

# **Experience from designing and applying collaborative learning services in distance adult education**

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## **Introduction**

Nowadays we witness a move towards learner centered education, primarily supported by a combination of distance learning methodologies and educational technologies. Among the latter, social media, which refers to technologies that can facilitate social interaction, collaboration and deliberation, show a continuously growing popularity (Bryer & Zavattaro, 2011). Examples of social media include wikis, blogs and social networking sites such as LinkedIn, Facebook, Twitter, and virtual worlds like Second Life (Hu & Johnson, 2011). These environments are used to complement the tele-conferencing systems that were used in the previous decade to support collaboration and engagement.

This paper presents the collaboration environments used by the academic community of Hellenic Open University, focusing on wikis and tele-conferencing. Our aim is to use them to create a student-centered collaborative learning environment, keeping in mind that simply making an empty wiki available to online adult students is not enough (Mindel & Verma, 2006). For this reason, we also discuss our approach (Learning Design cycle) towards developing digital educational content for the courses offered by HOU.

## **Use of collaboration services in HOU**

Hellenic Open University (HOU) ([www.eap.gr](http://www.eap.gr)) is a Public University founded by the Greek Government in 1992 and fully operational since 1997. Its prime mission is to offer university level education (at both undergraduate and postgraduate level)

using distance learning methodology and to develop the appropriate material and teaching methods.

The Laboratory of Educational Content, Methodology and Technology (e-CoMeT Lab) (<http://eeyem.eap.gr>) was established as an independent unit with HOU in 1997. Its aims are: (a) to promote scientific research and innovation in the area of open and distance learning technology and methodology, (b) to develop eLearning content and methodologies, (c) to implement cutting edge technologies in educational material development and delivery infrastructures, (d) to support HOU in delivering eLearning services, (e) to certify the educational content used in HOU courses and (f) to offer consultancy services in the adoption of distance and lifelong learning methodology.

Collaboration environments and tools are used in HOU in order to help students to overcome difficulties relating to isolation and distance and to reduce travel expenses and telecommunications costs. In addition, by improving the e-learning facilities, these services offer students the opportunity to participate in the HOU academic community and enhance their feeling of belonging in a university environment.

A number of collaboration environments and tools (such as Centra Symposium<sup>®</sup>, Learning Activity Management System (LAMS), Wikis, discussion forums etc.) currently are used by HOU in order to improve the quality of educational services. The introduction of collaboration environments in the educational procedure can contribute in overcoming major problems such as limited participation in face-to-face meetings, constant demand for updated material available daily, and high dropout rates of geographically remote areas.

Online collaboration environments can support a large (and in some cases, unlimited) number of participants such as presenters, subject experts, students etc. With easy to use features for recording, editing, storage and playback, users can create professional, self-paced recordings in industry standard formats. These recordings can be viewed outside these environments with any standard media player or included as content within a live or self-paced session. These features make collaboration systems particularly attractive for consulting and mentoring in students.

### **Use case: wiki**

A wiki is an online collaborative writing tool, "a collaborative web space where anyone can add content and anyone can edit content that has already been published" (Richardson, 2006). Practically, wikis are software-based hypertextual web pages that support content creation, revision and redistribution by Internet users (Buffa & Gandon, 2006).

Wikis are designed to help groups collaborate, share, and built online content, and are especially useful for distance learners who are separated by time and place (West & West, 2009). So, wiki is an excellent tool for sharing information, and building a knowledge base, as well as for promoting critical evaluation, judgment and making choices based on research.

The fact is that many types of wikis exist, each having varying sets of functionality and features. For instance, there are wikis with features that include simplicity, flexibility (Reinhold, 2006), and open editing (Leuf & Cunningham, 2001). There are wiki platforms where users can visit a wiki, create a wiki, edit, or even delete a wiki easily and as frequently as they like (Thomas, King & Minocha, 2009). Additional features such as authentication and tracking are required for wikis to be suitable for teaching and learning online (Augar, Raitman & Zhou, 2004). As Augar et al. (2004, p. 103) explain "authentication enables all wiki edits to be traced back to the author, enabling the assessment process. Tracking helps to secure wiki content against possible misuse and intentional deletions".

But, as Schwartz et al. (2003) indicate, many of the university wikis are purely text-based with very few images, while the use of wikis for administrative scheduling, faculty use, course management and learning support materials appears to be rare.

A successful wiki for distance adult education must take into account the special characteristics of adult learners. According to Knowles' theory of andragogy (1984) instruction for adults needs to focus more on the process and less on the content being taught, which in practical terms, means:

- There is a need to explain why specific things are being taught.
- Instruction should be task-oriented instead of memorization.
- Instruction should take into account the wide range of different backgrounds of learners.

- Since adults are self-directed, instruction should allow learners to discover things for themselves, providing guidance and help when mistakes are made.

Given these characteristics, adult learners will bring specific strengths to a wiki. As West and West (2009) suggest, adult learners:

- prefer learning that is active and participatory,
- prefer learning problems that are practical and relevant to the real world,
- will be more likely to self-organize and break the wiki into specific goals and outcomes,
- will be capable writers and editors.

Therefore, we advise our tutors (distance adults educators) to prepare their students for wiki work by helping them understand what a wiki is and by orienting them to the new learning environment. Then we support them in order to create well-designed wikis, which not only complement print learning materials, but are also flexible enough so as to encourage quality participation by students.

In order to encourage the three types of interactions, which according to Moore (1989) are:

- a) learner-to-instructor interactions,
- b) learner-to-learner interactions, and
- c) learner-to-content interactions,

the HOU educators create wikis where students can also provide:

- overviews, to help them find their way through the wiki,
- different types of activities,
- comments and feedback for activities at any time throughout the entire wiki to other peers and the instructor.

### **Use case: educational tele-consultation**

Within one academic year, HOU tutors have to conduct five face-to-face meetings with their students. These meetings are well structured and planned and aim at discussing students' progress, solving difficult problems and issues, clarifying obscure parts of the study material, etc. Tutors have a variety of techniques at their disposal,

including lecture (the least efficient), collaborative problem solving, brainstorming, participatory activities, etc.

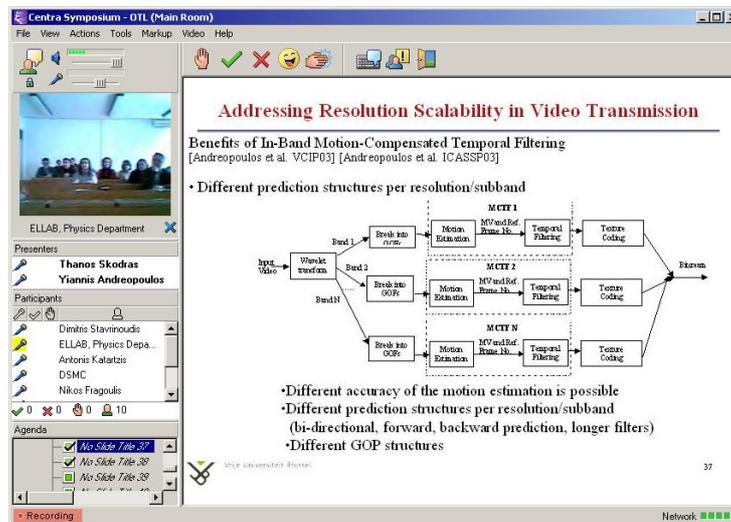


Figure 1. Sample screenshot from a tele-lecture using Centra

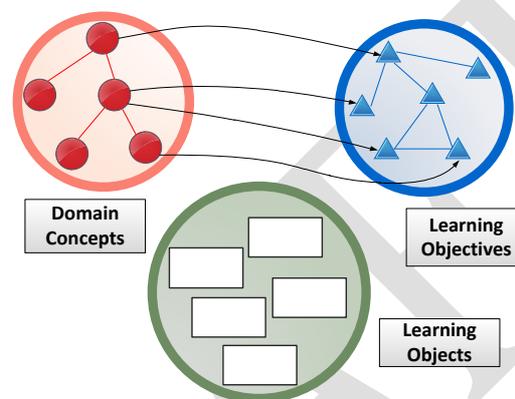
Unfortunately, a large number of our students is unable to attend these meetings because of personal, financial, occupational or other difficulties. Thus, the challenge we face at HOU is to provide an online environment that would facilitate participation to virtual meetings from a distance. For the past ten years, we have been using Centra Symposium<sup>®</sup>, which offers a broad range of collaborative activities. It is an online learning environment that can be used for virtual classroom learning, for meetings or for consultation and mentoring. Centra Symposium<sup>®</sup> online classroom includes many interactive features including two-way audio, an interactive whiteboard, application sharing, text messaging, user feedback, breakout rooms, surveys, evaluations, web surfing and more. Tutors planning an online session can prepare the learning content using PowerPoint which can then be imported into the live session. Centra sessions can also be recorded for later review and playback.

This collaborative environment (Figure 1) is used to support Instant meetings, tele-lecturing, virtual classes, collaborative problem solving, master thesis presentations, implementation of virtual laboratories, etc. The goals and processes of collaborative activities vary widely. Some tutors design small group work around specific sequential steps. Others prefer a more spontaneous agenda developing out of

student interests or questions. In other cases the students' task is to design a process or to resolve an exercise. The frequency of use ranges from infrequent, on-demand lectures, to periodic (sometimes weekly) online meetings.

### The Learning Design cycle

During the past two years, the e-Comet Lab has focused its resources in applying a new Learning Design cycle, which is learner rather than tutor centered. This cycle is based on the interplay of three key elements: teaching domain concepts, learning objectives, and learning objects (Figure 2).



**Figure 2.** The interplay between the three key factors of the HOU Learning Design

The HOU Learning Design cycle starts with the analysis of the educational problem and the educational context, resulting in the specification of the teaching (knowledge) domain and the learning goals for the course. Subsequently, the learning objectives of the course are determined. Lastly, based on the learning objectives, a series of Learning Objects (LOs) that lead to their achievement are designed and developed. An LO is associated with at least one measurable learning objective and it is designed so as to support the learning (educational) process.

LOs constitute a novel approach in organizing educational content, which is found in the core of a whole new instructional design paradigm developed in the field of distance learning. The main idea is to decompose the educational content into smaller chunks and construct self-contained learning units, which can then be combined in almost infinite ways in order to create collections and build sections, lessons, or courses (McGreal, 2004).

With a view to providing a complete element set for describing LOs, we use a new educational metadata schema, which is actually a subset of the IEEE LOM, with a particular orientation in distance education material. This profile adopts the majority of IEEE LOM's elements, augmenting them with additional attributes in order to represent concepts commonly used in distance education, like learning objectives. The proposed schema is rich enough, so that it can effectively describe all aspects of a LO (educational, technical, etc.), but not exceedingly analytic as to become difficult in use.

We use ontologies to represent the domain concepts and the learning objectives. Ontologies conceptualize and define the knowledge of a particular domain through commonly acceptable terms, typical axioms and constraints, capturing in this way the domain's semantics. They constitute a formalism for perceiving and processing information, sharing knowledge, allowing its reuse and thus enabling communication between heterogeneous and distributed systems (Gruber, 1993). The Combined ontological schema is in essence the merging of three independent ontologies (TeachingDomain, LearningOutcome and BloomTaxonomy). The main objective of the Combined ontology is to assign learning outcomes to the various knowledge domains and levels of the Bloom Taxonomy (Kalou, *et al.*, 2012).

The Learning Design cycle is supported by e-Comet and involves the participation of a large portion of the HOU academic community including scientific content creators (authors), reviewers, tutors and coordinators, supported by editorial assistants, laboratory technicians etc. The development process follows an ISO 9001:2008 certified procedure.

## **Conclusions**

Distance education is different from contact forms of teaching in a number of ways. Although teaching does not guarantee learning, we already know from our own experiences of learning that a capable educator can improve the quality of our learning. As online educators at HOU, we examine how different teaching techniques and strategies can be incorporated into the everyday teaching practice. Among them, wikis and tele-conferencing tools are included.

West and West (2009) suggest that before an educator can answer the question "Why wiki?" he or she must first answer "What do I want learners to be able to do?" or "What do I want learners to gain from this learning experience?". The answers to these questions guide the project's instructional purpose and provide clear direction to the frame-work or structure of the wiki.

In addition, especially adult learners need to be clear about what they should aim to achieve and also what they should do with the material and information they are studying. So a wiki should state an aim about what students should know, what competencies they should have and what qualities they should be able to demonstrate when they have completed the specific wiki project, and a behavioural objective as a statement about what learners should be able to do after completing a wiki.

However, electronic social media and tele-conferencing technology are no panacea for distance education, although some of these media and technology are more effective educationally than print material. Consequently, social media tools, due to their great potential for student engagement and empowerment (Wankel et al., 2010) deserve more scholarly research (Hu & Johnson, 2011). One way that would enhance their efficient integration could be the combined use of semantically rich representations of course components, as is shown from the application of the learning centered Learning Design cycle, which is based on the combined use of domain concept, learning outcomes and learning objects. The application of this cycle is heavily based on the use of ontology based semantically rich representations of the above three key components.

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