

Staff Development on Virtual Learning Environments

General Introduction

Combining the services of computers, local networks and the Internet, VLEs provide facilities for the flexible organisation of all aspects of the learning process, both in terms of access to resources and communication with others.

The application of VLEs is of great significance to vocational training in many ways:

- the content of vocational knowledge is rapidly changing; VLEs support a modular structure to the syllabus, which ensures that specific modules or their elements can be easily updated, and which allows efficient tracking of changes in the electronic documents
- a major part of vocational training and re-training is undertaken by adults, and the provision by the VLE of training content independent of the place and time of study is advantageous to these 'lifelong learners'
- the wide-ranging application of information and communication technologies (ICT) is reflected in the safer handling of the informatics background to vocational services, that is the application of ICT in VLEs enriches ICT content knowledge and promotes its use in the vocational field.

Adequate ICT skills in vocational teachers are essential for the effective application of VLEs in vocational training. This imposes a dual task on vocational teacher training:

- on the one hand, the content of pre-service vocational teacher training for the application of ICT needs the appropriate emphasis through the content enrichment of education technology, multimedia and subject methodologies, with a proper acquisition of experience in the field of e-learning and VLEs
- on the other hand, in-service training of practising teachers, who have received their qualifications in former years, as well as of teachers taking part in vocational teacher training, must summarise and publicise in the form of distant training the content and methodology changes due to ICT development.

The following sections of this report detail the introductory module for the in-service training of vocational teachers and the vocational teacher training staff. In addition to this there will be the practical training modules, within the framework of the in-service training.

A Brief Survey of the Development of Internet, E-learning and VLEs

Major steps in the evolution of Internet

1945 – Vannevar Busch drafted his informatic vision of the future and the electro-photomechanic storage unit for the extension of memory, thus practically forecasting the later application of hypertext and hypermedia as well as the logical links that can be established among stored documents.

1966 – Dany Engelbert prepared the prototype of an on-line system, which was able to process hypertext materials and enabled the use of e-mail. The application of the mouse as a device for feeding data into the computer was among his inventions.

1973 – The Bolt Beranek and Newman Inc. (BBN) installed Telenet.

1980 – With the programme of Tim Berners-Lee, considered to be the father of the world web, the individual cluster computers of the network became addressable and the materials stored in them accessible.

1982 – The protocol used in Internet application was defined.

1989 – Tim Berners-Lee's proposal ("Information Management: A Proposal") was published and the term of World Wide Web introduced.

1995 – WWW and search machines became the technologies of the year.

By making a global size dialogue possible for its appliers, Internet secured an active participation in communication for the users. This fact together with the technical possibilities: multimedia environment, the application of hypertext and hypermedia as well as overcoming communication space and time, opened up new vistas for education, which, with an almost prompt reaction, urged the pedagogical application of Internet, because educational experts recognised that it motivated users for the independent acquisition, organisation and continuous reorganisation of knowledge.

The development of information technology also created the trend, to be regarded independent, of e-learning.

The development of e-learning

It is almost impossible to follow the fantastic development of e-learning technologies.

Flash created and developed through several versions by Macromedia, and supported by almost all the important browsers, is suitable for the displaying of programmes that are vector-graphic, with various animation effects and sounds, and offer interactive possibilities. Its display, applied with the widely used browsers, ensures unified surfaces on the various platforms.

Java Script provides the possibility for displaying dynamic HTML pages for the insertion of interactive elements into static HTML pages. Its disadvantage is that, due to the inadequacy of standardisation, the dynamic elements only function in particular browsers.

Although VBS and the web pages containing different DirectX elements guarantee more possibilities than Java Script, they can be used only on a single platform (Windows, Internet Explorer).

VRML pages are even more advanced regarding service content, pages are stereoscopic and suggest movement of 3 grades of liberty in a space constructed in advance. Owing to the increased bandwidth and computer speed, the institution of education itself, together with its classrooms and equipment, can be modelled, that is the virtual classroom has come into being with their help.

SUN Java is a programming language the virtual running environment of which has been prepared for almost all the popular platforms.

So the development of e-learning has led to the formation of VLEs.

E-learning is the comprehensive and complex application of the use of ICT to support education.

According to the "e-Learning Action Plan" document of the European Union, e-learning embraces all the forms of education that wish to make the teaching-learning

process more efficient with the help of multimedia-based ICT. The environment of e-learning is virtual, its resources independent of place. Looking for the position of e-learning among the various forms of teaching and learning, it can be stated that in a certain sense it is a common part of computer-based learning (CBL) and web-based learning (WBL). Experience proves that it best aids the teaching-learning process if applied as a complement to the traditional educational experience.

The European Union summarised the developments necessary to secure the spread of e-learning in the document, "e-Europe":

- each citizen of Europe must possess the abilities needed for living and working in an information society
- efforts must be made that the overall population should possess the skills of digital reading and writing, which presupposes the system of concepts in information technology, IT skills, the knowledge of language, and technical competence.

The most important tasks of the programme of e-learning have been defined as follows:

- extensive provision of adequate equipment (with multimedia computers organised into networks)
- establishment of links with varied forms of source centres (educational centres, libraries, museums)
- development of quality multimedia contents and services by reinforcing the multimedia industry as well as the establishment of links between institutions or centres of education and vocational training
- changing the organisation of the educational process and the methods of education by means of teacher training and in-service teacher training.

The development of VLEs

Managing the Digital Enterprise (<http://digitalenterprise.org>)

An enterprise of distant learning, which offers courses and provides sources both for institutions of higher education and company courses.

Embanet (www.embanet.com)

A non-technology-specific service without a Learning Management System of its own. It offers the choice of the following five, various system shells.

FirstClass (www.firstclass.com)

Supports internet co-operation, basically not founded on distant learning.

IntraLearn (www.intralearn.com)

Develops flexible e-applications for enterprises and institutions of higher education.

Prometheus (www.prometheus.com)

Offers a public system shell for higher education and research, which users may freely adjust to their needs.

Blackboard (www.blackboard.com)

Its system shell is suitable for organising courses and forming higher education portals with appropriate administrative surfaces. Provides opportunity for the placement of free courses.

WebCT (www.webct.com)

Offers a web based learning environment. Syllabus developers prepare HTML pages. Applies a simple system of evaluation (multiple choice, gap filling, cross-word puzzle).

Natschool (www.natschool.com)

Uses standard search. Download and installation of further software are necessary for the operation of the full system. Its new feature is PCM.

Asymmetric Librarian

Ensures multimedia developing environment through the individual programming of the syllabus. Programming and developing the syllabus require the knowledge of the entire system.

Computer communication, such as discussion among study groups, e-mail or synchronous chat, in VLEs is very efficient; it enables students and tutors to develop interactive relationships, thus avoiding the risk of isolation involved in on-line learning.

Nowadays several established companies are already creating VLE networks internationally. At the same time, however, there are solutions developed at training institutions using inner and usually outer networks, too. The advantage of the former is that due to the normally richer financial background of the developer company the products are many-sided and more professional. They are more expensive for the user and there are more limitations of use. To enlarge the circle of potential customers, generally much more of them are offered than needed by the user, therefore unnecessary excess expenditure appears on the side of the user. Local development usually works on a more modest financial basis and with simpler solutions, and its development demands a lot of time and energy of tutors. At the same time, however, such environment adapts itself very well to concrete needs. Particular demands may occasionally be met by local development only, in an inexpensive way. This circumstance makes local development not only justified but indispensable as well.

The advantage of locally developed electronic syllabuses is that they reinforce relations between training institutions both nationally and internationally. Relationship and co-operation that are really productive and long-term are established almost exclusively by local research and developments.

Nevertheless, it is to be clearly seen that the selection of VLEs is a process requiring the thorough analysis of relevant factors.

Tutors may at any time and place, or at least at several places, download professional and pedagogical information, texts, figures, charts and data with the help of which they may flexibly form the content, course and methods of training. At the same time, they may incorporate into training the latest technological and pedagogical results in the fastest possible way.

VLEs also make the international exchange of experience possible in the development of teacher training in the set of students and tutors respectively, and in the common set of the two as well. International co-operation is becoming increasingly important with the expansion of the use of VLEs. This may be hindered by problems of compatibility, which can, paradoxically, be solved just with the help of co-operation.

When developing contents, efforts must be made to make feasible a later change-over either to a new system or to an improved form of the system applied.

XML makes it possible with the joint preservation of content and architecture to store documents structured according to the objective of training. Conversion into another format can be performed without data loss in XML format.

Changes in Learning Strategies due to the new Information and Communication Technology

The most significant change is to be seen in the transformation of learning strategies. Learning has so far been characterised by a certain linearity. As we describe things with a sequence of words one after the other, so we mostly turn the pages of textbooks in the order of page numbers. We are used to things following each other in succession.

However, the exclusive application of the sequential model of syllabus-transmission has become antiquated due to the development of ICT.

With the change in the form of the appearance of syllabi an increasingly wider use of constructive and heuristic models has become possible besides the sequential one. The preparation of students for independent orientation and learning in the new ICT environment has become an important task.

In this environment there is an opportunity to orientate oneself, then to roam about as if, to use a simple simile, one glanced into different rooms from the different storeys, corridors and their bifurcation in a three-dimensional building; then, on reconsideration, one changed floors by express lifts in back staircases. Similarly learning is continuously being reorganised as the aims are changing on the way; therefore an opportunity presents itself to harmonise learning strategy with the nature of the syllabus and the student's individual needs.

For independent knowledge acquisition and the independent as well as continuous reorganisation of the knowledge acquired, it is important for students not to get lost in the 'hyperspace'. Strategies must be recommended, which aid orientation and progression. Since it is systematically impossible to open all the thousands of menu points one by one, the recommendation of "bookmarks" may make learning more expedient.

Compared with spontaneous internet learning, VLEs consciously endeavour to use the possibilities of interactivity. Such uses are synchronous and asynchronous types of communication (e-mail, chat, forum, inner message system, web-telephony, web-videophony).

Teachers' roles have in several respects changed owing to the development of ICT. Teachers have to, metaphorically speaking, "scaffold" the entirety of the learning process so that the particular intersections provide safe holding points and orientation. The organisation and continuous reorganisation of knowledge appear as new tasks. The explanatory role of the teacher is complemented by an interpretative one, which helps students' adjustment to the changing sources of learning. The necessity of disciplining thought also appears, justified by the limitless use of technical tools.

VLEs reshape the traditional teacher-student relationship. The teacher is informed of problems of understanding not only by the student's verbal signals (questions) but he also has the technical possibility of following progress in the student's studies as well as of prompt intervention. The teacher can continuously alter and develop the syllabus on the basis of students' comments and difficulties in learning.

Teachers are set varied and new tasks in the fields of handing out and taking in assignments, organising group work or testing. The administrative burdens of these tasks become simplified and statistics are easily generated.

However, the key element in the teaching process remains undoubtedly the production of the content of teaching.

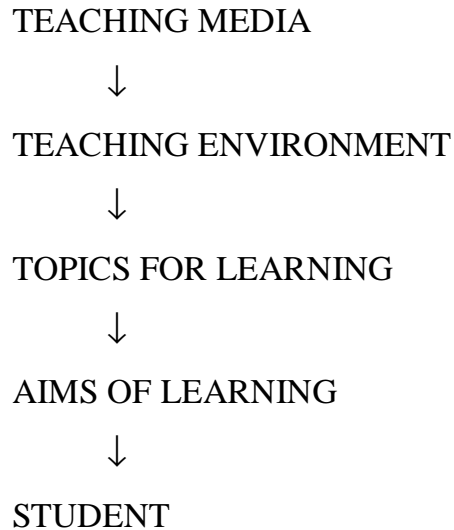
To this a more definite consideration of students' needs and an exact definition of output requirements is becoming increasingly important. Teachers must learn the tricks and methods of electronic syllabus writing.

The main token for the introduction and spread of e-Learning is the training of teachers/trainee teachers for the preparation and/or use of new teaching materials.

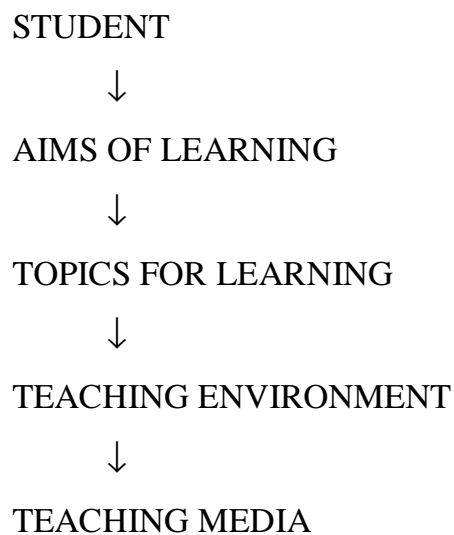
In her "Thematic Assessment of E-learning Projects within the Framework of the Leonardo da Vinci Programme", Andrea Kárpáti justly accentuates the basic importance of the *how-s* of syllabus planning. She contrasts the outdated *technocrat* scheme with the up-to-date *pedagogical-andragogical* e-learning syllabus organising

scheme, and recommends the latter. The logics of the two kinds of syllabus planning schemes show an exactly opposite order of processes:

technocrat scheme



pedagogical-andragogical scheme



It can be seen that the comparison of the two schemes does not only reflect well the paradigm shift in virtual e-learning but also that in traditional forms of education.

It is not accidental that the Dutch Heesch Hooghuis' analysis points out that in this new environment students "are expected to build up a knowledge of their own instead of passively accepting being taught. They are expected to study." Motivation in studying for individual learning is obviously enhanced if planning focuses on students' interests and aims. Syllabus planning starting from students' needs may harmonise the structure and the characteristics of the syllabus with the possibilities of ICT interventions.

"In technical solutions pedagogical methods lie hidden." A discerning application of the system may radically transform teachers' methodology culture.

New syllabi are usually prepared by team-work. The teacher willing to engage in team-work acquires the use of already existing materials first. This way he encounters (either positive or negative) examples and, in possession of critical experience, he may later have a better chance to plan and/or prepare competent teaching materials of his own.

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