



*EUROPEAN DISTANCE EDUCATION NETWORK*

**EDEN 2003 ANNUAL CONFERENCE**

# **THE QUALITY DIALOGUE**

**Integrating Quality Cultures in  
Flexible, Distance and eLearning**

**CONFERENCE PROCEEDINGS**

**15 - 18 June, 2003  
Rhodes, Greece**

# **2003 EDEN ANNUAL CONFERENCE**

## **The Quality Dialogue Integrating Quality Cultures in Flexible, Distance and eLearning**

**Proceedings of the 2003 EDEN Annual Conference,  
held in Rhodes, Greece**

**15-18 June, 2003**

**Edited by**

**Dr. András Szűcs, Dr. Erwin Wagner  
on behalf of the European Distance Education Network**

**and**

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**European Distance Education Network**



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# PRINCIPLES, QUALITY REQUIREMENTS AND SOLUTIONS FOR ON-THE-JOB E-TRAINING IN SME<sup>1</sup>

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## Introduction

The urgent need for innovation and continuous training and competence development of the personnel of Small and Medium-size Enterprises /SMEs/ is widely recognised. These have to be developed systematically around sound training structures, ensuring that working and learning are matched effectively. SMEs in any sector cannot respond effectively to this vital need. The reason is their small size, which usually means shortage of resources.

The SMEs specific training and consulting needs would be covered by the development of Internet-based environment. The building of a network for e-Learning would provide the integration, customisation, deployment and dissemination of the training platforms, methodologies, services developed under various successful projects, and best-practice results. E-learning also acts as support to the process of change within the organisation, offering a new approach towards learning, teaching, working, interacting and thinking, which is necessary today.

The aim of this paper is to present the basic implementation phases of e-Learning network for on-the-job training /OJT/. The current paper addresses also the requirements, principles and criteria providing an effective and qualitative development.

## Basic Phases of e-Learning Network Architecture Implementation

The e-Learning network has to be established on a sound technological baseline. Technology has to be considered as “a critical element of the learning process itself by allowing substantial methodological and cognitive innovations” [3]. The adoption of effective learning methodology is another critical point. The special requirements of adult training as well as the support of the in-classroom, in-company, distant learning, self-paced and group-work learning have to be considered during the methodology tailoring. The standards regarding re-usable learning objects fostering the creation of specialised courses by intermixing and exchanging material with other learning environments supporting these standards have to be considered too.

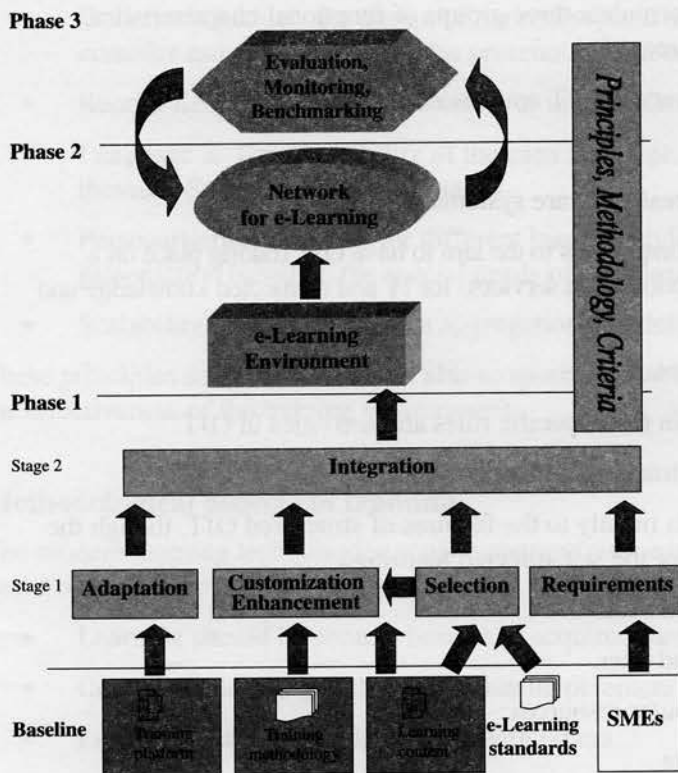
The figure below depicts the overall work have to be done starting from its baseline and advancing gradually until the network is fully operational. In particular, the work is organised in three distinct phases. The first phase takes as input available generic technological platform along with international e-Learning standards and builds the training network. This phase has two stages.

Stage 1 refers to the necessary adaptations on the training platform, customising a relevant training content and training methodologies, and selecting appropriate e-learning standards to follow. In parallel there is a user requirements analysis running to specify the specific features of the training network in order to meet the needs of the concrete SMEs sector.

Stage 2 of this phase integrates the customised material into the adapted learning platform following the selected e-Learning standards.

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During the second phase, the network is operational and the monitoring of its performance starts. In parallel a detailed evaluation framework has to be elaborated based on concrete criteria about the functionality of the learning environment, specific objectives in terms of building and using user competencies, and methodological aspects for adult training. The extensive monitoring along with evaluation and refinements are high-priority tasks in order to have a self-sustainable and fully functional environment. The detailed specifications of the benchmarks for measuring the impact of the used approach to the concrete SME sector are mandatory.

The final phase includes extensive testing and refinements on the basis of the evaluation framework specified in phase 2. In addition, during this phase the deployment of extensive marketing and dissemination activities contribute for the expansion of the network.

The next part of the paper illustrates the building up of dedicated e-Learning network on the example of the OJT e-Learning network, developed under the “Leonardo da Vinci” project ADONIS: “Advanced On-the-job e-Training Solutions in E-Business for SMEs” (2002 – 2004).

## Training platform

The ADONIS architecture is an enhancement of the generic training platform developed under project ARCHIMED: “Advanced Multimedia-System Architectures and Applications for Educational Telematics” [3, 9] (1998-2000). The ARCHIMED platform was aimed to build an environment adaptable to the learner needs, by offering her/him tools that facilitate learning and collaboration. It supported a number of facilities that proved efficient in supporting the virtual university paradigm:

- Organisation of training material in Web-based presentations.
- Provision of registration and “virtual desk” tools to learners, such as annotations on the training material.
- Development of the training material on-line, in a set of web-based presentations.
- Development of on-line and automatically corrected exercises.
- Digital Library, providing a common pool of information in different file formats (documents, presentations, spreadsheets, multimedia content etc.).
- Discussion Forum, facilitating the communication and exchange of knowledge and information between the network members.

The functional characteristics of the ADONIS learning environment, build up as adaptation and enhancement of the ARCHIMED platform, consider the specifics of:

- the form of learning processes - on-the-job training;
- the target group – personnel of tourist-oriented SME’s;
- the learning content – IT and other knowledge and skills, allowing and stimulating successful e-business activities.

The analysis of these specific topics allows to formulate three groups of functional characteristics, necessary or desirable for the ADONIS environment:

- Operation in Internet mode by DL delivery of OJT courses/modules
- Support of learning-by-doing practice
- Operation in working conditions (with real software systems)

The necessity of these functional characteristics corresponds to the aim to have OJT (taking place on a working place and oriented to regular working products and services) for IT and connected knowledge and skills.

- Execution of assessment tests and projects
- Support for the teachers/trainers acting in their specific roles and activities in OJT.
- Registration of the learner's history for tracking his/her progress.

This set of functional characteristics corresponds mainly to the features of structured OJT, though the facilities for self-evaluation are important also for the self-directed learning.

- Asynchronous connection with the teacher/tutor.
- Sufficiently intuitive interface for the end-user.
- Work with standard/not excessive computer resources.
- Considering moderate data exchange rate.
- Avoiding the need to download programs/files on the learner's computer (lesser requirements to the learner's computer resources, increased learner's trust in the security of his company confident information).
- Allowing the learner to work and practise with real software system on a remote computer without the need to purchase the system for his exercises.

This third set of functional characteristics concerns mainly ADONIS implementation, taking into account some pragmatic considerations about the learners community.

### ***Design principles***

The design of the ARCHIMED training environment and its enhancement in the ADONIS architecture consider a set of common design principles [6]:

- Content Eligibility - the learning material has to be tailored to the needs of target group, revealed by requirement analysis.
- Sound instructional design - proper learning objects assembly to support effectiveness in terms of learners' performance.
- Engagement/Interactivity support - the aim is to keep the attention of the learner with the right amount of interactivity and support for interaction between the learners and the users in general.
- Navigation Support - the learner should be able to control navigation and not get disoriented during a course. Users' navigation could be aided by means of course maps, availability of options, user profiles, and usability of visual components.
- Motivations - use of appropriate means of motivating the learner to forward with the course, including case studies, involvement of experts in the training process, practical exercises, group work, multimedia content and dynamic adaptation of courses.
- Sequencing. The course structure enables learners to build on existing knowledge. The courses are built on lessons organised from simple to more and more complex ones.
- Feedback and Evaluation Support. The learners can get feedback and tests for progressive evaluation in all phases of the learning process.



- Esthetical Quality - the design of the courses and the training platform environment has to consider esthetical quality of the presentations in order to raise user attention and satisfaction.
- Record Keeping - suitable recording of user performance and preservation.
- Language & Tone Suitability of the used language, support for dictionaries and domain specific thesauri. Support of local languages.
- Personalisation - support for different learning styles, customisation of the course material and the presentation based on the special needs of each learner.
- Scalability in terms of content aggregation and delivery to the learner.

These principles have to be reflected also to specify suitable metrics for the evaluation framework testing the effectiveness of the training environment.

### **Methodological aspects of training**

The modern learning technologies apply constructivist pedagogy principles. The models of learning are based on the following main ideas [3, 5]:

- Learning should be context based and acquired through making links with existing knowledge.
- Conceptual learning is through active involvement.
- Learning is through collaboration with others.
- Learner should have personal autonomy and control over learning.
- Teacher mediation depends on needs and skills of the learners.
- Multiple perspectives of the learning tasks and different approaches of understanding.

The ADONIS environment is oriented towards adaptation of the constructivist pedagogy principles to the specific requirement of the on-the-job-training life cycle [1, 2]. Essential criteria for on-the-job training activities are the following:

- The location in which the learning takes place is a work place and the nature of the learning process is largely similar to the working environment.
- The trainees produce regular working products and services.
- The activities include “hands-on” experience.
- The training is highly similar to the current or future everyday tasks.

The ADONIS architecture is designed to reflect the specific quality requirements for OJT by supporting the following types of learning processes and activities in case of structured OJT:

- Learning by doing (practice-based OJT).

In this case the role of the ‘master’ may be supported by: 1) examples included in the course materials - e-demonstrations of master tasks execution; 2) in-classroom training in case of combined on-the-job-/off-the-job-training.

- Learning by practising partial skills (instruction-based OJT).

The ADONIS architecture concepts suppose that the courseware structure involves this kind of training by means of exercises offered for execution without direct supervision by the instructor. In case of acquiring IT knowledge and skills combinations of e-demonstrations and exercises – tasks to be executed with real software products – will simulate also the apprentice-like type of training.

- Learning by systematic feedback and reflection / self evaluation (study-based OJT).

In this case the feedback function of the ‘coach’ is provided in the e-Learning environment by development of communication functions, allowing the supervisor to follow the execution of exercises and development of projects by the trainees.

The ADONIS architecture consider also possibilities for unstructured OJT:

- Self directed learning with options for free access to the courseware units (access to selected units independently of the standard sequence, access to units of given type, e.g. exercises on given theme etc.).
- Coaching and group discussions by means of the communication functions of the environment.

### **Development and integration of training materials**

A traditional approach to training is based on the theme's features list - the course is developed on this features list baseline and the students are tested on their recall of the features. A performance-based approach, by contrast, is outcome based rather than content based. It focuses on what people want (or need) to do, rather than on what there is to know. This approach to the specification of learning goals of a training material seems more appropriate for OJT as OJT is oriented primarily to skills acquisition.

The user requirements analysis identifies the needs of knowledge and skills and necessary levels of competency for the user groups supported in the learning environment. The learning content of the courseware under development in the ADONIS environment covers the following topics:

- Training in tools and services for the SME in the role of an information supplier - templates for web site construction, electronic publishing tools for the publishing of internal documents, "business-to-business" documents, client oriented documents (catalogues, advertising), tools and services for SME web marketing within the regional context.
- Training in tools and services for the SME in the role of an information receiver within the regional context (databases for archiving information, user profiling tools, library of specialised information, search engines and agents).
- Training in tools and services for the SME in the role of an information exchanger (messaging tools, cooperation tools and services).
- Training in methods and tools, catalysing SME e-business activities (business plans, business models, introducing e-commerce).

The courseware is developed in the form of learning objects - mainly short courses/modules with explicit practical learning goals rather than as courses with complex structure, more typical for formal institutional training. The learning objects are built according to clear conceptual scheme and are kept in repository of training materials. Therefore they may be further reused, customised and intermixed. Standards for reusable Learning Objects (such as SCORM) [6, 7] will be supported so that the training material can be shared combined and mixed with Learning Objects from external sources.

### **e-Learning network set-up and evaluation**

The ADONIS e-Learning network is an open distributed environment, supporting distributed repository of training materials and a set of nodes - local centres of expertise for on-the-job training /OJT/ with their own networks of tourist-oriented SMEs. The distributed repository contains information resources as software solutions, training courseware, multimedia and documents, oriented towards successful e-Business activities. The local centres are built-up by the project partners and will organise testing in the real practice of ADONIS on-the-job training solutions. The integration of the local centres networks forms the network for virtual communities of users.

The approbation of the effectiveness of ADONIS operation and the applicability of its interactive training materials will be performed through flexible scheme for different groups of SMEs according their business goals, working organisation, staff background etc. It will apply set of benchmarks (quantitative and qualitative measures) to evaluate the suitability of learning methodology and the training materials and the usability of the training platform. The set of benchmarks is developed in close user-supplier co-operation. The local centres evaluation reports will be integrated in order to provide recommendations for refinements of the training environment, pedagogical methodologies, the training materials and the training platform services.

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