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Virtual Learning: Implementation Practices in Traditional Learning Settings

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1.1 Pressures for change

The rapidly expanding volume of knowledge, the increasing demand for higher education, the financial constraints faced by public institutions, the possibilities offered by new technologies but also the new skills that need to be mastered and new attitudes that need to be formed, create new challenges for Higher Education establishments. The added value new technologies offered for scientific purposes -data handling, computational capabilities, networking, collaborative learning - has been recognized and accepted by the academic community. The expansion of the web and the Internet as learning facilities have not only dominated concerns on educational research but further re-oriented thinking on the democratisation potential and accessibility of learning opportunities for all. The possibilities offered by the vast range of their services has revolutionize thinking not only on the manner by which knowledge can be provided but also by facilitating the individual learners needs by allowing him/her to acquire knowledge and/or skills at his own pace, style and preference of content.

Currently, conventional universities are faced with the challenge to expand their services in addressing the emerging needs of professionals (life long learning) and students (integration of traditional and technology-based techniques in their programmes of study, distance learning, etc). The degree to which this challenge is addressed varies greatly, not only amongst universities but even between the different Department/subject areas of the same university. Moreover, the degree to which technology is used varies greatly: from acquisition of specific skills to implementation of Virtual Learning Environment (VLE). Innovatory approaches, introduced as pilot projects, and other more consolidated experiences, are currently tested and implemented in an effort to respond to the new felt needs on the one hand, and to overcome resistance factors on the other. Abs. 2

In Europe the attempt to introduce technology in the education and training systems and is well supported by the current policy orientation both at national, and community levels. Abs. 3

1.2 Latest developments in the Information Society in Europe

European Policy focuses on the development of human capital as a necessary precursor for growth in modern Europe. This necessitates increasing the opportunities for lifelong learning for all members of the community. One way of doing this is to offer people the opportunity to learn in non-traditional ways possibly through the use of Virtual Learning Environments (VLEs), which offer more flexibility than traditional face to face learning environments. Abs. 4

For some time now, the Conference of European Rectors (CRE) recognized the need for higher education institutions to explore new pedagogical strategies with the help of ICT. The deployment of a telematics infrastructure would help universities to share common teaching programmes and material, exchange specialist materials, and develop the virtual mobility of staff and students. Abs. 5

The Community action program in education Abs. 6

(SOCRATES) with the aim of integrating the European academic community promoted the unconstrained access to the Internet and its ever-increasing use for communication, dissemination, information and exchange of ideas. And, is further exploring the idea of the European framework for Virtual Degree Studies (VDS). (Stanczyk, 2001).

Abs. 7

The notion behind the Knowledge and Information Society, as manifested in the Lisbon Summit, is no other than an encouragement for the integration, or even "assimilation", of ICT in all aspects of life. (Reding, 2001)

Abs. 8

Likewise, the report from the Commission to the Council and the European Parliament: Designing Tomorrow's Education - Promoting Innovation with New Technologies, defines the Commission's role to support the Member States as they implement the e-Learning Initiative, integrated into the European Social Agenda adopted by the Nice European Council in December 2000. (CEC, 2000a)

Abs. 9

The Commission's intent to facilitate the application of technology in the educational environments is further manifested in the e-Learning Summit which supports challenges on:

Abs. 10

- The development of the comprehensive integration of ICT into education and training
- The creation of flexible infrastructures that will make e-Learning available to all
- The promotion of universal digital literacy
- The creation of a culture of Lifelong Learning
- The development of high quality European educational content

(CEC, 2001d)

Abs. 11

Recently, the publication and further discussion at national level of the Memorandum of Lifelong Learning (CEC, 2000c) offer new insights about the role of ICT and virtual learning as a way to take advantage of the opportunities of approaching an European development of lifelong learning. The Memorandum already points out the need for collaboration among formal and informal educational institutions by introducing the vision of gradual osmosis between structures of provision that remain today relatively disconnected between each other. This points to

the need for changing higher education institutions to new forms of learning with the help of ICT and virtual learning modes, and to change the functions and goals of current higher education institutions: "Opening university studies to new and wider publics cannot be achieved unless higher education institutions themselves change - not only internally, but also in their relations with other learning systems" (CEC, 2000c).

Within the context of the European convergence and collaboration initiatives of the Higher Education institutions, especially after the Bolonia Declaration and the Convention of Higher Education in Salamanca (Spain), the role of virtual universities has been recognised widely. In the European context the so-called "virtual mobility" is slowly becoming a viable alternative, but also competition among institutions has been triggered by the institutionalisation of virtual campuses in many traditional learning institutions and in the private sector. Competition among universities (either public or private) will be strengthening in a scenario of many virtual campuses around Europe. Abs. 12

Currently, all tertiary education institutions in Europe, while alert on the growing importance of e-Learning are highly problematic and uncertain as to which developmental strategies will prove effective. According to Darby (2001) the classification of e-Learning generations is of importance. He classifies e-Learning into three generations, where: Abs. 13

- First generation: techniques are used to produce a close analogue to conventionally deliver courses.
- Second generation: courses created with top level learning outcomes as equivalent conventionally delivered courses. These online courses are more expensive to produce than First generation courses are educationally superior since the application of learning technologies has been optimised for remote learners. These are generally less labour-intensive to deliver and are scalable.
- Third generation: Goes beyond offering mirror existing provisions in that it assesses prior learning and current learning requirements of each potential learner and on this bases offers tailor-made courses to meet the individual's needs. (id, p.2)

Abs. 14

Undoubtedly education is changing with the increasing availability and implementation of ICT in educational settings. However, the current situation of using ICT for teaching and learning obviously is not satisfactory. Whereas the speed of technological innovations is increasing more and more, there are concepts needed for their adequate application in education. (Trindade, 2001) Abs. 15

According to the European research community, actions are required both heading at solving focussed "problems" or improving the situation of traditional education as well as investigating the potentials of pedagogical concepts and technologies of new educational approaches, which might better contribute to meet the needs of current and future education. Scenarios and experimentations are needed in order to verify the effects for learning. There should be a clear focus on the area addressed with multi- and interdisciplinary approaches. Abs. 16

Collaborative learning remains an important aspect to be further on explored in the future from different perspectives, taking into account organisational aspects on cooperation and collaboration as well as pedagogical, including staff development and pedagogical work in networked educational settings. Experiences are needed demonstrating sustainable results and concepts of good practice, analysed in a multi-cultural/European educational setting and based on different technological approaches. Abs. 17

The same applies to learning environments which still need to be tested with different technologies, pedagogical concepts and educational implementation (curricula, place of learning etc.). Here mobile technologies need to be explored in regard to their potentials of supplying easier and more effective access to learning. Abs. 18

Furthermore, a holistic approach to coordination of research is needed as well relating to selected target-areas of research (including organisational, technological and pedagogical dimensions), requiring a more active role of the European Commission or the delegated institution in charge with the coordination of the IST research. Abs. 19

A frame is needed as well ensuring scientific assessment of research results and valorisation of the outputs. Some standards should be proposed relating the research methodology applied and the interpretation/presentation of Abs. 20

results. This frame should provide as well devices ensuring synergies with project outputs of other programmes and actions. (Scheuermann, 2001)

1.3 Characteristics of the research done, the framework and cases studied

Abs. 21

The Thematic Network IVETTE (Implementation of Virtual Environments in Training and Education) funded by the TSER Programme was implemented in the period October 1998 to October 2000 and concerned itself with the study of the concept of Virtual Learning Environments (VLEs) and the consequences of implementing these new learning environments in conventional (especially face-to-face education) education/training institutions. Embedded in the project's conceptual orientation was that VLEs are above all Learning Environments. The main objectives of the project were to map out the institutional, learning and cross-cultural factors that affect the implementation of virtual learning environments, and propose recommendation to stakeholders on strategies for promoting its implementation. The project contributed to the European discussion on these chief issues and offered background information for policy implications to educational institutions, mainly at the level of higher education.

Abs. 22

The definition given by Pulkinnenn and Peltonen (1998) to Learning Environments constituted a first approach in considering the project's research frame: "LE is a place or community arranged specifically for learning purposes that it is based on ideas of a) knowledge, the structure of knowledge and learning; b) and practical arrangements necessitated by learning connected with time, place and repetitive rituals (seen as a system and process in constructivism) which together provide the social organisation for learning/teaching".

Abs. 23

Virtual learning environments (VLEs) are on-line domains allowing both synchronous and asynchronous collaborative interaction among teachers and learners. Meanwhile, VLEs provide learning resources to be used by students at any time. Compared with traditional learning environments, the chief role of different technologies, especially those related to Internet, triggers the new educational opportunities of VLEs.

Although the concept is relatively new, VLEs have had an evolution in time. There have been many learning environments considered as "virtual", most of them related to different ways of distance education. Oilo (1998) mentions different terms that, having been used during the last decades, are connected semantically to VLEs. These range from "The Open University" to "The Virtual University". It is seen as an integrative concept of the new paradigm, in which physical space and the need for synchronicity disappear). For IVETTE, the evolution of the concept specially given to the deployment of telematics, makes possible to integrate the conventional learning institutions into the scope of virtual universities. Abs. 24

The operational definition chosen for VLEs was any combination of distance and face-to-face interaction, where some kind of space/time virtuality is present. Then, from the point of view of the project IVETTE we did not distinguish distance education institutions from traditional ones (based on a face-to-face interaction) when studying the problems faced. Many of the issues confronted by both types of institutions are similar, although of different extent and orientation. They both need to implement similar changes, since in a few years time they will have to adapt their organisations following similar patterns. ODL and VLE come close in concept and in its practical deployment. Abs. 25

One of the assumptions behind the work undertaken was that one of the characteristic of the labour and professional market in the Information Society is the need for flexibility and the project adaptability. The workforce members are being compelled to change their professional orientation during their career. The traditional face-to-face institutions cannot respond to this need; it could be done in a cost-effective way only with the modern methods of Flexible and Distance Learning, i.e. the VLEs. Abs. 26

The Thematic Network IVETTE studied nine cases of learning institutions around Europe, belonging to six different countries. Those institutions were conventional universities, including a national distance education university and a training institution. The project was implemented at a time when many institutions were experimenting and providing pilot courses using different virtual learning arrangements. The work undertaken was based on a case-study methodology under which the central research areas were "Teaching/Learning Abs. 27

approaches, European Cross-cultural Dimension and Integration, and Institutional issues". More than twenty pilot experiences (mostly of international type) and several virtual courses belonging to the regular offering of Universities were studied and discussed. Much of the research work that it's currently being carried out by other teams confirm that diagnosis of problem areas and solution alternatives that emerged from the activities of the Network.

Abs. 28

Presented in the sections that follow are the main results obtained under this three-axis perspective to the study of VLEs. Chapter Two defines and reports on the context of teaching and learning in VLEs, and their innovative dimensions. The cross-cultural perspective of VLEs is given in Chapter Three, where raised are the issues of cultural, socio-economic and linguistic diversity in Europe, pointing to cross-cultural approaches and problems identified in the use of VLEs in Europe. The last chapter addressed VLEs from an institutional/organizational perspective under the scope of innovation approaches to institutional change, barriers to VLE implementation and implications for change. The Thematic Network regards that the results presented here are neither all inclusive nor universally applicable, these non the less show the tendencies and problem areas regarding the implementation of VLEs mainly in conventional learning environments in European institutions of Higher Learning that are moving with different strategies to a mixed mode of face-to-face and distance education.

2. The context of teaching and learning in VLEs

Abs. 29

There are various aspects how information technology is used in education: 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. This covers relevant aspects about environments and courses which cannot be analysed separately due to their inter-dependency. The question arises as to whether open and flexible learning environments built on information technology will lead us to qualitatively better, more effective and more efficient education and how these new educational models have to be brought about.

Instructional methods and the quality of courses within the different environments can hardly be compared, since it is the whole setting of the educational activities which must be considered, too. Some environments are based on the virtual mode to a full extent, others are linked to traditional courses talking place on a local university campus. Some are taught to an international audience, others to a local community, some course topics need different pedagogical features than others and finally it is the applied hardware and software technology as well determining some of the key indicators of the context. This influences the structure of the virtual environment as well as the methods being applied. Abs. 30

In their study about the evaluation of environments Britain and Liber (1999) define two crucial issues for the work with Virtual Learning environments: Abs. 31

1. VLEs should provide opportunities to improve the quality and variety of teaching and learning that are not being achieved using current methods.
2. VLEs should reduce the administrative burden on teachers, thus allowing them to manage their workload more efficiently and to be able to give more time to individual students educational needs. Abs. 32

Considering these requirements as the bases for the study about teaching and learning in it becomes obvious that the approach for analysing the process must reflect various other aspects too than just the discussion of didactical techniques within Virtual Learning Environments. Abs. 33

2.1 Key issues for pedagogical design in VLEs

Taking a closer look on the courses internationally given in Virtual Learning Environments we observe that in practical teaching situations the methodology used in computer assisted instruction is moving more and more into ICT assisted knowledge construction, distributed expertise and collaborative learning. Hyper- and multimedia-based sources of knowledge have replaced in many cases traditional study books with electronic books. ICT and networking can make the learning environment more open in terms of knowledge acquisition in all phases Abs. 34

of education.

To analyse key issues in the implementation of teaching and learning in VLEs, we refer to pedagogical functions as being the practical activities and methods in the learning environment that make learning possible. Abs. 35

When teaching and learning take place in Virtual environments it should be kept in mind that there is already a didactical concept incorporated within this environment determining the scale of pedagogical functions made available for the courses. Speaking in the context of the Internet: first it is the technology itself limiting the range of possibilities (dominance of texts due to bandwidth restrictions). Then it is the environment based on the functionality of the technology, containing a certain design with a set of tools, functions, bars, fixed hierarchies and positions - again with some kind of pedagogical limitations provided at the final stage of the pedagogical design of courses. Abs. 36

This is less problematic when the environment can always be adapted to the specific needs as it can happen with (often times handmade) modularised developments, flexible and open from their technical concept. But there are pedagogical barriers to overcome and compromises to be made when standard software applications are chosen which are increasingly available on the commercial sector. These environments (sometimes called "Integrated Distributed Learning Environments - IDLE" [see McGreal, 1999]) become more and more popular especially in those cases when teachers shall be enabled to run and easily administer courses without being confronted with the full set of actions to be taken, when implementing a Virtual Learning Environment. The variety of pedagogical functions is then reduced to the tools which are offered by the pre-defined and standardised environment. Abs. 37

2.2 Principles for teaching and learning in different types of learning environments

Wilson (1996) has described the relationship between the ideas of knowledge and the consequences for the nature of the learning environment (authors' comments in parentheses): Abs. 38

Abs. 39

Metaphor about knowledge, knowing	**Consequence for the learning environment**
Knowledge is a quantity or packet of content waiting to be transmitted	Products that can be distributed via different methods, media. (Electronic self-study materials)
Knowledge is a cognitive state as reflected in a person's schema and procedural skills.	Combination of teaching strategies, goals and means to change the schemes of thought in the individual. (Teaching program)
Knowledge is a person's meanings constructed in interaction with one's environment	The student acting and working in an environment with plenty of resources and stimuli. (Collection of tools and resources)
Knowledge is enculturation or adoption of a group's ways of seeing and acting.	Participation in the everyday life and activities of the community. (Collaborative working environment; can also include the above-mentioned items)

Table 1. Relationship between the ideas of knowledge and the nature of the learning environment (Wilson,1996)

Abs. 40

By analysing the concepts of environments and courses where information is given on the Internet, all the mentioned types of learning environment can be found. ICT is therefore not prone to support one particular type of learning environments. On the contrary, in the design of ICT-based educational innovations, the technology will have to be introduced in such a way as to create and support the learning environment desired. However, in practice we notice that the development of a virtual learning environment can be a result of a pragmatical decision at the institution too, as it was expressed in some of the cases. This can also be used as a step for introducing the evolutionary transition from traditional teaching environments towards settings related to ideas of social constructivism. The evolution of learning environment is a complicated process, where institutions cultural and historical situation with practical arrangements is often the critical factor, not the learning theory (Bourdieu & Passeron 1977).

As a consequence of this shift towards a student-centered approach the building of "learning communities" and "collaboration" play a crucial issue in instructional design of (social constructivist) learning environments. Abs. 41

General principles for such kind of environments are cited from Chickering and Gamson in a recent report by the University of Illinois (1999): Abs. 42

1. Good practise encourages student-faculty contact
2. Good practice encourages co-operation among students
3. Good practice encourages active learning
4. Good practice gives prompt feedback
5. Good practice emphasises time on task
6. Good practice communicates high expectations
7. Good practice respects diverse talents and ways of learning.

Abs. 43

This leads to several other principles for the design and implementation of a learning environment as listed by Cunningham, Duffy, & Knuth (1993): Abs. 44

1. Provide experience with the knowledge construction process,
2. Provide experience in and appreciation for multiple perspectives,
3. Embed learning in realistic and relevant contexts,
4. Encourage ownership and voice in the learning process,
5. Embed learning in social experience,
6. Encourage the use of multiple modes of representation
7. Encourage self-awareness of the knowledge construction process.

Abs. 45

The listing becomes more concrete when relating it to Xiadongs (1995) presentation of a typical instruction design process: Abs. 46

1. Identify objectives (e.g., what do you want students to be able to do when they have completed the instruction?)
2. Assess students' prior knowledge and skills (e.g., determine whether the target students have the

Abs. 47

prerequisites to benefit from the instruction)
3. Specify the content to be taught (e.g., what content skills should be taught to students?)
4. Identify instructional strategies (e.g., what instructional methods should be used?);
5. develop instruction (e.g., a learner's manual, instruction materials, tests, and an instructor's guide);
6. Test, evaluate, and revise (e.g. how should students be evaluated to determine the degree to which students have meet the performance objectives?).

2.3 Planning and development issues in VLE

Abs. 48

As a consequence the important issues relating to the design and planning of Virtual Learning environments and courses taught within become clearer. It must nevertheless be stated that providing education in virtual learning environments require a lot more aspects to be considered as it is listed above from a pedagogical point of view.

Abs. 49

It should always be kept in mind that teaching and learning always takes place in a specific context. On the one hand this context is drawn by the infrastructure available concerning personal manpower and competencies, budgets and technologies. On the other hand it is the society, including teachers and learners formulating the needs in regard to the environment and courses. Therefore an environment and its concepts are based on a certain level of needs, requirements and facilities. There are several stages for course design which must be considered:

Abs. 50

1. Analysis of basic conditions (e.g. infrastructure, resources)
2. Planning
3. Development
4. Course running, execution
5. Evaluation

Abs. 51

The stage of the analysis can be characterised by the examination of the context conditions mentioned above. Who is the user group, what is the technological

environment, what is needed, which resources are available?

A conceptualisation can then be performed during the planning phase. Here various components have to be taken into account for the development of the environment and course delivery: Abs. 52

1. Information selection and design (e.g., learning material, guidance) Abs. 53
2. Communication (e.g., Language, synchronous/asynchronous, channels: text, audio, video)
3. Organisation, Management:(e.g., certification, scheduling, user administration, agreements on inter-disciplinary/international collaborations, fees)
4. Technological realisation (e.g., e-mail, Chat-tools, Video-/Desktop-conferences)
5. Pedagogical issues (e.g. how to raise/maintain/increase motivation, how to implement/hold/improve inter-action (teacher-learner, learner-learner, teacher/learner-environment, considering learning-cultures, design of assignments and control units)
6. Evaluation issues (learning process and outcomes, deficiencies etc.)

During the stage of planning, development and while courses are running with the Virtual Learning Environment it can be stated that there are also a lot of other aspects important to be considered in this discussion about pedagogical techniques. Teaching in VLEs also means a lot or organisational aspects to consider. This point even increases dynamically in inter-cultural settings and even more when the benefits of technologies are even applied in the context of collaboration between local, regional, national or international collaboration. So, being a good teacher means as well being a good organiser and designer of information, communication, didactical implementation and media integration. In an optimal way the course concept varies according to cultures integrated, available infrastructure concerning technology and networks. This demonstrates too, that teaching becomes a complex process during several stages to a higher degree than it is known from traditional educational situations. Abs. 54

Although in typical Internet-based learning environments there are no limitations given concerning the number of participating students it is obvious that as more students participate as more organisational and administrative work is required. If education takes place on an international and inter-cultural level there are even more aspects to be considered related with the organisation of communication, the basic language to be used and the taking into account of cultural specialties. Abs. 55

Closely related to these issues of teaching and learning is the point of evaluation which must take place in order to determine the success of the environment and online teaching. Economic factors (cost for staff and technology) have to be assessed as well as pedagogic (quality of teaching, outcomes). Evaluation activities consist of validation of the knowledge as well as the assessment of the students. According to a constructivist approach, it is essential to involve students in the validation process of the information produced on the course. This will lead to more critical and reflective discussions (Gokhale 1995) of the course contents and can make meta-cognition possible in students' learning processes. Special discussion forums for debates and criticism and collective commenting of the writings are good tools for assessment of students in the open learning environment. Abs. 56

So far, it becomes evident that teaching issues in virtual environments are multi-dimensional and directly inter-linked with other crucial aspects of activities within and outside of the environment. This explains too, why there is such a variety of environments and courses, which can be found on the market. Abs. 57

Most of the studied learning environments allow an open and independent learning, including methods that involve the individual search for information and investigation. Higher education is offered in a flexible and open learning environment taking into account important aspects of academic education: Access and provision of high quality information and provision of communication between students and teachers, among students as well as with the "outer world". Abs. 58

2.4 New Teaching Strategies

As it was pointed out before the role of the teacher is changing to a large extent. Within the context of new educational paradigms the new functions can be characterised by the shift from acting as a content provider and "transmitter" towards a mentor guiding and supporting learners through the process of knowledge acquisition. Abs. 59

In an open learning environment, learning can be largely directed by the learners themselves. Therefore the meaning of mentoring and tutoring, a system for supporting learning and study guidance, gets special emphasis. Tutoring can mean support related to the learning process, study contents, tasks or technical problems. According to Daloz (1990, 223) effective mentorship is akin to "guiding the student on a journey at the end of which the student is a different and more accomplished person. In a formal learning situation, mentoring functions can be understood as variously providing support, challenge and vision.". Tools for providing both tutoring and mentoring should therefore be adaptable for each purpose in Virtual Learning Environments. Abs. 60

Especially in constructivist learning environments tutoring in terms of "moderation" gets special emphases. This is the case when communication concepts are implemented including support for interactive processes like group works to be done collaboratively by learners. There are a lot of "open questions" for online teaching which are still being widely discussed with the scientific community in the field of computer-mediated communication (CMC) as how and to what extent moderation must take place in settings where learners work collaboratively on the assessment of contents. Abs. 61

Although the 'transparency' of the technology is one of the most important goals in the learning environment, special technical tutoring might become necessary in open learning environments as well in order to avoid student frustrations. It can help learners to get to know the technical equipment and software used, thus 'taking charge' of the tools in their learning environment. As a result of technical developments, it is possible to include a range of functions in the same user interface. These kind of learning environments built on Web based technology, for instance, only require students to use a single application, a Web browser. Students need to have only minimum knowledge of information technology. Tutors can use an increased range of alternative channels to Abs. 62

provide efficient tutoring (telephone, e-mail, tutorials, etc.) either at a distance or in a face-to-face context.

Which methods can be applied in online education? In a study about teaching techniques for computer-mediated communication, Paulsen (1998) interviewed 150 teachers and figured out 24 techniques, which can be applied in virtual learning environments: project groups, discussion groups, case studies, online journals, debates, internships, nominal group techniques., learning contracts, apprenticeships, simulations or games, software libraries, online applications, forums, role plays, brainstorming, online databases, online interest groups, correspondence studies, symposiums, transcript based assignments, Delphi techniques, skits, interviews, lectures. Abs. 63

Whatever kind of techniques is being used, pedagogues need special training for online-education. They must be qualified in knowing: Abs. 64

- how to decrease anonymity and to establish the atmosphere of a learning community
- how to motivate and keep the motivation of learners high; how to avoid student frustrations · how to establish and maintain interaction among students, between teacher and students and between the user and the system,
- how to moderate discussions. Abs. 65

There is a set of tools, techniques and "tricks" which can be learned for application in virtual pedagogical settings. Nevertheless this must be taught to the staff concerned to avoid any repetition of same mistakes, same explorations and even in order improve the applied methods in detail. Abs. 66

But the new "burden" cannot be ignored too that new task areas have to be covered by the teacher as well. Implementing teaching in Virtual Learning Environments needs competence in technological and organisational aspects as well and new qualifications in applying relevant didactical methods within this context. Even if several steps are covered by the technology and software tools implemented as for instance user administration, there remains a lot of other work to be done within the process of design, implementation and evaluation of Virtual Learning Environments. Abs. 67

Many cases studies report of a lot of enthusiasm guiding teachers who are concerned with working in such environments. Nevertheless there should be some kind of justification for the time and money invested towards today's education, if applied concepts shall demonstrate of way of good practice in the European context of Higher Education. Since virtual teaching cannot be left only to enthusiasts and third party funded projects new qualifications for teachers are needed. It is important that teacher training is updated with this new forms of education reflecting all crucial aspects already found and pointed out by the literature available. Future teachers must be introduced to technology and its application in the educational area in order to be enabled to measure the whole range of possibilities available for organising education and teaching in this virtual context. Even when a sharing of work takes place within a team of specialists a minimum competence of knowing what the others do is required. Some soft skills like working in inter-disciplinary teams become more important too in this context and are to be considered as well in teacher training. Abs. 68

3. Cross-cultural approach to Virtual Learning Environments (VLE) and Open and Distance Learning (ODL)

In this section, we analyse how traditional teaching/learning processes have deeply changed due to the development of ICT and whether or not the new alternatives are really meeting the needs and expectations of a students' population whose main trait is a remarkable and increasing diversity. Diversity of languages, background, social-economical contexts and an unequal access to new technologies. Thus, we propose to reflect on the emerging VLEs and open and distance learning (ODL), from a cross-cultural approach. The analysis doesn't limit itself to diversity of race, ethnic origin or nationality, but also to the new challenges of learning international environments. Abs. 69

The development of VLEs and ODL has transformed agents and contexts of learning, make them acquire new dimensions, essentially as mediators, and here we will understand mediator as the person who eases processes of communication in all their levels and elements. VLEs Abs. 70

represent one of the most relevant challenges for communication and learning, and the most important aspect in this specific context is not the elaboration of the message in itself or the kind of media that can be used, but the fact that teaching and learning, as a way of communication, obviously implies to "put in common", that is, sender, message and the channel are bound to address a target population with multiple identities, which means that an important task to carry out from the cross-cultural perspective is to identify possible "interferences" that may appear as a result of the lack of consideration to these differences and peculiarities.

Abs. 71

To assess the level of adjustment of VLEs and ODL to diversity, it is necessary to determine what is a VLE made of. New learning environments imply the design and use of all possible resources, as for instance written materials, graphic and sound files, guides for study, electronic books, Web pages, CD-ROMs, videoconferences, etc. Then, if we assume the cross-cultural perspective, it is necessary to consider, as a part of this type of environments, the temporisation, the methodology, the type of evaluation that better fits the commitment with cultural diversity, and the specific strategies that will be applied to cope with differences.

Abs. 72

Focusing on the ODL methodology, we see that it involves much more than a didactic or technological aspect, as it influences the emergence of models and contents of ODL, and at the same time it is influenced by the same phenomenon of ODL or VLEs itself. These methodologies are appropriate to extend educational opportunities to people living in diverse contexts and with different needs and expectations", but there are also ODL offers with the only objective to cover a sector of a market because this gives the institution an image of innovation.

Abs. 73

Finally, the combination of both alternatives is a fact that already gave interesting results. Having as a reference the traditional concept of ODL, we find that this model is mainly intended for students who live far away from big urban nucleus, they may also have reduced economical resources, long periods of unemployment and therefore, the subsequent consequences as the gap between the labour market requirements and the level of people's knowledge up-to-date, but the concept has changed and today the number of universities that offer courses and activities on both methodologies is increasing, ranging from distance education universities to conventional face-

to-face ones. Though, very often, the reason for this to happen is just to not to step down from the "train" of technological progress, it is also true that this type of offers has the potential to reach a wider range of population and this means more possibilities to meet the students' educational demands.

3.1 Culture as a variable

Abs. 74

Cohabitation and, at times, confrontation of different cultures in the modern European nations, has required, and requires, the implementation of political and educational initiatives that support the process of social and cultural integration - not only economic - to which we are committed. The way cultural pluralism has been addressed in Europe is different from that of other continents, due to national intellectual styles, linguistic structures, legal framework, and characteristics of the cultural groups in contact.

Abs. 75

Other elements have appeared in the European context - permanent settlement of immigrants, inter-communities relations, influence of the mass media, re-appearance of nationalisms, xenophobia and racism among others, awareness of ethnic minorities, or regional movements. All these factors pose a new challenge on educational systems as they have an strong impact on the citizens' perceptions and behaviour, and what need to learn to participate in a plural and democratic society.

Abs. 76

We assume that a cross-cultural approach considers that education should attend citizens' cultural differences, in coherence with the axiological reasons derived from the principles assumed by societies which go in favour of the equity of rights, and social participation, because these are the guarantee that allow to achieve essential educational objectives, for instance the building of the own cultural identity and equity of opportunities in the access to all available benefits and resources in education. This initial premise is grounded on certain assumptions: Students, their families and communities coming from minority are culturally different and socially unequal in relation to the dominant groups of reference. Those cultural traits that are not in balance neither with the dominant culture, nor with the requirements of the labour market are eradicated and eroded. In opposition to this situation, assuming and

keeping those of the dominant culture acts as a counterweight to achieve the social - educational success as educational institutions tend to reproduce and maintain them. Culture transmitted through these institutions is usually grounded on specific social-cultural patterns of reference, students belonging to that group "play with advantage" in the access and use of the educational resources vs. the students pertaining to cultures far away from those patterns.

Abs. 77

One of the milestones of educational intervention from the cross-cultural approach, is to reach the equity of opportunities, understood as a matter of possibilities to choose, which are determined by the interaction among individual characteristics and social conditions. The way in which institutions manage these relations, in order to achieve educational outcomes, determine these students' real options and conform their academic careers. To guarantee equity of opportunities means to offer different strategies for different people and the use of VLEs and ODL constitute valuable methodologies due to their versatility and flexibility of procedures.

Abs. 78

Undoubtedly, these challenges are causing serious problems in traditional Higher Education Institutions since it is difficult to deal with institutions that belong to different cultural and organisational models. It seems evident that we are entering a period in which Universities and other educational institutions need to adapt their mechanisms to new ways of managing education and new values. What are the conditions under which educational institutions would be prepared to integrate new ways of accessing networked telematic based education for all the population, and how are they going to balance all the cross-cultural factors involved in the modern society? In the following sections, we look at some practical concerns to take into account.

3.2 Diversity and diversification

Abs. 79

One of the consequences of implementing VLEs projects, is the distortion of traditional ideas of space and communicational interaction, and this has a deep effect on the social organisation and on the cultural representations. In fact, the concept of geographic distance, becomes irrelevant and school centres are not isolated anymore,

now they can establish links to one another institution much more solidly and systematic in a global environment (international, regional or local).

Recognising and accepting of cultural and linguistic diversity, characteristic in the European social context, is one the goals established in the design and implementation of ODL. This should be a matter of permanent reflection on the integration of the ICT technologies in education, something that would help to reach the goals of European cohesion. Acceptance of cultural diversity according to the parameters of the assumed cross-cultural perspective, implies understanding and respect of all cultural patterns and also of the prevailing values common to the different national cultures, feeding an European identity. Ethnic, race groups, an gender differences need also be evaluated. Abs. 80

The underlying idea is the consideration of the student as an individual who needs to carry out a task that another person, the teacher, has previously prepared (programmed) with the purpose of making the student develop certain skills. The objective for such an assignment, that traditionally had happened in face-to-face interaction, would be carry out by the student in her/his computer, either locally, that is within the training centre, or at distance (at home or at a centre different from the one he or she is involved). These new forms have evolved according to what technological development, the fields of application and the characteristics of design, has allow at different times. Abs. 81

3.3. Teachers training

A turning point in the implementation and development of VLEs and ODL from a cross-cultural perspective is the one related to the teachers' training. At this point, it is necessary to stand out a situation that needs an urgent answer from educational policy in general and from educational institutions in particular. Teachers have to understand the power and importance of the implementation of VLE resources and alternative methodologies, and the necessary changes that this imply in the planning and elaboration of teaching strategies, materials and selection of contents. Abs. 82

Teachers are supposed to promote the use of ICT among Abs. 83

their students and in order to give them the possibility of learning to learn, they must coherently demonstrate aptitude and attitude first. Thus, VLEs can be used in teacher training strategies to develop positive attitudes and practises in relation to new contexts and media, and to enable professionals in the designing and implementation of programmes that will cover the different fields of the educative interventions. Lecturers and future teachers must be aware of the why, where, which sense, and which situations are most appropriate to enable the integration of VLEs within the teaching and learning processes. Without guidance, there is the risk of getting what according to Lefrere (1997) considers are "free range students", students fed on the wild fragments of knowledge available on the Web.

Abs. 84

Besides the general skills mentioned in the previous section, teachers would need to need special training for working in multicultural and multilinguistic virtual learning environments. The training programs should take into account these variables by encouraging the creation of a mixed community of learners when promoting team work, learning discussions or any other teaching strategy.

3.4. Overcoming problems in international VLE experiences

Abs. 85

Cultural and linguistic practices need to work within the cross-cultural and multi-directional space. Progress of new global ICT technologies has persuaded an important sector of population of the possibility of distance meetings and social, educational and professional exchanges. The top of globalisation is the convergence among distance education, experts' meetings, and tele-employment. International virtual courses are at the edge of these trends. Here we have some of the problems identified in international learning settings:

- Calendar of the experiences

Abs. 86

In order to fix the calendar of a distance learning course (or a less formal learning experience) organized jointly by a number of institutions distributed over a large area of Europe, and therefore involving learners and tutors belonging to different cultural and/or linguistic environments, one has to take into account a number of

relevant factors. The fact that the academic year in the various countries involved in the course follows traditionally different calendar: In some countries the academic year is subdivided into two semesters, in others it is subdivided into three terms. Also the dates of the beginning and the end of these subdivisions, and therefore of the corresponding vacations, are different from country to country. Finally, holiday vacations in the different countries are also different. Asynchronous learning activities are easily organised, but for real-time activities, because of the fact that the different European countries belong to different time zones, the hours of the day during which real-time joint learning activities can be scheduled (such as computer mediated conferencing or ISDN-videoconferencing) have to be selected very carefully. The latitude difference among the various European countries we have significant climatic differences from country to country, as well as differences in the duration of the day and night..

- Syllabus of the Course

Abs. 87

The syllabus of VLE courses organized jointly by a number of institutions distributed over a large area of Europe, and therefore involving learners and tutors belonging to different cultural and/or linguistic environments should be also selected very carefully. Among others one should take into account that the national curriculum for primary and secondary education is different in various European countries. Also the curriculum of undergraduate and/or graduate studies for the same discipline is different in various European universities. Finally, the training needs of the workforce, which must be taken into account when preparing the syllabus of a continuing education and training course, are also different in various European countries.

- Language differences

Abs. 88

Specially sensitive is the linguistic field, where there is a serious risk in the implementation of virtual models which may have a negative effect, and no matter the language used, this can be limited to reducing the grammar and, above all, the vocabulary to a minimum. This aspect should be taken into account to try to promote and create other forms of expression, using images, simultaneous translation and design of courses adapted to the cultural patterns of the target groups. The European contexts has a

"lingua franca", English, and different second languages, but the predominance of English over the rest of languages is something obvious in the development of cross-national distance courses, with the subsequent discriminatory effect for other linguistic groups that may not have as proficient in that language as they are in their own.

Then, in international virtual learning experiences, language use remains a difficult issue; maybe less at the level of post graduate courses but surely on the undergraduate to graduate levels. This aspect needs attention from the very start of course development on, otherwise the absence of solutions or trials to solutions remain unsatisfactory. However, it is an issue that is not easily introduced in practice. Solutions have to be found in language management policies (e.g. combining activities in native language at the site level and a common language for the transnational interaction). Although very limited, they cannot be disregarded technical approaches based on automatic translation (eventually combined with speech recognition technologies. Abs. 89

In any case, learning processes can be influenced in various ways, being some of them: *language interaction* among students, *cultural and academic background*, *agreement* between kind of programs offered and students requirements. So, in order to build a learning environment able to cope with these cross-cultural challenges, the answer cannot be a standard one as it happens in many other courses, but one able to create common spaces, to address significant and representative contents and to succeed in the interconnection among persons. Abs. 90

As a final reflection, cultural and linguistic diversity, which characterises our continent, and even more, that characterises many of its countries, should be taken into account when dealing with the design of courses and educational and training programs, using all their potential and considering the possibility to extend institutions beyond local and national boundaries, benefiting from the possibilities offered by VLEs. This general purpose requires taking measures that allow an adjusted knowledge of the social-cultural profile of the potential users of the system and an assessment of the outcomes that includes comparisons among diverse social and cultural groups. In short, what is intended is to identify the population to whom attention is directed and the groups that really benefit from distance education actions. Abs. 91

4. Institutional and Organizational Issues in VLE

4.1 Innovation approaches relating institutional change

Abs. 92

In looking at change and its management, it is important to take a broad and historic view of the situation. Change does not happen in a situation where there is no pre-history. An existing system has its own sets of mediation systems, values, rules, customs and division of labour. These will become disrupted by any transformation, however those disruptions will place demands on the existing dynamics. Studies of changing systems require a highly dialectical analysis that fully recognise the importance of the history of a system to be able to analyse the success or failure of attempted transformations of systems.

Abs. 93

Institutions of higher education are social organisations characterised by traditions, cultures, norms, and institutional missions. Universities themselves carry out the "learning patrimony" in a country. The learning patrimony refers in this case to a set of values, dispositions and attitudes in regard to education and training. The pedagogic relation between students and trainers is an example of how the pre-established roles of transmitters and acquirers of knowledge is mediated by the attitudes embedded in the learning patrimony (Cullen, 1998).

Abs. 94

In academia, according to Jaffee (1998), obstacles to change are closely associated with the established practices and cultural traditions of the teaching faculty. Changes, then, do not exist in a vacuum. As Sarason (1990) suggests some innovations will change ways organisations are constituted: second-order changes are those that seek to alter fundamental ways in which organisations are put together, including new goals, structures, and roles. There will be a variety of cultural attributes in the site of the change. Goals, structures and roles do not emerge accidentally but arise from experiences of current contexts. This fact can be linked to Nisbet's (1980) concern for viewing innovation in relation to "contemporary society", and leads us to think that we need to look at broader systems of activity, which are placed in their social and cultural context.

Consequently, one needs to look at broader systems of activity of the VLE's, which are placed in their cultural and historic context, as suggested by Cole and Engestrom (1993). Abs. 95

The sections that follow look on what aspects have to be taken into account when implementing VLE's in practice from this point of view. It considers the opportunities, constrains and consequences at all levels of introducing VLE in educational organisations. Abs. 96

4.2 An Institutional Perspective on the Implementation of VLE's

It seems advisable to retake the major reasons for why introducing VLEs from the institutional perspective. Subsequently, one has to review the observed trends in the implementation of VLEs in Europe, and outline the range of organisation aspects touched upon: Abs. 97

a) The need for VLE's from an institutional perspective

The first phase analysis of the different case studies considered identified two sets of factors that, the first facilitating the use of VLE's and the second that work against the introduction of VLE's into mainstream education. Abs. 98

In terms of the facilitating factors identified include: availability of funding for pilot projects, enthusiasm of a small number of staff and potential staff, the availability of technologies, the changing nature of the student population, national and European policies, the financing of higher education, and, new trends in the provision of education and training. Abs. 99

In terms of the second factors identified include: the structure of Universities which inhibits speedy decision making, internal University regulations which define how teaching is to be carried out, indifference or lack of awareness of staff with regards to the use of ICT, existing Abs. 100

government legislation which defined the role of Universities before ICT is commonly used, and the lack of identification of a market for ICT-based learning. This classification facilitated the identification of institutional trends regarding VLE implementation.

b) VLE's as parallel structures alongside Traditional structures

Abs. 101

There is still little evidence of major initiatives of handling the problems of mainstreaming VLE activities or considering the ramifications of such expansion for the overall life of the institutions. On the contrary, some universities are not happy to use virtual campuses in their regular teaching structures. At the level of undergraduate, there is a consistent tendency to introduce VLEs as part of new initiatives, as for instance, new curriculum contents and course activities, new optional courses, etc. Generally speaking, these are innovations that are in process of validation, or are part of research and demonstration projects both at national or international level. This means that the existing activity system of course provision is not so perturbed.

Abs. 102

Exceptionally, significant efforts have been made in some universities, setting up a number of different entities inside the organisation to regulate and promote the expansion of flexible learning systems, based on an analysis of the current and future needs. For individual innovative learning projects there are some specific virtual learning environments that use either an adaptation of the regular campuses or an ad-hoc learning environment. Therefore, a first decision will be on how the new VLE activities will be integrated inside the university structure, taking into consideration the extent of the offering and the target population.

c) VLEs as instruments to provide access to new students and co-operation among institutions.

Abs. 103

From the examples examined, institutions take into consideration VLEs for accessing more students and other client population that otherwise wouldn't reach educational institutions.

With respect to the local clientele, there is synergy between the development of VLEs for regular University activity and for Distance Education. Methods developed for VLE are changing internal practice. On the other hand, materials developed for University-based use are a starting point for institutions to produce VLE materials. Even traditional methodologies (master class) can be used for creating materials or educational experiences for virtual learning environments like for instance satellite video-conferences. Abs. 104

It can be concluded that most of the institutions examined looked for students out of the regular clientele, either from their own country or from outside, independently from providing VLE opportunities in the regular face-to-face classroom. Abs. 105

With respect to the co-operation among Universities for course offering, strategies vary along European countries. They ranged from creating consortiums of universities inside one country, to promoting international partnerships of Universities running postgraduate courses, or to organise flexible co-operation networks with other institutions world-wide in order to offer international seminars of high quality adapted to the needs and existing competencies in the partner institutions. Abs. 106

d) The ability of educational organisations to respond to pressures

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. Abs. 107

Universities being mainly public bodies are subject to public statutes. They have obligations of their pre-existing operations. The VLE activities operating are either at a level that does not demand new legislation or do not place any pressure for change on the institution as it is sufficiently at the margins of the institution's work. Abs. 108

The internal politics of each institution play an important role in the way decisions are made. Within the activity Abs. 109

system framework the internal politics of institutions results from 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.

e) Professional Development

Many people involved in the implementation of innovations do not have tenure; they are research assistants, tutors, and other personnel working on a contract basis. There is also a tacit reason for this to happen, and this is the belief that most of senior staff will not participate in this type of innovations, as we mentioned before. The typical Professor's profile is of being a lecturer working individually. Abs. 110

Where existing university staff participates in innovative projects, these received training in the skills required. It is not always clear whether they volunteered for the projects and whether there were satisfied that they received appropriate and sufficient training. In any case, pressure of existing work (arising from increased accountability) undoubtedly played a major part in colouring perceptions of engaging in any change. Abs. 111

In most European universities initial appointments are based on the performance in scientific research. Undoubtedly this is a major priority for many academics in universities. Individual development for those who wish to stay in academic work in their discipline maintaining research performance is critical. Abs. 112

Lastly, the teaching of subjects by university teachers has historically been teaching what the lecturer knows, especially at higher levels. This is in marked contrast to the way education is practised in VLEs, where a diversity of skills comes together to create a course. Historically European universities have guarded the autonomy of the university faculty. Notions of academic freedom have been highly valued. Whereas this allows the adventurous to venture into VLE, it also means that reluctance is acceptable. Abs. 113

The factors that raise the status of a lecturer therefore Abs. 114

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 mitigated against mainstreaming of VLEs in institutions unless there is a change in the reward structure for university teaching.

Only very recently is there a more credible discourse about ICT that emerge from the very same University experiences, to the point that a teaching innovation can be considered now as research in teaching, a phenomenon that it is new for University knowledge areas other than Education. Unfortunately this type of research still does not have the same status and academic recognition as that of traditional research. Abs. 115

f) Financial matters

Many of the projects receive funding from a number of sources: government bodies, the University itself, course fees of the participants (often paid by the organisations employing these learners in case of professional training), or private companies. Subsidies are also available from the European Commission in different ways. The trend now is that most of the initiatives under way depended on funding that is secured through competitive bidding (either national or European), and less the course fees. Abs. 116

The overwhelming picture on financing is that there are "special funds" for experimentation. There is a long-term feeling that VLEs may either provide new sources of income or reduce current costs. Few of the institutions seem to have been developing the capacities and methods that will manage the replacement of existing work with lower cost VLE activity or marketing based on the VLE activity in a sufficiently planned way that VLE activity could be economically self sustaining just now. A source of concern is then to secure the long term financing of VLEs experiments. Collaboration in further education courses with private companies seems to be a solution that many institutions have considered. Abs. 117

g) Links with External Organisations / Partnerships

Because VLE activity is, generally speaking, additional to normal university activity it is often sustained by special initiatives or in expectation of extending the reach of a university beyond campus. This encouraged collaboration with external partners as either funding organisations, as clients or as suppliers. This is not unusual for modern universities as increasingly research work depends on such collaborations. The experience should make the situation less problematic. However the effects of collaborative effort may have long term effects on universities. Abs. 118

As mentioned before, partnerships with the private sector look promising in this field. In some institutions VLE development/implementation will be addressed through a collaborative model approach, where the institution will be responsible for providing the subject matter content, organisational experience, accreditation role, other partners will address issues of technical specifications, exploitation, and other will act as clients. Abs. 119

h) Validation

All award bearing University courses needed validation. This is the case of the courses that take place within existing validation structures. In any case this is an issue in VLE's. Who will be the accreditation bodies in international courses, and how these will be embedded in the organisation regulations of the participant institutions? Who will assure that the content offered by the other providers may not meet their own quality standards? Abs. 120

Little number of the European institutions has specific regulations for validating VLE-based learning. This may be an issue in the future, as there are new requirements in assuring the quality of service delivered. Abs. 121

i) Sustainability / Scalability

Very little work appears to have been done in Europe in relation to increasing the scale or extending the scope of pilot projects and more consolidated experiences in terms Abs. 122

of measuring and allowing for the impact on the institution.

Since technology changes so rapidly, we can barely measure sustainability by how the pilot projects become adopted by the institution, but how these projects are able to adapt to or keep pace with technological changes. Sustainability is then vicarious of further technological and social trends. Abs. 123

j) Institutional consequences of some pedagogical issues

The pedagogy of the VLE activity is mostly determined by those actually working in the innovation. This is in line with concepts of the relative autonomy of teachers in higher education. There is no "given" pedagogy in VLEs in that there is a variety of potential pedagogic strategies, however, specific technologies tend to support particular models of teaching and learning. Therefore a decision to adopt a given model for a virtual campus does in fact make specific decisions about the pedagogic model to be adopted by an institution. This issue needs further research. Abs. 124

There is a clear dilemma for universities regarding VLE's requirements for teamwork. 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. However, the 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. Abs. 125

4.3 Barriers to implementation

This section presents the identified barriers for the implementation to specific pilots rather than major issues. Here is a list of common issues identified in different experiences: Abs. 126

- resistance to change by the institution's faculty members. This resistance is highly associated with the multiplicity of tasks and prioritisation of needs and requirements facing the staff.
- funding for the VLE projects, since most of the experiences are experimental. Many are self-sustained, so the fact that some courses need to recruit trainees poses also a threat to the continuation.
- lack of adequate facilities and the fact that experimental projects had no priority of use over other users. These classrooms were not provided with technical support for the VLE experiences.

Abs. 127

No common pattern relating to the barriers emerged from the study, but all institutions 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, etc. In any case, further investigation is necessary for identify other sources of issues in implementation.

Abs. 128

4.4 Implications for Change in Institutions

From the above discussion, the major implications for change consequent to the adoption and implementation of VLEs appear to be on:

Abs. 129

a) Staff

The regular classroom and its teaching arrangements are deeply embedded into the organisational university culture. The classroom, combining both material and symbolic features, is a sacred institution deeply institutionalised especially immune to transformation. VLEs goes against that culture. And beyond that, the traditional classroom and traditional tutoring arrangement are part of the professional identity of University lecturers (Barajas, 1998). This would explain and also prevent the resistance VLE do have and will face in the future. One way to overcome this problems is assuming that many of the lecturers are not happy with the traditional classroom either, and that the VLE arrangements might be an

Abs. 130

opportunity to improve their practice.. This needs examples of good practice and programmes for staff training, as demonstrated in some of the examples studied in this project.

b) Division of Labour

Abs. 131

The introduction and use of VLEs can impact not only those people who are employed by the institutions but also those working at the periphery of the institution. These may be individual freelance workers or employees of companies providing services to the Institution. It can alter the work they do, alter their workloads and shift work from one group of professionals to another. These shifts can also bring about shifts in relative power of the groups and individuals. It can also alter the balance of work performed by humans and by machines. It can impact the students by altering their chance to engage in studies, to work at a distance, and to interact in different ways with fellow-students and with tutors. It might also affect the possibility that more advanced students have to supplement their income by engaging in teaching or support activities.

c) Students

Abs. 132

Those students who are well trained and well motivated seem to enjoy using VLEs, but it is not yet evident that there are a sufficient number of students in this position. The benefits that could arise from a large student group engaging in online collaborative learning remains 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 greater demands on the skills of students such as time management and ICT knowledge.

Abs. 133

Some cases experienced students engaged in international collaboration projects. Now they notice that students were keen to engage in VLE courses as long as the following two conditions are met: a) they receive initial training in the VLE tools and methodologies, and b) the VLE courses are assessed.

d) Technical Infrastructure

There are 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. The ability of low cost computers to provide sophisticated multimedia services provides the client machines. There is a plethora of software suites providing teaching in a range of pedagogic models. Abs. 134

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 does not see that there will ever be a sufficiency from the point of view of the administrations. Is this because the University is not making the best use of available hardware? Abs. 135

5. Policy implications for the implementation of VLE

In looking at policy recommendations the approach is to look at all actors involved in VLEs, and not only at the traditional policy makers and managers. In order to deal with the issues raised in this paper a dialog among all stakeholders is needed. The recommendations below are addresses to policy makers at the level of senior management and national higher education authorities, but also to those researchers and practitioners able to influence decisions making in education and training institutions. Abs. 136

The analysis of the complex characteristics of VLEs necessitates consideration of many different dimensions, which influence how we learn, and how we organise learning. Consistent with the ideas of this article, we deal with these dimensions from a holistic perspective, taking into account the institutional and the teaching and learning dimensions. Any recommendations for policies in this area need to take into consideration these dimensions (among others, for instance cross-cultural approaches) and how Abs. 137

they are intertwined.

5.1 Teaching and Learning Policy implications

1. New pedagogical approaches. Fostering curriculum integration, constructivist approaches to learning (problem solving strategies, team work, but also autonomous learning and learning for understanding), sensitivity of instructor or moderator to cross-cultural differences among learners. Abs. 138

2. Innovation units. To support the development of "innovation units", integrating interdisciplinary teams made up of academic staff (subject-matter experts), pedagogical advisors and technical support, working cooperatively in promoting and implementing VLE experiences. To support the development of "innovation units", integrating interdisciplinary teams made up of academic staff (subject-matter experts), pedagogical advisors and technical support, working cooperatively in promoting and implementing VLE experiences Abs. 139

3. Pedagogy-technology balance. It is necessary to look for a balance between the pedagogical model and the potential of technological tools. A decision to adopt a particular VLE has major implications for the pedagogic model to be adopted by an institution. Abs. 140

4. Professional development. Teaching using VLEs needs technological, and organisational competences and new skills in applying relevant didactical methods, new strategies for teaching/tutoring and moderating/facilitating. It is necessary to recognise new educational roles for those involved in the development of VLEs at different levels. Abs. 141

5. Specific VLE resource design. The efficacy of learning materials specifically designed for teaching in VLEs has been proved. The problem is the cots of developing high quality teaching materials from scratch. Institutional innovation units can ease the process. Abs. 142

6. Evaluation. Implementation of evaluation programmes to assess the efficiency of processes through VLEs, and Abs. 143

the adequacy of pedagogical models, flexibility, and the capacity of the structure to allow interactivity with students, among other factors.

7. Updating of the Training of Trainers Programs. Training the trainers and teachers' programmes should reflect the current state of the art concerning educational technology and new methods to be applied. Training must be updated and awareness of students engendered towards the need for technology integration in almost any kind of pedagogical concept. Abs. 144

5.2. Cross-cultural policy implications

We can derive certain guidelines to bear in mind when we want to implement processes, materials with the objective of meeting the cultural needs and expectancies of target populations. Abs. 145

1. Redefining of the teachers' training to allow them the use of NNTT and the identification of diverse needs among the potential students. The aim is to make teachers interested, innovative, imaginative and creative when approaching students' differences. Abs. 146
2. Elaboration of guidelines for the development of cross-cultural strategies in teachers' training program.
3. Implementation of evaluation procedures adapted to the peculiarities of the population, having in mind the relation between what an specific educational program intends to develop in their students and the real possibilities of a given population to achieve this objective, in terms of the students' general cultural background and social-economical context.
4. Defining of diverse levels of VLEs and ODL to adjust to differences, these levels would go from VLEs as complement of conventional education till programs that would develop as full virtual ones. The implementation of different degrees of VLEs and ODL would be carried out according to the different aspects of the teaching-learning processes. These can be, kind of educational requirements, type of educational offer (graduate, postgraduate, long life learning, etc.)

5. Looking at individualising educational programs and courses.
6. Exploring context-based cross-cultural teaching-learning processes
7. Promoting policies at European level, to compensate unbalances between the most developed European regions and the less developed ones, this implies investing in educational technology setting up, giving impulse to interchange of experiences among institutions and to increase links among them.

5.3 Institutional Policy implications

1. Embed VLE into an institutional strategy. The introduction of VLEs should not be considered as merely a technical development with a few management implications. Institutions are changing as a consequence of the diffusion of new technologies throughout society. Institutions require a strategy, coherent with the overall plan for innovation in the institution. We propose a sequenced step-by-step plan meeting the pace of change in each institution: Abs. 147

- Initiation phase: The production of a Green - consultative- Paper as the basis for decision-making on implementation of VLEs. Abs. 148
- Implementation phase: a) Preparation of the technical infrastructure; b) Organisation of training and development courses for staff; c)Promotion of a new organisational culture through dissemination activities inside the institution.
- Diffusion phase; a) Development of professional development programmes and institutional support structures; b) Promotion of a higher status for "research in teaching"; c) Facilitation of team-work in VLEs; d) Dissemination of good practices.
- Adoption phase: a) Publication of the institutional 'White Book' including, Business plan, Survey of most used pedagogical model(s), Descriptions of case studies concerning the implementation of VLEs, Research documentation, and conference reports related to University development, to learning and other topics connected to VLEs; Surveys of existing hardware, software and communication networks; Report about the likely

future development of hardware, software and communication networks for VLEs; Identification of potential populations for VLEs and innovation and description of their main interests, characteristics and needs; Evaluation of the existing infrastructure; Market research report.

- Strategic Plan: a) Embedding the 'White Book' approaches inside the Strategic Plan of the institution secures the success of the innovation; b) Revision and update; c) Formative Evaluation

2. Establishing new working conditions. It is important to establish agreement on new working conditions for tutors and lecturers and other staff involved in the virtual campus operations, as well as to adequately reward those professionals involved in innovation. To recognise 'teaching overload' in VLEs is the first step towards managing it and it is necessary to support and implement strategies to reduce the workload of online teachers Abs. 149

3. Improving international quality assurance procedures. Quality assurance systems in Europe remain local or national despite the globalisation of the economy and the emergence of virtual learning leading to an international higher education environment. Academic and professional mobility are on the increase and institutions and curricula are crossing borders. The rise of transnational education constitutes a challenge to quality assurance; the urgent need is to protect students and employers from fraudulent institutions and awards. While national quality assurance is geared towards accountability and improvement, there is a need to contribute to the international visibility and compatibility of European qualifications at the international level. Abs. 150

4. Looking at financial support and the consequences of VLEs. Few universities can afford the development costs of VLEs on their own, still less the cost of producing learning materials for every sector of the curriculum. The result is collaborative ventures between universities, leading, in some cases to the creation of merged or federal organisations. Most institutions are reliant on national or European funding, to a greater or lesser extent. Abs. 151

6. Final remarks

The focus of much work in this field has been on the development and capability of VLEs in themselves, rather than on the ways institutions may change to encompass the use of VLEs. The development and implementation of VLEs in education and training is based on the connection between organisation and collaboration. Organisation will be facilitated through carefully constructed collaboration. There are still questions to be answered. The research related to administrative functions is sparse. Collaboration needs to be organised on three levels: institutional (including the international level), conceptual, and at an individual level. Investments of time, money, and effort need to be considered. Abs. 152

If educational institutions want to meet the future needs of the learning society, they need to engage in a critical process of change in regard to: Abs. 153

a) the institutional culture and the professional development of staff with respect to learning innovations using ICT;
b) improving the technical infrastructure and planning for VLEs;
c) policies that develop collaboration and competition among European learning institutions.
d) an important movement towards cross-cultural understanding requires the promotion of policies and practices which allow for multilingual communication, equity in the assessment of students' outcomes, adjustment of courses to the different cultural and social backgrounds and needs.
e) For institutions coping with structural change, a key issue is the enactment of strategic thinking and planning. Abs. 154

The piecemeal introduction of VLEs can be no more than experimental. To transform teaching and learning in higher education it will be necessary for the whole institution to change. It is our hope that the analyses done, laying bare a series of interesting and challenging issues to take into account in the further discourse on VLEs in education and training, will elicit a stimulating and fruitful exchange of ideas in the future. Abs. 155

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