Learning Through Projects in Virtual Environments Designed for Adult Training

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Abstract
The paper explores principles of virtual environments design, based on the project-based learning methodology. Starting from the common problems identified by several evaluation papers, related to the difficulties encountered in practice both in terms of institutional management and training process, the article reveals a series of requirements for virtual learning using project-based method. The paper is based on the work of the project-team within the RENOVA project (www.projectrenova.eu), financed by the European Commission and developed from February 2011 until February 2013 by a consortium of institutions from Romania, UK, Poland, and France. RENOVA is supporting participants in the acquisition and the use of skills and qualifications for professional development in the health management domain, through blended learning sessions.

Keywords: project-based learning, virtual environment, pedagogy, adult training

1. Introduction
Various experiences with notable results, reported in research reports and scientific studies, range the ICT-assisted training in a horizon of expectations characterized by efficiency and quality in education/ training. Extraordinary potential of ICT, grafted on the trend of an approach to learning through a suite of curriculum sequences (learning objects), indicates a possible way forward both for the reorganization of educational situations and for a rethinking of training pathways. In addition, the transformation of training institutions into learning organizations brings the "project" in the foreground within a double perspective: on the one hand as a model of institutional organization based on cyclical, parallel processes, oriented toward a well defined goal and with its own dynamic, integrated in the management system of the organization, and on the other hand as a prioritary methodological option across the instructional strategies used in the training of beneficiaries.

RENOVA project (RENOVA - A knowledge transfer and framework construction for nursing staff across Europe to develop professional skills as managers) introduces such changes trying to deduct and to propose a modern curriculum based on learning through projects, applied in a sensitive area: (re)training of a category of medical staff [13]. The online platform designed for medical staff is available online at www.projectrenova.eu, together with other information about the project and regarding the supporting research work leading to the development of the virtual training environment. RENOVA mainly addresses members of the nursing-practice community.
who want to develop organisational and managerial skills, being based on the transfer of French experience and expertise to facilitate face-to-face and eLearning sessions.

2. The Specifics of Adult Learning

Adult learning – a relatively recent studied domain - has been frequently analyzed in terms of differences from children learning, the similarities between the two processes being most often ignored. American Professor Malcolm Knowles had a major contribution to shaping the field of adult education as research fields and in the popularization of adult learning characteristics [7], such as:

- independence and motivation in learning: adults need a different guidance, a non-directive one, they need support; their motivation is intrinsic and related mainly to the profession;
- the need to link learning with the experience and the prior knowledge of learners; learning is not predominantly a process of accumulation, but a restructuring one, a development and generalization, and students feel the need to relate theories and concepts with their own experience that they want to exploit;
- learning oriented to a goal: adults want to know very clearly and right from the beginning why and for what they are taking a course;
- relevance of learning: adults seek to understand the applicability of knowledge and the value of what they learn in terms of their social or professional life; in the case of project-based training, students can choose topics according to their interests and needs;
- pragmatism: adults find and select the most relevant and useful aspects/ knowledge/ skills;
- the need to be respected and for their experience to be recognized (and from this perspective the project method is very adequate as it allows students to highlight and exploit their own knowledge and experience).

Based on these main characteristics of the learning process for adults, some techniques can be extracted in order to facilitate the learning by using the PBT method:

1. identification, valuation and use of the previous personal experience (project not only allows, but should even be based on previous experience);
2. treat students with respect and create an environment based on trust and cooperation – aspects favored by the work in small groups and the role of facilitator or organizer that the trainer mainly has when using this method;
3. orientation of the training towards practical solutions and clear goals, relevant to the profession of the participants (students are involved in management of the training process);
4. encouraging reflection on their experiences and extracting "lessons";
5. involve students in activities by ensuring the relevance of the content, by designing their own tasks, by fostering the exchange of experience, collaboration and small groups work;
6. students motivation (motivation changes their behavior, increases their attention, it stimulates and guides their learning).

Modern methods in adult education are considered essentially experimental, requiring personal effort and active participation.

There are also issues that may slow the adult learning process and the training through projects:

- previous experience - often an asset in adult education it may nevertheless lead to reverse consequences due to the "already know" sensation or the effects of previous failures in learning (the feeling that the training does not help, that is theoretical and not applicable, that it does not justify the time spent, that it is difficult and will not meet the requirements etc.).
- misconception that learning is specific to early ages and not to adults is sometimes a way to mask the fear of not cope with new requests for training, especially the fear of new technologies;
- lack of motivation, feeling that training will not bring benefits to match the investments;
- fear that their image could be affected, that could be perceived differently by others and judged on their performance in the training process;
- lack of exercise to learn, to work in groups, to collaborate.

3. Learning through Projects in Virtual Environments
The transfer of the project based learning method in the training programs with an online training component proved to be a suitable strategy as far as the design of the curriculum combined the correct tools and innovative methods to allow the traditional use of the facilities offered by the virtual environment and a thorough learning by focusing content and orientation on learning outcomes. Research shows that well-known and tested training techniques must be further kept and used and the applications with higher degree of novelty must intervene only if justified in terms of teaching. Focusing on technology is both a temptation and a tendency both at the level of the training conceivers and among participants, but balancing the excess/abuse of technology starting from the design phase of the training platform allows a balanced use and a focus on learning. [3]

Some experiences summarized in evaluation studies and reports reveal a simplistic use of training systems based on web technologies (WBT - Web-based training) [5] and the ignorance of recent theoretical science education guidelines [4]. Authors' suggestion and solution is to design integrated WBT systems that equally support different actual learning paradigms. The argument is that the purpose of these training programs delivered online or in the mixed system (blended learning) is to improve training by replacing or supplementing traditional methods in an attempt to increase the performance of participants measured at the end of the program. In this perspective, the approach of the training project should go through two phases: transposition of existing training and learning practices in a model for use in virtual space (electronic/digital format), then finding those ways to deliver content and interaction that are specific to the online environment and that bring added value to the training sessions. The premise - which is perfectly valid and consistently mentioned among the advantages of using new technologies in education and training - is that the new ICT should be a catalyst for the innovative, interesting and effective training experience.

3.1 Common Problems
The identification of the problems and learning difficulties associated with the project based method was subject of a meta-analysis conducted in 2000 [11], and most of the issues highlighted can be transferred in using the project-based training in the virtual environment. With regards to training participants, they do not have difficulties in generating detailed project blueprint and going through the project steps, but they have problems in managing the time allocated and systematically fail to address the tasks of the process due to the lack of exercise in implementing projects [12]. Also, they find it difficult to efficiently use the data collected during the project. For example, participants tend to draw conclusions based on information from external sources, rather than directly use their results and interpreting them, even though they would serve their goals better. It is the role of trainers to help them anticipate more realistically the complexity and the time required for each stage, through discussions and adjustments in the project development phase, resulting in a better project management. In addition, trainers should indicate on the map what are the most interesting data obtained from the investigations of the project, directing the participants to conclusions based on logic and evidence. Web tools that support the project method
in a virtual environment incorporate sufficient variants that the trainer can use to monitor ongoing investigations and provide feedback whenever needed.

On the other hand, several common problems were identified and were also encountered by trainers (Marx et al 1997, cited Helic 2005) [4]. First, the management of the group of trainees is more difficult in the context of project based training approach; in the management of learning, for example, it is difficult to establish from the beginning the proportions between independent work and work with tutorial support in a balance that would be valid for all types of the projects chosen by the participants [2]. Second, inadequate feedback from the trainer can create serious problems to participants; in the cases analyzed, the trainers did not provide enough support during the development of the project, which has led to mismanagement of projects and to unsatisfactory results. In the virtual environment, there is the same need for appropriate tools for quick support in learning and/ or investigations during the project, along with the imperative to adequately design the entire virtual environment in accordance with the purpose and type of training.

3.2 Requirements for virtual learning using project based method

Project-based learning was the focus of specific concerns that have followed the development of web tools for education and training. Among the most known are CaMILE and CSILE.

CaMILE (Collaborative and Multimedia Interactive Learning Environment) used the procedural facilitation (concept developed by Scardamalia and Bereiter in 1984) and included facilities for effective collaboration [6]. Procedural facilitation involves the announcement of the role of individual participants in the collaborative group, also suggesting the reaction models in a dialogue. The first version of the platform was developed for Macintosh, afterwards other options for web modules have been built to support anchored collaboration, with the help of which comments of the participants could be linked to any context or situation of the platform, through one simple click, leading to increased collaborative activities in the working groups.

CSILE is a tool developed as a result of explicitly formulated recommendations for the requirements of the projects design, particularly those which result in assumptions about the content of training. CSILE consists of a computer-supported intentional learning environment designed to support students with difficulties in formulating key questions and developing the project investigations.

But neither of the two instruments provides facilities for project management: the ability to make plans for projects or project phases calendars, effective ways to present projects, etc. [4]. Consequently, a number of requirements for virtual environments approaching project based training are formulated as follows:

Support for project management. Trainers should be able to develop curriculum in the form of a project plan. Each plan consists of a sequence of steps that participants must go through to achieve the final goal. Each stage can be described by a number of actions. The plan must include a schedule of activities that establish also the timeline. Granularity of the project phases and the activities timeline must be adjusted depending on the cognitive level of the participants and their preferences and degree of familiarity with the technologies used in the program. For example, the trainer must be able to define several stages of a project if participants need more support along the way, in order to break the process of creating the final product into several sub-stages (each with concrete results, measurable and observable ) that can be discussed to improve the process.

Participants are in the center of training. During the project based training sessions, participants must be offered support in achieving learning through various methods and techniques: prompt feedback at all stages of planning and project development, supporting their motivation, offering them examples/ counter-examples, alternatives, additional resources and reflection themes adapted to the project theme and the difficulties of the project, providing tools for communication as well as development and reviewing tools of the products they create.
together. Also, it is important to avoid "technology abuse" and any restrictive applications and tools as well as to offer a technological environment able to integrate file formats that are widely used: documents published in the most common word processors, HTML, PDF, spreadsheets, presentations etc.

Support for collaboration. Both the communication between participants and the communication between trainers and participants must take place as a normal act, using tools similar to previous experiences of the trainees. The most common examples of ways of communication in the virtual environment are the forum and chat types, designed for asynchronous, and respectively synchronous communication. Communication tools should allow the opening of private sessions or discussion spaces for collaborative work in groups accessible only to the members of a working group engaged with the same project. As collaborative tools associated with these activities, facilities such wiki/ collaborative online documents must be included as they allow simultaneous editing of the same document. Additionally, you can use web-meeting applications such as Adobe Connect or Dim Dim for virtual training sessions, seminars or colloquia with the entire group.

Support for monitoring participants. In order to monitor and assess progress in learning throughout the course of projects, trainers should have easy access to the desktop of each project and to the documents being edited and uploaded by the participants. There are also some useful tools for monitoring access such as participation checklists, statistics on the number of hits and time spent on the categories of resources as well as track changes facilities for the collaborative documents developed by learners.

4. References
[12] *** RENOVA - A knowledge transfer and framework construction for nursing staff across Europe to develop professional skills as managers. Online: www.projectrenova.eu