

## Issues and Challenges in Organising and Evaluating Web-based Courses for Adults

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### ABSTRACT

Adult education theory and practice provide some guiding principles for the organisation, implementation and evaluation of courses addressed to adults. Issues such as active participation, self-direction, barriers to learning, and participatory evaluation are considered as some of the crucial elements of most adult education courses. Moving from traditional forms of adult education to distance learning and specifically to web-based courses, the access of adults in educational activities expands, while at the same time the need of adaptation of the above-mentioned principles to new environments is emerging. This article focuses on the adaptation of adult education participation and evaluation approaches in organizing, implementing and evaluating web-based courses. The way that barriers to learning are dealt with in web-based courses is presented, using as an example the implementation of an existing course. In this example, the CIPP (Context, Input, Process, Product) model was used for evaluation purposes, and the main results are also highlighted.

### INTRODUCTION

The main characteristics of distance learning, particularly location- and time- flexibility, establish adult education (formal, non-formal, and informal education) as a privileged field for the development and application of distance learning courses. During the last years, the evolution of the Information and Communication Technologies, mainly the development of Internet services, has resulted to the wide development of web-based courses for distance learning instead of using the traditional way (Eastmond, 1995; Sargant, 1996; Halaris et al., 2002).

The continuing growth of Internet favours the implementation of web-based courses for adults, particularly for specific target groups that face serious problems in accessing educational services (for example, disabled people, people with family commitments, or people living in remote areas). However, the convergence of diverse educational modes (*classroom mode* and *distance learning mode*) is an issue brought up for discussion in parallel to the development of distance learning, especially of courses based on the new technologies. The content of this convergence concerns several aspects of a course, such as teacher's profile and roles, support of students, curriculum development, learning strategies, learning materials and processes (Trindade et

al., 2000). At the same time, current research focuses on comparing the two modes in terms of courses' outcomes and students' attitudes towards distance learning (Phipps and Merisotis, 1999).

In addition, the development of adult education theory and practice provides some guiding principles affecting all phases of adult education courses (organisation, implementation and evaluation). Active participation and self-direction of learners, overcoming barriers to learning, motivation and empowerment of the participants, and participatory evaluation processes are some of those principles, with a radically different content from that of non-adult education. While shifting from traditional methods to distance learning and to web-based courses, the convergence of these two different modes of education depends on the adaptation of those principles to new environments. Thus, a prerequisite for the development of web-based courses is to create analogues of the traditional mode of education by incorporating and adapting those principles for organisation, implementation and evaluation.

The first section of this article deals with the content of these principles (mainly active participation and overcoming barriers to learning) in adult education theory and practice, and the implications in designing web-based courses for adults. In the second section, the TELNET teletraining system is presented as an example of incorporating these principles in the development of web-based courses for adults. The third section deals with evaluation issues in Internet-based distance learning and presents some first results of the evaluation of the TELNET system in a pilot phase (training of disabled people).

#### WEB-BASED COURSES AND THE ADULT LEARNER

In order to specify the issues arisen when developing and, mostly, when implementing web-based courses for adults, it is necessary to define the term 'adult learner' and the conditions under which adults participate in educational activities. Characteristics of adult learners include a background of prior experience, an independent self-concept and a strong internal motivation (Pratt, 1993). According to Rogers (1996), the characteristics of adult learners, radically differentiated from those of non-adult learners, are the following:

- They are in a continuing process of growth
- They bring with them experience and values
- They come to courses with intentions
- They bring expectations about the learning process
- They have competing interests
- They already have their own set of patterns of learning.

Additionally, Rogers points out that «... for learning to be effective, the student participants in our group need to be active; they must be fully involved in the learning processes». Active participation, which in the above framework is clearly distinguished from attendance in a course, is at the same time a prerequisite for achieving the objectives of both the learners and the educational course itself. Also, active par-

ticipation is not confined in the processes of the group of students and their relation with the tutor. Since it is directly connected with self-direction of adult learners, it also specifies the involvement of the participants in the procedures of a course, particularly in identifying and analysing (Rogers, 1996; Knowles, 1998):

- The educational needs
- The course's objectives and content
- The educational methods and techniques
- The learning styles
- The evaluation process of the course.

In the above-described framework, the concept of the active participation of adult learners is not delimited from attendance percentages or dropout rates, but extends in facilitating the communication within the group, as well as in the intervention of students in all phases and components of a course. In this framework, active participation is differentiated from attendance in the same way that communication is differentiated from interaction.

Distance education in its traditional mode (correspondence) and Internet-based education are connected at the adult education field with the expansion of accessibility to educational processes. This is concluded from the main advantage of distance education, which is the elimination of barriers regarding time and place. However, considering active participation (as it was previously described) against attendance, the barriers to learning are not concerning only the reasons and conditions that refer to the time and the location of a course, but these are mainly specified in relation to the conditions of conducting a course and the characteristics of the participants. In this approach, the barriers to learning are distinguished from barriers to participation (Hillage and Aston, 2001; McGivney, 1993) and they are classified as follows (Rogers, 1996; Hybrid workgroup, 2002):

- Barriers concerned with the organisation of educational programmes
  - Barriers arising from the situation in which the learners are, i.e. physical or contextual factors, concerns or troubles related to personal problems, bad relations between teacher and learners, or between learner and learner, lack of communication inside the learning group
  - Internal barriers, which the adults may possess towards themselves. The barriers of this category are further classified in those due to previous knowledge, skills and attitudes of students (i.e. adherence in existing perceptions, misconceptions) and those arising from psychological factors (i.e. pressure, insecurity, fear of failure).
- In the same framework Cropley (1989) suggests that factors affecting the participation of adult learners include motivation, system factors (such as costs, geographical isolation, lack of information) and social reasons, while Knowles (1998) focuses on the conditions of learning (self-fulfilment, mutual helpfulness and trust, learning processes based on participants' previous experience).

Some of the above mentioned barriers are eliminated in distance learning and much more in web-based courses (for example geographical isolation), while some others ex-

ist, in a different way. According to the classification mentioned before, we propose an analogue of learning barriers for web-based courses, as proposed in Table 1.

The learning barriers of Table 1, which are derived from adult education theory and practice, are also reported by other researchers working in different areas: Soong and associates (2001) determine as necessary pre-requisites to realise benefits of on-line courses' resources, human factors, technical competency, mindset (about learning), level of collaboration and IT infrastructure, and technical support; Cronje (2001) states that "Internet-based models that were adapted from face-to-face models can lead to successful and motivational learning".

Concluding, a "paradox" is noticed, which characterises both traditional and web-based distance learning: while educational opportunities increase, resulting in extension of potential access and participation, active participation is significantly hindered due to the inner characteristics of distance learning: isolation and lack of contact with tutors and students render the functioning of the group and the active participation of adult learners doubtful. However, the exploitation of communication facilities offered in networked distance learning may contribute in overcoming the aforementioned barriers. As Pantelidis and Auld mention (2002), "recent technological innovations have reduced some of the former communication-related barriers in distance education, and have allowed new forms of interaction and course delivery".

#### DEVELOPING WEB-BASED COURSES: A CASE STUDY

To eliminate the impact of some of the barriers of Table 1 and, at the same time, enhance the active participation of adult learners, the organisation and implementation of the courses should be carefully designed and planned. The following principles, some of them being met in existing web-based courses (Cronje, 2001; Dimitrakopoulou and Petrou, 2001) have been also taken into account in designing and developing the TELNET web-based training system:

Table 1. Barriers to learning arising in Web based courses

Organisation of the course	Situation of learners	Internal barriers
Inadequate publicity	Poor relations among learners	Preference in traditional methods - Technophobia
Inadequate hardware or bad connection to Internet	Bad relations between tutor and learners	Lack of knowledge and skills related to the use of computers
Unattractive graphical design or bad structure of the content	Time split due to personal, professional and social commitments	Weak time-management skills and self-motivation
Unavailability of skilled tutors - motivators	Lack of sense of orientation when navigating in the course	Deficiency of communication capabilities (interpersonal and within the group)

- Participation of learners in the needs' analysis phase of the course, as well as in setting personal objectives
- Capability of forming and adapting the content of the course according to the educational needs analysis results and the personal objectives set
- Communication capabilities within the group of students and between students and tutors, both on inter-personal and group basis
- Design of activities that promote and support collaborative work
- Adaptation of the pace of learning to the specific needs of the group of students
- Structuring the course in a flexible way for different learning patterns
- Structuring the content in a way that corresponds to potential learners' needs, who have no experience in using the Web as a learning environment
- Strengthening the counselling and facilitating dimensions of the tutor's role
- Participation of learners in the evaluation process of the web-based course.

The TELNET system has been developed in the framework of the project «TELNET: Teletraining in new technologies » of the CONNECT Programme (main contractor: Mentor Training, Vocational Training Centre), partially financed by the General Direction "Education and Culture" of the European Commission. The project's aim was to develop multilingual vocational training courses (in English, Greek, Dutch, and Swedish) regarding Electronic Commerce, Electronic Publishing, and Teleworking, which are asynchronously provided through the Internet. The authors of this article were the main researchers in the TELNET project, being responsible for the educational design of the courses, for the specification of the educational services and facilities, and for the pilot implementation of the teletraining system.

The TELNET system's services aim at achieving an educational process that approaches the traditional education strong points, keeping in parallel the features of autonomy and flexibility in time and pace of learning. The TELNET system's main services, features and facilities, which attempt to confront the barriers to learning, are presented here below:

- Electronic forms for organisational purposes (registration, selection of the educational course and language), as well as for analysing training needs and setting students' objectives. According to the learners' needs, the tutor focuses on supporting them in specific areas where weaknesses are observed, enhancing thus their self-confidence and increasing their interest for the course.
- Embedded navigation system, with the use of a Database, and map for each course; the trainees may explore the educational material in a flexible and easy to use way ('next' and 'previous' page arrows and 'start of section' arrow), while they may also use the map both as an orientation tool and in order to move directly to any part of the material. The navigation facility helps trainees both to orientate themselves in the training process and to overcome technology-fear feelings. The combination of the navigation system and the map of the course support different learning styles.
- Synchronous communication tools: trainees may specify 'meeting' times on the Internet, in order to discuss (among them or with the tutor) about the course or any

other subjects of common interest with the use of a chat facility; they may also participate in collaborative activities, under the tutor's guidance, through a whiteboard facility. Real time communication combined with tutor's animation enables trainees' active participation and strengthens team working and collaborative learning.

- Asynchronous communication tools: students may communicate among them or with the tutor by means of e-mail; a discussion forum is also provided (with 'read message', 'open thread' and 'reply' facilities) for exchanging ideas and reflecting on the educational process. Asynchronous communication promotes the dialogue within the group and permits participation of trainees with communication deficiencies.

- Useful educational tools, such as personal electronic notebook, glossary of terms, and library with interesting links and electronic educational material, which render web-based education resembling to traditional educational forms. The contents of the electronic notebook for each trainee are connected with specific pages, where comments are written and recorded in a Database, for future use.

In addition, the characteristics of the TELNET system's educational material that make it appropriate for distance education of adults are as follows:

- The material is split in small units that constitute a modular course, which permits learners to study in stages and in short time intervals, according to their availability, as well as to avoid extensive scrolling when studying. These units have also a relative autonomy, which is necessary for dispersed studying.

- The trainees' existing knowledge and experience are taken into account (through analysing their educational background and professional experiences) and connected with new knowledge by presenting specific examples and case studies of the educational material.

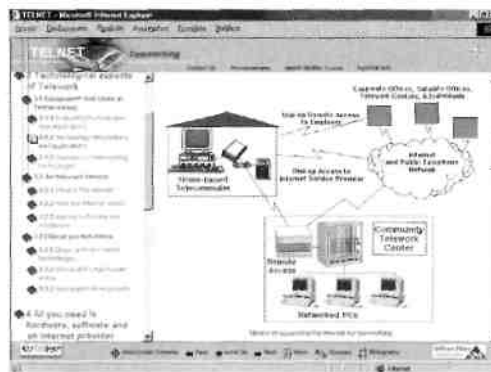
- Exercises, tests and activities-projects are interspersed in the educational material, for improving the interactivity with the material and the active participation and for fulfilling self-evaluation objectives.

In Figure 1, two screens of the "Teleworking" course of the TELNET system are presented. The TELNET system services (Library, Chat, Forum, etc.) are accessible through the top horizontal bar and the navigation tools (back, next page, and previous level arrows, map of the course, glossary, notebook, exercises, help) through the bottom bar.

## EVALUATION OF WEB BASED COURSES

According to Scriven (1991), the field of evaluation includes many substantial sub-areas such as product evaluation, personnel evaluation, programme evaluation, policy evaluation, and proposal and performance evaluation. In that framework, educational evaluation is something wider than the assessment of students, or the performance of teachers, including all issues of educational activities or organisations.

The evaluation processes of web-based courses should have three components, related to the above-mentioned sub-areas of evaluation:



- Measurement and assessment of knowledge, skills and attitudes of distance learners (performance evaluation)
  - Evaluation of the web site, considered as an independent product aiming at the delivery of the educational course (product evaluation)
  - Overall function of the educational course (programme evaluation), in relation to criteria such as effectiveness, consequence, coherence and pertinence.

The issues previously underlined regarding active participation and communication, mainly the absence of physical presence, arise also in developing the plan for the evaluation of web-based courses: models and approaches of evaluation and much more of participatory evaluation, are mainly based in face-to-face interaction of the evaluator and the participants of a course. Questions arising in evaluating computer-mediated programme delivery include, among others, the following (Gay and Bennington, 1999):

- Is there compatibility among the technology, methods and objectives of the evaluation?
- How does technology fit with the community's existing social norms, practices and past experiences with technology?
- Does the technology enable or facilitate the participation of diverse stakeholders?

- Does the technology or tools enable the collection of data in a manner that facilitates learning, improved decision-making, or reflective practice?
- What evaluation practices are transformed or displaced by implementation and use of the technology?

General criteria for the evaluation of web-based courses include ease of use, relevance to course's topics, fostering student interaction, facilitating feedback on submitted work, promoting critical thinking skills, and encouraging reflection (King, 1998).

To develop a plan for the evaluation of the "Teleworking" course, that fosters and supports the active participation of adult learners, we have chosen, among several different types, models and approaches of evaluation, those which:

- Are more appropriate for continuously improving course
- Propel the involvement of all factors of the course, especially the learners
- Are based on continuously providing feedback to the learners.

During the pilot phase of its application, the evaluation scheme of the "Teleworking" course was based on the formative evaluation type and the CIPP model. The term formative evaluation (Worthen et al., 1997; Mark et al., 2000) refers to evaluation that aims at the improvement of the internal functioning and the expected results of a programme. In formative evaluation, the objective is to feedback the programme factors with information that is necessary for adopting the appropriate remedial interventions in order to improve the quality of the implementation of the programme. Therefore, formative evaluation is characterized by:

- Detection of deviations in relation to the initial design of the course and formulation of suggestions to achieve the initially set objectives
- Proposing alternative solutions, instead of those initially set and judged as inadequate
- A continuous dialogue between the evaluator and the factors of the programme.

The CIPP model has been used for the last thirty years by many evaluators and organisations and has constituted a subject for discussion and questioning in the field of programme evaluation. Its acronym comes from Context, Input, Process, and Product, which refer to four discrete phases of the model. The content of these phases is presented here below (Stufflebeam, 1989):

The "Evaluation of Context" phase concerns the registration of the strong and weak points of a programme and the definition of actions for improvements.

The "Evaluation of Input" aims at the specification of the strategy to follow during the programme's implementation. The actions of this phase include the evaluation of alternative strategies, the review of successful programmes and practices, the analysis of restrictions that are based on the results of the previous phase, the estimation of the availability of human resources, and the analysis of the budget breakdown and the time plan.

The "Evaluation of Process" concerns the monitoring, the assessment and the continuous review of the achievement of the programme's objectives. The aim of the Evaluation of Process is to provide the programme's factors with feedback about the achievement of the objectives set during the previous phase and the effective use of the available resources.



Table 2: Adaptation of CIPP model for web-based courses

Context	Input	Process	Product
Needs analysis for target group	Development of web site	Implementation of the web course	Knowledge and skills of participants
Advantages of web-based courses, compared to traditional methods	Structuring the content	Remedial actions and improvement	Achievement of initial objectives
Complementarity of web course to traditional methods	Analysis of target groups characteristics	Participation level of adult learners	Capability of generalisation
Internet penetration and connectivity (for target group)	Needs analysis for target group	Attitudes of adult learners	Cost-benefit analysis of the web course
Attraction of interested adults	Adaptation of the course to the specific needs of the target group		Cost-effectiveness analysis of the web course
Review of existing web courses	Setting of course objectives		
	Budget and schedule		

The “Evaluation of Product” aims at the estimation and interpretation of the programme’s results and products and includes the registration and analysis of implications (positive or negative) observed during the implementation of the programme, as well as the comparison of the programme’s results with the results of other programmes.

The content of the CIPP model’s phases has been adapted and specialized in order to satisfy the needs and specific characteristics of the web-based courses, as it is shown in Table2.

A pilot implementation of the TELNET course “Teleworking” was carried out for a group of ten disabled trainees (people with kinetic problems), who were not familiar with using new technologies before the course, in the framework of the training phase of the project “DARING: Disabled people working in the new Internet jobs” (European Initiative Employment-Horizon), implemented by Mentor Training. The main objective of the DARING project was to develop the infrastructure and supporting mechanisms for teleworking , and to provide vocational training to disabled people in order to use new technologies for teleworking. The group of trainees was considered of seven women and three men, all of them been unemployed, aged between 23 and 36 years.

Prior to the implementation of the course, a short “training of tutors” phase has been conducted, having had as its subjects: the use of the TELNET system, motivating

distant learners, managing a group of trainees, needs and attitudes of disabled people. The training of tutors was considered as necessary in web-based distance learning, in order to ensure that learners will favour encouragement, motivation to participate in activities, advice, technical support, and timely feedback in their actions. In addition, a training needs' analysis was conducted, based on interviews with the participants, in order to adapt the distance learning process to the specific group's characteristics.

The evaluation process for the pilot implementation of the TELNET learning system included:

- *Initial questionnaires* regarding personal objectives and training needs, which were completed by the trainees before the beginning of the implementation of the "Tele-working" course.
- *Communication* between the evaluator and the trainees during the educational process, either via e-mail or with traditional means (personal contacts or telephone); the purpose of this communication was to investigate possible problems in the educational process and proceed to remedial actions.
- Frequent *contacts* between the evaluator and the tutor of the "Teleworking" course, aiming at monitoring the progress of the course, examining the participation level of trainees, and proposing solutions for improvements.
- *Questionnaires* completed from trainees at the end of the course for evaluating the TELNET system, its services, and the course itself.
- *Progress reports* from the tutor in the middle of the course's implementation and after its completion, as well as evaluation report from the evaluator.

The pilot implementation demonstrated that the most popular and attractive parts of the TELNET system for this group of trainees were:

- Communication (both with chat and discussion forum facilities), which is related with the increased communication needs of the specific target group
- Activities and projects that were carried out in a collaborative way
- Use of personal electronic notebook.

More specifically, all trainees participated in chat and discussions, while their participation in collaborative activities and exercises has been achieved after tutor's encouragement. All of them used also the personal electronic notebook, although for a limited number of pages.

According to statistics based on log files, the trainees preferred participating in activities and projects rather than studying alone the educational material of the course. Analysis of the log files showed that seven trainees spent over 70% of their time in activities, while three of them distributed equally their time in studying and in participating in activities.

Eight out of ten trainees pointed out that the use of Internet offers communication prospects and that teleworking is a potential solution for them, in order to enter the labour market, while two of them (both women) preferred the traditional ways of learning and working. Nonetheless, all trainees were interested in learning what exactly this new way of working is and how should they use it for their own purposes.

Four out of ten trainees expressed some technical problems (mostly in using the Internet), which were solved through contacts with the tutor. All trainees needed more frequent contacts initiated by the tutor, empowerment and motivation.

The main conclusion of the pilot implementation of the TELNET system was that the participants asked for regular and more frequent meetings, both face-to-face and through the Internet, aiming at acquaintance and join of the group. They also asked to upgrade the evaluation process, to improve the functionality of the educational material and enrich it with more exercises and activities.

## CONCLUSIONS

In this article, we examined the implications of adult education theory and practice principles in designing and implementing web-based courses and we presented the adaptation and use of the CIPP model for evaluation purposes in web-based courses. The main points that can enhance active participation in web-based courses and contribute to overcoming the barriers to learning are summarised as follows:

- Taking into account the target groups' needs
- Supporting communication and collaboration within the group of learners
- Structuring the educational material in a flexible way for different learning styles
- Promoting tutor's motivating and facilitating roles.

The pilot implementation of the TELNET system indicated that appealing the adults' previous knowledge and experience, improving and extending communication services, and actively involving participants in the educational process through cooperative exercises and activities seem to become key points in effective web-based learning. In this direction, the role of the tutor is very important; training of tutors is an essential procedure for successful distance learning courses.

In future development of the TELNET system, emphasis will be given in the application for different target groups, in tutors' practices, and in types of collaborative activities that enhance active participation of adult learners in web-based courses.

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