strategic planning that some students found very useful in order to exploit the potential of a program for their personal and professional development. An ePortfolio has been included in the E-Urbs MA design aimed at providing students with some strategic career planning guidelines and a constant open channel with the organisation. Furthermore, we received very valuable information about the progress of the individual students, helping us, and the tutors in particular, to offer a more goal-oriented support.
Questionnaire Management Tools (QMT)

In order to manage properly a complex project like the E-Urbs MA virtual campus, there was the need to structure a regular feedback flow using various instruments – including non conventional ones – at different points in time (see Figure 2). For this reason we used the QMT that colleagues from the Applied Informatics Department developed and integrated into the OpenLoL platform. The QMT has a double functionality: firstly, it allows instructors to create their own databases of questions and to build meta-questionnaires made up of questions randomly taken from the databases; secondly, it is a test management tool (TMT), allowing instructors to set-up exam calls, to administer both supervised written exams and unsupervised self-evaluation tests, feedback forms, and allowing students to fill in online questionnaires and to check their scores.

The QMT feedback management tool was used both for indirect and direct monitoring of the learning activity. Indirect monitoring was carried out by means of three types of questionnaires aimed at monitoring Customer satisfaction (CS), Learning styles (LS), and Psychological sense of community (PSoC). Direct monitoring was carried out by means of three types of questionnaires: Self-evaluation test (SE), exams, and Learning curve questionnaires (LCQ). Exams were setup by tutors and instructors as online tests made up of multiple-choice and open-text questions. The tests were submitted at the end of each teaching activity to evaluate students’ preparation. Self-evaluation tests were made available to allow students to check their preparation and were associated with each lecture of each course. All self-evaluation tests were the same format as the exams.

As mentioned earlier, a learning curve questionnaire was prepared in order to monitor the effectiveness of the learning process considering the learning curve of the overall class at specific points in time. The questions were prepared with the contribution of all professors teaching in the Master and the learning curve results were calculated in terms of correct answers to a given number of randomly selected questions. Figure 4 shows the average scores obtained by students before the beginning of the Master (w0), after the first f2f period (w5) and at the end of third online period (w37) (see Figure 2 for timing and Figure 4 for results).

The scores confirm a general and decisive improvement of the learning outcomes. The line summarises the results of the overall questionnaire, while the dotted and dashed lines are calculated taking into account respectively the scores related to the f2f and online courses. As we expected, the dotted line grows much faster in the first part,
while the dashed line grows faster in second one. There is also a significant cross-talk effect between f2f and online courses. This proves the coherent organisation of the overall programming of the Master with a strong correlation between the different topics of the course.

We used also customer satisfaction questionnaires, which were submitted three times to monitor the satisfaction of the stakeholders and the suitability of the proposed teaching methodology (see Figure 1).

Complementary to the other tools briefly described, a learning style classification questionnaire was used in order to infer how students learn and to make them aware of their learning attitudes and give them advice on how to take advantage of the teaching activities of the Master. Out of the different learning-style classification models which could be used for this purpose – e.g., Honey & Mumford, (1982; 2000), who use 40-80 questions to distinguish between activist and reflectors and between theorists and pragmatists; or by Kolb (1984), who uses 12 questions to classify students in accommodating, diverging, converging and assimilating – we adopted Felder’s (2005) model, in which a 44-item questionnaire is used, and 4 dichotomised styles are identified: active/reflective, sensing/intuitive, visual/verbal, and sequential/global. For the results of these questionnaires see Pigliapoco et al., (2007).

The Way Content is Conveyed

In order to put forward an innovative and truly international curriculum, the contents of the course have been designed considering three interrelated aspects: a) the multidisciplinary competences existing within the network of universities; b) the complementarities of theoretical and empirical approaches based on a long-lasting joint-research activity carried on by the project partners; c) the comparative perspective informing all issues addressed from the content point of view. In designing the content of the learning path, we tried to balance these three aspects by organising a general introduction to the basic theoretical and empirical elements of urban studies during the first f2f period, followed by a second period online, characterised by more targeted and specialised topics (e.g., governance, quality of life, planning, etc.). Thanks to this organisation, the different disciplinary backgrounds of the students were considered to be consistent with the comparative spirit of the MA and they were an enrichment from the very beginning. Those students with less related disciplinary background (e.g., psychology) had to face more difficulties at the beginning but were able to catch up, also thanks to the crucial role of the local tutors, overcoming the difficulties and writing a good thesis. Also linguistic diversity among professors, tutors and students allowed the construction of a highly flexible yet powerful multi-linguistic educational model. English remained the working language for common interaction and study, while a variety of languages were used when needed. When comparative research is done, multi-linguistic skills are to be taken into account. Far from being just a problem, language diversity is also useful both for literature review of the social reality that is to be compared and for empirical research (interviews, questionnaires, etc). When language skills were not directly available local and thematic tutors were available.

The different teaching activities were organised according to a modular approach, whose main idea is based on breaking down educational content into small teaching units that can be reused in various learning environments, in the spirit of object-oriented programming. These learning objects are autonomous yet complementary units and can be used also in other learning contexts.

The Institutional Dimension

The institutional dimension was one of the most difficult challenges to deal with in the virtual campus organisation. This is particularly true
when we consider the ambitious goal we had to institutionalise the international curricula. For this purpose we addressed three interrelated issues: a) the Bologna process frame; b) the adoption of multiple institutional solutions; c) partners’ agreements.

The Bologna Process Frame

In order to design a truly European higher education learning path we wanted to ground it within the frame of the Bologna process so that we could contribute to the development of a European higher education area. From this point of view we needed to foster the approval of a joint E-Urbs MA degree. However, different national regulations and highly bureaucratised systems made this goal extremely difficult to attain. We organised several f2f project meetings, where we also invited representatives of the administration in order to better deal with the difficult legal and administrative issues we needed to address. This helped us partly to overcome the classical division that can be found in most universities between teaching and administrative staff, even though, despite all expectations, the existing legislation and universities internal procedures do not always comply with the Bologna process.

Multiple Institutional Solutions

In this context, all parties involved worked together with the common objective of finding the best possible solutions given the existing constraints related to legislation, bureaucracy and internal rules. Multiple solutions were found, ranging from a joint degree among two Universities, a double degree with other two universities and the mutual recognition of ECTS credits acquired during the MA course by all parties involved.

Partners’ Agreements

From the administrative point of view, the multiple and flexible solutions mentioned under ‘multiple institutional solutions’ were not easy to achieve and required ad hoc agreements with the partners. The final diploma acknowledged the contribution of all institutions and the specific ad hoc solutions. Moreover, the E-Urbs consortium also issued the Diploma Supplement, in order to increase the transparency and recognition of qualifications across Europe in line with the Bologna Process.

The Risks of Unbalanced Virtual Campuses

Keeping a dynamic balance can be very difficult and an accurate and strong coordination is needed in order to face and overcome the challenge of the existing differences, whether they are cultural, linguistic, and institutional. Considering one single dimension isolated from its synergic effect with the others would produce an unbalanced virtual campus and would affect the learning results. Focusing too much on didactics might produce excellent learning material, but if this is done without considering the synergic effect with the technical requirements of accessibility, students from African countries with no broadband connection, for instance, might not access videos or other multimedia content. Underestimating the institutional dimension, would not guarantee the achievement of an internationally recognised diploma degree, making the pedagogical results obtained less spendable (or not spendable at all) in the European context. If the technical dimension outweighs other aspects and contents tend to be left behind, students would have the means, but not enough value added in terms of knowledge.

All this implies the following risks:

- Too much “pedagogy” → pedagogism: The pedagogical approach, and the consequent
organisation of the learning activities, is a crucial dimension of the success of a virtual campus, but needs to be fine tuned in relation to the other dimensions to be effective in its objectives, otherwise it remains a mere expression of pedagogical theory.

- Too much “technology” → technicism: The belief that newer and more recent technologies are simply “better”, might overestimate the role of the technical means in order to organise a virtual campus, fostering a blind acceptance of the online learning platform developments and completely forgetting the pedagogy that should direct its improvements.

- Too much “institution” → Bureaucratisation: Bureaucratisation puts an excessive attention on procedures and formalities, blocking potential institutional innovation. If every stakeholder within a large consortium is not willing to interpret its own rules and procedures with a problem-solving oriented attitude, the institutional building process entailed in the vision behind the Bologna process would not progress.

- Too much “content” → eclectic disarticulation: An excess of unstructured information would be highly ineffective. The added value of a well organised learning path relies on the fact that information is focused and needs to be integrated in its modules (pedagogy), transmitted (technology) and recognised as valid (institutional dimension).

In synthesis, the need to relate each dimension to one another becomes not only a crucial element of the blended approach we adopted in order to avoid the risks just described, but also to maximise the outcome in terms of quality and effective teaching.

**ENRICHING THE BLENDED APPROACH WITH WEB 2.0 OPTIONS**

As we maintained in the previous section, the flexible blended approach we adopted was crucial in overcoming the complex challenges faced by the E-Urbs Master course. Yet flexible integration of f2fs and online learning experiences are not always enough to address in an adequate way, some of the challenges involved in distance learning. From this point of view, the Web itself is going through a major change. The new emerging Web 2.0 characteristics are modifying the way in which information is treated and blended approaches improve substantially when integrated with a Web 2.0 perspective. The expression “Web 2.0” became famous after the first O’Reilly Media Web 2.0 conference in 2004. It does not refer to any technical update of the World Wide Web technologies, but it is a new way in which users can take advantages of the Web. The classical role division present in the mass media system between the information producer (i.e., writer, movie director, and singer), the information editor (i.e., editor, major, and publisher) and information user (i.e., reader, viewer, and end-user) suddenly tend to collapse. With youTube you can broadcast yourself without any filter; with Wikipedia you can write an encyclopaedia, not just read it; with del.icio.us you can directly share your bookmarks. No major, no editor, no publisher, no filters. All information is collectively created and immediately shared. Distribution of information loses its hierarchy and it becomes peer-to-peer based. Keywords of the Web 2.0 become wikis, p2p, blogs, folksonomies. As Högg et al., (2006) explained the Web 2.0 is a philosophy that mutually maximises collective intelligence, producing in this way added value for each participant by formalised and dynamic information sharing and creation.
Such a huge change in the way in which the Web is used and conceived could not have any impact on virtual-campus-like arrangements. The E-Urbs MA in Comparative Urban Studies, with students with very different backgrounds and age groups, eager to learn from each other and to share and compare their experiences, was the perfect opportunity to test a Web 2.0 approach in an E-Learning environment. E-Urbs changed traditional learning paradigms based on a clear hierarchy between the professor (who possesses the information) and student (who has to receive it), in order to take into account the new peer-to-peer learning paradigms in which the information increases its value and richness because each participant shares it, regardless of his/her statutory role. Albeit this major change in the way in which society treats information cannot be forgotten, a learning agency such as a university needs to retain some structure and integrity against the relativism of the informational value. Old learning paradigms need to be updated, but Universities remain the institutions where the means for processing information are given and where it is learned how to distinguish among the indefinite informational flow of information that the Internet presents to us.

In order to integrate Web 2.0 approaches and to address learning needs more adequately, as we have already seen in the previous paragraphs, we used several tools and methods: a) we incorporated a co-opetitive learning approach, as an innovative way of fostering p2p collaboration and motivation for achieving excellence; b) we developed a visual laboratory on “changing cities”; c) we used a repository for sharing documents, gray literature, provisional papers, etc.

**A Co-Opetitive Approach**

As described in the previous section, co-opetition is a methodology that combines cooperation with competition by contextualising and promoting both among students. In this way, existing differences are transformed in further learning opportunities, in the spirit of Web 2.0. Nonetheless, the method we adopted retains some more traditional elements since it is structured in a way in which students’ performances can be clearly assessed by the professors of the single courses. The co-opetitive exam we proposed, was made up of two parts: i) the first part with 5 multiple choice questions to be answered in 20 minutes on an individual basis; ii) the second part with one open question to be answered in a collaborative way within a given number of small groups. Important elements for the assessment of the outcome of the second part of the exam were: a) all members of the group have to agree on the answer; b) the division of the tasks should be discussed online within the group; c) the author of each part of the answer should be identifiable, i.e., we should be able to allocate the different parts to the different members; d) All interactions (i.e., including the discussion on the answering strategy) are tracked and considered in the assessment of the exam. Responses by the students to the learning methodologies we proposed were enthusiastic, not just for the excellent results they achieved and for the further consolidation of the psychological sense of the community they felt to belong to (as a side-product), but also because they were feeling that the over-all system was enriched by their own contribution and discussion.

**The Visual Lab**

The comparative Urban Visual Lab implemented in the E-Urbs project pushed the p2p 2.0 collaborative approaches even further. It allowed MA participants to develop collaborative and comparative projects using images of several cities (both European and non-European). The visual activities were focused on taking and collecting pictures that would illustrate the way in which different sociological concepts embody themselves differently across various cities. Participants were using visual tools to reach a deeper and richer un-
derstanding of urban societies and the respective metropolitan areas. Since the images produced were available in an open wiki-image-gallery, they were used not just by the Master participants, but also for teaching all over the world. Currently, in the E-Urbs MA the visual lab contains more than 9,000 pictures on more than 40 cities around the world uploaded by more than 100 MA and PhD students in Urban studies around the world and classified according to 9 main thematic issues relevant to urban studies.

The Repository

Inside OpenLoL, E-Urbs students had access to a digital repository where they could download most of their teaching materials. The peculiarity of this repository relied not so much on the instrument itself rather on the way in which we decided to use it, giving to each student the possibility to share his or her own resources, being those links, notes, pictures or draft papers. The Web 2.0 is not based on a major technological change, but much more on the way in which users make use of technology for collaboration. The repository is the digital place in which the concept “collaborative learning” became real, giving to the E-Urbs learning model a solid ground on which to base its collaborative memory.

FUTURE AND EMERGING TRENDS

As we have seen throughout the chapter, the results of integrating a blended learning approach with Web 2.0 features can be considered a viable model for experimenting and implementing new learning (and social) environments. Web 2.0 is changing the way in which information is constructed, (re)produced, distributed, consumed, allowing users to take advantage of the changing paradigms of the information society, in order to enhance the quality of the learning process. In synthesis, blended approaches improve substantially when integrated with a Web 2.0 perspective. This needs to be considered not just as an emerging trend, but a requirement for any future E-Learning development that has the ambition of being an innovative and effective means of education. The knowledge-based society has changed the way in which information is conveyed and learning agencies cannot simply avoid dealing with the issue.

Coherently, future trends in this domain will integrate electronic and paper based knowledge and between traditional and new paradigms of education. This will mean that most of the courses offered by Universities (or other learning agencies) are moving towards some form of blended 2.0 learning approach. Traditional face-to-face courses become each day more electronic dependent (assignments and research is done most of the time on the Web) as well as traditional online experiences need some physical attachment in order to be effective. So much differentiation is moving toward many variations of a single model in which physical presence remains fundamental but just if it is coupled with the e-means that allow students to navigate and process the fluidity of this new knowledge-based society.

As counter-intuitive as it may seem, the Web increased the number of flights instead of diminishing it, as virtual mobility has amplified physical mobility and computers (and printers) have boosted the amount of printed paper, the evolution of the Web 2.0 complexity and fluidity is calling for more structured and organised learning agencies that will have the responsibility not just of using, but also of educating people in dealing with the new information paradigms.

CONCLUSION

The main objective of the E-Urbs project was to contribute to the development of a higher education area in urban studies in Europe taking advantage of the use of virtual campus arrangements. The
E-Urbs learning model, which characterises the virtual campus we described in this chapter balances different strategic dimensions like the institutional, technical, pedagogical and content related ones into a flexible blended approach with new co-opetitive Web 2.0 learning paradigms built in. The outcomes of the complex and interrelated arrangements resulting from the monitoring processes reported in the last two sections are rewarding and consistent with our initial hypothesis: a balanced approach taking into consideration the relevant dimensions not only adequately addresses the challenges of distant and transnational teaching arrangements, but also fosters a strong sense of psychological community that also improves learning effectiveness by building a collaborative learning culture.

REFERENCES


ENDNOTES

1 The MA has been jointly organised with the following institutions: University of Urbino (Italy) (Coordination); Sako Musterd, Johan Post and Marco Bontje (University of Amsterdam, Netherlands); Marisol Garcia (University of Barcelona, Spain); Hartmut Haeussermann (Humboldt University at Berlin, Germany); Enzo Mingione and Giampaolo Nuvolati (University of Milan-Bicocca, Italy); Alan Murie and Rob Rowlands (University of Birmingham, United Kingdom); Hans Thor Andersen (University of Copenhagen, Denmark); Chris Kesteloot, (Catholic University of Leuven, Belgium); Grzegorz Weclawowicz (Polish Academy of Sciences, Poland). The arguments presented in this chapter are based on data gathered within the E-Urbs Master (www.e-urbs.net) and all partners are to be gratefully thanked for their support throughout the project.

2 The project was funded for 24 months (January 2006-2008) under grant agreement: 2005-3870/001-001ELE ELEB12E.

3 For the basic documents of the Bologna process, see: http://www.sociologiaidip.unimib.it/unimon/ Unimon is a European project aimed at monitoring the harmonisation processes of tertiary education in EU countries. For a critical perspective, see Amaral 2002.

4 Participants have been selected on the basis of an application procedure. Students had to include 2 recommendation letters, all relevant information on their previous studies, a statement on their knowledge of English and a motivation statement of why they wanted to embark on a Masters programme in comparative urban studies.

5 Mec Informatica is a software house based in Rome (www.mecinformatica.it), interested in the development of a LMS for online teaching and training activities. We had the opportunity to collaborate in the development of Land-of-Learning (LoL), building-in all features we considered relevant for a high level university online teaching. From 2008 onwards LoL will be made available as open source software.
The working group was headed by Alessandro Bogliolo from the Applied Informatics Department of the University of Urbino “Carlo Bo.”

For further information see www.landoearning.it

The software localisation was carried out in the languages spoken by the partner universities: Italian, Spanish, German, Danish, Dutch, Polish and French (English was already available at the project’s start).

A more detailed and careful description of all the tools used and the results obtained is to be found in Pigliapoco et al (2007).

For more information on the visual lab and its theoretical background see the following link: http://www.shakti.uniurb.it/eurex/visual_lab/visual_lab.htm
Chapter XV
Network Organisation to Improve Virtual Campus Management: Key Factors from a French Experience

François Fulconis
University of Avignon et des Pays de Vaucluse, France

Thierry Garrot
University of Nice Sophia Antipolis, France

ABSTRACT

In the restructuring and reforming of European education, e-learning has become one of the priorities of the Ministry of Education, Higher Education and Research in France. Since 2001, e-learning virtual campuses have been promoted by the state. Within the context of Economics and Management, the CANEGE project (CAmpus Numérique en Economie-GEstion) was created. Identified as a form of network organisation, this virtual campus will be explored in this chapter in relation to its functioning and its management. Through the academic literature covering network organisation, the main purpose of this chapter is to make recommendations and establish best practices regarding the management of e-learning virtual campuses based on the CANEGE experience. This chapter explores what the authors consider to be the most relevant aspects that need to be considered in relation to the establishment and implementation of virtual campus initiatives that comprise several partners.
INTRODUCTION

In the fields benefiting from Information and Communication Technology over the past few years, e-learning has been one of the most important for universities. With a variety of online didactic resources for different types of public, this learning method has progressively increased the number of degrees on offer. The variety of e-learning projects not only provides web-enhanced learning for current students but also provides solutions for adults who would like to obtain a degree without having enough time to attend tuition at a university (Lorenzo, 2006). In France, in 2000 and 2001, after two first calls for projects from the French Ministry of Education, Higher Education and Research, several universities decided to work together and create a virtual campus (Thibault, 2007). They proposed a five-year cycle of degrees in Economics and Management: modular, computer-based, flexible access, at distance, with ECTS (European Credit Transfer System) and capitalisation. These universities promoted learning favouring educational programmes adaptable to each individual, thanks to suitable didactic resources and teaching methods focused on learners’ specificities. They also developed training courses for both the administrative staff and the teachers involved in the project. Among successful projects, CANEGE – Campus Numérique en Economie-GEstion – is an original collaborative experience between several French institutions organised as a network (Grevet, 2005).

The CANEGE campus that offers fully online degrees, is based on a consortium contract which initially comprised six universities and the Centre National d’Enseignement à Distance (CNED). In 2004 it was recognised as an example of “best practice” by the e-learning programme in Higher Education “Virtual Models of European Universities” (PLS Ramboll Management, 2004), and described and presented as a network structure in a recent paper (Fulconis & Garrot, 2008). These two facts give the authors the opportunity to study the functioning and management of this virtual campus in detail using the theoretical framework on which network organisations are based (Jarillo, 1993; Miles & Snow, 1986; 1992; Powell, 1990; Thorelli, 1986). The CANEGE project, which was the basis for our study is outlined using an “HPAC” observation grid, whose main components are Heterogeneity, Partnership, Autonomy and Cohesion. The chapter will also provide a diagnosis of its functioning and then propose strategic and operational recommendations to improve the management of this consortium and, more widely, virtual campuses, as well as highlighting best practices. Finally, the chapter will consider the future of virtual campuses both within the French e-learning field and within the wider European context.

BACKGROUND

Like other examples of network structures, the CANEGE project goes beyond the notion of organisation borders. It resorts to approaches in terms of resource pooling, process management, partnerships and more widely of “extended firms” (Capraro & Baglin, 2003). Indeed, the participating universities and the CNED are mobilised with the aim of organising and coordinating the assets and competences necessary to carry out their common project of a virtual campus, offering on-line qualifying education in Economics and Management. If this digital campus has been subjected to research in Education Science from a socio-economic point of view (Grevet, 2005), it has not been studied as a network structure using the theoretical frameworks of Management Science. From an analytical point of view, it is undeniable that the research in Economics (Aoki, 1991; Piore & Sabel, 1989; Williamson, 1975) as well as in Sociology (Granovetter, 1985; Lazega, 1998; Thuderoz et al., 1999), contributes greatly to describing network structures. However, it
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does not provide much help with analysing their functioning in a much more operational context (Fréry, 1998; Fulconis & Paché, 2008; Paché & Paraponaris, 2006; Voisin et al., 2004). It is for this reason that the research into network structures carried out in the field of Management Science is used to understand the CANEGE project better.

Description of the CANEGE Project

In order to provide a description of the CANEGE project, we intend to make use of the “HPAC” observation grid whose main components are those of the organisation network concept, i.e., Heterogeneity, Partnership, Autonomy and Cohesion.

Heterogeneity

According to managerial literature, heterogeneity refers to two archetypes. The first corresponds to the very heterogeneity of a network structure as a whole, i.e., to the very varied forms it can take according to the way its members are structured (Fréry, 1997). For instance, one talks of centralised or decentralised networks (Assens, 1996; Butera, 1991). The second archetype is based on the variety of companies, which are part of the network structures. It can be expressed in terms of trade, activity, internal organisation, size, managerial practices, leadership, information systems, etc. In the CANEGE consortium heterogeneity is characterised by three aspects: the degrees offered by the universities involved, the nature and inter-relatedness of their activities and competences, and their geographical location (see Figure 1).

The CANEGE consortium was formed by five universities (Pierre Mendès-France Grenoble 2, Nancy 2, Nice-Sophia Antipolis, Paris Dauphine and Paris Sud) and the Institut d’Administration des Entreprises (IAE, Paris 1 Panthéon Sorbonne). To facilitate organisation, and to encourage students to get a degree, the partner universities made three subgroups. The universities of Grenoble 2, Nice-Sophia Antipolis and Paris Sud associated to create the DEUG Economics-Management (two-year university diploma). The universities of Nancy 2 and Paris Dauphine were in charge of the Maîtrise de Sciences de Gestion (Bachelor’s degree in Management Science). Finally, the universities of Nancy 2, Nice-Sophia Antipolis and the IAE of Paris 1 collaborated in offering the DESS Certificat d’Aptitude à l’Administration des Entreprises (Master’s degree in Business Management).

Regarding the nature and inter-relatedness of their activities and competences, right from the beginning, these six establishments created a partnership with the CNED which could contribute its long practical experience in distance education in terms of communication, logistics and diffusion. Thus, in the value chain, it added its commercial power to the educational services, with no risk of...
competing directly with the universities. As for geographical allocation, it plays a significant role as, even if the education programmes are online, they include a part in situ during the student integration week, or later during the exam period. It was then decided that a fair allocation of the students would be made in order to enable each establishment to develop its activity of e-learning. Afterwards, creating subgroups by degree resulted in a geographical division respecting the spheres of influence.

**Partnership**

According to the theory of dependence on resources (Pfeffer & Salancik, 1978) and the approach based on resources and competences (Grant, 1991; Wernerfelt, 1984), a company’s competitiveness relies on the accumulation, development and exploitation of resources, both inside and outside the company. In this sense, a network structure represents a way to acquire and exchange competences, allowing the partner firms to sustain their development. The latter not only try to conform to a system of constraints and opportunities characterising a competitive environment, but to modify it or even create and lay down new “game rules”. In the 1980s, Johnston and Lawrence (1988, p. 94) described network structures as a “value-added partnership”, i.e., “a group of independent companies working closely so as to manage flows of goods and services along a value chain”. So partnership refers to the coordination of legally autonomous organisations and covers all the cooperation links, whether they are formal or informal, likely to be established between two or several partner companies. The establishments involved in CANEGE turned towards two types of contracts. The first one, called a “consortium contract” and signed in 2001 between the six universities, was planned for a five-year duration renewable by tacit agreement. It set up the consortium and laid down how it would work. Three fields of activities were selected:

- Offering an education programme in Economics and Management which is modular, computer-based, flexible access, at distance, leading to a degree by qualification (ECTS) and capitalisation;
- Promoting teaching methods favouring a tailor-made education, i.e., better adapting educational content and form to the learner’s specificities (i.e., their objectives, their culture, their previous knowledge, their availability and their rhythm);
- Training both the administrative staff and the teachers involved in the project.

A second contract called a “partnership agreement” was signed in 2002 for a five-year duration renewable by mutual endorsement binding the six universities with the CNED. It sets out the administrative, technical and financial terms of the missions entrusted to the CNED by the consortium’s members. The CNED was in charge of five missions: (1) putting a specific computer platform at their disposal and carrying out its maintenance; (2) creating a reception website “Economics-Management” dedicated to the CANEGE structure; (3) providing logistics for the on-line reception, information, guidance, communication and management of learners in collaboration with the different parts of the consortium; (4) devising and implementing an Extranet with the partners, which is exclusively dedicated to the consortium’s internal coordination; and (5) co-producing teaching material (interactive online lessons, etc.).

The modes of coordination and organisation between the partners are very detailed. They are based on three committees laid down in the consortium contract. The first, the *Executive Committee*, is responsible for determining the main trends of the consortium policy; the second, the *Steering Committee*, carries out the project’s operational leadership; and the third, the *Scientific Committee*, gives its opinion on the content of the electronic resources available online.
Autonomy

Autonomy of partner companies according to Froehlicher (1996) covers: legal autonomy (a fundamental element for a network structure made up of legally autonomous companies to exist), financial autonomy (there are no financial links between these companies) and decision-making autonomy (corresponding to the extent of local decision-making power of each company and their capacity to decide on their management, internal organisation and the use of their resources). Håkansson (1989) emphasises the networking strategies and leads us to reconsidering the company as a “living organisation” interacting continuously with its environment. These structures require a wide range of essentially political processes by which the various actors try to find partners to reach their objectives.

Even if the State is perceived as an independent and overriding authority, the partners of CANEGE also had to deal with the relative autonomy of the different university components (UFR: Unité de Formation et de Recherche) and the personnel implicated in the project. Although a Department (UFR) receives almost all of its financial resources from its university, it nevertheless retains considerable pedagogic and decision-taking autonomy. In the same way a lecturer/researcher cannot be forced to participate in any institutional project once he has fulfilled his statutory obligations.

Cohesion

Cohesion is defined as the force enabling the company members of the structure to remain united around a common project. It is based on complying with a principle - the same willingness to remain and evolve together - and relies on a shared value system whose major preoccupation is the search for mutuality (Lazega, 1998; Thuderoz et al., 1999). The partners of the CANEGE consortium have defined a system value in order to create a common identity and to strengthen the mutuality that founded the project. To achieve this, they have relied on a whole range of tools such as a registered trademark, logo, website (http://www.canege.fr), distance learning platform, graphic layout for the learning resources, and a standard contract with the writers and co-producers.

At the same time, the Steering Committee has been working continuously towards reaching a consensus and harmonising approaches and solutions. They have rarely had to resort to voting. The committee works in a very friendly atmosphere where the fact that the members know and trust one another is of great importance and this has been possible thanks to continuous investment in the relationship. Pursuant to the consortium contract, the meetings of the Steering Committee take place each month for one day at least. They are completed by both working parties on themes linked specifically to the Steering Com-
mittee (business pattern, technical standards or pedagogic norms of delivery) and meetings between institutions to create teaching modules or implement degrees.

This search for mutuality and the determination to progress together have borne fruit in problem-solving. Pragmatism and effectiveness have guided the arbitrations and the solutions chosen. Aware of formalisation heaviness and administrative slowness, the partners have often given priority to actions over the respect of planning and processes *stricto sensu* (writers’ contracts, co-producers’ contracts, learning charter, etc.). Through this approach, even if the decision-taking processes have always been respected, the methods of assessment have been adapted to meet effectiveness requirements. Thereby, this approach, commonly accepted within the Steering Committee, has enabled the CANEGE consortium to offer three degrees in Economics and Management via the Internet since 2003.

**Methodological Framework**

**Qualitative Research and Case study**

Given the subject of our study, which endeavours to understand the functioning of the CANEGE campus better, we favour qualitative research. The standard method of research is the case study, as it is the most suitable strategy to understand how this digital campus is structured, and how it was set up and has worked since 2001. This case study method meets the three requirements emphasised by Yin (2002): (1) the research question is “How?”; (2) the researcher has little influence over events and the observed behaviours do not require checking; (3) the study deals with a contemporary phenomenon in its social context.

**Data Collection**

Concerning data collection, data from primary and secondary sources were favoured. Primary data was collected by conducting 32 face-to-face interviews with representatives of both the various entity members of the consortium and the three constituent committees: 15 course-writers (present or future), 5 administrative staff involved in the pedagogic-administrative follow-up of the courses, 4 members of the Steering Committee, 4 representatives of CANEGE within their university and 4 Heads of Department (*UFR*). These interviews enabled us to collect observation data about the origin of this project, its implementation, the difficulties faced, the reorganisation carried out and the main results achieved. These semi-directive interviews used an interview guide elaborated from the “HPAC” observation grid previously mentioned. This grid is based on the study of network structures from a strategic management angle and considered as a vector of competitiveness, i.e., as an organisational answer to the search for the factors of efficiency and effectiveness.

It is from this point of view that, in theoretical terms, the concepts of competitiveness and of network structures have been related to develop the concept of “network structure vector of competitiveness” (Fulconis, 2004). This concept was developed in three stages: determining its main dimensions, then determining its basic components, and finally, converting these components into indicators. In terms of consistency, a review of managerial literature brings to light four main dimensions of the “network structures vector of competitiveness”: structural consistency (constituting the network structure), external consistency (coordinating inter-company activities), internal consistency (combining the partner companies’ independence and interdependence) and the value system consistency (looking for mutuality and maintaining the companies together around a common project). According to a deductive logic, each of these dimensions was associated to a “basic component”: Heterogeneity, Partnership, Autonomy and Cohesion. These components are described by means of indicators in order to trans-
late the concept of “network structures vector of competitiveness” into directly observable terms. They appear in the “HPAC” observation grid.

As for the secondary source data, they were collected from people involved in the CANEGE project. They consist mostly of documents used for the creation of the consortium (consortium contract, partnership agreement with the CNED, writers’ and co-producers’ contracts ...), the minutes of the Steering Committee’s monthly (then three-monthly) meetings, and the minutes of the Executive Committee’s meetings (once a year). As for external secondary source data, they were extracted from web-sites and university libraries.

Data Analysis

The qualitative analysis of empirical data was carried out by coding, based on a thematic analysis of the content of the interviews and the aforementioned documents, using the established methods (Ghiglione & Blanchet, 1991; Mourguès, 2002; Thiétart & Coll., 2006). These analyses were made during the data collection period (summaries of interviews and documents), and then adjusted after this period. This approach was applied to understand better how the CANEGE consortium functions. It relies on combining the concept of network structures introduced earlier and the concept of dynamic competitiveness expressed in terms of operational and strategic potential (see Table 1). It enables us to expound managerial recommendations and best practices for virtual campuses. All the results achieved were validated later by the members, experts on the project.

HOW CANEGE PROVIDED BEST PRACTICES FOR VIRTUAL CAMPUSES?

While the French government decided from 2003 to stop financing French virtual campuses and thus not to support the development of CANEGE any more, leaving it in the hands of the partners, the European Union started supporting the development of virtual campuses promoting the pooling of best practices. Faced with this paradoxical situation, we tried to answer the following question: how could we grasp the functioning of this consortium so as to improve its management? To achieve this, we will present the elements of diagnosis and managerial recommendations regarding the strategic and operational dimensions of the concept of competitiveness (see Table 1).

Indeed, by linking up the concepts of “network structure” and of “competitiveness”, we were able to observe how heterogeneity, partnership, autonomy and cohesion could strengthen the functioning of virtual campuses.

Issues, Controversies, Problems

Strategic Analysis

The CANEGE launching phase resulted from an ambitious project initiated by the State. Both the decision, which was at the same time original,
innovative and unifying, to create a French digital university in Economics and Management and its conditions of implementation, and notably the temporal aspect, led the establishments to accept and even to give priority to heterogeneity. The three objectives described in the consortium contract clearly reveal a project going beyond mere e-learning since the aim was to bring about radical changes within universities, at a pedagogic as well as organisational level. Putting things into perspective, the question of sufficient heterogeneity is then raised: are all the partners who are necessary for the project to succeed involved? Are the agents, vectors of change within establishments, notably in political terms, involved enough in the project?

These issues refer to the deep-seated motivation of the partners. Were they looking for funding with an attractive project corresponding to the Ministries’ expectations or had they a project of their own different from that of the contractors? This question must be raised, seven years after the setting-up phase, even if it is difficult to give a clear-cut answer. Indeed, even the State has largely softened its strategic position. After backing the digital campuses for three years, it decided in 2004 to launch two other calls for projects. The first was to create the UNR – Regional Digital University (improvement of services, availability and generalisation of digital tools for students). The second to create the UNT – Thematic Digital University (pooling of digital resources free of copyright into a database). The backer sent a strong signal: digital campuses will not benefit from public funding any more. Simultaneously, the minutes of the Executive Committee clearly indicated that the members were gradually losing their motivation. At the same time, other long-term missions were not, or only partly, being carried through. A CANEGE representative from one university underlined that “training the employees in the project identity or resorting to the Scientific Committee had not been of major concern since 2004”.

During the phases of development and of maturity of CANEGE, the notions of internal consistency (autonomy) and of value system consistency (cohesion) enabled us to grasp the network dynamics of the actors. The autonomy of the institutions involved in the consortium was visible in 2003 and 2004, when every establishment negotiated their educational institution contract with the French Ministry of Higher Education and Research. It consisted, for each university, of defining an education offer in keeping with the new European system of university degrees (BMD/ECTS), and many of them chose a differentiation strategy. The minutes of the Steering Committee show that before the introduction of the new system only one final year of a Bachelor’s degree was offered by the CANEGE partners, whereas, afterwards, each of the university members of CANEGE created a separate programme. Thus, by opting for this strategic orientation independently of the CANEGE project, did not the universities, themselves, upset the balance of degree offers and so undermine the very existence of this project? Most of the members of the Steering Committee did not take part in defining these new offers. At the same time, given the projects undertaken by their establishments and the signals sent by the Ministry about digital campuses, the university vice-chancellors did not develop a common policy to protect the CANEGE education offer. Thereby, eighty percent of this offer had to be reconfigured, each establishment having to rebuild specific programmes. The Steering Committee’s members often have to manage with these constraints: a direct consequence of imposed university autonomy.

Already in 2003 the IAE of Paris I Panthéon Sorbonne had suspended their activities with CANEGE followed, in 2005, by the University Pierre Mendès-France Grenoble 2. Both of them had chosen this solution as their educational strategy or their priority strategic target ran counter to the consortium project. Such radical strategic changes question the pertinence of the
continued membership of these two institutions in the CANEGE project with regard to their own general policy. Nevertheless, thanks to the contract form chosen, the strong identity, the value system consistent with the working and decision-making methods as well as the Steering Committee members’ commitment, the project was maintained. Besides, CANEGE has been recognised in the European e-learning world as a “best practice” experience (PLS Ramboll Management, 2004) and so can be used as an example, i.e., an innovative approach that has been tested. Thus, one can be reasonably confident about the success of implementing the same kind of new approaches and processes elsewhere.

Operational Analysis

It emerges from the content analysis that heterogeneity has enabled partners to offer a full education programme in Economics and Management up to the end of the first year of the Masters degree programme, and a fifth-year non-specialised degree (DESS CAAE), with very little delay. By resorting to both designers of varied and high-level lessons and exchanging available and trained tutors, the consortium was able to improve the pedagogic and scientific level of its degree offer. The coordination of their activities has been facilitated by the backbone role played by the Steering Committee. By focusing on a customised education project, the partners have extended their traditional recruitment area. However, regarding the number of students expected, recruitment has remained well below the forecasts. According to Grevet (2007, p. 5), “CANEGE, responding to a ministerial call for projects in 2001, tabled on 1,820 students for 2003-2004, a year in which about 200 students were registered” and since then numbers have never exceeded 400 students. The project aimed at a wide and not very diversified public, whereas experience has shown that the people concerned consisted of small groups with very specific demands (employees in vocational retraining, people looking for dual skills, disabled people, etc.).

From a financial point of view, the consortium contract designates the University of Paris Dauphine as the administrative backing establishment of the CANEGE project. It is the recipient of the subsidies and is in charge of distributing them between the member establishments according to the particular following condition: “5% is kept by the backing establishment to carry out coordination operations”. It is disconcerting to note the gap between the initial enthusiasm of the partners to launch and develop CANEGE by pooling resources and the limited financial support allotted to the post of coordination. Thus, is this publicly displayed attitude between the partners genuine or does the partnership mask more opportunist behaviour? This question is reinforced by the fact that the coordination of tasks has been essentially carried out thanks to mutual adaptation and by giving priority only to interpersonal communication medium, such as e-mail correspondence, without any real integration of e-documents. The initially planned extranet has remained at an embryonic stage. According to one Steering Committee member: “Extranet does exist, but it is of very marginal value because it isn’t used for lack of organisation and the documents are not updated regularly”.

Still, from an operational point of view, a detailed analysis of the autonomy highlights that besides an institutional autonomy of the partners, CANEGE has had to deal with the autonomy of the university Departments concerned and often with the autonomy of the individuals involved (teachers, course writers, contractual multimedia providers). For example, Department heads have refused to register CANEGE students because their administrative staff had to set up a specific registration procedure for too small a number of students. Moreover, the agreement of a Department didn’t systematically imply the agreement of course-writer teachers. In fact, reports of interviews with course-writers showed that: (1)
the relationship between the amount of work and the expected remuneration dissuaded them from taking part; (2) others preferred to leave their work group before producing any documents because of operational difficulties; (3) for those who contributed, if some respected scrupulously the schedule concerning the framework for interactive lessons, others simply supplied digitalised versions of paper documents. As for the contractual multimedia providers, some took advantage of their situation (for example by refusing to supply the source for the interactive lessons) slowing down and even compromising the continuation of the CANEGE project.

Nevertheless, it seems that the level of concordance with the Steering Committee’s values has had a positive effect on the level of quality of the results. In spite of the various modes of expression of autonomy, this functioning, strengthening mutuality, has enabled the establishments to develop about fifty learning resources. Moreover, here cohesion has played a significant role to maintain and manage the project efficiently. Cohesion also appears as essential regarding the role of broker played by the Steering Committee. A member of the Steering Committee declared when referring to this that “often faced with a culture and with administrative or accounting rules slowing down both the cooperative approach and the project, the coordination of the committee’s members enabled them to solve many problems by promoting solutions found by an establishment with other partners and went thus beyond the traditional resistance.”

Recommendations and Best Practices

Strategic Dimension

The strategic dimension has turned out to be particularly important in the experience shared by the CANEGE project partners. Concerning the effects of heterogeneity and partnership in the long run, managerial literature (Miles & Snow, 1986; Snow et al., 1992) insists on the necessity of having a clear and stimulating project. The phase preceding the virtual campus constitution is thus critical. Even though it has not been neglected in the case studied, it should probably be more detailed and openly discussed between the partners. Among the essential points, we emphasise the necessity of cooperation: is it the most suitable structure for the project? The positioning of each partner along the value chain turns out to be critical: are there competition or threats between the partners? After having clearly and undeniably solved these questions, the question of the exhaustiveness of the competences necessary to carry through the project has to be raised: what are the competences brought by each partner? Do they meet all the needs? Particularly when the actors of the project try to obtain external financing, the deadlines to submit applications and the other administrative constraints should not restrict this stage.

The first recommendation that can be made to those designing virtual campuses involving several partners is: (1) to define a clear and stimulating project with both the aims and the public clearly specified; (2) to allow each interested institution to contribute to the value of the project and (3) to check that all the necessary skills really exist and are available from the partners involved. Concerning the CANEGE experience, for instance, it seems to be difficult in the public sector to undertake radical pedagogic changes without a strong political commitment at both top university and State level.

A second lesson can be learnt from the CANEGE experience. It emphasises the need for training specific to the project in a long-term perspective. There seem to be two key aspects: on the one hand, a common representation of the societal and environmental constraints which hamper the actors and on the other hand, a consensus about the objectives of the project and about its usefulness for the partners. From the moment that there are questions about extending
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the initial duration or about adjusting objectives, it is necessary to widen the scope of the data shared for the project. If the partnership aims at developing a true capacity to adapt and generate change, the actors will have to integrate strategic information in the shared system. So, when the ambition is to make virtual campuses last, cultural elements become important. In a multicultural context, Etzioni (2000) suggests constituting a “common culture”. In this sense, he emphasises the idea that any social life is certainly based on the State’s authority and the market system, but also on standards, moral rules, emotional and solidarity bonds, i.e., on a “common culture” where collective values would be very important as they would play a role of integration. Thus – a second recommendation – when partners want to build an effective and perennial collaboration, it necessitates both resorting to training to consolidate the project identity and clearly defining the long term vision.

If the two recommendations already mentioned are indispensable for the launch and development of the project, they are not enough to guarantee its survival in the long term. Autonomy and cohesion are also required to strengthen the links between each of the partners and the project. A high degree of concordance must exist between the university’s general policy and the e-learning project, and this will have to be clearly shown, not only over a limited period of time and for a given public, but on a longer term basis. The question is then how the university considers e-learning in its general policy and what is the common denominator with the virtual campus? This issue is particularly important in the case of CANEGE today, when Grevet (2005) wonders about the sustainability of the structure and when even the partners have difficulty considering a future for this virtual campus. This situation enables a third recommendation to be proposed to manage this type of network structure in virtual campus projects: autonomy is effective as long as there is, constantly, a common denominator between the objectives of the project and the general policy of each partner particularly in the e-learning field. For example, some partners of CANEGE have put the project in the hands of their already existing pedagogic development workgroups in order to take advantage of this experience gained elsewhere.

To conclude with these aspects of strategy, it should be noted that, paradoxically, if a strong identity and the actors’ commitment are factors of success in the emerging phases of the partnership, they can turn out to be restraints in the long run. Too much cohesion can prevent the individuals involved from having a clear vision of the project evolution and can lead to organisational paralysis. Insofar as the circle of partners does not change and the active people (i.e., the members of the Steering Committee) remain unchanged, the initial project cannot be in accordance with its own needs. These observations incite the partners to consider various types of formalisation of the partnership links: contractual and close links when the project is clearly defined; conventional and general links to develop collaboration in the long run. Of course, one does not have to choose exclusively one kind of partnership or the other. They can be associated and thus allow greater flexibility in the organisation. Faced with this reality, two examples of best practice of the CANEGE experience can be retained and a fourth recommendation made. Cohesion can be maintained thanks to a strong identity and a commitment of the Steering Committee members. Likewise, the contract must be flexible enough to adapt to changes in the network composition. As a consequence, the member institutions of a virtual campus will, as time passes, adjust their relationships according to their implication in the projects (signature of a general agreement, renewal of teams, etc.).
Operational Dimension

In order to reinforce the recommendations made regarding the strategic dimension and to concretise them on a day-to-day basis, operational suggestions will now be developed.

The study of the consortium shows that, if heterogeneity and partnership have made the CANEGE project possible, from an operational point of view, the real identity of the target public could have been clarified. The virtual campus studied has mainly focused on students and continuing education trainees, i.e., on those who provide financial resources. Even if this target has been refined, the issue of competition between universities has remained unresolved for the institutions involved. For example, the Steering Committee decided, after experiencing difficulties during the first years regarding the distribution of the student intake between the universities, that this task should be given to the CNED, its associated partner. A solution might be perhaps to direct the offer of shared services towards other publics for whom partners would not be in competition. From this point of view, the example of the European project eLene-TT is interesting as it is focused on the training of teachers:

The driving idea behind eLene-TT is to improve the ability of Higher Education teachers to make pedagogic use of ICT, through the development of a Virtual Learning Resource Centre providing guidelines and resources for both teacher trainers and teachers themselves and through student-driven teacher training actions, pooling and testing tools and approaches developed by each of the partners in the wider European context. (retrieved June 18, 2008, from http://www.elene-tt.net/project/htm)

From all this, a first operational recommendation would be: to determine the characteristics of the target public precisely. For better efficiency, it is absolutely necessary to define the potential users accurately in order to choose suitable partners (associations representing the disabled, French-speaking people abroad, or staff of government institutions).

In order to set up and, afterwards, to maintain the virtual campus it would seem that the role of the inter-organisational information system, in the creation of collective storage, is central. If its implementation is essential, facilitating the collection, checking, circulation and distribution of the operational information, and training its users remains critical. In numerous virtual campuses, there is no assessment of the university staff level of knowledge either from a technical point of view (the use of tools) or as regards their organisational understanding (how information is organised, what the risk involved is in pooling, exchanging or losing information, etc.). At a time when Computer Science diplomas, such as C2i (Certificat de Compétences en Informatique), are becoming widespread in Higher education, it is surprising that all the people involved in virtual campuses do not necessarily have recognised skills in this field.

Thus a second recommendation for designers of virtual campuses would be to take particular care in developing an inter-organisational information system able to create an organisational memory. It would facilitate the collection, checking, circulation and distribution of the operational information necessary to carry out the project. At the same time the skills, especially the computer skills, of the staff involved in the project would be evaluated and developed.

If in the strategic dimension it appeared essential to maintain explicit links between the project and the institutions, in the operational sphere, on the other hand, the CANEGE partners marked their autonomy by trying to impose their own administrative and financial ways of working on the rest of the consortium. Cohesion by accepting common rules thus seems primordial in order to find the most effective solutions for managing the project. This fact underlines the importance
of assessing the impact of the project on the various partners’ functioning. The questions would then be: (1) is it enough if an institution has only a describable intersection in common with the projects it develops in partnership (accounting and financial rules, communication interface tools, etc.)?; (2) are there other essential elements they must have in common (types of contracts with course-writers and with contractual providers, bonus system for administrative staff, remuneration of teaching activities, etc.)?; (3) are there indicators which have an impact on the autonomy of the partners and the cohesion of the project, following the example of Pareto’s law or the ABC analysis, for instance? The large amount of time given by the Steering Committee to trying to resolve this type of question confirms the rules should have been strengthened in the case of the CANEGE.

A third recommendation would be to study the impact of the project on the autonomy of both the institutions and the people concerned. Anticipating the changes produced by the project on the functioning of the institutions and the people involved would improve the effectiveness of the chosen solutions.

Still, concerning the materialisation of autonomy and cohesion in the short run, the quality of interpersonal relations appears as essential in the CANEGE experience. If these aspects have not been made truly explicit, the experience of corporate networks allows us to identify best practice and imagine improvements. Hence, the CANEGE case points to three courses of action: (1) planning the time devoted to interpersonal exchanges; (2) asserting the key role of the project manager undertaken by the Steering Committee and its representative and (3) from the beginning, the relations between partners sustained by the pursuit of interpersonal confidence. Indeed, considered as essential for the future of their common project, it lays the foundations for the same shared ethics of functioning requiring all partners to be honest, to listen, to share, to exchange and to respect each other. In order to improve the quality of interpersonal exchanges, a final recommendation can be made: during the life of the project ensure a high level of interpersonal relationship, within the Steering Committee as well as with each individual involved in the project. In order to do that, entrepreneurial management literature (Butera, 1991; Grima, 1999) advises recruiting people whose role is to nurture good relations between the project participants.

**FUTURE RESEARCH**

The strategic and operational recommendations already made open up many possibilities for future research. In this last section the CANEGE project is reviewed in the light of the three following questions: (1) can one confirm, today, that the initial aims of the project have been achieved?; (2) how is this project, which was so original from its inception, now regarded in the field of e-learning in France?; and lastly, (3) faced with the development of virtual campuses in general, what is the place occupied by CANEGE?

Regarding the aims stated at the outset by the CANEGE designers, it has to be admitted that it has only partly achieved its objectives. At the moment, diplomas of both Bachelor and Masters level are on offer but students still cannot obtain a complete five-year course, with distance e-learning, in Economics and Management. No possibility exists for students to enrol for the final year of the Masters after completing the first four with e-learning. If the partners have managed to design courses to offer new Bachelor’s degrees, they have not found a consensus for creating new course material for the final Master’s year. As for the promotion of teaching methods favouring tailor-made education, they do exist within the virtual campus but they are only developed by a very small number of teachers. However, it should be noted that, in the French university system, these methods are not at all considered
favourably. Lastly, some positive effects can be observed, notably that most of those who have acquired experience with CANEGE are now actively implicated in the development of e-learning in their own universities.

In the French context of e-learning, the CANEGE project now appears as a digression conceived at the height of the Internet bubble. This virtual campus foresees the mobilisation of a new public, a campus strong in numbers and rich in innovative and imaginative services. In reality, even though the public exists, it is small compared to the total number of students. Moreover, as we have shown, the declared pedagogic choices complicated the working, increased the cost of investments and lead the initial partners to close this educational system to potential partners. At the same time other universities have opted for solutions which are simple (posting of textbooks), less ambitious (digitalisation and distribution of paper documents) and, above all, less costly. They have taken a share of the e-learning market by mixing traditional methods with digitalised tools. As a result, the CANEGE project is not at all well-known today in the French university circle in Economics and Management.

As we saw in the study by Grevet (2005), the future of CANEGE is uncertain for three main reasons: (1) the number of students involved and the success rate were smaller than expected; (2) the close cooperation between institutions seemed to decrease over time and (3) the pooling of digital pedagogic resources existed almost exclusively between the authors and tutors of the same establishment. Nevertheless, CANEGE still exists in 2008, so justifying the attribution, made by PLS Ramboll Management, in 2004, of its qualification as an example of “best practice”. Moreover, it has served as a basis for people in charge of e-learning projects, and especially AUNEGE7 (Association des Universités Numériques en Économie-GEstion). Created in 2005, AUNEGE aims at federating all the French universities in the field of Economics and Management by pooling and making use of ICT tools in the French Higher Education System. Other interesting European examples should be noted, like the eLene network8. The partners share the same approach, the same image and the same culture and only the partners interested in a given project are involved.

CONCLUSION

The CANEGE project, which started in 2001 in France, is in a restructuring phase of the current reform of the European Higher Education System. Even if most of the efforts made by European Higher Education Institutions are focused on the improvement of European degree compatibility and the increase in student exchanges, the number of virtual campuses involving partnerships of several universities is increasing steadily (Thibault, 2007). Within this context, the CANEGE project is an original organisational structure of virtual campuses. Clearly identified as being like a network organisation, the connection between virtual campus initiatives and the managerial literature about networks opens up a vast and interesting field. This link, which was explored in this chapter may help readers to reinforce their own knowledge about the functioning of virtual campuses, and to highlight both the strengths and weaknesses in the strategic and operational aspects of management. Even with this chapter being limited to the CANEGE case study, it does nevertheless enable one to grasp the pertinence of the network structure and its implementation in a given context. Key elements from the investigation of the CANEGE project that are relevant to other virtual campus project experiences are provided, and recommendations and best practices are identified for coordinators and managers of e-learning initiatives or institutions that are attempting to establish a virtual campus with several partners.
ACKNOWLEDGMENT

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REFERENCES


Network Organisation to Improve Virtual Campus Management


ENDNOTES

1 Virtual campus in Economy and Management: http://www.canege.org.


3 See Appendix Figure 1 Observation grid HPAC.

4 For further details please see Appendix Figure 2 Organisational basis of the CANEGE consortium, three committees (Contract of the CANEGE consortium 18/10/2001).

5 These contracts allow the institutions to obtain financial means for their policy and are established for four years. They cover all the activities of the institutions and comprise a constituent called *Techniques de l’Information et de la Communication appliquée à l’Enseignement (TICE)* which deals with digital campuses.

6 For further details, see http://www.elene-tt.net/.


8 For further details, see http://www.eLene-centre.net/.
Figure 1. Observation grid HPAC (adapted from Fulconis, 2004)
An **Executive Committee**, made up of six vice chancellors and of the chief education officer of the CNED or of their representatives, is vested with wide-ranging powers to determine and plan out the major trends of the consortium policy. It is presided over by one of its members, elected for one year renewable once. The chairman convenes the members, sets the agenda and writes the report of the meetings.

The Executive Committee appoints both the members of the **Steering Committee** (3 members per institution including a project manager) and the **Project Manager of the Steering Committee** for a one-year renewable term. The function of this committee is notably to manage production, to implement logistics and to coordinate the pedagogical monitoring of the consortium’s activities. It meets once a month in ordinary session in person, by video-conference or by audio-conference. It coordinates the financial and legal aspects and settles the conflicts that are not part of the Executive Committee’s competences. It puts out calls for tender within the consortium, adjudicates on their compliance with the models of authorized degrees and assigns the resource design. It can resort to working parties that are linked to it. Their members and their manager are appointed by the Steering Committee for an indeterminate period. Moreover, the Steering Committee writes an annual report, which must be approved by the Executive Committee during its annual ordinary session. The Project Manager of the Steering Committee uses all the means he has to convene the members to the sessions and gives them the agenda at least 7 days in advance. He presides over the sessions and writes the minutes of the session, which will be co-signed by every member present. More generally, he carries out all the tasks necessary for the smooth functioning of the Steering Committee. Each of the members of the committee has one vote during the meetings. The decisions pass with a simple majority, excepted in some situations requiring a qualified majority.

Finally, a **Scientific Committee** is created. It has an advisory role and it gives its scientific opinion on the contents of the electronic resources developed by the consortium on the basis of the Specifications and of a partial model available online.
Chapter XVI
Developing and Managing an Effective Virtual Campus: The eLab Experience in the Swiss Higher Education Context

Luca Botturi
eLab – eLearning Lab USI-SUPSI, Switzerland

Lorenzo Cantoni
eLab – eLearning Lab USI-SUPSI, Switzerland

Benedetto Lepori
eLab – eLearning Lab USI-SUPSI, Switzerland

Stefano Tardini
eLab – eLearning Lab USI-SUPSI, Switzerland

ABSTRACT
This chapter presents a successful Swiss experience in developing and effectively managing virtual campus projects: eLab, the eLearning Laboratory of the University of Lugano and the University of Applied Sciences of Italian Switzerland. eLab activities are presented at two distinct moments in time. We first describe the context of e-learning in Swiss higher education institutions, focusing in particular on the Swiss Virtual Campus programme. During that programme, eLab emerged as one of the best performing e-learning support centres in Switzerland, thanks to three main elements: the establishment of a clear prototype-based design and development model, the definition of quality control procedures, and the implementation of a consistent and institution-wide online learning environment. After the end of the programme, eLab had to switch from a project-oriented laboratory towards a service unit. The general strategy that drove this change and the concrete tools and practices that made it possible are presented in this chapter.

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INTRODUCTION

eLab is the e-learning Laboratory of the University of Lugano (USI: Università della Svizzera italiana) and the University of Applied Sciences of Southern Switzerland (SUPSI: Scuola Universitaria Professionale della Svizzera Italiana), two higher education institutions of Ticino, the Italian speaking part of Switzerland.

eLab is one of the Support and Production Centres (CCSP) that were founded in Swiss Higher Education Institutions (HEI) thanks to an initiative of the Swiss Virtual Campus (SVC), a national programme launched by the Swiss University Conference in 1999. The programme aimed at “promoting innovative Information and Communication Technology (ICT) based e-learning at Swiss Universities at a high level of quality that is commensurate with that provided at the top international institutions in the field” (SVC, n. d.). The three main goals of the SVC were:

- To improve the quality of student learning processes and strengthen interactive teaching by broadening university teaching into a range of available courses for both on-campus and corresponding students;
- To strengthen collaboration between universities;
- To develop high-quality teaching materials and methods.

The SVC funded 108 projects and 10 ad hoc mandates. It was discontinued in 2008, leaving an important inheritance in most Swiss universities. As operative units, the SVC promoted the institution of CCSP. The overall context of this chapter are the activities of the SVC, which was indeed the most influential initiative to promote and establish e-learning experiences throughout the Swiss higher education landscape at large. The first two sections will provide background information on this and introduce the eLab. In this chapter we present the successful case of one of the e-learning support centres, namely the eLab. Although eLab is the CCSP of two of the youngest and smallest Swiss higher education institutions (HEI), during the SVC programme it proved to be one of the best performing centres in the country, thanks to three main strategic elements: (a) the establishment of a clear prototype-based design and development model; (b) the definition of quality control procedures; and (c) the implementation of a consistent and institution-wide online learning environment.

After the end of the SVC programme, eLab had to tackle a new challenge: switching from a project-oriented laboratory towards a service unit, providing ongoing support to the established educational technologies initiatives in its home institutions. This implied getting to be sustainable after the end of the SVC financial support. The general strategy that drove this change is presented later in this chapter. It was – and still is – an attempt to create an effective virtual campus among USI and SUPSI, throughout their five seats, based on the experience eLab had previously gained in managing and supporting SVC projects.

E-LEARNING IN SWISS HIGHER EDUCATION INSTITUTIONS

Although a small country, Switzerland hosts a rich and diverse higher education landscape, including ten cantonal universities, two Federal Institutes of Technology and seven Universities of Applied Sciences focused on professional education and applied research (Lepori, 2007). The development of e-learning in Swiss HEI went through a rather slow start, before rocketing up from the end of the 1990s thanks to the launch of the SVC (Swiss University Conference, 1996, 1997 & 2003). In its first phase, or impulse phase, run from 1999 to 2003, the SVC financed a rather small number of large consortia among Swiss HEI to develop high-quality teaching materials for online education. The underlying rationale was that these courses
could be shared by most Swiss HEI, especially in domains with large numbers of students, improving the educational performance of subjects taught in overcrowded classes and achieving significant scale effects. Some of these projects played a relevant exploratory role, achieving high quality and international awards. However, the expectation of having distance courses in Swiss HEI proved not to be realistic. Most projects actually developed materials and applications to support classroom teaching, for self-study or for complex tasks as simulations. At the organisational level, these largely stand-alone projects, integrating content specialists, pedagogical experts and their own technical personnel, proved to be too expensive and too difficult to be sustainable (Gertsch et al., 2004; Lepori & Succi, 2003 & 2004).

Thus, the focus of the SVC switched from distance learning towards the enhancement of face-to-face education and the introduction of new pedagogical approaches, such as learning by doing. The main paradigm chosen for the SVC second phase, or consolidation phase, was blended learning. This phase which ran from 2004-2007, still largely determines the current landscape of e-learning in Swiss HEI. This was combined with the goal of having a high number of small projects (Swiss Rector’s Conference, 2002). The centrepiece of this second phase was the establishment of a Centre of Support and Production (CCSP) for e-learning in each HEI, which would provide technical and pedagogical competences, sustaining the academic personnel in the design and development of contents.

This policy has been quite successful. The final evaluation of the programme showed that most of the Swiss HEIs had a CCSP at the end of 2007, even if large differences emerged between institutions (Lepori & Probst, 2008). Thus, in a number of institutions, including most of the largest ones, the established units have found a stable organisational position and actually serve as a reference point for a large share of teachers. For example, a large share of courses are hosted by the Learning Management System (LMS) offered by the CCSPs. However, CCSP in other institutions, including many Universities of Applied Sciences, are still in a development phase and face a rather uncertain future with the end of federal support.

What are the elements for this success? Usually, these centres benefit from a clear strategy at the university level, including explicit sponsoring by the presidents. At the organisational level we can distinguish between two different models for the establishment of CCSPs:

- Individual centres that gather in a single unit the interdisciplinary competences needed for e-learning projects and activities. In some cases, these centres also have delegates or ambassadors in departments and faculties to allow for better integration;
- Network centres, where the CCSP is composed by multiple coordinated units, for example an educational centre and the informatics services. This model better answers to the needs of decentralised institutions like most Universities of Applied Sciences, or where different centres existed already before the establishment of the CCSP.

A look at the services offered by CCSPs shows a clear picture: with very few exceptions, CCSPs focus on offering basic services and consultancy to a wide audience of teachers, instead of developing products for a few selected curricula. Through the two SVC phases, CCSPs made the transition from a technology and product-based approach to an approach oriented to the enhancement of classroom education even with simple services. For example, a number of CCSPs offer basic consultancy about an instructionally sound use of Microsoft PowerPoint. In more detail, the main services of CCSPs include:

- Dissemination of e-learning, including workshops, courses and consultancy, on both
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instructional and technological domains;
• Maintenance of institution-wide Learning Management System (LMS), with Moodle being the most common choice;
• Management and advice on technical devices and media production;
• Management of internal calls for proposals for small-scale projects, and support to accepted ones;
• Maintenance of the SVC-funded projects, which were all concluded in the first half of 2008.

In 2006, the Swiss Conference of Rectors announced the end of the SVC programme in 2008, and that no further funding would be available in the future. This was explained by the focusing on other priorities, but also with the wish that HEI would start considering e-learning as a regular part of their own current activities and educational strategy. In July 2008 the Swiss National CCSP Assembly was founded, which gathers the e-learning competence centres of all Swiss HEI with the aim of establishing cooperation and exchange opportunities at a national and international level.

eLAB: ORIGIN, MISSION AND VISION

The regulations for the second phase of the SVC programme required HEI to establish a CCSP. eLab was born as an answer to this request in January 2004 by an agreement between two units of USI and SUPSI. The mission of eLab is to promote the development of e-learning applications at USI and SUPSI in the first instance, and then in the Italian speaking part of Switzerland at large.

eLab’s approach to e-learning relies strongly on the history of so-called technologies of the word (Ong, 2002). As a matter of fact, education has always integrated every new available technology of the word in a rich and creative way, in order to maintain, increase and transmit knowledge. Take handwriting in Medieval universities: the word lectio, meaning lesson or lecture refers to teachers dictating important texts so that students could write them. In such a historical perspective, the use of new information and communication technologies (ICTs) in education – e-learning – is extremely new if we consider the available technologies and the opportunities they offer to enrich the learning experience. At the same time, however, it is completely traditional if we consider the opportunity and willingness universities have to integrate technologies into their practices in order to “do their job better”.

eLab staff see e-learning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration” (CEC, 2001, p. 2). This is indeed a very broad definition, which encompasses three layers: (a) e-learning as the use of ICTs in education and training; (b) e-learning as online education and training; and (c) e-learning as the capacity for transforming education and training through the use of ICTs (Cantoni & Tardini, 2006). Such a comprehensive approach turned out to be successful: eLab has soon become one of the best performing CCSP, at least if measured by its ability of getting SVC-funded projects, by the marks received in the annual monitoring by the SVC committee and by the extent of use of its LMS.

In its activity of supporting all USI and SUPSI SVC projects, eLab was in charge of providing instructional design services and support for the technical development of digital content. eLab set up an interdisciplinary staff resource composed of instructional designers, developers, one graphic designer and one expert in legal issues. In this way, the necessary skills and competences have been guaranteed to all projects. The activities of the eLab team were aligned with three major strategic elements, which proved to successfully
implement its vision and approach: a prototype based design and development model, lightweight but ongoing quality control, and the set-up of a consistent institution-wide online learning environment.

**eLAB FAST-PROTOTYPING APPROACH TO E-LEARNING DESIGN**

The first strategic element for eLab is its design and development model. eLab staff were aware that the key to success of most projects is a positive collaboration among an interdisciplinary team composed by people from different institutions. Therefore, eLab needed a model that put communication first, and developed a well-shaped and sound prototype-based design and development model. This model sees fast prototyping as a communication catalyst, i.e., a tool “to enhance discussion in the team in a focused way by concentrating on facts and results and not on theories or prejudices about learning technologies. Enhanced and focused communication fosters the development of a mutual understanding among the different professionals involved in the project and the creation of trust – two important conditions for a successful development” (Botturi et al., 2007b, p. 274).

eLab’s fast prototyping model is composed of two cycles: (a) the inner or product cycle and (b) the outer or process cycle (see Figure 1).

It is important to emphasise that the key elements are embedded in a scenario, a narrative and semi-formal description of the instruction, which sets some parameters, such as target students, the blend of face-to-face and distance learning activities, and so on. The scenario is an informal definition of the instructional and technical requirements for the project. Its development is indeed an opportunity to bring together all the ideas of team members and to generate a shared vision.

The scenario is the starting point for the product cycle, which starts with the development of a prototype of the product that fits the scenario. By prototype we mean structured courseware, with real content, already implemented as if it were to be used in a real setting. A prototype usually includes only a part of the content, or leaves out some features, but the main point is that it is

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**Figure 1. eLab fast prototyping model for e-learning design (Botturi et al., 2007b, p. 275)**
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actually usable in the scenario. The prototype is indeed the second focal point that brings together the team: beyond their personal views and ideas, they need to decide on the quality of a concrete product.

The project team then internally evaluates the prototype following the quality control process, and leads to potential revisions both in the prototype and in the scenario. The evaluation makes project members move one step further in the development of a shared understanding. Developing the scenario, they merely described a wish-situation; now, the prototype has helped them evaluate single features (e.g., navigation structures, exercise feedback, etc.) and make decisions. The prototype is then revised according to the evaluation’s results, and a decision is made as to whether it is ready for real testing; if it is, the process moves onto the process cycle.

The process cycle is basically a field test, constantly monitored. When it is over, the final evaluation of the process cycle follows three steps: (a) the delivery of a standard questionnaire to the students, which measures satisfaction, learning and transfer (the first three levels in Kirkpatrick model; see Kirkpatrick, 1998); (b) the analysis of the students’ performance in the course exam or assessment; and (c) a focus group that collects feedback from the instructors. According to the new inputs provided by the evaluation process, the project team can decide to make revisions and perform another test, to conclude the implementation and produce the final courseware, or – if the real situation proved to be very different from the scenario – to even switch back for another product cycle (Botturi et al., 2007b, p. 274-276).

Thanks to this approach, eLab has been able to manage the quick start of many projects at the same time, and also – through the cross-review of prototypes – to share ideas and solutions. The effect of this approach as communication catalyst is also visible, as it allowed the creation of effective teams with a clear focus on development, rather than on theoretical or ideological views of e-learning.

eLAB’S METHODOLOGY FOR QUALITY EVALUATION

Quality control is a key issue for all virtual campus implementations. Are projects delivering what they planned? Are they achieving the desired effects? For eLab, this issue was strictly connected to the fast-prototyping design and development model. The real issue are actually resources: quality management and control has costs – often huge ones – and project budgets often do not allow extended quality measurement processes. For this reason, eLab has developed a lightweight method for making e-learning quality evaluation a feasible and sustainable daily practice (Botturi et al., 2007a), and to share the idea of quality control among all team members, including content experts from other departments and units.

The method focuses on three elements:

- Quality of e-learning tools and learning materials as a “perfect product”, resulting in the evaluation of the technical quality, i.e., of the usability of digital learning materials and of the online environment;
- Quality of the e-learning service as “exceptional service”, resulting in the evaluation of the integration, i.e., to what extent and how e-learning activities are deployed within the framework of a single course, completely online or blended learning;
- Summative evaluation, i.e., the ex-post evaluation of a course at the end of its life-cycle.

The methodology follows three steps: (a) prototype evaluation, (b) process evaluation, and (c) summative evaluation, as shown in Figure 2. The three steps are closely related to each other but have different goals and exploit different instruments. Details can be found in (Botturi et al., 2007a). These steps also refer to different stages in the design and development process: the prototype evaluation refers to the product
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Prototype evaluation aims at improving the technical and usability features of all digital resources developed in the project. The prototype evaluation starts when the prototype is finalised. It consists of two activities performed by an evaluator: a technical inspection that controls a list of features, and an expert review performed following a list of specific scenarios and tasks.

Process Evaluation was designed to provide feedback on the actual practices of students during their learning experience and to assess satisfaction and learning. Unlike the prototype evaluation, this step does not evaluate a specific online resource or learning product, but a whole course as a learning experience. The evaluation starts before the course starts with the description of the course scenario. Right before the end of the course students are surveyed with a standard online questionnaire built around Kirkpatrick’s (1998) first three dimensions: reactions, learning and (some hints as to) perceived transfer potential. Once the course is ended, the instructional designer interviews the instructor(s), in order to understand what has happened during the course, what did the instructor do, whether the course has met their and students’ expectations or not, and so on. All this information is put together with the course grades and a standard analysis of log files in the final evaluation report, which is then discussed with the project team. Figure 3 sketches the activity plan for the process evaluation.

Process evaluation can be repeated more than once, in different test phases, thus providing incremental results.

Summative Evaluation summarises all the evaluation activities carried out so far with a final picture of the overall quality of the project. The results of this step are useful mainly in order to present the outcomes to important stakeholders — such as the financing body, which can sometimes be responsible for a continuation of the project itself. In the summative evaluation, the final test phase of the project is monitored through the same activities as in the process evaluation. Its results are then compared with those from previous process evaluations into a final report targeted to external reviewers (Botturi et al., 2007a)

eLab is a small unit with several projects that were concurrently under development. Time and cost effectiveness was therefore a crucial criterion, much more than exhaustiveness: the choice was made for a continued monitoring of the projects resulting in a set of limited but comparable data, rather than for sporadic, more complete, but non-comparable observations. In this way, quality could become a habit, with techniques that can be improved, refined or expanded when necessary.
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eCOURSES

The third key strategic element, after the design model and the quality control process, was the development of a consistent and institution-wide LMS. Having a unique – or at least controlled – technological environment is indeed a precondition for long-term sustainability and for efficient management of resources.

Before the creation of eLab, USI and SUPSI already had a year-long experience in blended-learning courses and in funded e-learning projects with some commercial LMS, namely WebCT and BlackBoard. These two LMS yet served only a very limited number of courses of early-adopter instructors: the largest part of courses simply distributed electronic documents through shared folders on the universities’ intranets. Also, from experiences in other academic institutions and from the literature, eLab staff were aware of the danger of having “lone ranger” professors setting up their own technological infrastructure for online activities.

In the process of creating common services for USI and SUPSI, a central LMS had therefore to be chosen. The choice was made for an Open Source (OS) solution: Moodle.

Choosing an LMS

The perceived benefits that pushed eLab toward an OS solution are threefold, and concern (a) costs; (b) infrastructure; and (c) tailoring and integration. One of the main issues with commercial LMS is indeed funding. USI and SUPSI were skeptical about the real return of a potential huge investment for a commercial LMS for three main reasons:

• Before the transition to e-learning, the actual use of the LMS was unpredictable, since instructors and students did not have established practices in using online tools;
• The uncertainties of the market and the rapid and often earthshaking developments of the e-learning world made the commitment to a single vendor risky;
• It was a one-shot situation: in the case of failure, the cost would have made almost impossible to try out another solution.

Moving to an OS solution mitigated these issues: even a failure would have had reduced impact on the overall budget, and would not have prevented moving to another OS or even commercial solution later. But how much does an OS software cost? Actually, one of the major hidden costs of OS software is the need of infrastructure (hardware and network connection) and of in-house workforce for set up and maintenance. However, USI and SUPSI, like most universities, already had a dedicated IT staff and infrastructure, virtually making these issues irrelevant. Moreover, the hardware demands of OS software are usually significantly lower than those of commercial software.

Finally, a LMS potentially affects the core of the academic activity, teaching and learning. It has to be integrated into an organic system of class scheduling, enrollments, assessments, quality evaluations, network accounting, etc. The main advantage of an OS solution is the possibility to tailor the application to institutional needs, so to integrate it seamlessly into the existing procedures and systems. Once it was decided to look for an OS solution, a review and selection process started: the selection ended with the identification of Moodle as the main eLab platform (Botturi, 2004).

Tailoring Moodle to the Universities Needs

Selecting a technology is not enough to make a consistent e-learning environment, in which the academic staff would “feel at home”. Indeed, Moodle had to be adapted and integrated in
order to fit the needs of USI and SUPSI, and to be communicated to the users. This happened through three steps: integration, customisation, and enhancements.

Integration

Integrations are modifications to the application that are aimed at making it a functional part of the bigger system. In the case of Moodle, the main challenge was to try not to make it an additional problem for the users who received yet another username and password. In the first instance, the issue was solved by creating a small module that allowed the authentication in Moodle through the email account, which was the only common information present at all USI and SUPSI seats. Afterwards, the authentication system was changed and integrated into AAI (Authentication and Authorisation Infrastructure), a common system developed at the Swiss national level in order to allow single sign-on Web access across Swiss universities, thus simplifying inter-organisational access to Web resources (SWITCH, n. d.).

Customisation

Customisations are modifications to the application that adapt it to the preferences and practices of the users. Moodle was introduced at USI and SUPSI as a platform called eCourses, with its own URL (http://corsi.elearninglab.org), logo and look-and feel (see Figure 4).

Enhancement

Enhancements are new features. In the context of an European project, some new modules for Moodle were developed: we mention here GISMO (Graphical Interactive Student MOnitoring tool), a module that generates relevant visualisations of student tracking data logged by Moodle. These visualisations are useful to get a synthetic overview of online activities, and proved to be effective especially for tracking completely online modules (see Figure 5) (Botturi et al., 2006). Furthermore, other tools have been added to Moodle, such as Turnitin, a suite of learning tools that includes a tool for plagiarism prevention, and Mindmeister, a tool for collaborative online mind mapping.

Promotion and Communication

After selecting the technology and preparing it for the specific institutional environment, eCourses had to be communicated and promoted within its target community, namely professors, instructors and students. As a matter of fact, innovations do
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not automatically spread in the contexts where they are supposed to be adopted, but need to be adequately promoted and communicated (Rogers, 1995): e-learning makes no exception. In order to ease the adoption process of the platform in the involved universities, two main activities were undertaken:

- Workshops on the use of Moodle for all instructors and teaching assistants of USI and SUPSI. The workshops dealt with both technical and pedagogical issues concerning the use of Moodle. In addition, an online module about the basic features of the LMS was developed and put online, available to all the eCourses users;
- One-to-one assistance with ad hoc modules was offered for teachers who could not take part in the workshops and requested it. This happened as a clinic-by-phone call service, and through the presence of eLab staff at the different departments of USI and SUPSI on a weekly basis.

Monitoring and Evaluation of eCourses

A different and service-oriented aspect of quality control included monitoring the actual use and effectiveness of eCourses. Also, observing the use of a tool is a way to learn more about the population eLab is intended to serve. Monitoring happens in two ways: by means of a survey aimed at measuring users’ satisfaction with the LMS, and by means of an analysis of the logfiles of the LMS.

Starting in 2005, surveys were carried out once a year, usually at the end of either the Winter or Summer Semester. Surveys are conducted by means of online questionnaires, designed in Italian and English to accommodate the international population. The results have always been encouraging. In the last survey (conducted in February 2007), the general satisfaction was very high: 93% of 120 teachers and 82.4% of 239 students who responded to the questionnaire declared to...
be enough, much or very much satisfied with eCourses. Concerning the use, the answers show that eCourses was mainly used as a distribution tool for didactical materials (slides, handouts, etc.). Among the other tools offered by the platform, it is worth noticing that the use of lessons, assignments, forums and diaries has increased over the years. It is also worth noticing that several students expressed their strong wish that all USI and SUPSI teachers use the platform. As for the impact eCourses had on teaching activities, 50% of respondents declared they had noticed positive didactical changes; nobody experienced negative changes. The improvement of interactions with students, the variety and completeness of courses, the possibility of working from different places and students’ autonomy have been indicated as the most relevant positive aspects of this change.

After Summer Semester 2007 eLab started the analysis of logfiles, which will be replicated yearly. The goal of the analysis is monitoring how the LMS has been actually used by students and teachers. At the end of Summer Semester 2007, 1,368 courses were hosted on eCourses. However, about 27% of them had no users enrolled as students and/or no access by the course’s instructor(s), reducing the number of active courses to about 1000. Generally speaking, the analysis showed that the use of eCourses and of its functionalities strongly varies in the different faculties of USI and departments of SUPSI: for instance, in some faculties and departments eCourses is used by almost all the instructors and students, while in others it has still reached only a few adopters; furthermore, some faculties and departments have started using different functionalities offered by Moodle, while in others the use of eCourses is still limited to the delivery and sharing of online learning resources, as it has also been showed by the results of the survey. Such information is useful in order to plan and refine eLab services and training programmes.

eLAB AS A SUSTAINABLE SERVICE

While e-learning can start as a “lone ranger” effort (Bates, 1999), and continue as projects, it eventually develops into an institutional strategy (Bullen & Janes, 2007), changing the practices at the very core of educational institutions: teaching and learning. This of course means a change in the roles and positions of dedicated units within an organisation.

The strategy outlined, based on its design model, quality control and consistent e-learning environment, achieved good results during the SVC programme, and granted national and international visibility. Moreover, its experience, the tools developed and the services offered, have made eLab necessary to USI and SUPSI. For this reason, in January 2008 the two universities decided to integrate the eLab into their core structure, making it a joint service unit. After the discontinuation of the SVC and of its funding, eLab had to find its own future, and that decision guaranteed its stability, along with interesting prospects to the development of e-learning at USI and SUPSI. The manpower of eLab staffing has been slightly scaled down, but it has been made stable, safeguarding its peculiar and effective blend of skills and competencies.

The main risk connected to the transition from a project-based unit to a service-oriented one is the possible slowdown in the innovative drive. eLab tries to overcome this risk by maintaining a very strong link with the two units from which it was formed: the NewMinE Lab, a university lab deeply involved in basic research in the e-learning field, and the SUPSI Department of Innovative Technologies (DTI), oriented towards applied research in the technological domain. As a matter of fact, most eLab people are collaborating in research projects or in teaching activities at either NewMinE Lab or DTI. This integration is also interesting from the perspective of eLab collaborators, since they can to some extent get
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attractive jobs with both a service and research component.

Furthermore, eLab is continuously searching for new projects, either participating in public national or international calls or through specific agreements with single partners, such as private companies, associations, other educational institutions, etc. For example, in January 2008 eLab has started a collaboration with a Swiss bank, in order to introduce e-learning activities in its learning practices. In addition to the “traditional” solution of an LMS, where different courses are made available, eLab is developing resources available through other devices, in particular using PSP (PlayStation Portable): the basic concepts and some self-evaluation quizzes of a course about basic banking are condensed in short animations or interactive presentations accessible through a PSP.

Also, eLab is collaborating with the Technology Enhanced Communication Lab of USI, in the development of a completely online programme in Technology Enhanced Communication for Cultural Heritage. The programme, offered within the Faculty of Communication Sciences, is targeted at “practitioners and/or graduates in the heritage field who wish to advance their career, to develop a specialisation, or to redirect their professional orientation” (Tec-CH, n. d.). The programme started with a pre-opening offer in Spring 2008. Offering a complete online programme could seem to be against the trend of the Swiss context of e-learning in HEI, as the SVC experience has showed; however, in eLab’s vision, this kind of offer – high-quality curricula in niche fields where Switzerland has an important international reputation, targeted at international top-level professionals – could be a solution for expanding the Swiss market of e-learning.

To sum up, four main points – strictly related to one another – have been relevant in eLab’s experience to guarantee its sustainability:

- A deep link with research, through the collaboration of eLab staff in research projects led by other USI and SUPSI research units;
- A continuous effort towards innovation: every semester, eLab proposes to USI and SUPSI one new service, such as a new tool (e.g., the aforementioned Turnitin) or a new workshop (e.g., workshops on psychological issues in e-learning);
- A strong commitment to self-financing: in 2008 30% of the whole eLab’s budget has been obtained through external funds coming from specific mandates of single partners;
- Finally, the cooperation strategy between the two regional HEI – USI and SUPSI, which allows eLab to achieve a sufficient critical mass despite the small size of the two institutions (having about 2,000 students each).

FUTURE TRENDS

The establishment of such a virtual campus has modified the learning cultures of teachers and students at USI and SUPSI, including e-learning as a part of it. This still needs to be strengthened and improved, working in both breadth and width. On the one hand, the use of eCourses has reached almost the total population – but not yet all. On the other, its use can be improved and adapted to the different organisational and instructional situations within the institutions.

The first step in this direction is the promotion of a more aware and advanced use of the tools that are available to the community, providing support for better integration into the teaching and learning practices. Concretely, some actions have been planned to promote this awareness in instructors and teaching assistants:
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• New workshops will be offered in addition to those on the use of Moodle, concerning in particular psychological and pedagogical issues in e-learning: Instructional Design, Online tutoring, Multimedia learning, Computer-Supported Collaborative Learning will be some of the topics that will be presented in these new workshops;

• Personalised continuous assistance during one whole semester will be offered to selected teachers of different faculties (USI) and departments (SUPSI), in order to help them design better the online activities and resources of their courses, in a kind of “personal eLearning clinic”.

Related to this first step, a revision and refinement of the quality methodology will be performed, in order to have a more comprehensive framework where also the activities of monitoring and evaluation of eCourses are integrated.

Furthermore, new tools are continuously being monitored and tested as possible integrations to teaching and learning practices: for instance, Web 2.0 tools and resources, such as blogs, wikis, 3D virtual worlds, folksonomies, and others, are being experimented as teaching tools (Kemp & Livingstone, 2006); in this field, special attention is paid to Open Educational Resources (OER), which were defined by UNESCO in 2002 as “the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for noncommercial purposes” (UNESCO, n. d.; Johnstone, 2005). The possible use of videogames in learning and teaching is also under continuous investigation, as the aforementioned pilot project with PSP in collaboration with a Swiss bank shows (Gee, 2003; Gibson et al., 2006; Van Eck, 2006).

A further step will be to promote e-learning application specifically targeted to some educational strategies and needs of USI and SUPSI. This might include, for instance, specific services for curricula devoted to part-time workers (one of the core businesses of SUPSI), modules for students who did not pass exams, as well as integrating courses to fill in gaps in previous education (e.g., to access Master courses). To this purpose, eLab will be required to cooperate much more closely with educational departments at the level of design of educational offerings, beyond addressing the needs at the level of individual courses.

CONCLUSION

In this chapter the eLab’s experience has been presented as a successful case of the development and management of a – relatively small – virtual campus. The success achieved by eLab is based on four main strategic elements developed thanks also to the support of the SVC programme:

• The fast prototyping approach, which put communication in the foreground. This allowed eLab to support many e-learning projects simultaneously, thus gaining an important experience in the development of e-learning experiences and in the management of the corresponding e-learning teams;

• A lightweight methodology for evaluating the quality of the e-learning projects, which guaranteed a sustainable control of quality for all the projects with a sensible management of resources;

• The set up of a consistent and institution-wide online teaching and learning environment, achieved through the adoption of Moodle and the consequent adaptation, management and promotion of eCourses. This provided a common platform for the creation of a joint virtual campus between USI and SUPSI, hosting the different courses offered by the two institutions;

• The strong integration of eLab in institutional strategies of USI and SUPSI and close
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communication with the directions of both institutions, ensuring that eLab services are in line with institutions’ strategies overall.

Some steps are still required for eLab in order to improve the quality of teaching and learning at USI and SUPSI. However, the establishment and correct balance of the four aforementioned elements was key to the actual creation of a stable virtual campus, and it was so far entrenched in the educational activities of USI and SUPSI that they were considered to be essential. But the core element that allowed this is the presence of a collaborative interdisciplinary staff, dedicated to the mission of the eLab and focused on innovation.

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ENDNOTE

1 In the 3rd SVC call, USI and SUPSI received funds for 8 projects out of the 32 funded. In the 4th call the success of the two universities was even greater: 10 projects funded out of a total of 27.
ABSTRACT

In three projects funded by the European Commission (EC), European and Latin-American project partners have developed, improved, and successfully tested an e-learning business model for the exchange of e-learning courses. Typically, high-quality e-learning is expensive and many ambitious e-learning projects have been discontinued after the end of the funding period. The mission of the three EC projects was to ameliorate this problem by creating an organisational model for exchanging e-learning courses with limited resources. The design of this model rests on two pillars: firstly the re-use of existing resources and secondly the sharing of resources in an international network. Each university in the consortium develops one e-learning course, which is based on an existing course and teaching materials. This is then provided, including teaching, to the students of the partner institutions. In return, each partner university receives two or more courses on a non-fee basis. After the end of the project, eduGI, the project partners have continued with the model, exchanging e-learning courses without the need for further funding and with even lower costs and higher benefits than providing the courses as regular face-to-face classes. Although this business model was developed by institutions specifically in the context of Geoinformatics, the exact field is irrelevant; teachers and decision makers of all scientific fields can apply this business model.
INTRODUCTION

The Institute for Geoinformatics (IFGI) at the University of Münster began exploring e-learning five years ago by attending educational conferences and listening to presentations of many e-learning initiatives which, at this time, were funded largely by European and national programmes. Interestingly, while much success was reported in papers and conference presentations, discussions afterwards revealed many obstacles (Brox et al., 2006). Therefore, along with success stories from e-learning projects, the hurdles to be overcome need also to be considered in the design and introduction of e-learning at the Institute for Geoinformatics. Major concerns and considerations for introducing e-learning at an institute are:

- e-learning initiatives with substantial funding often disappear as soon as the backing has dried up (Boezerooy & Gorissen, 2004). Projects receiving funding from the European Commission’s programmes very rarely turned into sustainable initiatives (Salajan, 2007).

- Due to the problem of the importance of funding it is even more important to consider costs: “e-learning production by universities will be accompanied with a relative high investment in ICT infrastructure and digital applications, as well as in methodological issues (course designs, didactic materials, etc.) and labour adjustments at the university level” (Castillo-Merino & Sjoberg, 2008).

- How high the expense for an e-learning course is directly related to the quality of that course; it is obvious that the development of interactive teaching materials cost more than simply providing online text. Costs are saved, however, since e-learning material often does not require teachers; e-learning, especially in the training sector, is often designed for self-learning. For example, a cost comparison of Caterpillar University’s instructor-led courses versus e-learning courses reveals a cost savings of 40–78% (Wallicker, 2005). It is therefore important for each institute interested in using e-learning to analyse its requirements weigh the costs and benefits in regards to expense versus quality.

- Is e-learning better than face-to-face instruction? Empirical studies support both answers: “campus students tend to perform better compared to online students” as well as “online students perform significantly better compared to their peers who take the campus version of the same course” (Lundberg et al., 2008). There is also tendency for pure online-learning to blended learning (Simonis, 2004). Each institute has to make a strategic decision where to place itself in the spectrum from traditional classroom learning to a purely virtual university (Seufert, 2001).

- Each institute has to decide what it wants or can do on own resources. Among commercial e-learning vendors, there is a trend towards outsourcing; alliances among vendors of complementary technologies or services are an increasingly common business strategy (Barron, 2002). There is no reason why educational institutions should not consider alliances and networks among universities as well.

In summary, an institute needs to develop a consistent business model for setting up an e-learning environment as well as for assuring mid-to-long-term sustainability. According to the holistic business model by Hoppe and Breitner, three interdependent partial models have to be designed and defined (2004):

- Activity model: defines the activities of the business (manufacturing, marketing, after sales and support activities);
• **Asset model**: includes costs and revenues;
• **Market model**: defines the various actors, their roles and the market structures, considering the supply side as well as the demand side.

When IFGI was starting its e-learning initiative five years ago, the institute faced two key questions:

• Can IFGI afford e-learning?
• Does e-learning help improving the quality of the study programmes?

In relation to the first question, high-quality e-learning includes several significant cost factors including setting up an e-learning platform, retraining teachers to learn and apply new didactical concepts, and developing new types of teaching materials. After considering these costs, IFGI determined that it could not afford to set up an e-learning environment with only its own resources.

The second question addresses whether e-learning could improve the quality of education. With IFGI being an institute with only full-time students, the typical e-learning argument that “learning whenever and wherever” is less important than in other cases where students cannot attend classes full-time, e.g., in training programmes for professionals, with students from other cultures, regions or countries, or when groups are excluded from being a full-time student due to familial, cultural and socio-economic constraints (Khokar, 2007). So what is e-learning good for in an institute where teaching part-time students is not an issue? The answer for IFGI was that e-learning is a very good solution for providing *additional* courses to advanced students. Being a small institute with few teachers, it is hard to cover all topics that are relevant for geoinformatics students. For example, the New University of Lisbon has experts and courses in “Geospatial Data Mining,” a highly innovative topic in the field of geoinformatics although one not offered at IFGI despite being highly recommended for advanced students. The goal of introducing e-learning was to import additional courses that could not be offered by its own resources through *virtual mobility*.

The next section will explore the background of the project activities, starting with organisational considerations for the introduction of e-learning into an organisation within the context of the three EC projects. Secondly, the design of the business model for the exchange of e-learning courses will be described, basing on the re-use of existing resources and sharing resources within an international network. After this, the next section will describe the results of the three EC projects, emphasising both positive as well as less positive experiences. Next, the IFGI course in “Project management in GI projects” will be used as a case study for a detailed cost-benefit analysis. The section “e-learning versus blended learning” will then discuss how IFGI has decided this issue. Finally, the key results will be summarised and final conclusions provided looking at future work.

**BACKGROUND**

**Is E-Learning Right for your Organisation?**

To answer this question, Anderson (2002) reveals the “five Cs” of successful e-learning programmes: culture, content, capability, cost, and clients. However, Brox et al., (2006) found that the “five Cs” can be reduced to just one: cost. Just how that reduction is realised is presented as follows:

**Culture**

A study on “Virtual Models of European Universities” reveals that the current organisational structures of the universities rather seem to
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impede ICT (Information and Communications Technology) integration and e-learning in many EU universities (Ramboll, 2004). One of the key obstacles towards implementation for universities is the lack of a culture supportive of e-learning within the university. Without a receptive institutional culture, an innovative institution interested in introducing e-learning will face high costs. The experience at IFGI has shown that the process for gathering the required know-how in organisational, technical, didactical and e-learning content issues are very time-consuming. The Institute for Geoinformatics had no immediate connection to existing resources at the university. This requires an experimental phase, which may result in costly mistakes.

Content

The paradigm change from monolithic geospatial information systems (GIS) to interoperable geospatial information (GI) services also has an effect on GI Science education. The content of up-to-date curricula needs to be extended by additional learning topics, e.g., legal and business aspects regarding geographic data (Frank & Raubal, 2001). This results in the need for providing a wide range of required educational topics that are difficult to cover with the resources of single GI institution. In addition, “new GI products, services and ideas are appearing at a rate beyond any one individual’s ability to keep track” and “a significant percentage of GI knowledge, particularly as it relates to the technology, becomes outdated within less than 6 months” (Heywood & Kemp, 1997). Consequently, keeping course materials up-to-date leads to high costs, which is one of the key problems of many e-learning initiatives at the end of a project, and at the end of the funding period. Therefore, it is very unlikely that one institute alone is capable of maintaining a set of e-learning courses at the same time—cost requirements can only be handled within a network.

Capability

In many cases, a single institution interested in establishing an e-learning environment are without the required ICT resources (Ramboll, 2004). Not having the background infrastructure of a university, a single GI institute will hardly have the financial resources to establish an e-learning environment of its own. Commercial e-learning environments are expensive, at least for small institutions, and while open source solutions do exist, they often do not fulfil the quality criteria or are also costly to establish and maintain, especially due to turnover of employees.

Clients

Many e-learning arrangements can be considered as “one-way streets”; despite the potential, e-learning is often just a digital variation of analogue media techniques (Geißler et al., 2004), that does not fully exploit the opportunity for interactive learning processes. Therefore, in many e-learning environments, the users’ acceptance and gratification from e-learning is low and this is traditionally one of the reasons for the trend towards blended learning. Unfortunately, technical improvements alone will not increase the acceptance of an e-learning environment. Key success factors are motivation and didactical design (Zambach et al., 2004). In addition, there is not just one didactical model that fits all students. There is a challenge for “new learner-centred ways to offer students a wide choice of learning tools and a high degree of freedom to adapt the tools to their individual learning style” (Jungclaus et al., 2004). The elaboration of high-quality didactical concepts and the development of interactive learning tools (instead of the mere provision of PDF files or PowerPoint slides) are not only difficult, but also cost-intensive.

Due to significant costs on different levels, a single GI institution will not be able to establish a high-level e-learning environment. There is
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clearly a need to develop new business models that enable the development, provision, and maintenance of e-learning courses using only limited resources. This can only be achieved by re-use and sharing of resources with several partners. Clearly, then “it is crucial to foment European educational projects. They can establish partnerships, coordination of resources and actions in the GI sector, as well as improve the effectiveness of public resources” (Wachowicz et al., 2005).

Project context

European and Latin-American partners developed the business model for the exchange of e-learning courses step by step within three EC projects. The first project was called eduGI.LA (Network for GI Science Education - Latin-America - ALFA programme, www.eduGI.net/eduGI.LA, 2003-2004). Seven Latin-American and European partners cooperated in this project: Technical Institute of Toluca, Mexico; National Institute for Space Research (INPE), Sao José, Brazil; Federal University of Pernambuco, Recife, Brazil; University of Concepción, Chile; University Jaume I, Castellón, Spain; ISEGI-New University of Lisbon, Portugal; and IFGI, University of Münster, Germany. The objectives were to set up an organisational framework for cooperation in GIScience education as well as to perform mobility measures of students and teachers. The partners agreed on a common e-learning environment and developed a prototype for the exchange of e-learning courses.

In the follow-up project, eduGI.LA2 (ALFA programme, www.eduGI.net/eduGI.LA2, 2004 - 2007), the consortium focused again on e-learning, developing and exchanging eight complete e-learning courses according to the business model. An improved version of the business model has been employed in the third project: eduGI (eLearning programme, www.eduGI.net/eduGI, 2005-2007). Eight European partners cooperated in this project: ISEGI, New University of Lisbon, Portugal; International Institute for GI Science and Earth Observation (ITC), Enschede, The Netherlands; University of West Hungary; BW University Munich, Germany; Harokopio University, Greece; Technical University of Vienna, Austria; and Uppsala University, Sweden. Altogether, the project partners developed 16 e-learning courses, at 3 ECTS (European Credit Transfer System) points each, all taught in English language. All courses were targeted to advanced students in the field of geoinformatics (Masters level, age mostly between 23 and 28 years). Teaching materials were published on the project’s Websites.

BUSINESS MODEL DESIGN

Institutions interested in introducing e-learning into their teaching face the paradox of balancing the costs of quality with the need to keep expenditures low. The challenge is to create a business model that establishes an e-learning environment that is sustainable given resources. Success is based on “concentrating on core competencies, pursuing the right target group, finding suitable revenue models, and then designing the appropriate product” (Hoppe & Breitner, 2004). The ideas for augmenting the three reported EC projects are two-fold. First, the observation was that many elements of an e-learning environment already existed: e-learning platforms, digital teaching materials, course concepts, etc. Furthermore, previous initiatives, e.g., UNIGIS (www.unigis.org), GITTA (www.gitta.info) in the field of geographic information, had already started networked approaches for sharing resources. Therefore, the business model is based on these two pillars:

- Re-using existing resources;
- Sharing resources in an international network.
Re-Using Existing Resources

On the technical level, existing resources are numerous. Many e-learning platforms are available both commercially and through open-source platforms. In these three EC projects, the partners used a commercial platform with very few additional costs as the partner New University of Lisbon was already using this software. Even without this established connection to a commercial e-learning solution, it is not that difficult to find cheap solutions. Within the EC projects, three other partners could have offered access to free e-learning platforms—University of Münster, INPE, and Uppsala University. Additionally, there is also the option of using open-source solutions such as Moodle.

The most valuable resources are those that already exist internally in terms of know-how, course concepts, and course materials. Within the EC projects, the available internal resources differed widely. For example, the ISEGI-New University of Lisbon was running an online Masters programme which included a course called Geospatial Data Mining. The only effort required to make this course interoperable with the other partner universities in this situation was the translation of course materials to English and an update to course materials. On the other hand, the course in Project Management in GI Projects by the Institute for Geoinformatics, had only ever existed as a regular face-to-face course. Nevertheless, the basic resources for developing a project management e-learning course were there: know-how, the concept of the course, teaching materials, exams, students’ tasks etc. If combined with the business model of sharing resources, the internal resources and know-how are perhaps the most valuable assets.

Sharing Resources in an International Network

Many online teaching materials already exist and are publicly accessible. For example, there are two large projects in Germany and USA, “GI-Multimedia for a New Interdisciplinary Course of Studies” and the “NCGIA Core Curriculum”:

GI-Multimedia for a New Interdisciplinary Course of Studies

The project consortium consists of nine interdisciplinary German partners, including the University of Münster, whose mission it is to introduce multimedia to geoinformatics courses (www.geoinformation.net). Components developed for this project include:

- Fourteen teaching units, i.e., lectures. Each teacher can individually compose generic slides;
- Project environment for the provision of geodata and geo-services. This environment also facilitates the design and execution of ongoing projects;
- GeoCafé for communication and learning interaction.

NCGIA Core Curriculum

The NCGIA Core Curriculum in GI Science (http://www.ncgia.ucsb.edu/giscc) is a working document, composed of over 150 units organised as lecture notes and supporting material, all available free of charge. These materials are meant to provide fundamental course content assistance for educators to be adapted by each instructor. In this case, there is no comprehensive textbook for students, nor materials designed to be used for distance learning. The teaching units focus on four branches:

- Fundamental geographic concepts for GIS;
- Implementing geographic concepts in GIS;
- Geographic information technology in society;
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• Application areas and case studies.

E-learning approaches such as the NCGIA Core Curriculum assume that putting teaching materials onto the Internet for public use is beneficial. However, the experiences at the Institute for Geoinformatics have been different; adapting external materials for one’s own course is not much easier than developing a course “from scratch”. More importantly, trying to develop a course in a new topic the teachers are not familiar with still requires much effort since the teachers are not familiar with the subject. Updating is another major challenge since, especially in the IT sector, knowledge can be outdated within months. Clearly, updating course content in a scientific field that a teacher is not familiar with is impossible. Therefore, the idea in the EC projects was to “import” additional courses from institutions with experts in the desired fields.

It follows that available teaching materials cannot by themselves make a course, especially when the teacher is not an expert in this specific topic. It is however rather easy to develop an e-learning course for a topic where one is an expert in. Therefore, the eduGI project approach is for each partner university to provide an e-learning course in a topic of his/her core competence, with each partner then receiving two e-learning courses in topics that others are experts in.

Key Features of the Business Model

Based on the two-pillar approach of re-using existing resources and sharing resources in an international network, a business model for cooperation was developed with the following key features:

• The consortium agrees on an exchange of e-learning courses on a non-fee basis;
• Each partner provides a single e-learning course, in return getting access to two or more of the partners’ courses;
• Each course is based on an existing class and on available teaching materials, so that the materials only have to be adapted to the requirements of e-learning;
• Each partner chooses a course topic in which he/she is an expert, which reduces development time and increases quality;
• Each partner provides a complete course including teaching. This is one of the key ideas of the business model. Ideally, the receiving partner requires no more effort than sending a list of participating students and then getting back a list with students’ grades after the course is finished;
• All courses are recognised by the receiving partners as part of their respective regular study programmes – no difference is made between physically present guest teacher and virtually present e-learning teacher at a partner institution;
• The consortium uses an existing e-learning platform of one of the partners.

PROJECT ACHIEVEMENTS

Within the projects eduGI.LA2 and eduGI, the project partners designed and developed a total of sixteen e-learning courses in various topics of geoinformatics. The following table provides an overview on the topics and providing partners, followed by a summary of positive and less positive experiences during the projects.

Courses have been evaluated by the participating students (approximately 70 students each in the projects eduGI.LA2 and eduGI). The evaluation has been performed by an evaluation questionnaire, consisting of:

• Fifteen explicit questions targeting course contents, organisation, tools and materials, and overall satisfaction, graded on a scale from 1 to 5 with 1 being the best and 5 the worst;
The questionnaire was filled in anonymously by the students. While this means that students were free to frankly write what they were thinking, there was no control over whether the students filled in the questionnaire or not. However, the feedback rate of approximately 70% was deemed acceptable and ultimately provided more significant results than a non-anonymous evaluation. The open comments section also proved to be especially informative and useful.

In the project eduGI, the contact persons (faculty) of the receiving institutes also evaluated the received courses. This evaluation was informal, with participation determined by whether the faculty member had revised teaching materials, attended at least one of the synchronous sessions, and had personal contacts with the participating students. The evaluation results and other aspects, e.g., costs, will be summarised in the following two sub-sections.

### Positive Experiences

The key aspect of e-learning is cost. In both projects, the partners were able to develop and teach sixteen e-learning courses with very limited resources. The overall project budget of the eduGI project was approximately 230,000€ and resulted in the development of eight e-learning courses, with two received by each partner. It must also be considered that this amount contains additional, EC project-specific management tasks and costs, e.g., reporting, budgeting, and organising dissemination workshops, which are not required of non-funded projects. Excluding this, the cost for development and one-time performance was 22,000€ per 3 credit point-course. It is difficult to compare this number with other case studies.

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<th>Providing Partner</th>
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<tr>
<td>University of Concepción, Chile</td>
<td>Spatial Databases</td>
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<td>Technical Institute of Toluca, Mexico</td>
<td>Artificial Neural Networks</td>
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<td>University of Münster, Germany</td>
<td>Introduction to Digital Cartography</td>
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<tr>
<td>New University of Lisbon, Portugal</td>
<td>Self-Organising Maps for Geospatial Data Mining</td>
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<tr>
<td>National Institute for Space Research (INPE), Brazil</td>
<td>Introduction to SPRING</td>
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<td>National Institute for Space Research (INPE), Brazil</td>
<td>TerraLIB</td>
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<td>Federal University of Pernambuco, Brazil</td>
<td>Cadastre</td>
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<td>University Jaume I, Spain</td>
<td>Spatial Data Infrastructures</td>
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<td>Harokopio University, Greece</td>
<td>Geographic Databases</td>
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<td>Uppsala University, Sweden</td>
<td>Virtual Excursions in Earth Science</td>
</tr>
<tr>
<td>University of West Hungary</td>
<td>Data Acquisition and Integration</td>
</tr>
<tr>
<td>BW University Munich, Germany</td>
<td>GI Standards</td>
</tr>
<tr>
<td>University of Münster, Germany</td>
<td>Project management in GI projects</td>
</tr>
</tbody>
</table>

Table 1. The e-learning courses developed
because few concrete costs can be found in literature. Personal communications with developers of other e-learning courses revealed their costs to be at least three times higher. An additional cost calculation for a one hour of class of 100 students reveals cost of $9,500 for e-learning mode and $17,062 in the face-to-face mode (Wallencher, 2005). Relative to the number of students (a maximum of 30 students per course in the eduGI project) and the number of hours (3 credit points per course, equivalent to a student’s workload of 90 hours, or approximately 25 contact hours of a face-to-face course), the eduGI project approach was very inexpensive.

Apart from costs, another important aspect to consider is quality. Each partner developed a course in which they are an expert. Because of this, the content was up-to-date. Especially in the IT sector, know-how expires very quickly, and it is a major challenge to keep track on the most recent developments so with the e-learning business model this problem is at least partially ameliorated.

According to the free-text comments in the evaluation questionnaires, the students’ motivation was high. Many students appreciated the opportunity of taking classes in new topics not provided by their own institution. For example, a student from Münster took the Portuguese course in “Geospatial Data Mining” and is now writing his diploma thesis in this topic, which would never have happened without this e-learning course. Secondly, students responded that it was a new and “adventurous” experience to be, for example, in Germany, taught from Chile, and learn with other students from Portugal and Brazil.

Re-using resources does not only affect the development of the e-learning courses, it also means that the developed e-learning courses can be re-used for other purposes; most of the partners will be able to re-use the e-learning courses and materials within their own institution. For example, ISEGI-New University of Lisbon will use their updated course in “Geospatial Data Mining” for their distance-learning Masters programme and the Institute for Geoinformatics in Münster will be able to re-use the e-learning course in “Project management in GI projects” for its GI Bachelor programme in blended learning mode.

The most significant result of these projects was an agreement of the eduGI consortium to continue with the exchange of e-learning courses. This agreement covers a period of at least three years and the exchange is already ongoing. The exchange does not require any additional funding, which can be considered as a validation of a sustainable business model.

**Less Positive Experiences**

Although there were many positive outcomes, there were also some problems that may require improvements:

- Technology and the didactics of e-learning were new to most of the partners. Therefore, it took some effort to get accustomed to this concept. Improvements will be necessary, but this can be considered a part of the normal learning process for the teachers.
- Student evaluations of the sixteen e-learning courses were quite heterogeneous, depending on the quality of the provided course and the how well the students accepted a new way of learning. Motivating factors for the students were the international learning environment and the option to access new learning topics. The teaching materials were mostly evaluated as good. Negative factors in some cases were technical problems (in access to and usage of the e-learning platform), organisational issues (e.g., provision of sufficient course information) and students missing face-to-face interaction with teachers and other students.
- Simple but crucial problems included different semester schedules in partner countries. It was hard to find common start and end
dates for the courses as well as dates for common online sessions during the courses. In the project eduGI it took a period of eight months to perform all eight e-learning courses.

- Another improvement required is a better integration of the external courses into the university’s study programme. First, integration means a better scheduling. Some of the courses were developed and announced quite late and were often at odds with the regular study programmes of the receiving institutions. Second, integration requires that universities advertise to their students the e-learning courses of the partners as a regular and equally recognised part of the study programme. All courses were planned for up to a maximum of 30 students and in the eduGI project, on average 10 students attended a course, with a range of 3 to 17 students. In future, this will be addressed by two issues:
  a. due to the agreement to continue to exchange of e-learning courses between the partners, the courses can be better integrated and scheduled;
  b. while having 30 students in each class was initially a measure of success for the e-learning classes, in the future, this will not be a success determinant. The e-learning courses often address advanced Masters students to provide them additional topics to the regular study programme. For example, at the Institute for Geoinformatics it is not a quality criterion to send a large number of students, but instead to offer a topic such as data mining. Success can be determined by some students not only being interested in the topic but also feeling encouraged to pursue further research in the area, as happened last year when seven students attended “Geospatial Data Mining” and one of them is now writing his diploma thesis in cooperation with the New University of Lisbon.

COST-BENEFIT ANALYSIS

This section uses a case study for a detailed cost-benefit analysis. Within the project eduGI, the Institute for Geoinformatics developed the e-learning course “Project management in GI projects” – syllabus and teaching materials are available online at http://geoinf.uni-muenster.de/pm/. This course was chosen as a case study primarily because “Project management in GI projects” has been taught in three different modes, face-to-face, blended learning, and e-learning, so these three methods work well for comparison (Brox, 2007). Project management is quite an important course for the Institute for Geoinformatics since:

- A recent survey about the requirements of GI curricula resulted that know-how in project management is an essential key competence for the future professional careers of GI graduates (Brox & Pires, 2004);
- National legal regulations require that new Bachelor programmes need to have 20% of their courses as “general studies.”

The Institute for Geoinformatics introduced project management courses three years ago, first as a face-to-face course. Since course concepts and materials were available from the face-to-face course, it was easy to transfer the course to the e-learning mode in the eduGI project. The course is recognised with 3 ECTS credit points, equivalent to a student’s workload of 90 hours. The first, theoretical part of the course is based on an existing textbook. Major issues of the textbook and topics missing from the textbook are further explored with additional online materials (http://geoinf.uni-muenster.de/pm/). Each of the 5 modules closes with self-test questions for the students and the
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Theoretical part ends with an online exam. In the second, practical part, students work on a virtual project. Step-by-step, they develop a complete project plan for their assignment. Interaction is assured by six synchronous online sessions and by email contact.

In the eduGI project, 35 students from Lisbon, Munich and Münster registered for the course and twenty students attended the course. This can be considered a normal yield for optional courses as well as for face-to-face courses. Typically, due to the registration system and its timing, it can only be roughly estimated how many students will actually participate in a course in advance, and these figures are consistent with that. More significant is the failure rate: 17 of 20 students successfully completed the course, which is slightly worse than that of face-to-face courses, but still acceptable. Currently, the e-learning course is being conducted again with 9 students from Lisbon. In the blended learning mode, the course has been conducted once with 19 students from Münster with the theoretical part (roughly half of the course) being taught via e-learning and the practical part via regular classroom teaching. A first approach for a cost-benefit analysis is the “asset model” of Hoppe and Breitner (2004), which is one of the three sub-models of a consistent business model. The asset model includes the calculation of costs as well as a revenue model.

According to Breitner and Hoppe (2004), costs to be considered are fixed costs for maintaining the company, surveying market structures, generating contents, promotion, packaging and distribution, and after sales services. A more detailed approach is the cost comparison “instructor-led vs. e-learning” by Caterpillar University: in this case, more precise cost factors such as development costs per hour of instruction, instructor costs per hour of instruction, preparation time and post-class activities, and learner opportunity costs are considered (Wallicker, 2005). However, the approach of Bartley and Golek can be considered as the most appropriate one for “how to determine the cost effectiveness of education programmes offered online when compared piecewise to the traditional education medium” (Bartley & Golek, 2004). The reasons for preferring this model are two-fold. First, this approach is a general one for the academic and the business world. Second, the basis of Bartley and Golek’s research considers development phases similar to those performed in the e-learning projects: analysis, design/development, implementation, and evaluation.

As described before, the second part of the asset model by Hoppe and Breitner (2004) is the revenue model. They emphasise a big difference in the revenue model between commercial and academic suppliers of e-learning products—concerning academic suppliers, “the gap between costs of production and selling price is very often subsidised by public organisations or by grants” (Hoppe & Breitner, 2004). One can take this statement as a challenge to implement commercial revenue models in academia, such as advertisements in the e-learning platform, subscription fees for learners, and brokerage fees (Mendling et al., 2005). Alternately, one can accept that subsidies are often required and consider e-learning investments as “strategic investments of academic institutions that aim to achieve competitive advantage” (Mendling et al., 2005). A more neutral term for revenue model could be “value”, which defines tangible and intangible benefits. Beyond the mere cost perspective the “value” of the new e-learning solution can be measured (Skillsoft, 2005).

The following sections will address both approaches and analyze the costs for course development and performance as well as the return on investment or value by tangible and intangible benefits.

Comparison of Costs: E-learning Course – Face-to-Face Course

As argued before, the cost matrix suggested by Bartley and Golek (2004) for evaluating the costs
of online versus face-to-face learning will be used. This matrix will compare the costs of different modes of the course in project management at the Institute for Geoinformatics looking at the costs of the development and performance of the face-to-face course three years ago versus the ongoing e-learning course one year ago. However, the cost matrix has been simplified due to some restrictions:

- The cost matrix has been simplified and adapted either because the original cost matrix is unnecessarily detailed for the purpose (e.g., splitting “computer resources” into “individual computer costs/upgrades,” “computer classroom,” “server purchase/upgrade,” and “IT salary support”), or because some of the cost items are not applicable (e.g., printing and reproduction, outside services, general overhead allocation). As a result of this simplification the costs are estimates.

- Within the EC project both the costs and hours were recorded. However, this cannot be matched one-to-one to the cost items of Bartley and Golek because cost categories are different. When developing the face-to-face course, the hours and costs were not recorded as with the EC project. Therefore, some of the costs are only the best possible estimates.

- Situations are unique for each institution. For example, computers for students are available at the Institute for Geoinformatics regardless of whether additional e-learning courses are taken or not. Due to this factor, additional equipment costs are not calculated, which may not be consistent with the situations at other universities.

- Comparing the development of a new face-to-face course with adapting this course to e-learning is like comparing apples to oranges to some degree. However, it can be argued that the “savings” of resources by using an existing course for e-learning are outmatched by the additional effort for developing an e-learning course for an “e-learning beginner”. This, of course, fits into the business model notion of using existing resources.

This example of a specific course reveals several key observations. The development of the e-learning course was approximately two times more expensive than that of the face-to-face course—even if the face-to-face course provided substantial input (e.g., concepts, materials) to the development of the e-learning course. This is mainly due to the development of the e-learning content. Much of the know-how a teacher has in mind can be communicated easily in a face-to-face course whereas for an e-learning course most of this know-how has to be written down. Further major cost factors for an e-learning course are costs for the platform and technical support for the teacher. In addition, communication and cooperation with internal staff members (technical support, content support) and external partners (institutions receiving this course) requires more management activities.

An interesting observation is that for subsequent uses of a developed e-learning course the cost is about that same as that of a face-to-face course. On the one hand, costs for the e-learning course are heightened due to the e-learning environment and infrastructure (€10,000 for the design and development of the e-learning course versus €4,000 for the face-to-face course). However, on the other hand, the re-use of an e-learning course is less time-consuming for the teacher since much of the teacher’s know-how is already documented in the teaching materials. As shown in Table 2, while it costs significantly less to reuse a course than to develop it for both e-learning and face-to-face. Detailed teaching materials, self-test questions, and an online exam where half of the evaluation is automatic, reduces the time of direct student-teacher interaction—in this case
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from twenty-eight contact hours in the classroom to ten hours in online sessions, never mind the saved preparation time for fewer (online) contact hours. This yields a reduction of staff costs for the preparation/update and performance of the e-learning course to €2,000 versus €3,000 for the face-to-face course.

Return on Investment and Value

The cost matrix shows that the development of the e-learning course is approximately twice as expensive than the development of the face-to-face course. However, the business model in the project eduGI assumes an exchange of courses—in return of providing one course to the partner network, each institution receives two e-learning courses with new topics that cannot be provided through own resources. Consequently, each institution saves the cost of developing two face-to-face courses on its own. The success of this exchange is dependent on whether the number of students on each side balances so that the provided course is offered to up to 30 students, and in return each received course is for up to 15 students of the own institution. The business model might not be applicable “mass courses,” e.g., “Introduction to Geographic Information,” but instead works well for advanced courses with a limited number of students.

The key issue of the revenue model is receiving two e-learning courses in return of the provision...
of one e-learning course. The result of this trade can be translated into Euro. The following table compares the costs of using the eduGI business model and agreeing to further continue this exchange for three years with developing and performing two new courses with the institution’s own resources.

Although the development of an e-learning course is expensive, the business model reveals a positive return on investment given the fact that the exchange of courses is performed at least twice. Apart from the costs, there are intangible benefits that cannot be calculated in Euro – according to the aforementioned argument this is better called a value instead of revenue model. From the perspective of the Institute for Geoinformatics, the value of the e-learning projects and the introduction of e-learning at our institute are:

- The institute received insight into the new field of e-learning, and now understands what is applicable and what the future options could be;
- The exchange of courses improved the quality of education; students have access to new topics, which are taught by experts of these topics and are up-to-date;
- The course in project management will not only be used as an input for a networked exchange, but also for own purposes. It can be used for several purposes, because the course is scalable in a flexible way:
  a. usage for the Masters programme, blended learning, 3 ECTS credit points;
  b. usage for the Bachelors programme, blended learning, 5 ECTS credit points (by an extension of the face-to-face part);
  c. provision to eduGI partners in return of receiving their e-learning courses;
  d. future perspective: distance-learning, delivery of the first theoretical part as a stand-alone solution for training measures for professionals;
  e. public use: The teaching materials are published online so other institutions might use them as well.

**E-LEARNING VS. BLENDED LEARNING**

From the didactical perspective, the best learning results are said to be achieved by the use of different types of media. More complex media, such as online material, should be followed by a simpler medium, such as face-to-face sessions (Simonis, 2004). Blended learning combines the possibilities of e-learning with regular classroom teaching. The challenge is to choose the right mix of delivery methods. According to Gray (2006), a simple learning model follows four stages:

- Initial knowledge
- Increased knowledge
- Ability to apply knowledge in simple situations
- Ability to apply knowledge in complex situations

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**Table 3. Costs for two courses (development including prototypical performance and operational mode for 3 years)**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Costs with project eduGI business model (€) – 1 E-Learning course</th>
<th>Costs with own development (€) – 2 face-to-face courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course development and prototicial performance</td>
<td>22,600</td>
<td>23,200</td>
</tr>
<tr>
<td>Repeated course performance, 3 x</td>
<td>12,300</td>
<td>24,000</td>
</tr>
<tr>
<td>Total</td>
<td>34,900</td>
<td>47,200</td>
</tr>
</tbody>
</table>
For comparing different learning modes, it is useful to go back to the case study aforedescribed where the same course (Project Management in GI projects) has been taught by the same teacher (the author) in three different modes. For the course evaluations, students filled in structured questionnaires anonymously (which means that not all course participants filled in the questionnaires). The overall evaluation by the students had the following results on a scale from 1 to 5 with 1 as the best and 5 the worst:

- Face-to-face: 1.8 (feedback by 16 students)
- Blended learning: 2.0 (feedback by 7 students)
- e-learning: 2.55 (feedback by 9 students)

Considering the evaluation of this e-learning course, other aspects have to be taken into account. The students from the three receiving institutes in Lisbon, Münster, and Munich evaluated the same e-learning course very differently. The overall scores on the same scale were:

- Lisbon students: 2.0 (feedback by 3 students).
- Munich students: 4.0 (feedback by 3 students).
- Münster students: 1.67 (feedback by 3 students).

Although the samples are small, the differences between project partners are obvious; there is a big difference in score depending on the teaching style. Münster students seemingly got along very well and evaluated this course even better than in the face-to-face mode, whereas Munich students appeared not to enjoy the self-learning parts.

Consequently, other evaluation results of specific course aspects were quite different (e.g., the quality of the online materials and the helpfulness of the self-tests both scored between 1.66 to 3.33). Significantly for Lisbon students, instead of a previously estimated workload of 105 hours, they invested 150-170 hours for the course. For German students however, it was the other way around: instead of planned 90 hours, they invested 40-50 hours. A possible explanation might be the different background of the students, the German students having more background in geoinformatics.

So what is better: e-learning or blended learning? Even in the “older” dispute of e-learning versus face-to-face learning, there is no clear answer. Empirical studies have shown both answers (that e-learning or face-to-face learning is better) to be true (Lundberg et al., 2008). One of the reasons for different results might be the different survey methods. Another reason might be that the samples were not big enough for significant results. However, ultimately there is no true answer to whether e-learning or blended learning is better:

- First, varying abilities of the teachers, different students’ background and requirements, cultural differences, language problems, contrasting e-learning services, and different learning and teaching styles are all variables that need to be considered. One of the most unexpected results of the case study is that the same e-learning course in project management has been evaluated so differently, with Münster students giving it a 1.67 and Munich students a 4.0. If the approval of the same course is so different, how can there be a general evaluation of e-learning versus blended learning?

- Second, some topics and course concepts are more appropriate for an e-learning platform than others. There is a significant difference in the economic success between commercial e-learning providers and academic providers. Many commercial providers are successful with company training programmes, while many academic providers only produce “theoretically” marketable e-learning products (Hoppe & Breitner, 2004).
One of the reasons might be the different levels of the offered courses. Gray (2006) differentiates learning steps by acquiring initial and increased knowledge and applying knowledge in simple and in complex situations. Training programmes tend to be on the first level of knowledge acquisition while academic courses tend to be on the advanced level of knowledge application.

Therefore, the motivation of this section is not claiming to provide empirically generalised results and predictions for the higher quality of blended learning in general. In fact, the answers are different from case-to-case and the answer depends on a single institution with individual requirements, course topics, students, and goals. This section only seeks to show a decision process at the Institute for Geoinformatics, which might be a best practice example for other institutions in a similar situation.

In the specific case of the project management course, the face-to-face mode scored only slightly higher by the Münster students than the blended learning mode (1.8 and 2.0, respectively). While students overall graded the e-learning mode with a 2.55, the Münster students gave the e-learning mode a score of 1.67. Considering the small sample, the questionnaire, which is a typical evaluation method at a university, did not provide reliable results. Despite this uncertainty, academic institutions rarely perform a detailed study for a decision about the mode of a single course. Consequently, the decision process is most often not scientific but rather personal. Some decision support must also be provided by the personal experience of the teacher. In one case, personal communication in students’ working groups as well as between teacher and students was very important for the specific course concept in project management. Communication is an essential tool in project management, which is more difficult to realise via e-learning.

Consequently, the decision was to perform the project management in the blended learning mode for the students in Münster. The approach of the teacher was to “increase knowledge” and “apply knowledge in simple situations” via online teaching materials and online self-tests. Within these learning stages, e-learning enables students to work according to their own requirements, timing, and intensity. As for “applying knowledge in complex situations,” classroom teaching can be considered the better option, providing direct feedback and discussions with teachers and co-students.

**CONCLUSION**

In the EC projects eduGLLA, eduGLLA2 and eduGI, we have developed and tested a business model for a networked cooperation in the provision of e-learning courses. The business model was successfully applied in the presented projects. This model rests on two pillars: re-using already existing resources and sharing resources in an international network. The analysis of costs and benefits of the business model has shown reasonable costs and high value.

**Costs**

In the eduGI project, the costs for developing and performing a three credit points-course were approximately €22,000 per course, which is low compared with other approaches (see Wallicker, 2005). Key success factors were:

- Re-using existing resources such as know-how, materials, concepts, and e-learning platform, reduced the development costs;
- Each partner was only responsible for the provision of one course of their core competencies. More important than saving costs, this affected the high standards of the content...
and how up-to-date the teaching materials are;

* The most important success factor and innovative approach is the exchange of courses including teachers. Of course, this created organisational challenges, e.g., agreement of the recognition of students’ achievements and scheduling courses in varying semester schedules. None-the-less, this approach minimises the effort for receiving an external course to almost zero.

**Return on Investment**

A concrete return on investment, countable in Euro, is the fact that for the provision of one course each partner receives two courses from the partners. A limitation of the approach is that it only works with advanced courses with a limited number of advanced students: providing a course for a maximum of 30 students of course balances with the reception of two courses for up to 15 own students per course. Looking for additional offers for advanced students is quite typical for an academic institution that wants to improve its education quality by offering a broader array of innovative topics.

Additional value comes from the fact that each e-learning course can be reused. Each partner has developed an e-learning course in an area of mutual interest. For example, the New University of Lisbon will re-use its updated Data Mining course in its distance learning Master programme and the Institute for Geoinformatics will re-use the project management course for different levels (Bachelor and Master) of different credit values (3 and 5, respectively) and a different mode (blended learning). Which courses make sense to be developed as an e-learning and which do not is a very basic matter of the conception of an e-learning environment.

An obstacle of many previous e-learning initiatives is the lack of sustainability (Boezaerooy & Gorissen, 2004; Salajan, 2007). In our business model, we achieved sustainability from the point of view of the Institute for Geoinformatics as well as on the level of the eduGI consortium:

* As a validation of the business model is the fact that after the end of the eduGI project the partners are continuing to exchange their courses without any further funding. Six of seven partners made an informal agreement to go on with the exchange of courses for at least another three years. One of the partners withdrew from the consortium due to a member changing job. Three e-learning courses are or were already ongoing in summer 2008.

* From the perspective of the Institute for Geoinformatics, IFGI will exchange and benefit by e-learning courses also in future. By this virtual mobility, we will be able to receive courses and topics for our students from the partner network, which the Institute for Geoinformatics could not achieve with its own resources. As already highlighted, these are additional and advanced courses are for a limited number of advanced Masters students. The virtual mobility is a substantial improvement of the quality of education.

**FUTURE TRENDS**

The eduGI project can offer a small contribution to the dimension of European virtual mobility and virtual campuses as a best practice example, which can be applied by other institutes as well. It is not important that the business model has been developed in the domain of geoinformatics. There is sufficient evidence that institutes for chemistry, history, social sciences, or any other scientific area in higher education can apply the business model, provided that their requirements and goals are similar—for example willingness to introduce
e-learning, appropriate potential partners, or the goal to offer additional advanced courses to their advanced students. Given the goal of acquiring additional courses, the exchange of e-learning courses is a comparably inexpensive way of doing so. Requirements and conditions will of course be different in other institutions. This will lead to different cost calculations and different break-even points. However, the principle remains the same: after some years there is a positive return on investment and an improvement of quality in education can be achieved. Blended learning is also an option to extend the business model by exchanging these types of courses. Based on previous positive experiences with short-term teachers’ mobility measures and existing funding opportunities (e.g., Erasmus), the realisation of this type of exchange is feasible. For example, in the case of the project management course the theory can be taught via e-learning while for the practical part, a one-week visit to the receiving institution is conceivable.

There are further potential applications of this business model outside Europe. For example, in Latin-America high-quality teaching materials in geographic information are urgently needed. A potential network for sharing e-learning courses already exists in GILA (Geographic Information in Latin-America, http://www.dpi.inpe.br/GILA/). Additionally, many e-learning courses already exist in Europe—not only the 16 developed in the projects described here, but also others, for example, in the Swiss GITTA network (GITTA - Geographic Information Technology Training Alliance, www.gitta.info). The utilisation of these European resources would be possible with low costs, requiring only the adaptation to Latin-American requirements, i.e., translation, management for coordination, and some training in how to use the e-learning courses. Similar approaches are also possible in other non-European countries.

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About the Contributors

Mark Stansfield, PhD, is a senior lecturer in the School of Computing at the University of the West of Scotland. He has published numerous papers in areas relating to e-learning, games based e-learning and virtual campuses. Mark Stansfield also serves on the editorial boards of several international journals that include the International Journal of Information Management, Journal of Information Systems Education, ALT-J and the Journal of IT Education, as well as being an editor of the Interdisciplinary Journal of E-Learning and Learning Objects. He is project coordinator and principal investigator of the European Commission co-financed project ‘Promoting Best Practice in Virtual Campuses (PBP-VC).’

Thomas Connolly is a professor and chair of the ICT in Education Research Group at the University of the West of Scotland and is director of the Scottish Centre for Enabling Technologies and director for the Centre of Excellence in Games-based Learning. His specialisms are online learning, games-based learning and database systems. He has published papers in a number of international journals as well as authoring the highly acclaimed books Database Systems: A Practical Approach to Design, Implementation, and Management, Database Solutions and Business Database Systems, all published by Addison Wesley Longman. Thomas Connolly also serves on the editorial boards of many international journals, as well as managing several large-scale externally funded research projects.

* * *

Paul Bacsich worked for 25 years at the UK Open University finishing as assistant director in the Knowledge Media Institute. In this phase he was project director of the JANUS satellite e-learning project under the DELTA programme of Framework 3. He then set up the Virtual Campus Programme at Sheffield Hallam University in 1997-99, including a research group in e-learning. Professor Bacsich became director of special projects for the UK e-University (UKeU) in 2003-04, and edited and published material from their archives in 2004-05. He then took on a series of assignments from the UK Higher Education Academy, concentrating on benchmarking e-learning and acting as a Critical Friend for Pathfinder and Enhancement projects at universities in England and Wales. He has also advised a range of universities on e-learning issues including Middlesex University, the University of Leicester, the Arab Open University and the Worldwide Universities Network.

Theo Bastiaens is director of the Institute for Educational Science and Media Research and chair of the Department of Instructional Technology & Media at the Fernuniversitaet in Hagen and part-time professor at the Open University of the Netherlands. His specialisation is in instructional design and didactics of new media. He has published frequently about these topics. Prof dr Bastiaens’ project
management and consultancy experience involves business (for example Royal Dutch Shell, ING insurances, European Patent Office Munich) as well as non-profit institutes (for example the Dutch Ministry of Education, the Dutch Digital University). He was the regional project manager for the Socrates IPSS-EE programme 2001-2003. He has delivered numerous lectures and presentations at renowned national and international conferences and events. In 2007 he was co-chair of the world conference for e-learning in Quebec, Canada.

Helena Bijnens holds a master’s degree in Romanic languages (French and Italian) and specialised in media and information sciences at K.U.Leuven. In 1999 she started at ATiT (Audiovisual Technologies, Informatics and Telecommunications) where she worked as a project manager and researcher, in the field of technology enhanced learning. She was involved in projects related to: costs of eLearning, streaming media in education, and satellite technology in education and digital divide issues. In March 2005, Helena Bijnens started working for EuroPACE ivzw. Her role in EuroPACE consists of writing and managing European Commission supported eLearning projects, representing the network and disseminating its expertise to the wider educational community, piloting and evaluating innovative educational applications.

Dawn Birch, Ph.D, is a senior lecturer in the School of Management and Marketing at the University of Southern Queensland. She has published in the areas of educational technology, domestic barter, international advertising, services marketing and shopping centre management. Her current research focuses on academics’ adoption and integration of educational technology for developing interactive multi-modal technology-mediated distance education courses.

Luca Botturi holds a PhD in communication sciences and instructional design from the University of Lugano, Switzerland. He is currently instructional designer at the eLearning Lab, and researcher for the NewMinE Lab at the same institution. He is an active as trainer, consultant and game designer, and has founded seed, a non profit organisation promoting the development of a culture of educational technologies for international development and non profit education. His research interests focus on creative instructional design, games and design languages.

Christina Brey is project coordinator at the European Association of Distance Teaching Universities (EADTU). She is involved in different European projects, EADTU Task Forces, Academic Networks as well as seminars and conferences. Christina Brey works on topics like virtual mobility, language learning and e-learning in Africa. Prior to her appointment at EADTU in 2008, Christina Brey worked as scientific assistant at the FernUniversität in Hagen, Germany, as well as working for the Bertelsmann Foundation in Germany, the National Commission for UNESCO in South Africa, and the German-American Chamber of Commerce in Chicago, USA. Christina Brey has studied Sociology at the University of Bielefeld and the University of Gothenburg and has graduated with a major in science and technology studies and sociology of organisations.

Christoph Brox, PhD, is been engaged as a project manager at the Institute for Geoinformatics, University of Münster, Germany since 1997. After managing mainly research projects in the first years, his focus shifted to educational projects in the past six years. In the context of e-learning Christoph Brox coordinated and worked in the three European Commission projects - eduGI, eduGLA and eduGLA2
About the Contributors

(see www.eduGI.net/eduGI). Currently he is coordinating the Erasmus Mundus Masters Programme in Geospatial Technologies in cooperation with the New University of Lisbon, Portugal, and the University Jaume I, Spain (see http://geotech.uni-muenster.de) and managing the International Research Training Group in Semantic Integration of Geospatial Information in cooperation with University at Buffalo, USA, and the University of Bremen, Germany (see http://ifgi.uni-muenster.de).

Bruce Burnett, PhD, is a Senior Lecturer in the School of Cultural Language Studies in Education at the Queensland University of Technology. Bruce Burnett has a background in sociology of education and in particular the areas of narrative analysis, the socio-cultural impact of new technologies and Japanese education. His current research focuses both on the Australian and Japanese educational contexts.

Lorenzo Cantoni graduated in Philosophy and holds a PhD in education and linguistics. He is full professor at the University of Lugano (Switzerland), School of Communication Sciences, where he teaches e-learning and e-government. He is vice-director of the Institute of Institutional and Educational Communication, Director of the laboratories webatelier.net: production and promotion over the Internet, NewMinE Lab: New Media in Education Lab; is Executive Director of TEC-Lab: Technology Enhanced Communication Lab and scientific director of eLab: eLearning Lab. His research interests are where communication, education and new media overlap, ranging from computer mediated communication to usability, from eLearning to eTourism and eGovernment.

Ron Cörvers holds a MSc degree in environmental geography from Radboud University Nijmegen (1990) and a PhD in environmental policy and public administration from Utrecht University (2001). He is associate professor at the School of Science of the Open Universiteit Nederland. He developed a wide range of courses in the field of environmental policy and sustainable development, and is interested in innovative e-learning opportunities (virtual seminar, multimedia, games). In 2007, he joined the International Centre for Integrated Assessment and Sustainable Development (ICIS) at Maastricht University for two days a week. His research interests are in the field of governance for sustainable development, and participatory approaches.

Johannes De Gruyter holds a master’s in modern history (Katholieke Universiteit Leuven) and a master’s of science (social sciences, Universiteit van Amsterdam). Since August 2007 he is multicampus coordinator at AVNet-K.U.Leuven, which involves leading an expertise cell specialising in multicampus education, an advisory and consultancy function towards policy-making, a training responsibility and the management of a support team for any multicampus related questions for the K.U.Leuven and its association. Previously he was involved in AVNet-K.U.Leuven and the EuroPACE network as project manager and researcher for several EC-projects on ICT supported learning. He also contributed to the external communication, networking and graphic design for the EuroPACE network.

Pedro Fernández-Michels holds a master’s in education and ICT (e-learning) and works as a researcher and online tutor in the Open University of Catalonia where he has been collaborating with international teams in several European Research Projects dealing with e-learning provision, organisation, pedagogy, material design and quality. As an expert in instructional design and foreign language teaching he currently creates and offers teacher training events about ICT-application in the field of language learning. In his training activities he particularly explores and presents the possibilities of
Open Source programmes and Web 2.0 tools for teaching and learning purposes with a focus on constructivist and collaborative approaches.

François Fulconis, PhD, is an assistant professor of strategic and logistics management at the Institute of Technology, University d’Avignon and des Pays de Vaucluse (France). He is a permanent member of the CRE-LOG, REsearch Center on Transport and LOGistics (University of Aix-Marseille II). He also is an associated member of the GREDEG, UMR CNRS Research team in law, economics and business administration sciences (University of Nice-Sophia Antipolis). His research interests include strategic partnerships, organisational theories, network structures, supply chain management, and global competitiveness. He has published in academic journals, including Competitiveness Review, Gestion 2000, Management Decision, Networks and Communication Studies, Supply Chain Forum: An International Journal, Management & Avenir, Revue des Sciences de Gestion, Cahiers Scientifiques du Transport, Revue Française de Gestion and in the several international conference proceedings, reports and book chapters.

Thierry Garrot, PhD, is an assistant professor in accounting, control and finance at the Institute of Business Administration (IAE), University of Nice-Sophia Antipolis (UNS) (France). He is a permanent member of the laboratory of IAE (CRIFP), Research Center on Financial Information and Public Finance. His research interests include performance and management accounting for public institutions as universities and hospitals. He has published in Revue Française de Comptabilité and RUSC Journal. He directed the Lifelong Learning Centre of his university (Asure formation) for five years where he developed several projects linked to e-learning. Recently, he coordinated a two year research workgroup relating to the indicators of e-learning included in the European virtual campus eLene (http://www.elene-ee.net/).

Lourdes Guàrdia, PhD, is full professor and researcher at the Universitat Oberta de Catalunya (UOC), in the Department of Psychology and Education, where she is professor of the master’s degree in education and ICT (e-learning) and the Psychopedagogy Programme. Since 1996 she has been working at UOC in other different roles; as the head of Multimedia Instructional Design Department and as Innovation Project’s coordinator. The focus of her interest in research is instructional design, educational technology, e-portfolio and e-learning. She has participated in several innovation and research related European and national projects, in addition to publishing several articles and chapters on instructional design and ICT. She is now participating in different research projects about the personalisation of the learning process, quality in e-learning and instructional design for e-portfolios.

Stefan Hrastinski is a research fellow and director of Master Studies in Computer and Systems Science at Uppsala University, Sweden. He received his PhD in informatics from Lund University with a thesis titled “Participating in Synchronous Online Education.” Previously, he was a PhD student and lecturer in informatics at Jönköping International Business School. Stefan Hrastinski’s research interests include e-learning, computer-mediated communication, online communities, social software, collaborative learning and work, and design science research. He has authored or co-authored close to fifty peer-reviewed articles on e-learning published in, for example, the journals Computers & Education and Information & Management, and in the proceedings of the International Conference on Information Systems. For further details, see http://www.anst.uu.se/stehr914.
Yukiko Inoue, PhD, is professor of educational psychology and research in the School of Education, University of Guam. Inoue is also head of the school’s Educational Research and Technology Department. Her research interests include interdisciplinary studies on student learning and development, educational technology for diverse learners, improving university teaching and learning, and social contexts and learning in higher education. Yukiko Inoue is the co-author of *Teaching with Educational Technology: The Case of the Asia-Pacific Region,* and the editor of *Technology and Diversity in Higher Education: New Challenges,* and *Online Learning for Lifelong Learning.* She is also a poet and the author of *Roses, You Must Be,* and *The Window That Reveals Tomorrow.*

Lars-Erik Jonsson is a senior lecturer at the University of Gothenburg. He started his career at the University as a teacher trainer. Today his research and teaching interests are about the development of e-learning and he bears the main responsibility for the distance education master’s programme “Learning, communication, and IT” at the IT University of Gothenburg. He has also participated in research into other educational settings where technology plays an important role. Among these are military fighter pilot training, engineering training and schooling from primary to upper secondary level. Lars-Erik Jonsson has also carried out research and evaluation assignments for the Swedish National Agency for Education and the Swedish National Agency for Higher Education.

Dolf Jordaan has been involved in e-learning in higher education since 2000. He is the project manager for the implementation of the Blackboard Vista Enterprise Edition Learning Management System at the University of Pretoria, South Africa. He is responsible for the management and coordination, in collaboration with other stakeholders, of the University's Virtual Campus which includes student and lecturers’ portals. Dolf Jordaan has conducted consultation work at various levels for national and international e-learning projects, and has presented papers at various national and international conferences. He holds a master's degree (University of Pretoria) in computer-supported education.

Anna-Kaarina Kairamo worked with several publishing companies for ten years as a Publishing Editor and a Publishing Manager and several years as an Information Manager with Helsinki University of Technology, Lifelong Learning Institute Dipoli. Since 1995 she has been participating as a project manager in several EU projects related to ICT in education within the programmes TEMPUS, TAP, LEONARDO, SOCRATES, IST and eLearning Initiative. She is the founder and the first Manager of Teaching and Learning Development support services at HUT. Currently, she is working as a training manager of Lifelong Learning and International Projects at TKK Dipoli, Finland.

Yuri Kazepov (PhD in sociology), is professor of urban sociology and compared welfare systems at the University of Urbino. He has been Jean Monet Fellow at the European University Institute in Fiesole and visiting professor at the Universities of Bremen, Lund and Växjö. He is a founding board member of ESPAnet and the vice-president and treasurer of RC21 of the International Sociological Association. His fields of interest are urban poverty, social exclusion, citizenship, social policies in a compared perspective, urban governance. On these issues he has been carrying out comparative research and evaluation activities at national and international level. Within the field of e-learning he is responsible for the online courses of the BA in sociology and the MA in social policy management and has been responsible for the Eurex and E-Urbs European projects. He is the director of the Centre for eLearning of the University of Urbino.
**Christina Keller** is an assistant professor and research fellow in informatics and information science at Jönköping International Business School and Uppsala University. She received her PhD in information systems from Linköping University with the thesis “Virtual Learning Environments in Higher Education – A Study of User Acceptance.” Her research interests are e-learning, adoption of information technology in organisations and design research. She has authored or co-authored more than twenty peer-reviewed articles on e-learning published in, for example, the **Learning, Media and Technology** and **Journal of Educational Computing Research**, and in the proceedings of the European Conference on Information Systems. For further details, see http://www.ihh.hj.se/doc/7320.

**Gill Kirkup**, PhD, will be working for two institutions from 2008-2011. She is a senior lecturer in educational technology at the Institute of Educational Technology, Open University, UK, and Head of Research, Data and Policy at the UK Resources Centre for Women in Science Engineering and Technology. From 2004-2008 she was director of the Open University’s MA in online and distance learning, and deputy director of the institute with responsibility for taught courses. She is also a fellow of the Higher Education Academy and a member of the Association of Learning Technologies.

**Joop de Kraker** was trained as an applied ecologist at Wageningen University (MSc, 1989). In 1996 he obtained his PhD in agricultural and environmental sciences from that same university. After graduation, he has worked for more than 10 years in international educational and research projects in the field of sustainable agriculture in Africa, Asia and Europe. In 2001, he joined the School of Science of the Open University of the Netherlands, where he is currently associate professor of environmental sciences. His principal activity is the development and teaching of e-learning courses in environmental science and sustainable development and coordination of the school's research programme. Current research interests focus on the interface between environmental science, learning and policy support for sustainable development and the potential of virtual learning environments to develop the required competencies.

**Karen Lazenby**, PhD, has fifteen years professional experience in higher education. She is knowledgeable in the fields of e-learning and innovation and has ten years experience of matrix project management. After successfully establishing the virtual campus of the University of Pretoria in 1999, she established a one-stop contact centre for students and other clients of the University and has been the Director: Client Service Centre since 2002. Karen Lazenby has presented more than a dozen papers at international conferences and has published several articles in the field of technology and innovation. She obtained her PhD in 2003 (University of Pretoria) and an executive MBA in 2006 (University of Cape Town).

**Benedetto Lepori** obtained his degree in mathematical physics at the University of Rome in 1988 and a PhD in communication sciences at the University of Lugano in 2004 with a thesis on the Swiss research policy. Since 1997, he has been responsible for the research office of the Università della Svizzera Italiana. His research interests cover Swiss higher education and research policy, the production of S&T indicators, especially concerning research funding and expenditure, and the introduction of new communication technologies in higher education. He is Coordinator of the indicators activities in the PRIME network of excellence and chair of the PRIME indicators conference series. He was involved
in the Swiss campus programme and in the creation of the eLab and he recently performed the final evaluation of the SVC programme.

**Irene le Roux** has extensive experience in the e-learning environment which started in 1991 with the successful development and implementation of the computer-based testing facility at the University of Pretoria. She holds a BSc (physics, mathematics) and a MEd from the University of Pretoria. Before Irene le Roux joined the corporate sector in June 2008, she was acting director and deputy director of the Department for Education Innovation at the University of Pretoria. Her responsibilities included the strategic management of the e-learning and education consultation service the University of Pretoria. She published various articles and presented numerous papers and workshops both nationally and internationally, some by invitation.

**Jörgen Lindh** is associate professor of informatics at Jönköping International Business School (JIBS). Jörgen has during almost three decades been involved in development work and research projects in the field of computer supported learning. He was one of the pioneers in the 1980s when computers were introduced in the Swedish school system, both as an author of several textbooks and coordinator of several projects (DIS, DOS). In the 1990s he was evaluating some of the KK-foundation projects in different Swedish communities. His doctoral thesis is entitled “Computer supported teaching in school – possibilities and problems” (1993). During the last five years he has put a lot attention into online learning. At the moment Jörgen Lindh is a coordinator of the research group “Networked Learning, Collaboration and Competence” at JIBS.

**Grégory Lucas** graduated in 2004 from ENITA de Bordeaux with a master’s degree in agronomy and specialised in geographic information sciences. In 2005 he started at Cemagref (French agricultural and environmental engineering research institute) where he worked as a study engineer and researcher, in the field of water pollution and water management. He was involved in projects related to: rural development, agriculture, GIS network development and used GIS technology, databases, photo imagery and satellites images. In August 2007, Grégory Lucas started working for the University of West Hungary – Faculty of Geoinformatics as a project coordinator. His role in GEO consists of coordinating the e-learning projects in which the faculty is involved.

**Markku Markkula**, MSc (Tech) is the Director of the Lifelong Learning Institute Dipoli of Helsinki University of Technology TKK, in its field one of the largest continuing education providers among universities in Europe. He is chairman of the board of directors of EuroPACE, European Professional Association for Collaboration in eLearning; chairman of the board of the Finnish Information Society Development Centre TIEKE and chairman of the Continuing Education Working Group of the European Society for Engineering Education SEFI (a position he already held from 1987-1992). Markku Markkula was 8 years member of the Finnish Parliament (1995-2003) where he was an active member in the permanent Committee for Science, Education and Culture, and the Committee for the Future. In 2001 he served as the President of EPTA Council, European Parliamentary Technology Assessment Network. In 2001-2002 he also contributed as a member to the EU High Level Expert group on Technology Foresight. In 2002 he was appointed by the Finnish Ministry of Education to operate as a One-Man-Committee to make recommendations for the Finnish eLearning policy. This work was completed in 2003 and the report published in 2004.
Ilse Op de Beeck graduated in 1996 from the Katholieke Universiteit Leuven with a MA degree in communication sciences. In the framework of the Erasmus exchange programme she studied from January until May 1996 at Lunds Universitet, Sweden. In March 1999 she started working for EuroPACE ivzw, a European non-profit association of universities, educational institutions and their networks fostering collaboration in e-learning. Since then she has been involved in both European and Flemish projects and studies in the area of virtual mobility, virtual campus, networked e-learning, adult education and vocational training. She is currently e-learning projects coordinator. Her main tasks include (financial) project management, e-learning project proposal writing, we all as coordinating communications for the EuroPACE members.

Morten Flate Paulsen is professor of online education at the Norwegian School of Information Technology and director of development at NKI Distance Education in Norway. He is on the Executive Committee for the European Distance and E-Learning Network (EDEN) and on the European Association for Distance Learning (EADL) R&D committee. He has worked with online education since 1986 and published many books, reports and articles about the topic. Many of his publications and presentations are available at his personal homepage at http://home.nettskolen.com/~morten/. His book, Online Education and Learning Management Systems is available via www.studymentor.com.

Lalita Rajasingham, PhD, is associate professor communications studies, in the School of Information Management, Victoria University of Wellington, New Zealand. Since 1986, her area of pioneering research and innovative teaching approaches is in the application of information technology such as the Internet, virtual reality and HyperReality and artificial intelligence to human communication, particularly in education in multicultural environments. She is widely published nationally and internationally. Her co-authored books with Professor John Tiffin, titled In Search of the Virtual Class: Education in an Information Society (1995) and The Global Virtual University (2003) break new ground, sketch a philosophical foundation and present a paradigm for the future of higher education in an era of rapid technological change and globalisation. The books introduce the concepts of virtual classes, HyperClasses, virtual universities and e-learning on the Internet, and have been translated into several languages.

Sally Reynolds has a background in remedial linguistics and has worked for several years in radio and television in Ireland as a manager, researcher, presenter and producer. From the early 90’s onwards, she became increasingly involved in the field of technology enhanced learning and worked for University College Dublin, EADTU, EuroPACE 2000 and K.U.Leuven. Her work during this time was largely related to the management of European projects. In 1999, she set up the independent company ATiT, where she is now joint managing director and leading several projects in the area of audio-visual production, research and project management as well as training and consultancy services for clients including the European Commission, the European Space Agency and the World Bank as well as for corporate clients. She is an accomplished author of several publications largely aimed at users of ICT in education and training. Sally is also the conference programme manager for the annual Online Educa Berlin and eLearning Africa conferences.

Roger Säljö is professor of educational psychology at the University of Gothenburg, Sweden. He specialises in research on learning, interaction and human development in a sociocultural and interactionist perspective. Much of his work is related to issues of how people learn to use cultural tools, and how we
acquire competences and skills that are foundational to living in a socially and technologically complex society. In recent years, he has worked extensively with issues that concern how digital technologies and the new media transform learning practices inside and outside formal schooling. He is currently the director of LinCS, a national centre of excellence in research on learning and media funded by the Swedish Research Council, and he is also a Finland distinguished professor at the Centre for Learning Research at the University of Turku.

**Albert Sangrà**, PhD, is full professor and researcher at the Universitat Oberta de Catalunya (UOC), Spain, where he has been director for methodology and educational innovation (1995-2004), in charge of the educational model of the University. He is currently the academic director of the Accredited Masters Degree in Education and ICT (e-learning). His main research interests are the use of ICT in education and training and quality in e-learning. He has played the role of consultant in several virtual training projects in Europe, America and Asia, and he has also served as a consultant for the World Bank Institute. He is currently member of the Executive Committee of the European Distance and E-learning Network (EDEN) and also member of the advisory board of the Portugal’s Universidade Aberta. He also serves or has served the editorial and advisory boards of several international academic journals.

**Stefano Tardini** is a researcher at the University of Lugano (Switzerland), Faculty of Communication Sciences, where he is also the executive director of eLab: eLearning Lab. His research interests lie in the overlap between computer mediated communication, e-learning, (online) communities, cultural semiotics and argumentation theory. In 2002 he completed his PhD thesis in the linguistic and semiotic aspects of virtual communities. From then on he has developed his research in three interrelated directions: in the field of CMC, focusing mainly on a socio-historical approach to CMC; in the field of e-learning, focusing on the introduction of e-learning activities and tools in given communities; in the field of communities, elaborating a semiotic approach to online communities and social networks.

**Giovanni Torrisi** (PhD in sociology of law) is IT professor at the University of Urbino, where he also teaches a course on sociology of law and is member of the Department on “Politics, Society and Institutions”. He received a MA in legal sociology at the University of Bilbao in 1997, a LL.M on European Law at the European Academy of Legal Theory (Bruxelles) in 2000, and a PhD in sociology of law at the University of Milan in 2003. During the period from 1997 to 2008 he worked as IT consultant and project manager for the University of Urbino and its online courses in sociology. Recently he has been the coordinator of E-Urbs (www.e-urbs.net). During the last 5 years he has related his interest in socio-legal issues with his IT expertise, contributing to an action/research stream on e-participation and e-democracy for the local government of the Marche region.

**George Ubachs** is managing director at the European Association of Distance Teaching Universities (EADTU). He coordinates European initiatives in relation to LOF learning by organising strategic expert meetings as well as thematic seminars and task forces. Next to this he is working on the development of projects and is coordinator of several running European projects on virtual mobility, quality assurance and university strategies. Before joining EADTU in 2002, George Ubachs has been working on various European projects in the public and private sector (MAECON/EAM Consultants) in the field of regional economic development and social improvement and was coordinator of the European Network of E2C-Europe (Cities for Second Chance Schools). George Ubachs graduated at the State
University of Leiden and Erasmus University Rotterdam in Public Administration with specialisation in European Integration.

**Wim Van Petegem**, holds two MSc Degrees, one in electrical and one in biomedical engineering. After completing his PhD in 1993 at K.U.Leuven (Belgium), he conducted post-doctoral research at the University of Alberta, Canada. From 1994-1996 he was a post-doctoral fellow at the K.U. Leuven, in the Division of Biomechanics and Engineering Design. In 1996 he was appointed senior researcher with LINOV, the Leuven Institute for Innovative Learning (K.U.Leuven), involved in research on the introduction of ICT in education. From 1998 he was assistant professor at the Science and Technology Department at the Open University of the Netherlands, involved in research on Web-based learning and in education on ICT and management. In 2000 he became part-time senior researcher at LINOV (K.U.Leuven) and part-time lecturer at the Katholieke Hogeschool Leuven, Department of Economics. Since 2002, Prof dr. Van Petegem is head of the Unit Audiovisual & New Educational Technologies (AVNet) at the K.U.Leuven. Since 2005 he is appointed vice-chairman and treasurer of EuroPACE.
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