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Restructuring Higher Education institutions in Europe: The case of virtual learning environments

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Abstract

Research has been carried out into the educational and training innovations resulting from the current implementation of Virtual Learning Environments (VLEs) in institutions of higher education in order to understand how these innovations interrelate with teaching and learning; the implications at the institutional level; and the cross-cultural diversity within virtual learning environments, with an emphasis on those that combine face-to-face and virtual learning. In an attempt at innovating public educational institutions through the restructuring and promotion of educational co-operation at the European level, a study was made of nine institutions that provide tertiary education and postgraduate training in six European countries.

Keywords

Virtual learning, eLearning, online learning, institutional change, institutional policy, cross-cultural approaches to learning.

1. Introduction[i]

The steady implementation of telematics networks in teaching and in the day-to-day practice of universities is bringing about changes in the way learning is organised, while questioning the whole organisational arrangement and opening up opportunities that nobody could have predicted a decade ago. In the background, the political and cultural integration of the European countries is influencing the way institutions such as universities (which play a key role in the shaping of the workforce and in the socio-cultural weaving of society), undertake their transformation.

These processes are advancing at a pace that nobody could foretell, and there is no doubt that they are changing learning approaches, learning populations, and many of the practices of the academic and professional culture of lecturers. Meanwhile, we look at these emergent transformations in order to envision not only what the future could be, but what the main issues confronting these trends are and how they can be more efficient.

In this article, I describe and analyse some innovative virtual learning practices in nine European institutions of higher education[ii] and a private organisation (working in partnership with several European universities and schools) that were implementing virtual learning in

varied contexts using diverse learning technologies. The innovations took place (some of them are still going on, and other have became fully consolidated) in the so-called conventional (or traditional) universities; by conventional universities, I mean those in which the management, the curricula, and the exchanges among the learners are based on face-to-face interactions (the most predominant ones). After looking at emergent practices, I present a broad overview of significant trends and issues related to the implementation of virtual learning in European universities.

In looking at opportunities for change in universities, one must understand that the external environment is, by far, the most powerful source of internal change (Baldridge&Deal, 1985]. Universities today are participants in the evolution of the new information and communication technologies. Generally speaking, Europe is evolving towards an economy and society based on knowledge, and education and training are crucial to this transition (Bangemann, 1996]. Lifelong learning, a key strategy for Europe [CEC, 2000], affects large sections of the population; continuing education programs offer the possibility of updating or expanding one's knowledge and abilities in addition to or in conjunction with one's daily work. At the same time, the growing access to collegiate and graduate studies in all of Europe in the last decades has triggered an explosion in the demand of and change in the present conditions of teaching and learning.

E-learning makes way for new modes of learning that bring education into one's home, breaking the traditional structure of educational institutions as well as their delivery methodologies. The virtual campuses have begun to develop, not only within distance learning institutions, but, paradoxically, within those institutions in which regular personal contact with students is the basis of their organization, professional culture, and classroom-based curricula.

New paradigms of learning, new teacher roles and functions, and new didactic methodologies begin to form as a result of online education programs. It is obvious, then, that we have entered a period in which educational institutions and learners, must adapt the course management and teaching and learning methodologies to the needs of these emerging forms.

The current process of the integration of the economic and social systems in the European Union is another aspect of. The socio-economic reality of the last decade suggests that it won't be long before there is a learning demand that transcends national curricula, favouring the inter-europeanisation of education and professional training [Confederation of EU Rectors' Conferences and the Association of European Universities, 2000]. These circumstances require an investigation into the problems associated with the cultural, linguistic, and curricular diversity of the European countries.

This research attempts to contribute to a greater comprehension of the emerging phenomena and practices in the area of institutional, pedagogic, and cross-cultural innovations produced in European universities and learning institutions with an increasing introduction of virtual learning environments (VLEs). It contributes to the discussion of the change in policies and institutional strategies in the face of a future integration of educational systems.

For the purpose of clarification, it is important to make a preliminary definition of what **virtual learning environments** means in this study.

Although the phrase "virtual learning environment" is the most popular, there are others that point to similar concepts of open and distance learning, such as "telematics learning environments," "distributed learning environments," "online learning,", "open and distance learning (ODL),and currently, e-learning". The concept of Virtual Campus[iii] derives from these VLEs.

Since there are many conceptions of VLEs, I want to begin with the definition of Learning Environments and the delimitation of their main traits. A learning environment is a place or community arranged specifically for learning purposes. In order for learning to take place, there

are three essential components of any learning environment, which are defined on an inter-disciplinary basis [Pulkinen et al., 1998]: a) pedagogical functions (learning activities, teaching situations, learning materials, tutoring and support, evaluation, etc.); b) appropriate technologies (how the selected tools are connected with the pedagogical model); and c) social organisation of education (time, place, and community).

VLEs fit these general characteristics, but include other, more specific ones. The use of telecommunication tools in the teaching and learning process is a key point. Generally speaking, VLEs are on-line domains allowing both synchronous and asynchronous collaborative interaction among teachers and learners. Additionally, VLEs provide learning resources to be used by students at any time.

Hence, within the scope of the research, the definition chosen was the following: a ***VLE is any combination of distance and face-to-face interaction provided that some kind of time and/or space virtuality was present.*** The support learners receive in a VLE using different technologies, especially those related to Internet, triggers new educational opportunities . as compared to traditional distance education

2. The restructuring of the university and the context of the Information Society in Europe

There is an increasing demand for education in a lifelong learning context. Currently, we are seeing, and will continue to see in the years ahead, new learning needs arising [Henderikx et al., 2000], in areas such as specific professional training, general skills building for employability, vocational training and personal development. These demands are expected to increase rapidly in the next years as a result of the exponential growth of knowledge, the trend toward continuous innovation in employment, and online learning opportunities

Conventional universities and open universities play different roles. They aim at different market segments and use different approaches. It is clear that conventional universities will continue to be dominant in undergraduate degree education for adults in the foreseeable future, and their role in continuing education will continue to increase. Therefore, their ability to adapt to changing needs, locally and nationally, will determine their future viability as institutions of higher learning.

Trends in higher education and virtual learning

According to some researchers[Bang&Dondi, 2000; Trindade, 2000], European higher education is in a period of transition with several on-going developments in play simultaneously. They see two basic trends affecting the implementation of online learning: merging of campus-based learning and on-line learning, and market competition or collaboration among universities and between universities and private companies. Many universities have taken over the well-prepared educational material developed for VLEs and used it for campus-based students following regular face-to-face lectures and seminars. Very seldom the reverse operation is seen. In years to come, university education may be increasingly based on different types of virtual learning arrangements combining high quality interactive multimedia materials with online educational databases. In addition to these materials, universities will offer a variety of support functions for different groups of learners, such as face-to-face lectures and seminars, video lectures and video conferencing, on-line virtual seminars, and computer conferencing.

Virtual University Models

University models are evolving around the world. Hanna [[1998] introduces seven emerging organizational models of higher education dominant in the US. The models discussed are derived from analyzing trends, characteristics, and examples of emerging organisational practice:

A. Extended traditional universities
B. For-profit adult-centered universities
C. Distance education/technology-based universities
D. Corporate universities
E. University/industry strategic alliances
F. Degree/certification competency-based universities
G. Global multinational universities

These models can also be found in the EU. They are greatly influenced by the use of ICT in their functioning and especially by the involvement of telematics at all levels of operations. Conventional universities share characteristics of these models for the same reasons, hence boundaries between the organizational models are ambiguous. What is on-campus and what is not is less and less apparent.

Within this changing panorama, virtual university models can be located on a spectrum, from a complete dedication of institutional resources to distance learning on the one hand to the development of individualized courses on the other. In the former category, one can place universities such as the Open University of Catalonia; and corporate providers and education brokers, such as the University of Phoenix, Disney University, and the so- called international 'mega-universities' [Daniel, 1998], which include the Open University in the UK for the Anglo-Saxon market and the Spanish UNED for the Latino-American Spanish-speaking market.

Educational institutions begin to turn their attention towards online provision as an innovative way of providing access to new learning opportunities, so in the latter category one can place almost every university. This provision can take the form of incorporating a Web-based resource into a predominantly face-to-face course, developing teaching strategies which can be implemented both face-to-face and online, or designing a course which is delivered entirely online. There appears to be no one generic model of the virtual university or of virtual provision, and its particular nature will depend on a number of local factors, such as technology, pedagogy, assessment, training, communications, legal issues and support staff [McConnell, Harris & Heywood, 1999].

Thanks to the full use of virtual campuses, conventional universities are moving towards a dual model of face-to-face education and open and distance learning as compared to single-mode universities [Trindade, 2000]. In the dual-mode, formal programmes continue to be taught to resident students in the conventional way, while special programmes of mostly non-formal nature (like adult, continuing and community education, etc.) were offered in the distance learning mode to off-campus students.

The perception dichotomy between distance and traditional teaching in higher education institutions differs among countries. For those countries where a dual mode approach to distance teaching is the norm, many universities view their distance teaching as an extension of their on-campus programmes, often perceiving the close similarity as an implicit guarantor of equivalence of standards [Curran, 1997]. These countries might be better able to integrate virtual campuses into their traditional university system than others.

Although there is some classification of virtual universities in the literature, there is a lack of research on how conventional universities evolve towards complex learning organizations that

include VLEs. Foster [1999] suggests that a university's readiness to implement virtual learning is the first stage, what Fullan [1991] calls the initiation phase.

Institutional constraints on the development of virtual learning

Much has been written about the constraints and difficulties in implementing and institutionalising Virtual Learning Environments in conventional universities. Following are summaries of some of the issues researchers have studied.

- *The need for change*

For the majority of conventional educational institutions, the emergence of virtual methods of education presents major challenges for both technological and organisational change [Bates, 1999; Laurillard, 1993], decision-making [Collis, 1996] and costing [Basich, 1998; Collis, 1996]. Research done on institutional readiness for networked learning at a traditional university [Foster et al., 2000; Foster et al., 1999] identified the need for both technological and organisational changes in internal infrastructure, including the need for more effective channels between the administration and the faculty, and the need for greater inter-institutional collaboration.

- *Issues around change*

Developed organizations change significantly only when three conditions are met: a) there must be enormous external pressures; b) there must be people inside who are strongly dissatisfied with the existing order, and c) there must be a coherent alternative embodied in a plan, a model, or a vision. [Toffler, 1985]

The new learning environments do not emerge spontaneously; they must be created [Pohjonen, 1997]. The planning and implementing of new learning environments require a strategic and systematic view [Ryan et al., 2000]. educational managers need to set up the goals, strategic choices, and operative action. [Hamel&Prahalad, 1994]. A strategy paper is a good approach to planning change.

[Foster's, 2000] research supports many of the above stated findings, identifying the following areas of concern of support staff who were preparing for the implementation of networked learning methods: a) vision & top-down leadership; b) strategic planning in the areas of IT, staff development, curriculum development and learning opportunities for students and c) quality materials.

[Bates,1999] argues that adoption of technology, although widespread, must be accompanied by changes in the way learning and teaching are organised, including structural changes in the institution. This author identified strategies needed to tackle the changes required within an institution in order to support the integration of ICTs into academic teaching and other practices: 1. a vision for teaching and learning 2. funding reallocation 3. strategies for inclusion 4. technology infrastructure 5. people infrastructure 6. student computer access 7. new teaching models 8. contract agreements and training 9. project management 10. new organizational structures 11. collaboration and consortia 12. research and evaluation.

- *Issues around conflicting professional cultures*

It is usually assumed that the major obstacles to organisational change and technology adoption reside in the realm of technological feasibility and cost-benefit analysis. In reality, organisational change is contingent on a set of social and human social factors and dynamics that are much more difficult to manage and manipulate. In academia, according to Jaffee

[Jaffee, 1998], obstacles to change are closely associated with the established practices and cultural traditions of the teaching faculty. Both the traditional classroom organisation and tutoring arrangements are part of the professional identity of University lecturers [Barajas, 1998].

It is a complex process for a conventional institution of higher learning to come fully and successfully into the field of virtual learning. There are many methodological and pedagogical precautions to be taken, besides organisational and logistic ones. These are deep and delicate issues, for they are strongly ingrained within the institutional life, experience and tradition—these are purely cultural issues [Trindade, 2000].

For this author, given the differences between the roles, the duties and the degrees of freedom of a professor in a conventional university and in a distance-teaching one, we must recognise that there is a wide cultural gap between them. This is the reason it is easier to solve this problem in a new single-mode institution, wherein the rules of the game are established from the very beginning of the venture, than in a dual-mode operation within an established conventional university, where old habits and privileges of faculty may clash with the new requirements of the VLEs.

The impact of ICT on professionals needs to be seen in the context of and in dialogue with the other communities who are part of the institutional context Whether one is talking about the production of materials or liasing effectively with other professionals inside and outside the institution, the development of virtual education is an intrinsically collaborative process [Foster et al., 2000].

3. Dimensions of the study

Keeping in mind previous research, in this study I examined the key factors in the process of transforming traditional universities into new organizational structures based on virtual learning; the outcomes of virtual learning; and the socio-cultural factors for learners. One of the limitations of the study is that the field of virtual learning evolves so rapidly that some of the results may soon be obsolescent. This could be especially likely for this research since it concentrates on implementation (and to some extent the early adoption phase), a phase in which practices have not been institutionalised.

The basic assumption of the research was that socio-cultural, institutional/organizational, and teaching/learning factors are interrelated in the practices of the educational actors and in the institutional culture as a whole in the virtual learning experiences (Fig. 1). We cannot separate any one dimension, because each element separately as well as the combination of all of them together has a critical effect on the results of the implementation of VLE as a whole. For example, the cross-cultural characteristics of international courses directly affects the learning interactions, and as a consequence, inhibit or enhance the learning experience.

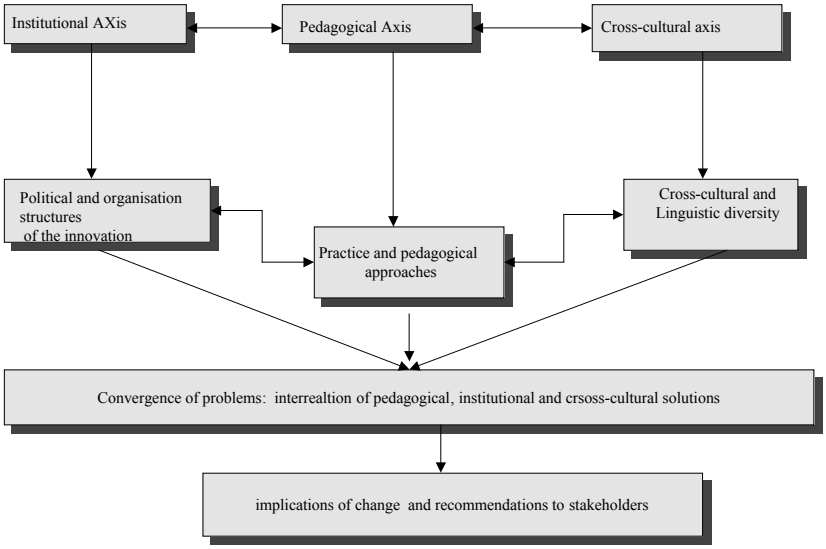


Fig 1. Complex interrelations in the implementation of VLE.

The institutional dimension

Without any doubt, the above mentioned changes are producing new dilemmas for the administration of universities. It is difficult to adapt virtual learning to structures that belong to old organizational models and established institutional cultures. It seems evident that we are living in a time in which public (and private) institutions will need to adapt their procedures to the new modes of educational direction. As mentioned before, the lifelong learning model demonstrates the necessity of continuing education as a response to the changes in the job market [European Commission, 1993; CEC, 2000; Blanding&van Oost, 2000] to the point that the boundaries between graduate, postgraduate and various forms of non-formal education start to blur from the management point of view. The implementation of online education (stand-alone or in collaboration with other national and international institutions), to meet the demands of education and professional training, as well as to offer flexible education (attracting potential students formerly excluded from a university education), requires the development of organizational structures and cultures different than those currently in place. In this dimension, the questions and issues that this study examines are the following:

° Under what conditions can public university institutions integrate new learning systems at the level of human resources?

° What institutional strategies are favourable to change?

° What changes in organization and infrastructure are necessary for the implementation of virtual campuses?

° Which factors promote innovation and which are resistant to the implementation of virtual learning environments?

The Teaching/learning dimension

Educators are facing a contradictory situation at the organizational and pedagogical level. As classroom organization is changing, along with the changing roles of teachers and students, the new tools allow for active communication, on the one hand, but pose new challenges for finding the most effective strategies for using them;. Some preliminary studies on innovations in virtual learning environments have been done (as I have mentioned in the review of the literature), but knowledge on this subject is scarce, especially in those cases in which traditional, in-class learning methods and virtual learning are combined. With regard to these issues, I established the following research questions:

° How do we learn in telematic learning environments?

° What models of collaboration among learning actors are established and how do we administer such learning situations?

° Under what conditions are teachers' and students' functions modified in virtual learning?

The socio-cultural dimension

Universities today are more open and accessible to all educational levels, independent of national, cultural, and linguistic barriers. The international collaboration between European (and non-European) universities will be important in the future, and will introduce certain elements of the market and competition into the relationships among these institutions. Collaboration and competition are opposing elements, yet they are also intimately linked, due to the fact that they allow for the creation of institutional alliances in order to attract a diverse group of students, both at the regional and the European level.

With respect to this setting, I have dealt with the following issues in this investigation:

° What are the communication problems that arise in virtual learning environments when the participants have different national languages and cultures?

° What factors affect the collaboration between university institutions (including professional training programs) when they offer virtual education?

° What are the strategies for using curricular content in countries with different educational systems and cultural identities?

The possible answers to these interrogations defined the first steps of the investigation. The genesis of these questions was based on the researcher's experience. As previously stated, only a holistic approach that combines the interrelationship of the diverse factors that influence this phenomenon and emerges from its analysis can provide answers to the questions posed.

4. Methodological options

The outline of this study was based on the multiple case-study model, and within this framework, the vision is closest to **collective case study** [Stake,1994]. This model is a variation of the so-called instrumental case study, extended to various case studies. The cases are analysed in order to provide knowledge about a determined theme or to refine a theory. For this author, the case itself is of secondary interest. Instead, it plays a supporting role, facilitating our understanding of the phenomenon being studied. When we analyse various cases, we may or may not have a previous understanding of their common characteristics. The cases are chosen because it is believed that, in understanding their intricacies, we can better understand (or even theorize more profoundly about) an even larger group of cases than those being analysed.

Definitively, the focus of the research was close to the so-called *reflexive interpretation* [Alvesson and Sköldberg, 2000], which principle characteristics aim to keep the following factors in mind: contact with the empirical material; awareness of the interpretive act; clarification of the political and ideological contexts; and a preoccupation with the issues of representation and authority.

Cases were chosen bearing the following premises in mind:

a) The centres were educational institutions which had implemented virtual learning experiences through a project funded either by the European Union, national or regional authorities, or by the institution itself.
b) As far as possible, cases had to have some kind of national or international dimension, either as a key element of the project or as a more or less formal collaboration with colleagues from European Union countries in this field.
c) Although the research did not seek to be representative of European education as a whole, attempts were made to ensure that the cases were distributed in four basic geographical areas: North-western Europe, Central Europe, Scandinavia and the Mediterranean.

Each of these institutions was an individual case. At each, telematic training courses and exchanges were examined, discussed and studied. The cases chosen had aspects that corresponded to the three initial thematic areas of the study (institutional, educational and cross-cultural), but some of them laid particular emphasis on certain areas; for this reason, the institutions were divided into three groups, corresponding to each thematic area.

Interviews, document analysis and *case study reports* were the main instruments of data collection. The interviews were semi-structured, conducted with members of the management teams and with people who had intervened in the VLE innovations. The interviews were the basic material for building a total of the nine case reports.

5. Research results

The following is the result of the cross-analysis of the different cases according to the dimensions, categories and indicators results of the research. The outcome of the process is a mixture of the descriptive, the interpretative and the evaluative [Merrian, 1988], intending to respond to the questions initially posed.

A learning innovation such as the implementation of VLEs, is a complex phenomenon that emerges historically, and is culturally mediated. Learning innovations are framed by institutional and organisational factors, by teaching/learning arrangements and by socio-cultural conditions. In the following sections, I analyse these three chief axes or dimensions in the nine cases studied, according to the categories that emerged from the cases.

5.1 The Institutional dimension

5.1.1 Pressures

Virtual Learning Environments have been set up as a response to a number of different pressures: political, economic, social, European, Government, and intra-institutional. These are considered in the following sections.

- *Political pressures*. It can be seen that, in some cases, government pressures on universities are both explicit and implicit through policy and fiscal control. Most of the time, these pressures are indirect, and come from control of the economic resources of the institutions. Direct pressures over European universities could not be possible, given the status of management autonomy they share, but control over the financial sources can be even more efficient as budget constraints. This limits the possibility of implementing new innovations, but, on the other hand, pushes the universities to find new ways of self-financing, introducing a market-oriented perspective. Indirectly, success in this process implies a competitive advantage for the future.

- *Market pressures*. Market pressures are generally more evident than political pressures in the cases studied, but they are clearly linked. The universities respond to the demands of new student population, because universities see themselves more and more as competitive organisations looking for new market segments. For some, it is interesting to ask, "If the market is requesting VLEs, why are institutions not responding to this need as anything more than a pilot approach?"

The universities that have long-term experience in marketing for traditional education courses are now often including VLE courses. They usually hold a language advantage at the international level.

This study has not engaged in market research, but there is a reported perception within the institutions that there is a potential market for VLEs.

- *European pressures*. Although the European Union is generally trying to promote interest in virtual learning, it does seem that the cases under consideration have had a relatively European influence. Many of the developments of the projects themselves have mainly stayed within their own national boundaries. This is not a handicap, but a result of evolution; most of the universities offering this type of innovation were recipients of European Union funds for pilot projects. Public funds have definitely been a positive pressure on institutions to begin innovations.

- *Government pressures*. Overall, in the cases considered, it appears that national governments are not trying to encourage or directly oppose moving to virtual learning. On the other hand, all Governments are trying to increase the use of Information and Communication Technologies in schools and, specifically, for courses for the Initial Training of Teachers.

- *Pressures Internal to Universities***.** Each university has such a multitude of pressures working in different directions that it is not always easy to see to what extent these are working towards the establishment of Virtual Learning.

For some senior managers, the pressures within universities generally seem to be towards limiting the spread of VLEs. There are a number of possible reasons for this: one is that many existing teaching staff are not very familiar with telematics and so are fearful of having to learn a whole new set of skills; another is that many staff are perhaps concerned that they could be replaced by Virtual Learning Environments.

Administrators may see that a big investment is needed before such systems can work effectively and may not see possible avenues for financing this. Financial control systems were designed in the days when all teaching was carried out in lecture theatres, laboratories and seminar rooms. These systems are not flexible enough to work out the true costs of the VLEs which need new investment in ICT infrastructures but less investment in buildings, and new multi-skilled teams engaged in teaching activities, rather than single lecturers.

Interestingly, it seems that the top management level of some institutions feel that innovation in this field is both necessary and possible. They are leading many initiatives;for instance, the establishment of virtual campuses). They seem to be driven by the academic prestige gained from association with dynamic, innovative institutions. Nevertheless, managerial support is not, on its own, a guarantor of innovation and change. Middle management is not playing a protagonist role in promoting this type of innovation; they are more concerned with the day-to-day running of existing conventional courses.

Finally, a factor that influences change is that of the new culture of innovation in teaching that is emerging among senior management and university teachers that benefits the implementation of ICT-based innovations.

5.1.2 VLE's Implementation models

The analysis of the cases indicates some of the models being used and trends in the scope of implementation. At the time of the data gathering, all models were not fully developed and did not share identical characteristics; they shared some traits, but some progressed further than others. I identified four basic models whose main characteristics were present with different emphasis. They are presented below:

- *Non-structural implementation of VLE.* We can define this model as the first step in the process of transformation of higher education institutions. These universities are in a phase characterised by the implementation of innovation at the level of pilot projects that are mostly funded by external bodies, generally by the Government or by the European Union.

- *Parallel Structures alongside 'Traditional' structures.* This model is a step forward in the development of VLEs in institutions; although the institution may not be very advanced in the implementation of VLEs, there is an strategic plan that promotes the integration of online learning in the academic and research arena.

The integration of VLE courses into the regular curriculum is the main mode of implementation , and it is not unusual to find VLE used for communication among teachers and learners in both distance and regular courses or for other learning activities such as professional development.

- *Mixed mode structures.* In this model, conventional universities are experimenting with changing their organisation, transforming their structure from single-mode to dual mode institutions. The combination of presence and ODL through a virtual campus has increased the capacity of existing universities to supply education and attract new students. It is more feasible and requires less effort to create VLE inside the conventional universities than to create new distance education universities. Within this model, universities create independent structures that can look at both national and international markets.

Virtual university models. This is the case of conventional distance education institutions in process of transformation **towards full online operations**. A typical case might be the UNED, the Spanish National Distance Education University, which offers a virtual campus for an increasing number of courses and students.

5.1.3 Characteristics of the VLE implementation process

- *Localisation*. In VLEs, students and teachers do not need to be present on a campus. To what extent are Virtual Learning Environments localised? Delocalisation raises many questions related to the organisation of the VLEs, universities' partnerships, fees, regulations, recognition of courses or diplomas, pedagogy models, etc.

- *Laws and external regulations*. Many learning organisations are steeped in tradition and are rigidly controlled by laws, rules and legislation. They are often quite unlike commercial organisations, which can reflect upon their structures and re-package themselves in moments of crisis or other occasions of need. In almost all European countries, the Universities do have autonomy from government, but in practice the regulatory framework is very rigid with respect to academics.

When we look cases of international scope, the same problems arise. There are problems whose nature goes beyond the institutions and the individuals themselves and are related to the regulatory national frameworks. Interestingly, it was noticed that for VLE programs at the level of continuing or permanent education, laws and regulations are less rigid in all countries.

- *Financial support*. Financing of innovations in general and of VLEs in particular is a key issue that influences their implementation and adoption. Any type of innovation requiring a large investment in equipment and maintenance is subject to many tensions on all fronts.

Many of the projects presented as case studies receive funding from a number of sources, both national and international. Financial support is available from the EU within different subsidy frameworks and research/development programmes.

There is a view that, in the long term, VLEs may either provide new sources of income or reduce current costs. So far, few institutions seem to have been developing the capacities and methods to manage the replacement of existing work with lower cost VLE activity that would make VLE activity economically self sustaining .

- *Staff and Internal Politics*. The internal politics of each institution play a very big part in the way decisions are made. The internal politics of institutions results from and creates the community values and the division of labour in the institution. There are clear implications for changes in these aspects if VLEs are to be more widely developed.

The efforts made in implementing innovations in general, and particularly innovations related to the use of ICT, are many times not recognised at the departmental level. An interesting fact is that many people involved in innovations do not have tenure; the work is carried out by contract staff.

Tenured staff who participated in pilot experiences volunteered for participating in the projects as part of their professional development and academic interests. What it is less certain is whether they were satisfied that they receive appropriate and sufficient training.

In Europe, university courses have historically been taught by lecturers who teach independently, especially at higher levels. Teaching tends to be an individual activity. This is in marked contrast to the way education is practised in VLEs, where a diversity of skills come together to create a course.

One of the hesitations to accept virtual learning comes from the opinion of faculty, staff and managers that the diffusion of VLE, instead of bringing new opportunities, would eliminate

jobs. . It is of the outmost importance that the various actors are clear on the complementary nature of VLE in the transfer of knowledge.

In the case of academic staff, the factors that threaten to lower the status of university teachers, therefore, seem to act against the adoption of VLE activity. In most cases, there is a group of promoters whose career path is specific to research and development of VLEs. This mitigates against mainstreaming of VLEs in institutions unless there is a change in the reward structure for university teaching.

- *Knowledge for implementing VLEs.* VLE activity requires a large number of different skills, and, consequently, its design and implementation is generally conducted by teams.

There is a clear dilemma here for universities. The development of new pedagogic skills in the teaching force and the incorporation of technical and pedagogic skilled personnel into teams require a major reconfiguration of the division of labour in universities. The development of such teams to undertake additional and/or pilot activity does not pose any particular difficulty. But in general, knowledge gained by such teams working on pilot projects tends to remain within the teams and is barely diffused to the rest of the institution.

- *Links with External Organisations / Partnerships.* Because VLE activity is mainly additional to normal university activity, it is often sustained by special initiatives in expectation of extending the reach of a university beyond the university campus. This encourages collaboration with external partners as funding organisations, clients or suppliers. This is true in all the case studies and adds a dimension to the system in order to incorporate the "laws", community values and needs of the partner organisations. This is not unusual for modern universities, since research work increasingly depends on such collaborations. These collaborations should make the implementation of VLEs less problematic; however, the effects of these collaborations may have long term effects on universities.

We can see the partnerships as a new culture of collaboration growing inside the institutions. The nature of VLEs calls for "external" students on the one hand; and, on the other hand, it calls for sharing costs and risks due to the large amount of investment required for implementing quality programs. What is important to point out is that universities, thanks to telecommunications and the possibilities offered by VLEs, are opening up to collaborate in teaching with other institutions.[

- *Accreditation and Validation.*. All award bearing University courses need validating. This is initially a guarantee of quality and interest at the level of management. Accreditation of international courses is an issue. The fact that are distributed in countries that differ in legal regulations, poses additional problems. In this sense, VLEs create a potential problem since, in some institutions, the virtual learning programs are being developed with several other institutions. However, all belong to the local universities, which are responsible for validating the courses[

- *Sustainability and Scalability.* To what extent can the achievements of a pilot study be sustained and integrated into a wider system? Scalability has to do with the way the projects were born and how they evolved in the following years. Once an innovation is started, given the considerable investment and personal efforts needed, the way it evolves and the support it gets influence the prospects for sustainability. If funds come from external parties, sustainability can be compromised when these funds terminate.

Some of the programs described, and many of the programs in Europe are supported by "special" funds;. This situation can result in a limited level of maturation of the programs and, therefore, a reduced level of institutionalisation ofVLE.

5.1.4 Institutional and organisational opportunities and barriers for implementation

Not all the institutions in Europe might face the same problems when dealing with implementation of VLEs [or: VLE innovations]. In the case of VLEs, the opportunities are complex and vary from one institution to another, from one country to another. In looking at factors that might be in favour of promoting VLE, we should be conscious that opportunities and barriers from the institutional point of view cannot be separated from the other dimensions of the study: the teaching/learning and the cross-cultural ones.

- *Opportunities and barriers for implementation*. Generally speaking, higher education institutions might look at pressures from a positive point of view, and see them as opportunities. I previously noticed that VLEs can be used (and in fact have been) to increase access to higher education by those young students who could not (for economic, geographic, physical or organisational reasons) attend university classes full-time. Equally, online learning (and the traditional ODL) has allowed adult learners to study in a way compatible with their work and family commitments, and universities have been able to provide higher education opportunities to an adult audience in a relatively inexpensive and organisationally compatible way.

As with respect to barriers, we noticed a lack of computer classrooms or classrooms containing computers for supporting the VLE programs; in other cases innovation projects had low priority for using the computer facilities.

There is also a problem with the system of teaching by "timetable". There is still a high expectation by the staff and students, who are accustomed to filling up their timetable with classes, and some find it difficult to accept a learning system that does not demand a particular time slot on their timetable.

An important barrier is the lack of strategic plans for implementing VLE programs. There can be a group of teachers that make efforts in this field, but if they are not supported by an strategic plan of the institution, the innovations probably won't last. The level of investment and the implementation strategies depend heavily on the support of university management that includes clear decision-making processes; many times this is absent.

No common pattern relating to the barriers has emerged from this study, but all universities share at least one of the barriers identified in each specific case studied: lack of facilities and technical support, lack of confidence of staff, resistance to change by the institution's faculty members, lack of strategic plan, etc.

5.2 Teaching and learning dimension

In this section we outline what are the main characteristics and changes observed in the cases studied with respect to new methodological approaches to learning. By doing that I tried to shed light on the extent to which VLEs represent an added value to learning compared with traditional environments.

There are various aspects to be considered in how information technology has been used by the cases studied: as a platform for the development and delivery of products for teaching and learning and as a tool for the organisation of the learning contents and resources as well. What have been the relevant roles of teachers and learners? What are the pedagogical perspectives used? These relevant aspects of VLEs and courses cannot be analysed separately due to their inter-dependency. The question arises as to whether or not flexible learning environments built

on ICT will lead us to qualitatively better, more effective and more efficient education, and how these new educational models have to be brought about.

The case studies show *different pedagogical approaches* and the complexity of the concept of Virtual Learning Environment. Each of the approaches are connected to different choices of technology, different needs for the delivery and organisation of the training, and, finally, different notions and emphasis on methodological definitions; therefore, it is difficult to describe pedagogical issues in a learning environment in the context of selected concrete courses.

5.2.1 New teacher roles identified as a result of pedagogical practices in VLE

The primary roles assigned by society and assumed by teachers are information transmission, leading students' learning behaviours , and having knowledge that can be attained by students: How are these roles changing? In this section, we will look at the changing roles of teachers.

The roles of teachers are part of their professional culture, and are deeply embedded in their practice. The new roles are usually accepted if they are: a) advantageous with respect to the old ones; b) pedagogically necessary given the characteristics of the learning environment; c) offering a personal initiative for innovating practice; d) a combination of all of them.

For instance, in VLE project work, the learners and the teacher can be scattered in time and place. The project group gets organised for its tasks with the help of the teacher, or independently, and it is assumed [by whom?]that the project is designed mainly by the students themselves. The teachers are seen as tutors supporting the learning process.

Moderation is a key component of teaching; learners learn by interactive processes among teachers, students and learning resources. Nevertheless, the role of moderator can be understood in different ways. If we are talking about face-to-face interaction in the traditional teacher function, the teacher has to follow the lesson plan. In the traditional courses, the instructor is playing the central role, dominating the classroom interactions; In VLEs the learners are not necessarily sharing the same classroom, so the teacher is removed from the centre and guides the individual learning processes.

In VLEs, the roles of the teacher are changing towards working in teams, which need a large amount of planning and new skills. A single lecturer or tutor seems to be not enough for dealing with so many roles. This makes necessary a new profile of a teacher for virtual learning. One person could hardly have all the abilities necessary for sustaining communication active among learners, so it is appropriate to create teams of tutors able to divide up the numerous functions incomplicated and demanding courses, such as online international courses. In this type of courses the "virtual lecturer" needs to work on a team, rather than independently. We can even suggest that the role of the individual lecturer becomes the role of the member of the "team of tutors".

Roles are also connected to the cultural differences of participants. Course coordinators and tutors should make an effort to provide for the maximum interaction among learners, since as we will see later in the article, one of the elements of success of courses is the ability to engage learners in interactions of all types.

Having said that, we must admit that *virtual learning did not necessarily change the role of the teacher.* On the contrary, it can support and reinforce the old transmissive models, such as the master class model, as demonstrated in videoconferencing sessions held by subject-matter experts scattered in different countries.

5.2.2 New student roles identified as a result of learning in VLE

It is obvious that students' new roles are dependent on the changes in the roles of teachers, and, in some way, are both complementary. The roles of students depend actually on the pedagogical approach used in classroom and on the learning context

The learner becomes in many virtual learning experiences, the *author of learning materials*: Learners can work collaboratively with the teacher in the creation of learning materials generated in and out of classroom activities; for instance, students can write summaries of online discussions, and upload them onto the web site as new learning resources:

No matter what learning strategy is used, students are asked to be *self-reliant*. This is almost a condition in VLEs where the teacher is not present at all, as well as in situations of combining face-to-face with VLE in which the cohort classroom can have a flexible timetable.

Usually, a combination of roles linked to the different tasks can be observed in the cases analysed. It seems that a rich technological environment facilitates different roles being taken by the student during the course. In any case, it is arguable that these roles are predominantly or exclusively a part of virtual learning.

5.2.3 Patterns of teacher-student, teacher-teacher and student-student interactions in VLE

Interaction is a key issue in learning, whether it is mediated by tools or not. In fact, what telematics claims about interaction is the ability of the different technologies to establish communication and rich interaction among the learners, teaches and students. Interactions among actors are mediated by machines which in some way impose "their" conditions and limitations. In fact, many efforts are made to insure that student have the technical facilities available for communication with their peers and their tutors.

The changes in interaction among the actors of learning are linked to the "changing roles" mentioned before. In purely virtual interactions, the communication is less direct, but the possibilities for intervening are no less than in traditional educational environments.

VLEs interaction can be synchronous or asynchronous, moderated or unmoderated, one-to-one or many-to-many. These alternatives facilitate the construction of learning communities, but this does not mean that it won't be difficult to establish a learning community where every learner feels socially integrated and motivated enough for working actively. Consequently, promoting interactions among learning actors is always an ongoing concern in virtual learning environments where it is far more easy for students to withdraw into anonymity, to stop collaborating, to be uninvolved, or even to drop out. In many cases, it was observed that interactions among teachers and pupils departed from teacher-originated interactions towards informal, exploratory, -and socially constructive discourse.

Synchronous courses are characterised sometimes by free interactions and relatively unstructured discussions amongst the learners at different sites. Moderation plays an important role, especially in achieving learning outcomes: often always the same few learners participate, and this needs to be controlled.

Asynchronous communication particularly provides freedom from the constraints of time and place. It gives the student time to consider the assignments or what has been said, and any responses can be given thoughtfully. If group interactions are asynchronous, there are initial difficulties for communication. But, asynchronous communication can enhance social interactions in a distributed cohort of students.

In general, the interactions in VLEs need an extra effort when there are specific learning objectives. The larger the groups involved, the more complex the interactions; and the technological and managerial problems grow accordingly.

5.2.3 Classroom organizational changes

When a university course is offered, it is assumed that there will be a classroom. For most teachers, it is hard to imagine teaching and learning in the absence of a physical classroom.

The cases indicated that, when the traditional classroom changes, the new organisational arrangements are driven by the following facts: a) virtual learning environments change time and space concepts, introducing an essential departure from the conception of the cohort classroom; b) the pedagogical approach usually moves from 'teacher-centred' instruction to 'student-centred' learning.

Not all VLEs support a student-centred approach (and sometimes the level of virtuality can be marginal if the course is mostly classroom based but the changes depend mostly on theses factors. In the cases studied, several classroom scenarios were identified:

- ***virtual classroom***. A virtual classroom in terms of time and space where the classroom and course organisation is set by only one institution. Only one institution is in charge of organisation. This model is fully virtual and fully distributed in terms of participants. In this type of experiences offering common courses, the design of course materials, seminars, and the management of distance tutoring with students of differing nationalities and cultures across Europe, are organisational issues to be solved. Similar to conventional distance education courses.

- ***distributed classroom***. A virtual classroom distributed in different centres; a coordinating institution is necessary in order to manage the organisational problems, but combined with coordinators and tutoring sessions at the local level. [oh! I see] Formal agreements are necessary between participant institutions.

- ***dual mode classroom***. Dual mode courses are usually organised by one institution, combining conventional face-to-face interactions with virtuality in terms of extending the classroom timetable or the classroom space (home, computer labs, etc). They introduce elements of self-directed learning, and can organise virtual experiences with other learners from other institutions without formal agreements.

	centralised	decentralised	Local	national	European
virtual classroom					
Distributed classroom					
Dual-mode classroom					

Table 3. Models of classroom organisation according to management and scope

5.2.4 Teaching and Learning strategies

When the teaching and learning process is relocated to the virtual classroom, the social space that encourages and enables the roles, relations, and practices of the teacher-centred pedagogy is eliminated. The virtual space allows for the reconstruction of roles, relations and practices that can deviate radically from the institutionalised classroom model. In this sense VLEs have the potential for being socially transformative of the classroom methodologies.

Self-directed learning is a key concept present in the strategy for portfolio and project work, where the student takes responsibility for his/her own learning interests as well as the way to achieve the learning goals.

On the other hand, but non-contradictory to the individual responsibility of learning, is *collaborative learning* [here you're not talking about your cases, per se], in contrast to the traditional practice of individual and stand-alone study. But, this is not a "natural" process: at the beginning, students are reportedly reluctant to carry out collaborative practice. The Internet is widely understood as a way to improve the efficiency of how course material is delivered rather than an opportunity to change patterns of teaching and learning. But it is quite critical to look for opportunities of implementing collaborative learning experiences where collaboration could be perceived by students as a clear added-value to existing learning practices.

Other pedagogical models combine *autonomous learning and project-based team work*. Learning through one's own experience and reflection emphasises the student's own participation in the learning process to a great extent. The *"study projects"* are strategies in which students have to consider the goals of their study and apply what they learn to practical situations.

Communicative approaches to learning have been emphasised to the point of being dominant in the cases explored, given the exchanging and interacting possibilities of the technologies involved. Discussion and learning conversations are among the most used learning strategies. It is hardly surprising when one considers the many benefits offered by classroom teacher email, electronic discussion groups and the Web. One such benefit is improved communication; synchronous and asynchronous *group discussions* serve to enhance and extend interactions between students and between students and teachers. As previously mentioned, creating situations rich in interactions among learning actors is a crucial point for success.

With respect to *information seeking strategies,* the Web is used for looking for information for learning purposes. This is included in most of the learning strategies used in virtual learning since the Web provides many resources for learning.. We can conclude that there is no "given" pedagogy in VLEs; there is a variety of potential pedagogic strategies, and specific technologies tend to support particular models of teaching and learning[iv]. Nevertheless, as mentioned before, within the context of new educational paradigms, there can be new pedagogical models inspired by the shift from traditional teaching as a content providing and "transmitting" towards mentor guiding and supporting learners through the process of knowledge acquisition.

5.2.5 Staff training

Training sessions for VLE participants were considered crucial in the cases studied, including all students, regardless of the nature of the environment or teaching strategy implemented. Getting oriented in the learning environment, moderating skills, etc., are abilities that teachers should get before the experiences start. Teachers need to be trained, as well, in the new skills needed for VLE teaching—technological, organizational, and pedagogical.

5.2.6 Teachers and students attitudes towards VLE

Teachers' attitudes towards ICT are connected to socio-cultural, professional and technological barriers. Attitudes of teachers are not only individual-dependent, but also dependent on the culture of the institutions. For example, the attitude of a part-time tutor might be different from that of a senior faculty member. Organisational culture is the most important and the one mostly ignored. Organisational culture includes the policies, attitudes and personal models of learning, organisational climate, staff rewards, assessment and grading systems, etc.

The factors that raise the academic status of a university teacher seem to work against the participation in and adoption of VLEs. In most cases, there is a group of promoters whose career path is specific to research and development of VLEs. This mitigates against mainstreaming of VLEs in institutions unless there is a change in the reward structure for university teaching.

A personal and professional barrier that produces a negative attitude is that of connecting of VLE with the replacement of teachers. Many teachers will look at these systems as an intent to replace traditional teaching, a perception which results in institutional resistance to change.

Attitudes of students towards virtual learning vary. Some students spend a great deal of time online and, therefore, expect teachers to be online as well; some are very enthusiastic about learning online. Some students are worry that their required courses will only be offered online. Others lack the discipline needed to complete the work and drop the course.

5.3 The socio-cultural dimension: cross-cultural and linguistic issues in VLE in Europe

The efficiency, feasibility and impact of VLE at the European level depend not only on the establishment of telematics infrastructures, but also on assessing and understanding the cross-cultural and linguistic problems involved in teaching and learning in VLE.

In this section, we look at the main cultural and cross-cultural aspects found in VLE, such as collaboration, professional culture, and language issues with special emphasis on international environments. The weigh of cross-cultural issues has come to light gradually in investigating key concerns with respect to cultural differences in virtual learning environments, at both local, nationaland international levels. The user groups considered were teachers and students, but also university managers, since the policy level is of crucial importance in this field when the innovations are mostly at the level of implementation.

5.3.1 The European dimension of VLE

One of the main spin-offs of the implementation of VLEs has been the promotion of what is called the European Dimension of Education. The European Union, through several initiatives, has supported VLEs for obvious reasons, and at all levels, from funding the collaboration of the community of researchers to promoting the mobility of students, lecturers and researchers.

The European dimension finds in the virtual learning experiences a way to extend collaboration among the academic community, to overcome cultural differences among the different European countries and to promote the national European languages and, indirectly the use of a lingua franca in the exchanges, the English language.

5.3.2 Cross-cultural barriers

Cultural differences in international virtual campuses have hardly been addressed. Undoubtedly, this factor is triggering complex problems since it is difficult for higher education institutions to collaborate at international level with institutions that belong to different cultural and organisational models.

When the VLEs are on the international level, the situations that emerge are rich and innovative, requiring new practical approaches to solving organisational constraints. A motivation to innovate has been observed, so it would appear that the effort is valuable. Otherwise, the complexity of being involved in international learning settings mediated by telematics tools that break the relative calmness of a face-to-face classroom would be unbearable for tutors and teachers.

A certain difference in attitudes towards technology with respect to European geographical areas has been reported. This reinforces the belief that cultural differences of the national learning patrimonies of the different countries directly and indirectly affect the learning innovations. As part of the learning patrimony of each European country, certain pedagogical traditions are deeply embedded in the teacher's practice.

Technology in education carries cultural heritage and certain pedagogical assumptions. Thus, technology is never just a neutral tool**.**

5.3.3 Limitations of virtual communication

Communication among actors (teachers and learners) is a matter of controversy when mediated by telematics. There are different communication approaches in VLE, all of them mediated by different technologies. Even voice communication in video-conferencing poses constraints (also, sometimes, opportunities) on understanding and communication among actors.

Many of the asynchronous communication tasks in VLE are currently done through a writing style that tends to be minimalistic. This can lead to misinterpretations which trigger unforeseeable emotional reactions on the side of the recipient.

There are also limitations for synchronous communication connected to time zones and geographical situation in international VLEs that practitioners should consider, emphasising the short window of opportunity in a working day for synchronous activity.

Given the above observations, it doesn't seem desirable to focus on only one technology in education. An advantage of using a combination of different technologies in one VLE is to provide a kind of safety network. Users can choose among various technologies depending on their own preferences, learning styles and needs and on what is available. Also, if one technology fails within the fulfilment of an educational task, another one can assist. If well organised, the mixed mode can combine the advantages of different technologies. Many communication channels mean many possibilities.

5.3.4 Language Approaches

In international virtual learning experiences, language use remains a difficult issue; maybe less at the level of post-graduate courses (in which English is the lingua franca for communication), but surely on the undergraduate level. This factor needs attention from the very beginning of course development..

Many solutions have been explored in international courses; for instance, automatic translation, and the differentiation of activities done locally in the local language and internationally in English. Another strategy is to provide learner support, especially in those courses with a high level of international participation.

For most organisational matters and for dealing with cross-cultural language barriers, it is advisable to distinguish between the *local and the non-local level.* Tutoring of students in international VLEs also calls for similar solutions, looking carefully at the local, national and transnational dimensions.

A useful strategy for overcoming language problems is promoting interactions among learners in all learning situations—an intensive use of the different telematics tools and a strategy of "forcing" communication among learners to stimulate group work.

At the local level, the use of different languages has a different profile. For instance, in countries where there is more than one official language, courses and resources can be in any of them.

Languages such as English and Spanish that are used by a large population around the world have an advantage in the virtual learning world. This is obvious for English, which is the lingua franca for European virtual courses. Language, then, is a strategic issue at all levels in VLE. Institutions, and lecturers (especially at the postgraduate level) need to make a careful analysis of their priorities and markets before they decide what their language of use will be.

5.3.5 Calendar and syllabi of international learning experiences

An important drawback for international courses is related to local regulations concerning the calendar and syllabi of courses; international virtual learning experiences must take into account the legal and cultural differences among countries that configure the different national learning patrimonies.

The language of shared resources might pose additional barriers. What language should be used in these cases? How do we combine the needs and language limitations of local learners with the creation and distribution of resources on the Web? This is a problem in many of the international courses with no clear solution as yet.

A good strategy is to divide the development of the course among participating institutions, so that local aspects can be added, and ownership among international partners can be shared.

Research in the area of cross-cultural issues in Virtual Learning Environments is at an early stage of development, but it seems clear that the Europeanisation of education cannot and does not exist outside of consideration for cross-cultural influences. The way towards cross-cultural understanding requires an awareness of the different levels at which online learning can impact on culture (including language as a key component of culture), but also how culture impacts on online learning.

6. Conclusions and Policy Implications

This section is a summary of the major findings on the implementation of VLEs in conventional educational institutions. The research concerns and the issues raised emerged from the case study analyses conducted and the continuous discussions between the researchers and participants in the institutions analysed, together with the inputs from a virtual discussion about this research organised by the International Forum of Educational Technology and Society [Barajas et al., 2000]

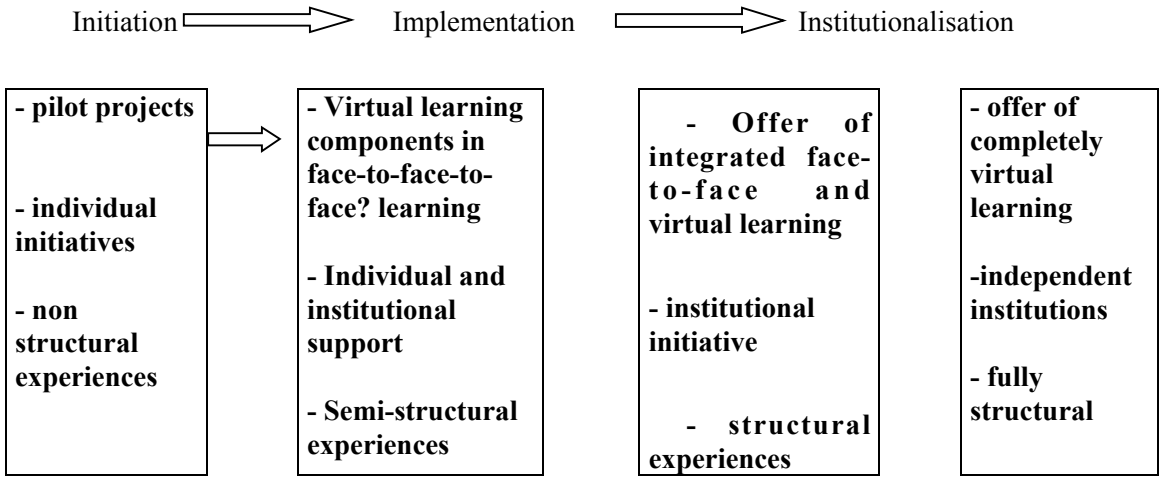
6.1 Conclusions and implications of change on institutional issues

This research has identified similarities and differences in the VLEs reviewed. Some of them are small-scale interventions of a pilot project nature emerging from the desire of individuals to introduce innovative practices in their teaching; others are experiences of a larger scope. The areas of specialisation or content addressed in VLEs, either at the level of continuous education or undergraduate studies, reside in the sphere of professional education.

Institutional evolutionary process

This research strongly considers the adoption of VLEs in the context of the traditional face-to-face paradigms of learning as a very important phenomenon. Such a consideration by the institutions implies a step forward in the transition from traditional teaching environments towards newer models of education. There seems to be an evolutionary path that starts from individual experiments promoted by individual teachers at the pilot level, and evolves towards

more complex innovations supported by managerial authorities through specific plans for supporting this type of innovation or through strategic planning. Three levels of evolution were distinguished: initiation, implementation and institutionalisation[v]. Both top-down and bottom-up approaches are present, although it seems unlikely that top-down initiatives could work by themselves.



1.1. Fig 2. Evolutionary phases of VLE in institutions

In general, undertaking VLE development within institutions of higher learning requires the following:

- *the attention of a variety of institutional actors*. These range from developers to administrators and involve institutional factors. Designing and using VLEs require fundamental changes in the role of academic and technical staff. Academics have to acquire or develop new knowledge and skills to become designers of teaching materials, tutors, facilitators, etc. Additionally, and more importantly, they have to cope with essential changes in the conception of time and space introduced by these technologies. On-going experiments with VLEs provide evidence of substantial transformations in the work carried out by teachers.

- *a transdisciplinary approach.* A multiplicity of subject matter specialists, instructional designers, and system administrators must be engaged.

- *the integration of socio-cultural elements*. The apparent accessibility and time and space flexibility of most VLEs are used by market-oriented agents to sell this "educational technology" as "the panacea" for educational problems and equity issues. But, as seen from the above discussion, there are major implications for the adoption and implementation of VLEs.

Implications for Staff

Resistance to change when introducing technology in the classroom is a universal problem in organisations. But, when we talk about VLEs, resistance become a chief issue, since VLE is a new radical application of instructional technology. Not only do the majority of staff have no intention of utilising this technology, they may also view it as an illegitimate learning mode. For many faculty, it represents a radical departure from prevailing practice that is incongruous with their understanding of the essential nature of teaching and learning. The regular classroom and its teaching arrangements are deeply embedded in the organisational university culture. The classroom, combining both material and symbolic features, is a sacred institution deeply institutionalised and especially immune to transformation. VLEs go against that culture. And

beyond that, the traditional classroom and traditional tutoring arrangement are part of the professional identity of university lecturers. This would explain current and future resistance to VLEs.

The virtual learning arrangements (as found in this research) might be an opportunity to improve teacher's practice. In this respect, examples of good practice and programmes for staff training, as demonstrated in the examples studied, are necessary.

Implications on Division of Labour

Will the introduction of VLEs change the division of labour in Universities? Will it benefit those staff members who have worked hard to become familiar with ICT, or those who have come into the university life offering technical expertise but aren't engaged in teaching? Surprisingly, these studies did not show any one group as having a particular advantage. There is almost a feeling that those who err on the side of inaction and maintaining the status quo were in a stronger position.

It is the nature of pilot projects to minimise changes in an institution. However, it is also clear that there will be a substantial change in the role of teachers if VLEs are to develop. There is a need for teachers to collaborate with fellow teachers and other educational professionals who are often in service departments in universities. Current methods of recruitment and rewards for university teachers in all the institutions are in favour of conservatism.

Implications for Students

The benefits that could arise from a large student group engaging in online, collaborative learning have yet to be established.

There are clearly questions for students to ask about the nature of VLEs and the quality of service they can expect. There will be great demands on the skills of students, such as time management and ICT knowledge.

Some cases dealt with students engaged in international collaboration projects. It was noted that students were not only keener on improving their ICT skills than before, but were also interested in engaging in VLE courses as long as the following two conditions were met: a) initial training in the VLE tools and methodologies, and b) assessment of VLE courses.

Implications for Technical Infrastructure

There were no major technological barriers to the introduction of VLEs. There is a strong commercial impetus to improve Europe's telecommunications infrastructure. The bandwidth available to all the universities is predictably improving. There is an availability of low cost computers to provide sophisticated multimedia services. There is a plethora of software providing a range of pedagogic models.

Universities recognise the need to spend money to improve the hardware available to students. If this is to be a university responsibility, in addition to their current responsibilities, it may seem impossible to keep up with demand from the point of view of the administrations. Is this because the university is not making the best use of available hardware?

Focusing on the small scale implementation of VLEs does reveal important factors; however, unless the wider issues are addressed, the ability of traditional HE institutions to respond to any opportunities or threats that VLEs pose for these institutions will be limited .

6.2 Conclusions and implications for teaching and learning in VLE

In this study, the cases were faced with such issues as the following:

- *The context of teaching and learning in VLEs*. The central players in a learning environment are the learners and the teachers. Classrooms, which are isolated from real life, can only simulate reality to a certain extent. This is also true of virtual classrooms constructed by technological means. Based on the evidence, it seems essential that open learning environments be closely connected with learners' real-world activities, situations and social relations.

- *The changing nature of teaching and students roles.* It is evident that the roles of teachers and students vary significantly. Teachers and students roles are interdependent. That is, if the role of the teacher is that of moderator, learners need to be self-reliant. A self-reliant student is connected to a less directed role of the teacher. This raised the level of students' responsibility in learning.

In traditional face-to-face courses, the teacher plays the central role, dominating the classroom interactions. In the virtual learning model (in which the learners do not necessarily share the same classroom), the teacher is removed from the centre by guiding the individual learning processes. The teacher's role in the virtual model moves towards that of a tutor who supports the learning process.

Due to the complexity of collaborative courses, such as international or other types of distributed learning arrangements, the teacher may be more of a member of a **"**team of teachers" than an individual. This is due to the complexity of collaborative courses, such as international or other types of distributed learning arrangements.

- *The pedagogical design and teaching in VLEs.* When teaching and learning take place in VLEs, the fact that there is already a didactical concept incorporated within the environment that determines the pedagogical functions should be kept in mind.

There are pedagogical barriers to overcome and compromises to be made when standardised products that are increasingly available on the commercial sector are chosen. There are a large number of commercial VLEs available on the market, each with a different pedagogical approach. Some emphasise team work; other are strong on promoting exchange among students and with the tutors; others are concerned with the emulation of all organisational and social features of the classroom, etc. A trade-off has to be made in order to select a particular learning environment, unless a university-made learning environment is chosen. This choice can facilitate adapting the VLE's pedagogical model to the technical possibilities and features of the environment, but can also bring about technical instability.

- *The planning and development of the learning experiences*. Teaching in VLEs means that there are a number of organisational aspects to consider. We can infer, then, that being a good teacher means that, in addition to being a good educator, you have to be a good organiser and designer of information, communication, didactical implementation, and media integration. Teaching becomes a much more complex process than in a traditional setting, having several stages. If education takes place on an international and inter-cultural level, there are even more aspects to be considered related to the organisation of communication, the basic language to be used, and the cultural particularities one might encounter.

- *New strategies for teaching.* Within the context of new educational paradigms, the new teaching functions can be characterised by the shift from traditional teaching as content providing and "transmitting" towards mentor guiding and supporting learners through the

process of knowledge acquisition. As previously discussed, in anVLE, learning is largely self-directed.

Nevertheless, some cases revealed examples of virtual teaching following the paradigm of pure transmission. Since there is no "given" pedagogy in VLEs, due to the variety of potential pedagogic strategies, all technologies do not necessarily support all models of teaching and learning.

Special technical tutoring become necessary in VLEs in order to avoid student frustrations. Tutors can use an increased range of alternative channels to provide efficient tutoring (e-mail, tutorials, etc.) either at a distance or in a face-to-face context.

Whatever kind of technique is being used, it becomes clear that teachers need special training for online-education. Implementing teaching in Virtual Learning Environments requires competence in technological and organisational aspects as well as new skills in applying relevant didactic methods.

Future teachers must be introduced to technology and its application in the educational area in order to be able to measure the whole range of possibilities available for organising education and teaching in this virtual context. Even when work is shared within a team of specialists, a minimum competence of knowing what the others do is required. Some basic skills, such as working in inter-disciplinary teams, become important in this context and are to be considered in teacher training as well.

6.3 Conclusions and implications for change on cross-cultural and linguistic issues

VLEs often involve co-operation between institutions, teachers and learners belonging to different cultural and/or linguistic environments.

Indeed, a strong feature of VLEs is their potential to operate at an international and even at a global level. VLEs allow institutions to extend their reach beyond local and national geographical borders. However, the fact that most of the cases studied did not optimise this challenging possibility deserves mentioning here. The element of collaboration turned out to be stronger at the intra and inter university (national) level than it is at the European level (independent of whether it was a university/university or university/industry collaboration). It seems that it is only with a level of maturation that some of these initiatives will lead to the establishment of collaboration with other European and international institutions and markets.

The issues of language and cultural differences constitute, perhaps, the two most important elements for consideration. This diversity should be taken into account in any educational and training programme that is organised either in a single European country or Europe-wide.

Although there have been legislative resolutions referring to cultural diversity at the level of the member-states and Europe, we observe that these have not been embraced by the educational policies of national educational authorities.

This fact gives rise to a number of issues and implications for change, such as the following:

- *To formulate supplementary resolutions and recommendations on cross-cultural matters*. The relevant European bodies need to formulate more strongly worded supplementary resolutions and recommendations to national governments referring to the necessity of implementing concrete measures in the field of cross-cultural approaches in their educational and training system.

- *To implement already existing and forthcoming EU recommendations*. It is of crucial importance for the various member-states of the European Union to take the necessary measures which will allow them to immediately implement already existing and forthcoming recommendations made by the relevant European bodies (such as the European Commission, the European Parliament, the Council of Europe etc.) referring to the intercultural approach in education and training.

At the practical level, we should value language and intercultural differences as an integral and dynamic part of the whole learning process and not as something separate or add-on representing different methodologies and approaches. Language and intercultural issues are identity factors representing the socio-educational contexts of the learners, which will be interacting and changing throughout a course as part of the ongoing processes of negotiating meaning throughout the learning experience.

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Notes

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[ii] These institutions were the University of Barcelona, the Spanish National Distance Education University, University of Wales-Bangor (the UK), the University of Saarlandes (in Saarbrucken Germany), the European consortium EUROPACE2000 established at the University of Leuven (Belgium), The University of Oulu (Finland), the Nottingham Trent University (the UK), FORTH-University of Crete (Greece), and the private learning organisation IET Ltd (Tessaloniki, Greece)

[iii] The virtual campus model uses telematics in order to perform formal and informal activities, which take place on a campus in a trans-national, network-based co-operation. It implies that all students on all participating campuses have access to all other participating institutions and professors. [Oilo, 1998]
For Working group 4, on Virtual Universities and more effectively titled "Flexible Universities" chaired by the Project Officers Knut Aslaksen (DGXXII Socrates), Peter Wintlev-Jensen and Joseph Urban (DGXIII Telematics Applications Programme), the concept of the Virtual University was perceived in three different ways: a) as an on-line learning environment (a virtual representation of a conventional university) simulating and enhancing traditional university features; b) as a model for virtual mobility and exchange of ideas and thoughts, and for the collaboration and co-operation between geographically distant partners;c) as a model for the re-engineering of traditional universities through the introduction of new technologies and flexible learning schemes. The key feature in all these perceptions is collaboration: on an institutional level, collaborative development and delivery of learning materials and services; and on an individual learner/tutor level, models for case-based collaborative learning.

[iv] In my opinion in the cases analysed, the very traditional face-to-face lecturing model is still valid. The presence of a technological medium and the ensuing creation of a virtual learning environment does not automatically lead to a profound change in the way teaching and learning are perceived and implemented.

[v] As suggested by Fullan (1991)