



ELEARNING INITIATIVE

PRAISE:

Peer Review Network Applying Intelligence to Social Work Education

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Interaction with the Semantic Network

Version 1.0

Executive summary

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1 Introduction

The PRAISE Project introduced several advanced methodologies and standards in the working practices of social workers.

While most of these practices are of pedagogical or social nature, there were also significant contributions involving from technical methodologies and tools. Such technical elements contributed to the partners' experience, expertise, and practice in at least 3 ways:

1. pedagogical partners were exposed to new technical solutions, of which they had little or no previous knowledge. In this sense, the role of technical partners can be described as information, training and capacity building;
2. pedagogical partners learnt to include in their work methodologies and work flows some technologies, in a blended overall setting, where the new tools were included in the tasks planned in the project. Such technologies were both standard (such as learning content management systems) and ad-hoc (such as specifically tailored case study data bases), depending on the need of the various phases of the project. In this way, social workers were involved in active usage of distance learning technologies and collaborative systems, and used them as an integral part of the pedagogical methodologies;
3. pedagogical partners, thanks to the experience gained in the project, actively reflected on the benefits, strengths and weaknesses of technology-mediated approaches. This helped them to "institutionalize" the usage of technology, i.e., to include in their regular activities (beyond and after the end of the PRAISE project) new tools and techniques, supporting and enabling new and better methodologies.

In this general context, the PRAISE project also allowed introducing, experimenting and evaluating innovative technical solutions, in particular based on semantic representation technologies. In fact, both virtual learning environments and on-line databases are quite standard technical tools, that have been "just" adapted for the context of the project. However, linking together case studies, and linking them with on-line pedagogical contents, in an automated way, was an innovative solution and methodology, both from the technical and from the pedagogical points of view.

The partners PRAISE project, in conjunction with activities carried on in the "cousin" CABLE project (better detailed below), analyzed, adapted, designed a Semantic Network representing the main concepts of knowledge domain chosen for the experimentation (namely: minors). This Semantic Network, that was developed thanks to the open reflections within the local Virtuous Circles, and that was formalized by extensive comparison and reconciliation by a group of international partners, is the basis for an intelligent search engine that allows discovering (and presenting to the user) semantically-aware relationships among case studies and between case studies and e-learning modules. The basic concept of an Ontology has been adopted and extended in the projects, to enable a multilingual conceptual representation able to discover relationships even across national borders and local languages.

This deliverable is structured as follows: Section 2 describes the specific context arising in the PRAISE project, in particular the pre-existing penetration status of ICT in the pedagogical partners' institutions, and the fruitful relationship with the CABLE project. Section 3 outlines the e-learning solutions that have been adopted in the project, that suit the specific needs and fit in the described context, in particular describing the usage of case study database and of virtual learning environments. Section 4 describes the

innovations in this process, in particular the advanced tools, the semantic conceptualization, the international and inter-lingual conciliation process. Section 5, finally, aims at a first evaluation, from a qualitative point of view, of the process and of the attained results.

2 The context

This section aims at describing the general context in which PRAISE methodologies and technologies have been developed.

While e-learning is now a quite mature field, and is adopted as a mainstream education approach in many contexts, the PRAISE project worked on a specific field, namely with social workers, where the introduction of e-learning, and of ICT in general, is currently quite low, and the work practices include only marginally the integration of technologies.

Therefore, besides the specific goals of the PRAISE project, one important activity that has been pursued during the project development, and in particular during the meetings, was to introduce the pedagogical partners to e-learning technologies and methodologies, so that they could use such instruments during the experimentation and especially after the end of the project.

One particularly important challenge has been the reconciliation of the subjectivity of individual elaboration of case study, with a more rigid setting imposed by technical tools used to communicate and share the those elaborations. Technical partners learnt the needs for a great flexibility (freedom and simplicity opposed to complex features), and at the same time pedagogical partners developed discussion methodologies and work strategies for resolving apparent conflicts and for agreeing on shared conceptualizations and views. This allowed us to reach the results of the project, that were judged very positive both in terms of technical value, and in terms of new competences and capabilities of all the partners involved.

2.1 Social workers and ICT practices

During the first period of the PRAISE project, the work was mainly focused in defining, formalizing and starting the collaboration of social workers in the Virtuous Circles methodology.

The collaborative methodology was designed to take into account that most Social Workers had little or no experience with e-learning, distance collaborative work, or knowledge management platforms. Therefore, the main parts of Social Workers activity would be initially through face-to-face meetings, that were a familiar toll, although with the goal of sharing and reflecting upon experience, that was new to them. While the face-to-face meeting progressed, the PRAISE projects' activities increased their awareness to e-learning techniques through two instruments:

1. some focused training events, in particular in association with project meetings, in which the technological partners of the PRAISE project illustrated the theoretical and practical aspects of e-learning platforms and of the blended e-learning approaches. The adopted training material is annexed to this deliverables.
2. the collection of case studies, that in essence were a pedagogical tool, was organized so that Social Workers had to realize them in electronic format, then uploading them to a collaborative tool (the Case Study Database), and they had to browse through other case studies (e.g. for cleverly selecting the keywords). Later,

they were involved in the process of conceptualizing their case studies, and on comparing experiences with other social workers in other countries, through the knowledge sharing platform. Therefore, in a pedagogically familiar context, they were gradually introduced to e-learning systems.

The importance of this “lightweight” process can be highlighted by analyzing the context in which Social Workers were expected to work, in most of the partners’ institutions. The local organization of social services requires them to be on-duty for most of their working time. As such, even finding time for meeting with colleagues or for attending training events becomes difficult (and puts an additional burden on the colleagues that have to “cover” their absence).

The perception of technology by Social Workers was ambivalent: on one side, they perceived it as a means for getting and staying in touch with colleagues, trainers, etc, without the constraints that face-to-face meetings would impose on their work schedule. On the other hand, the Social Services they were working on were equipped with limited and obsolete equipment, making it difficult to work on the workplace, and requiring in many case extra hours to work on-line.

Only thanks to a careful and gradual introduction of e-learning, directly targeted to their work and learning processes, seen as a facilitator of existing relationships and work flows, we could imagine integrating technologies in Social Workers practice.

2.2 Relationship with the CABLE project

The PRAISE project has been conducted in close collaboration with the CABLE project (a Minerva project running from October 2003 to September 2005). The collaboration was facilitated by the fact that many partners were common to both projects (on the other hand, many were new), and by the fact that the Coordinators of CABLE (Politecnico di Torino, Italy) and PRAISE (SFEP - Comune di Torino, Italy) had a record of past collaborations and were located in the same city.

The contents of the two projects’ work plans had also been carefully synchronized, to increase the synergy and allow the capitalization of the results.

In particular, the CABLE project was more technical in nature, and all the activities of tool specification, development, testing and deployment were funded by the CABLE project. On the other hand the PRAISE project had a stronger pedagogical content, and the learning methodologies were mainly developed in PRAISE.

Concerning the produced didactical content, all e-learning material (uploaded in the virtual learning environment) was funded by CABLE, as well as experimentation activities (using the e-learning platform with “students”, i.e. with social workers). Concerning case studies, each partner was asked to produce at least 10 case studies funded by each of the project; in other words, CABLE-only or PRAISE-only partners produced 10 case studies, while common partners produced 20.

We aimed at managing the project to make the best use of available money, trying to share travels costs by combining meetings (several meetings contained 1-2 days for CABLE activities and 1-2 days for PRAISE activities). Of course, all expenses were duly reported under the relevant project by each of the partners.

One very important aspect of the PRAISE-CABLE collaboration was the creation of the Semantic Network, since it involved all kinds of competences (technical development, pedagogical domain experience, knowledge engineering, work methodologies, ...) and

was the most innovative part of both projects. As such, the technical part of ontology development (the technical tools and the set of concepts and relationships) were developed within CABLE, but the formalized knowledge was extracted during discussions, group work, and Virtuous Circles conducted in the PRAISE project.

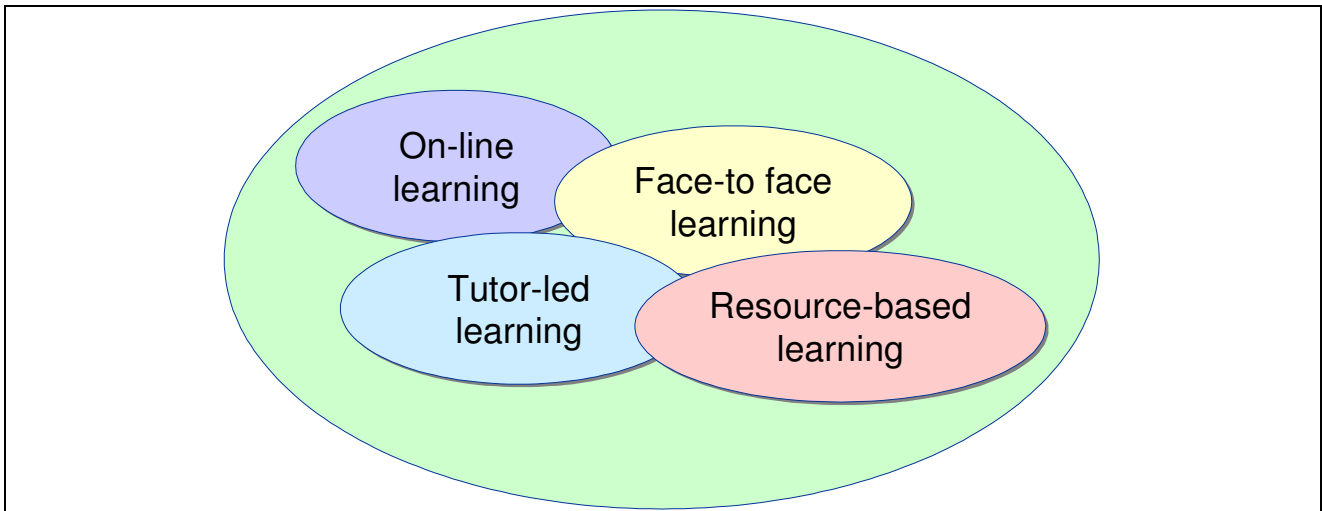
3 E-learning for social workers

Within the PRAISE project there was a constant interaction between more technically-oriented partners (in particular PdT and UHI) and the pedagogically-oriented partners.

The path followed in the project allowed Social Workers to understand and experiment ICT-enabled work, training and learning methodologies.

In particular, starting from the specific needs and from the specific working contexts of social workers, the technical partners, in collaboration with the project Coordinator, devised a waterfall training model:

1. during specific PRAISE events, the technical partners trained the pedagogical partners onto the use of e-learning methodologies and some specific tools. Such training, detailed below, included both theoretical and practical sessions, and was conducted keeping into account the specific context of Social Workers (see paragraph 2.1), but not limiting the scope to the specific needs of the PRAISE project. With this approach, pedagogical partners were equipped with the necessary conceptual framework, methodological best practices, and hands-on experience sufficient to (a) progress and perform their work in the PRAISE project, (b) share their knowledge and experience in their local contexts and their local networks, and (c) consider adoption of e-learning solutions in their professional work, especially after the end of the project.
2. the PRAISE pedagogical partners, during the activity in their local context (see point (b) above), met and worked together with several other social workers, during the Virtuous Circles meetings and in normal work occasions. In particular, the Virtuous Circles meetings were a formal occasion where PRAISE partners could involve other social workers in the new work methodologies, thereby spreading and evangelizing e-learning practices to a much wider audience. This second phase of the waterfall was especially important since the training came through 'peer' social workers, who could best understand the needs of their colleagues, proposed contextualized solutions, and could demonstrate what they personally gained from their experience.



This open and gradual training model allowed us to introduce to social workers several aspects related to the design, management and delivery of on-line training solutions. In particular, the following topics were discussed, both in “formal” lectures and during group discussions:

- eLearning: a general approach: giving a more general view of eLearning (educational, but also organizational); discussing the role of the actors involved in eLearning; a key role: the tutor; a possible eLearning course scenario; discussion about adoption in PRAISE/CABLE and in the “sustainable” future
- hands-on experience with the Bodington platform: collaborative design of a hypothetical on-line course
- From keywords to ontology: describing the structure and the role of a formal ontology; analyzing the links between ontologies, concepts, case studies, and learning modules
- Peer review of created courses: each partner, during the meeting showed the courses they had been creating. The content and the organization, and most importantly the gained experience, were discussed in the group
- On-line collaboration: the partners were trained to collaborate on a specific set of tasks (namely, defining a shared glossary, see next session), using distance collaboration tools.

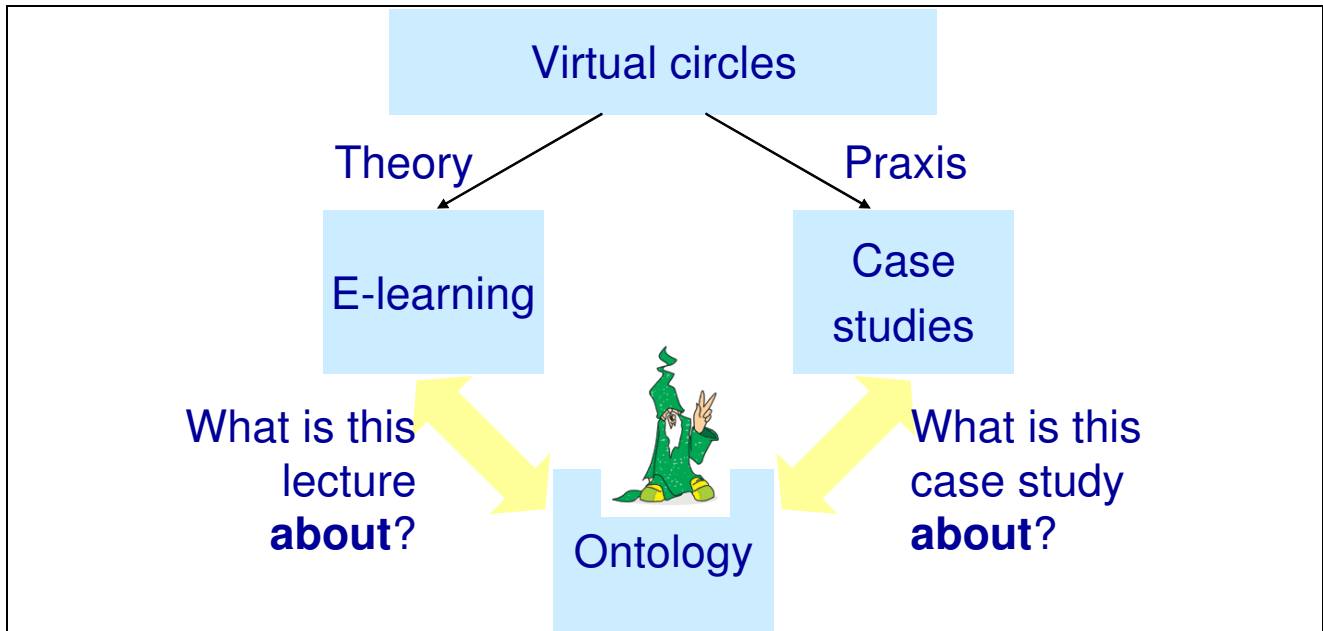
4 Advanced tools for social workers

The aim of the PRAISE project was not only to introduce the world of e-learning to Social Workers, but to advance the state of the art of the relevant work methodologies, from the pedagogical, social, and technical points of view. This ambitious goal was made possible thanks to the good cooperation of the CABLE project, that provided resources for tool development, technical deployment of the developed applications, and didactical experimentation, with the PRAISE project, that covered the formative aspects, the work methodologies for social workers, and the reflective sharing of the contents of their work.

The advances and innovations lay mainly around four main themes:

1. Virtuous Circles as a methodological tool

2. E-learning technology as a training model
3. Case studies as concrete representation of shared experiences
4. Ontologies for abstract representation of shared conceptualizations.



Pedagogical methodologies based on Virtuous Circles are described in due detail in other deliverables, and in the PRAISE book. The actions undertaken concerning the introduction of e-learning in the Social Workers' field were already described in Section 3. The remainder of this section therefore details the other two elements of the innovation structure: Case Studies and the Ontology.

4.1 Case Studies

The activity of Virtuous Circles, and the reflections about significant experiences in the local context, was formalized in a narrative form, according to a common template (developed within the project) including the most important variables.

Such Case Studies (whose pedagogical implications and whose structure is duly described in the proper deliverable, and in the PRAISE book), ought to be shared among all partners. This implied a distance working methodology, supported by specific tools.

In particular, under the funding provided by the CABLE project, a custom web application, called "Case Studies Data Base" (CSDB for short), was developed, and was used to host all the case studies produced by the PRAISE and by the CABLE projects.

The CSDB allows authors (i.e., social workers) to:

- upload their case studies, in their primary languages

- upload one or more translations of a case study (an owned one or any other one¹). In particular, for sharing information, during the project all case studies were required to be translated *at least* in English
- search for case studies, according to language, authors, keywords, full text
- search for case studies by concept (see next sub-section)
- view the contents of each case study, print them or export them to PDF.

Sharing and searching case studies is a particular form of e-learning, that was designed according to the needs of the social workers, allowing them to compare different experiences, utilizing the narrative model, understanding the relevant context, and overcoming the language barriers.

This tool was a simple but effective way to induce an open and distant collaboration model among the group of Virtuous Circles moderators. We observed that this collaboration was particularly fruitful and fluid since the participants already had occasions to meet and know each other personally, during the project meetings. However, towards the end of the project, other Virtuous Circles participants, who never met personally, started to use the system and started collaborating and comparing experiences with unknown colleagues of different countries.

The Case Study Database was a simple Internet application, that for Social Workers was intended as a small step towards e-learning. However, in the context of the PRAISE project, the role of the Case Study repository was by far more important. In particular, the availability of hundreds of case studies, of a set of keywords (in English) selected for each case study by the primary author, and of some translations, provided us with the following important conceptual tools:

1. The set of actual case studies *defines the knowledge domain* of the experimentation. These are concrete examples that all lie in a single domain of social work; the definition of the boundaries of this domain is extremely difficult with any a-priori approach, due to the different national and cultural approaches. On the other hand, the set of case studies defines an envelope that encompasses the social situations that were agreed during the planning of the experimentation.
2. The set of keywords provides *important key terms* of the domain, and their analysis is extremely helpful to identify common and recurring concepts, and their main relationships. Of course, the transition from keywords to concepts is complex (see next section), since it requires handling synonymous and quasi-synonymous, inaccurate translations to English, disambiguation, etc.
3. The availability of different language versions is an extremely helpful resource to help identifying correspondences between similar concepts, that are expressed in different ways in the different languages. In cases where the official nomenclature differs, and there is no satisfying common translation, it was found very useful to go back to reading the case study and understand the underlying concepts by analyzing the narrative context.

In other works, the Case Study Database was used as a *Trojan Horse* to introduce complex semantic analysis to social workers, without requiring specific training, and adapting to their work practices.

¹ This possibility permits interested social workers, that found interesting case studies provided by other institutions (in other countries) and invested to translate them in their proper language, to contribute the translated description to the learning community

4.2 *Ontology*

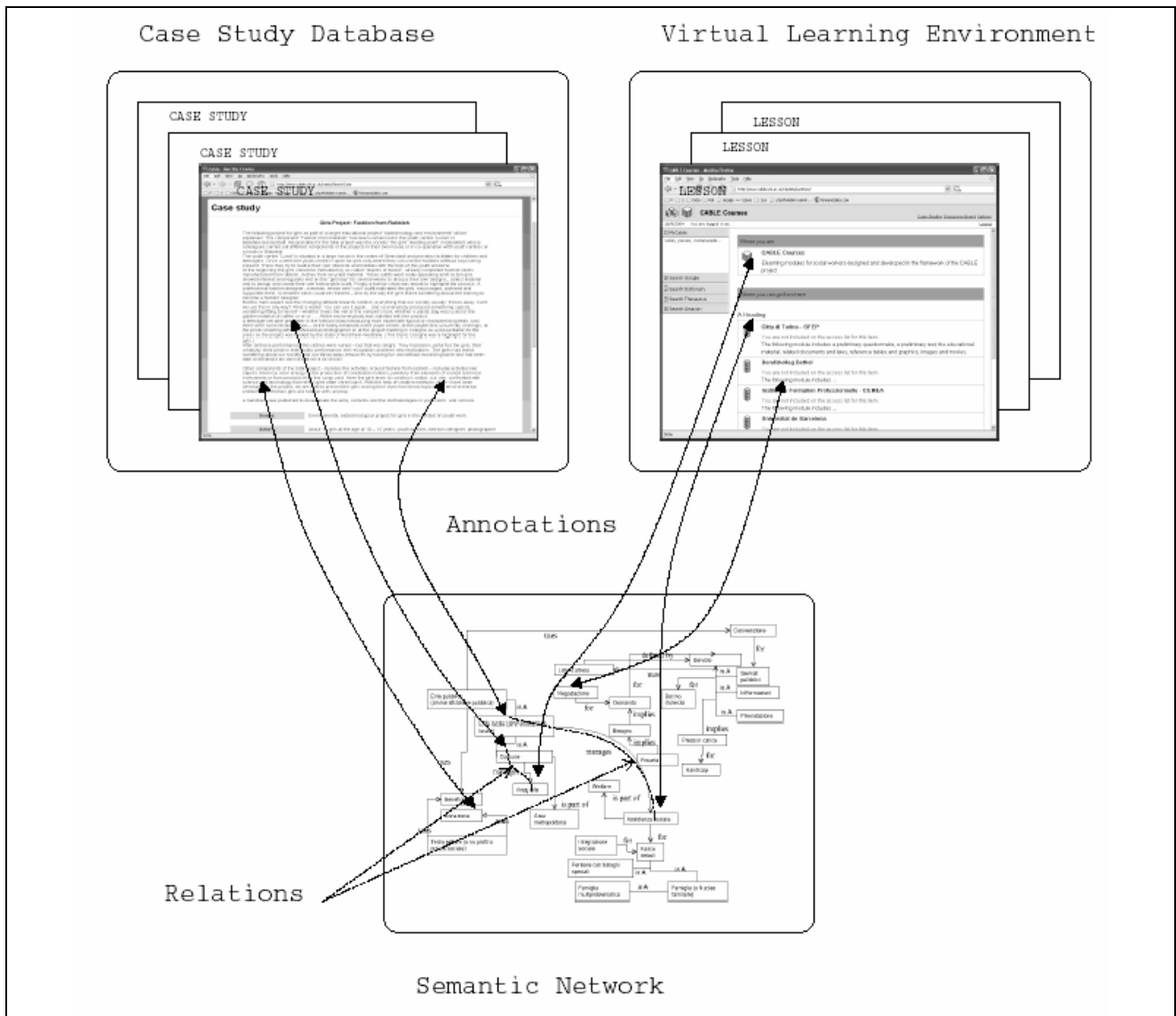
The final result of all the comparisons, analyses, conceptualizations, and knowledge sharing, is the formal definition of an Ontology for the specific sub-domain of social sciences.

A good and extensive definition of Ontology can be found in the appropriate chapter of the PRAISE book; this section rather aims at showing how the Ontology was used within PRAISE and what process was used to develop it in the international and intercultural context of the project.

Basically, the goals for the Ontology developed in the project is required to have the following characteristics:

- The nodes of the ontology are the main concepts of discourse in the chosen knowledge domain
- The semantics (explicit meaning) of each node should be defined *with no ambiguity* for all the interested readers. This goal was achieved by attaching no real semantics with the *name* of the node (contrary to many “classical” approaches), and providing, for each node, *a set of different extensive definitions* (of about a couple of sentences), in all the supported languages²
- The relationships between the nodes should first of all expose the *taxonomical* bound between the concepts, and less importantly represent other kind of dependencies and/or connections
- Some of the concepts may be significant in some linguistic/cultural contexts, only, therefore the ontology may lack some language-dependent definitions for some of the concept, without compromising the integrity of the formal model

² in CABLE and PRAISE the supported languages are: English, French, German, Italian, Spanish, Catalan, Romanian, Swedish. The approach is, of course, general, and more languages may be added if interested partners join the activity.



The developed ontology, in the form of a Network of different Semantic concepts, was represented according to standard ontology languages³ and allowed intelligent integration of the set of Case Studies with the set of Learning Modules. In particular, the Semantic Network allows the users of the system to perform the following activities:

1. Given a concept in the Ontology, find all the relevant Case Studies (in any language, or filtered by language)
2. Given a Case Study, find the most similar Case Studies (i.e. the case studies that share a "similar" conceptualization), ranked by similarity, and optionally filtered by language
3. Given a page in the Virtual Learning Environment, and given a (weighted) set of concepts representing the topic of the page, find the most relevant Case Studies to associate with this learning page

³ OWL Web Ontology Language: <http://www.w3.org/TR/owl-features/> and <http://www.w3.org/2004/OWL/>

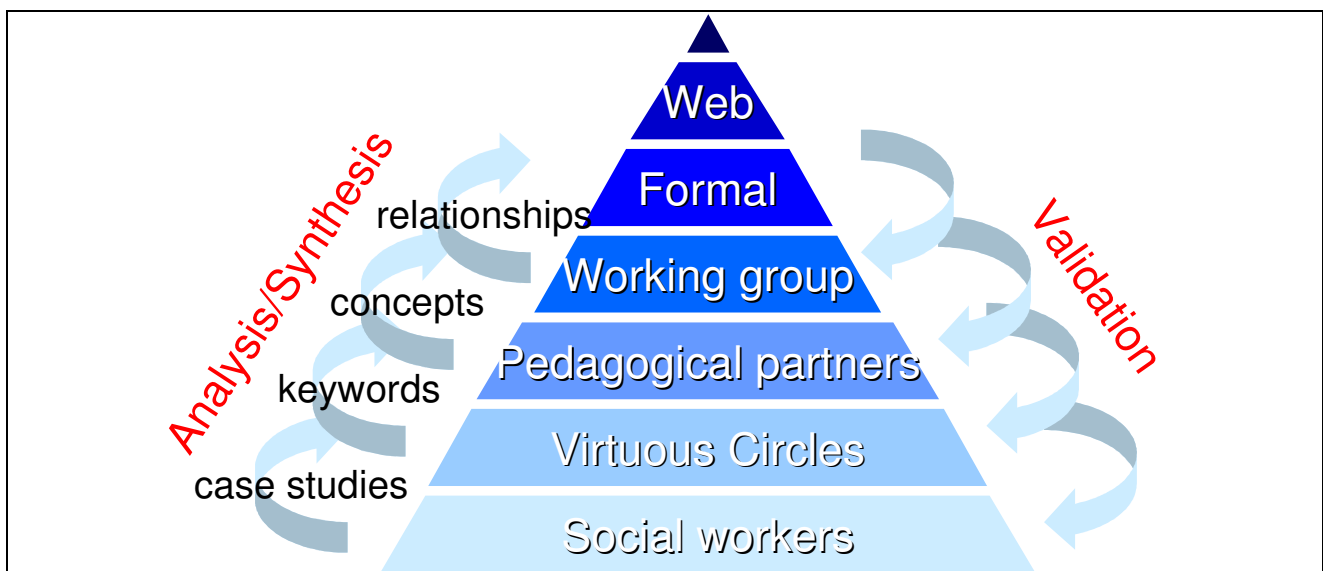
4. (supported, but not exposed in the user interface for usability considerations) Given a Case Study, list all the learning resources (pages in the Virtual Learning Environment) that may be relevant to that case.

The notion of similarity (or relevance), here, is very profound, since it compares resources through their semantic classifications. This allows us to avoid any problems related to synonyms, ambiguity, languages of the documents, level of generality vs. specificity of the query, competence level of the user.

The advantages given by the semantic representation of information is one of the main innovations in PRAISE, and is an extremely complex issue from the technical point of view, since it also requires exploring new algorithms and new information representation architectures. However, its understanding and management would require the involved partners to learn very specific and formal definitions and properties, in order to be able to properly design an ontology.

The PRAISE project found an elegant, effective and innovative solution to this problem, by developing a multi-stage process for development and validation of the formal ontology. This process can be described as *distributed information and knowledge extraction and distillation*, since it involves starting from available information and distilling it into the core knowledge elements subsumed by it.

More in detail, the process (illustrated by the pyramidal shape below) involves different kinds of users, with different levels of competence, to which a different level of formality is required. This is possible thanks to the adoption of useful *metaphors* to allow the social workers to work with familiar terms and contexts, but at the same time provide useful information for the ontology designers. Again, the *Trojan Horse* model was applied here.



The adopted steps can be summarized as follows:

1. The collaborating Social Workers bring their daily experience, and they identify suitable case studies, formalizing them in narrative form and with the appropriate contextualization
2. During the Virtuous Circles (Virtual or Face-to-face) meetings, such Case studies are presented, discussed, and compared (on the scale of the local experience).

Significant keywords are selected collegially within the Virtuous Circle. The activity up to this point is on the local level, with local languages. Keywords are then translated to English.

3. The set of (English translations of the) keywords is analyzed by the Pedagogical partners in the PRAISE project. This group better understands the goals of PRAISE, and has a basic training about the structure and the goal of ontology. Discussions among PRAISE pedagogical partners aim at identifying suitable concepts for inclusion in the ontology, thereby analyzing and eliminating all sources of ambiguities.
4. A smaller group, composed of knowledge representation specialists (in PRAISE, UHI), technical experts (PdT), and some appointed pedagogical partners analyzes the concepts, identifies their relationships, and builds the ontology.
5. A technical person then translates the ontology in the proper OWL language, uploads it to the web platform, and the result of the process is ready to be validated and tested by all the relevant actors.

During this process we used several metaphors to alleviate the cognitive burden of the colleagues:

- Social workers were asked to identify *case studies*
- Virtuous circles were asked to identify *keywords*
- Pedagogical partners were asked to compile a *glossary* composed of the most important *key words* with their proper unambiguous *definitions in various languages*
- Only the restricted “ontology group” and the technical persons really needed to understand and manage the formal ontology representation.

5 Evaluation

The partners of the PRAISE project were excited to learn about these new methodologies and techniques. However, the time frame of the project, and the limited possibilities for meeting, prevented a full training on all the aspects of e-learning and formal knowledge representation.

The PRAISE project was a success since it allowed social workers of different countries, cultures and language to start using ICT tools in their daily work, to start collaborating with distant colleagues, to understand how to formalize their work so that it can be compatible with a (suitable) e-learning system, to design their new activities and training courses taking advantages of the possibilities offered by blended e-learning solutions.

The PRAISE project was also a success since managed a very complex process, in which over 100 social workers of different countries contributed, at different levels, to the definition of a shared ontology on a sub-domain of social sciences.

The advancements in the ICT and e-learning competence of the partners is evident, and the main accomplishments are qualitatively reported in the following table.

Partner	Before...	After...
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Partner	Before...	After...
SFEP	Had limited experience of e-learning projects. Never used in curricular courses.	Has an e-learning platform installed and manages. Regularly delivers courses in blended e-learning. Continues to use the narrative pedagogy and to train other social workers to use it.
UB	Already had on-line courses offered by the University	Includes narrative pedagogy in their curriculum. Uses international case studies from the PRAISE project for student analysis work
CEMEA-INFOP	No previous experience with e-learning	Experimented e-learning in pilot groups. Using Case studies (on-line) in current courses.
UoA	Already had on-line courses offered by the University	A strong synergy between the University and the Social services has been built through the Virtuous Circles. Distance collaboration seen as essential due to the geographical situation in Iceland.
THC	No previous experience with e-learning	Virtuous Circles were one of the first occasions to compare experiences of different social workers. The local government became aware of the need of training and allocating work time on Virtuous Circles methodology for its jurisdiction.
(UP-RO) ⁴	Already had on-line courses offered by the University	Strengthened collaboration between the University and the Social Services (that in Romania are just starting), and among different University Departments. Extensively using Case Studies as a reference point for understanding and designing National and Local social services according to European best practices.

⁴ This partner participated to PRAISE with no funding. Nevertheless, their attained results with own resources.