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ProActive: Fostering Teachers' Creativity through Game-Based Learning

Progress Report Public Part

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Executive Summary

ProActive is a two years project in the EU LLL program (Project Number: 505469-LLP-1-2009-1-ES-KA3-KA3MP) which started on 01/01/2010. The project tackles creativity in the context of lifelong learning by stimulating creative teaching practices through the use of different learning metaphors in various educational levels, i.e. schools, universities and vocational training within Europe. Moreover, the project will use the concept of game-based learning (GBL) in order to support creativity in teaching / learning processes.

Traditionally, teachers and trainers used in their practice a dominant learning paradigm: the instructional, thus limiting their creative potential and inhibiting learning. Recent studies instead show that in normal situations learners combine different metaphors to a lesser or greater degree simultaneously: Imitation, Participation, Acquisition, Exercising, and Discovery.

The main objective of ProActive is to stimulate the creativity of teachers and trainers from different lifelong learning levels, through providing them a context and tools for creating game-based learning (GBL) scenarios. The chosen approach is through the design of educational games and with the help of five metaphors used in natural learning. Concretely, the project is creating learning contexts where teachers from schools, higher education and vocational education and training, can apply creativity in designing their own GBL scenarios using digital tools. Within training workshops, teachers will use two main game editors: a free of charge 3D virtual environment allowing collaborative interaction of the learners (EUTOPIA) and an Open Source framework for implementing 2D user-centred adaptable scenarios (<e-Adventure>). ProActive will adapt the five learning metaphors mentioned above and the tools, in order to foster creativity and support the flexibility of the teachers in designing their learning sessions in at least 18 pilot sites covering different educational areas and levels in four countries (Italy, Romania, Spain and UK).

ProActive consortium consists of six partners in four EU countries. The partners cover multidisciplinary skills and competences necessary for the successful completion of the planned activities. During the first project year the partnership has set the theoretical basis of the research activities, made initial field studies and created strong connections with teachers and trainers in several lifelong learning areas and levels. It had produced18 deliverables, which comprise 14 reports and 4 products, including software tools and a web portal (http://www.proactive-project.eu), and organised a number of events, namely three project meetings and fifteen focus groups in the participating countries. Furthermore, each partner had been involved in various dissemination activities, distributing promotional materials with the goal to increase ProActive visibility and involve larger audiences.

This document represents a short summary of ProActive, describing its objectives and targeted audience (Section 1), the chosen approach (Section 2), the project outcomes obtained during the first year of activities (Section 3), the consortium and partners' connection with the target groups (Section 4), ProActive's plans for the future (Section 5) and the relation to EU policies (Section 6).

Table of Contents

1. PROJECT OBJECTIVES 5

2. PROJECT APPROACH 6

3. PROJECT OUTCOMES & RESULTS 9

4. PARTNERSHIPS 13

5. PLANS FOR THE FUTURE 15

6. CONTRIBUTION TO EU POLICIES 15

7. REFERENCES 17

1. Project Objectives

The main objective of ProActive is to stimulate the creativity of teachers and trainers from different lifelong learning levels, through providing them a context and tools for creating game-based learning (GBL) scenarios. Through ICT tools the project will stimulate novel learning and teaching strategies embedding active learning approaches, such as creative problem solving, discovery, learning by doing, experiential learning, critical thinking, with teachers co-designing 2D or 3D learning games.

To achieve the stated main aim, ProActive team set the following sub-objectives:

1. To stimulate the creativity of teachers and trainers working in different lifelong learning levels, namely school education, higher education and vocational training, by developing a conceptual framework for integrating different learning metaphors;
2. To introduce innovative ICT-based experiences based on digital games created for the specific context in teaching and training practice, produced with two adapted game editors and integrating five learning metaphors in the game design process;
3. To implement co-design creativity sessions and pilot sites for addressing school, university and vocational education scenarios based on games;
4. To validate the proposed approach as a means of learning and evaluate its impact on teachers' creativity and students' outcomes.

The target groups addressed by the project are:

Comenius: In ProActive two of the partners[1] (UB and DPPSS) will implement pilot sites considering targets from Comenius sub-programme (school education). In previous research it has been demonstrated that games have positive influence on learners' motivation and interest. This is especially true for certain at-risk school groups. We tackle Comenius as a target group, studying user needs and will evaluate the impact of the chosen approach on them. Dissemination and exploitation will be, between others, directed to Comenius and the final product of ProActive (The Guidelines) will contain special section on this sector.

Erasmus: The university educational level (corresponding to Erasmus sub-programme) is also covered by two of the ProActive partners (UNINA and UCM). User needs were analysed and will be considered in the implementation phase. Dissemination and exploitation of the project will be, between others, directed to Erasmus and the final product of ProActive (The Guidelines) will contain special section on this sector.

Leonardo da Vinci: Focus on vocational education and training in ProActive is given also by two of the partners (CAST and UNIBUC) who will implement pilot sites considering Leonardo da Vnci sub-programme. User needs will be analysed and considered in the implementation. Dissemination and exploitation of the project will be, between others, directed to Leonardo da Vinci and the final product of ProActive (The Guidelines) will contain special section on this sector.

[1] Partners are described in section 4 of this report

2. Project Approach

As stated earlier, ProActive aims at fostering teachers' and trainers' creativity. The chosen approach is through the design of educational games and with the help of five metaphors used in natural learning. ProActive is targeting educators from different lifelong learning levels, including schools, universities and vocational education. ProActive is providing a context and suggests possible tools and methodologies needed for creating game-based learning scenarios.

A constructivist approach to GBL will be adopted, that is game design. The game design process has been described as a powerful learning environment according to attributes identified by Smeets (2005) in recent studies on children, as it promotes effective learning and learner autonomy (Robertson, J. and Howells, C., 2008). Indeed, game design is considered a rich activity that offers opportunities to exercise a wide spectrum of skills to embody creative ideas in a complex, cultural artifact that can be enjoyed in other contexts both from peers and from an audience (Robertson, J. and Howells, C., 2008). The most noted contributions within this theme come from Kafai (1995) and Kafai & Ching (2001) from their studies on children as game designers. The core idea of their studies relies in the possibility of turning children into producers of knowledge, and letting them interact and play with their own game objects.

On the game development side there are studies (i.e. Egenfeldt-Nielsen, 2006) that outline that there is always a psycho-pedagogical approach behind the design of educational games, both if the game developer is conscious of it, and if he is not. However, the corresponding studies refer to the learners / kids as game designers. Indeed, a literature gap can be observed, regarding the possibilities of game design by teachers. Furthermore, in the field of e-learning and technology enhanced learning it is not unusual to think about teachers as designer of the learning process.

What seems to be still an unexplored field, is the possibility to engage teachers with the design of educational games which can be then delivered to their students ProActive will engage teachers with the design of educational games which can be then delivered to their students. i.e. a socio-cultural approach to GBL: a process that starts from the construction of the cultural artifact to the sharing of it letting students play and learn with it.

Within the project lifetime, ProActive consortium will develop and validate a framework for fostering creativity through GBL in educational contexts. The methodology to achieve effectively ProActive outcomes is the following:

- *Literature review* – a theoretical analysis on the topics of creativity, GBL, games design for educational purposes, and learning theories was performed as initial step in the project. It serves as a basis for developing the pedagogical framework of the study.
- *Identification of success factors for GBL* - all ProActive partners collaborated to exchange experiences about successful GBL examples, which were analysed and compared to extract a set of success factors, which further informed the creation of the framework.
- *User needs analysis* - at the beginning of the project, 15 focus groups have been organized by the ProActive consortium in the four different countries (Italy, Romania, Spain and UK). The partners explored teachers' and trainers' use and interest in ICT and GBL in their teaching methodologies, their attitude and opinion about the link between creativity and GBL, their point of view in relation to learning metaphors and their adaptation to their teaching approach. The focus groups enabled to obtain quality data

on current practices, as well as on practitioners' interests and needs for developing creative GBL scenarios.

- *Development of a pedagogical framework* – ProActive training and implementation activities are based on an integrated framework developed on the base of the previous phases of ProActive methodology: the literature review on GBL and creativity and the user needs analysis. Furthermore, five metaphors of learning (acquisition, participation, discovery, imitation, experimentation) are central to the pedagogical framework, as they will act as guidelines for the creation of educational games. The five metaphors learning model (Simons, 2003; 2004; 2008) is a description of different ways of learning in different people, embedded with learning theories. It can be treated as a comprehensive model that comes out by combining some learning models with the theories of change by De Caluwé and Vermaak (1999). The result is a classification of the ways of learning into five groups (one per metaphor) each one representing a preference for learning that is not exclusive. In fact, every person is able to use all metaphors, but each one in a different situation. The core idea is that we do not learn in a sole way, but in different ways that depend on personal aptitudes, on the situation where the learning takes place and on the content to be learnt (Simons and Ruijters, 2004). The psycho-pedagogical framework will be used as a basis for the further steps of the project. According to the framework, the ProActive approach to training has been elicited. More specifically, it will help the consortium in designing the training content and developing the training workshops. Furthermore, ProActive psycho-pedagogical framework will be used by teachers and trainers during the project implementation phase.
- *Development of an evaluation framework* – ProActive evaluation framework, designed within the first project year, deals with developing and applying a methodology for evaluating the impact of ProActive approach, on the creativity and flexibility of trainers. In close collaboration the partners devised a detailed framework for evaluating ProActive implementation. The framework sets concrete evaluation goals, defines evaluation parameters, proposes evaluation tools and procedures. ProActive evaluation focuses on both technical and pedagogical evaluation, including evaluation of pedagogical innovation and teachers' creativity.
- *Adapted releases of two game editors* – within the first year of the project, ProActive produced an adapted release of the two game editors, employed from its beginning – EUTOPIA, a free of charge 3D virtual environment allowing collaborative interaction of the learners and <e-Adventure>, an open source framework for implementing 2D user-centred adaptable scenarios. Both tools are adapted according to the user needs, as identified through ProActive focus groups, thus further facilitating and stimulating educators' creativity. The editors will be available for free download during the whole project lifetime and at least 5 years after the project end.
- *Co-design Training sessions* – at the start of the second year, ProActive consortium will organise training workshops for the teachers and trainers that will participate in at least 18 pilot sites in the four countries represented in the consortium. The workshops participants will use different game editors (i.e. EUTOPIA and <e-Adventure>) in designing their learning sessions. Thus, the teachers will participate in 2 days workshop in their country. Together with the research team, they will first learn about the pedagogical and technical approaches of ProActive, including the 5 metaphors for natural learning, then, through a co-design process, they will reflect on the ways to introduce creativity and flexibility into their teaching practices and develop their first creative learning game with the provided tools.
- *Implementation of pilot sites, follow-up and support* – After the training, teachers and trainers will have the opportunity to implement their own games and apply them in their

educational context. Each partner will closely follow and support the pilot sites by means of regular observations, frequent meetings with the teachers and technical support, including a dedicated forum on ProActive web site. The data gathered will feed the assessment process in order to validate the proposed approach as a means of learning and evaluate its impact on teachers' creativity and students' outcomes.

- *Repository of GBL scenarios* – During training and implementation phases ProActive will generate a number of GBL scenarios - at least 10 scenarios per partner, and 20 per sector (i.e. schools, universities and vocational), thus a total of 60 GBL scenarios. These scenarios will be available on the project web site and will facilitate reuse by any interested educator.
- *Evaluation process* – ProActive evaluation will be conducted according to the evaluation framework (as described above). Data is being collected in various stages of the project implementation, such as the focus groups, the co-design training sessions, during the implementation of pilot sites and after its end. A report on evaluation data will summarize the evaluation data collected by the partners by applying the procedures of the evaluation framework. An analysis of results of the evaluation will be conducted and will serve to create a report presenting in detail the finding of the evaluation.
- *Development of guidelines on creativity with GBL* - ProActive will produce Guidelines on Creativity Enhanced by GBL and disseminate a database of learning games and related active learning culture within EU education. This constitutes the major final outcome that will gather the findings of the two years project activities. The Guidelines will be presented in a booklet also including a CD with the two adapted game authoring tools, with their dedicated libraries. The booklet will be widely distributed to all interested parties, according to partners' requests for reaching his local target group and to the available project's funds.

Information about ProActive and all project outcomes is being actively disseminated to a wide audience, which includes teachers' and trainers' communities in various educational levels – schools, universities and vocational training; educational and training institutions, including public and private organizations; ICT specialists in the areas of advanced software technology in the educational field; researchers in various areas of lifelong learning and GBL; policy makers related to educational and learning issues on National and EU levels.

Finally, ProActive is creating a community of users where our direct target users are the first members and which is expected to grow even after the end of the project for a cascade effect.

3. Project Outcomes & Results

The key ProActive outcomes within the first project year are:

a) ProActive psycho-pedagogical framework for fostering teacher's creativity through the design of GBL scenarios;

b) The adapted release of the two game editors (EUTOPIA and <e-Adventure>) - versions specifically tailored for ProActive based on the user needs analysis;

c) A collection of templates and libraries, which will facilitate the use of the editors and the production of creative GBL scenarios;

d) A Handbook for Production of Creative GBL Scenarios, which will facilitate the educators participating in ProActive training and implementation. The handbook contains tutorials for designing and developing GBL scenarios, as well as tutorials of the tools;

e) ProActive Evaluation Framework, which identifies tools and procedures for validating the ProActive approach. It will be used for data collection and analysis during the second year and will lead to the refinement of the pedagogical metaphors and elaboration of Guidelines for implementing GBL in the different targets of the Lifelong Learning Programme;

f) Dissemination and Exploitation plans have been developed, together with a number of dissemination materials that are used to promote the project, inform the interested users about project activities and stimulate educators' participation in future activities, such as training and implementation;

g) A community of teachers and trainers interested in GBL in four EU countries (Italy, Romania, Spain and UK).

The psycho-pedagogical framework represents a key outcome of the project first year. It is based on several previous tasks performed in earlier project stages. First, it is rooted into extended literature reviews[2] on the topics of creativity, GBL, games design for educational purposes, and learning theories. Secondly, it is based on the outcomes from 15 focus groups organised by the ProActive consortium and attended by 90 participants, in which teachers' / trainers' current practices, interests, expectations, attitude and opinion towards creativity, GBL and teaching methodologies were explored[3]. The workshops allowed gaining deeper understanding on target users' needs and taking them into account for the further activities of the project.

ProActive psycho-pedagogical framework can be described as following.

The main objective of the project is to analyse the conditions to stimulate the creativity of teachers by engaging them in GBL design processes. As shown in the theoretical background, teaching creatively consists in using imaginative approaches and combining existing knowledge in some novel form to make learning more engaging, assure the relevance of the curriculum, and increase understanding.

GBL is a good candidate to fulfil these requirements, as it provides challenging experiences that promote the intrinsic satisfaction of the learners and offers opportunities for authentic

[2] Documentation about the desktop study and the user needs analysis is available as private reports for the ProActive consortium and EACEA representatives within ProActive intranet platform

[3] see footnote 1

learning processes. For this reason, the study will offer to teachers the possibility to use a GBL as an innovative approach in their teaching practices. Furthermore, in order to overcome the obstacles of introducing GBL in formal learning settings, a constructivist approach is adopted, in which teachers will create their own learning games, i.e. innovative learning artifacts that are engaging for their students.

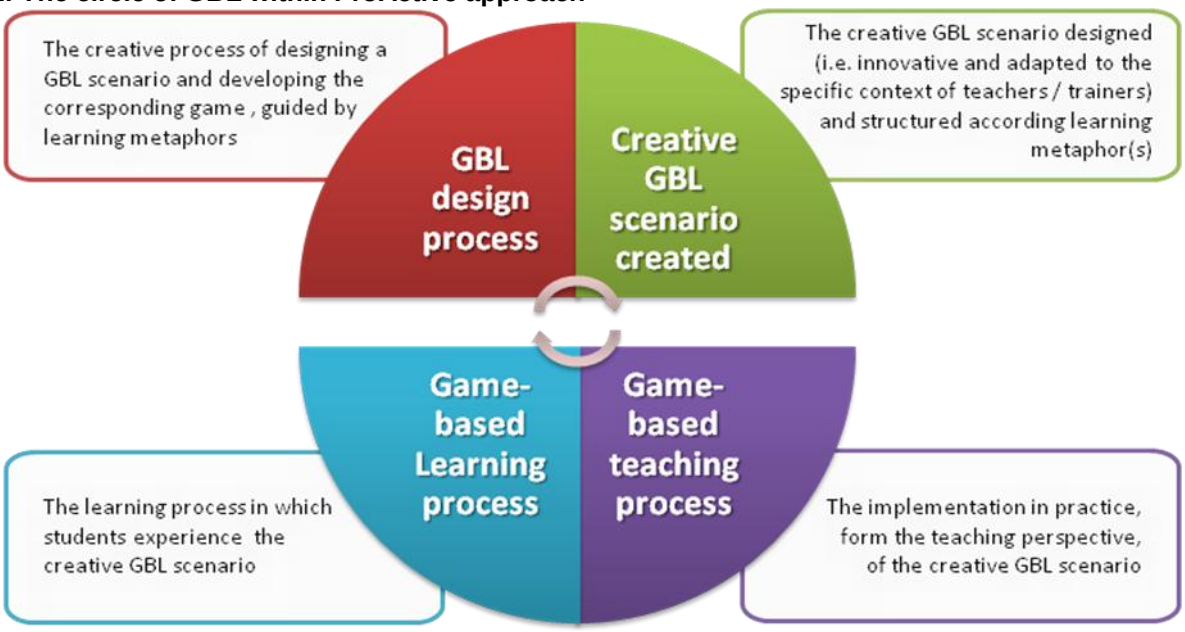
During this process, the five learning metaphors will be central, as they will act as guidelines for the project participants in the creation of educational games. Indeed, the metaphors will raise educators' awareness on different learning models, as well as they foster their reflection on possible new ways of active teaching, thus guide the game design process. In fact, it is assumed that each metaphor allows for the creation of games with different rules, objectives, roles for the actors involved, mechanics, tasks, etc. This fosters the reflection on which model to use for teaching.

Furthermore, as a result of the design process, a creative product will be obtained – a learning artifact (i.e. an educational game), tailored to the learning needs, institutional and curricular constraints and which can be shared with students. Such creative product is pedagogically innovative, useful and adapted to a specific teaching / learning context. It is assumed that this GBL scenario will be structured according to the learning metaphor(s).

Within an in-site pilot implementation of the GBL scenarios created, teachers will test their creative GBL scenarios in their educational settings. During this stage, students experience the creative GBL scenario.

The following figure summarizes the approach of the project. It links the concepts of creativity, GBL, game design and the five learning metaphors in order to draw a four stages circle of creative GBL.

Figure 1: The circle of GBL within ProActive approach



The psycho-pedagogical framework will be the used in several future tasks in ProActive. First of all, it provides basis for the organisation of the training and implementation that will take place in at least 18 pilot sites in four European countries in the beginning of 2011. Moreover, training materials for the teachers / trainers are being developed to correspond to the proposed approach. Finally, the ProActive evaluation framework and appropriate evaluation tools are designed as consequence of the elicited methodology.

The adapted releases of the two game editors (EUTOPIA and <e-Adventure>) were developed during the first project year. The adaptation was based on the feedback from the focus groups and the user needs analysis. Furthermore, the tools were enriched with a collection of templates and libraries (i.e. 2D and 3D graphical objects) which will greatly facilitate ProActive users in the design and development of their own GBL scenarios. During training and implementation, users will be provided also the Handbook with tutorials useful guidelines. Figure 2 shows screenshots of the loading screens of both tools.

Figure 2: ProActive game editors

The partnership has established direct contact with a number of teachers and trainers in various educational levels (schools, universities and vocational training) who will participate in local training and implementation in the second project year. These educators constitute the basis for an international community interested in GBL, which during 2011 together with ProActive partners will create a an online repository of GBL scenarios. Through the planned dissemination and exploitation activities, ProActive consortium will increase the size and extend the scope of this community of practice, which currently covers partners' countries (Italy, Romania, Spain and UK) to other EU countries.

In total, during the first project year, ProActive has produced 18 deliverables, from which 14 reports and 4 products, including software tools and a web site. Furthermore, ProActive organised a number of events (i.e. three project meetings and fifteen focus groups) and designed a a variety of dissemination materials. More concretely, the following documents/products/materials were developed:

- **In WP1 – Project Management**
  - Three project meetings took place in Barcelona, Bucharest and Madrid. Meeting minutes were produced
  - ProActive Consortium Agreement was devised and accepted by all partners
  - First year scientific, management and financial report
- **In WP2 - Quality Assurance**
  - ProActive Quality Assurance Plan
  - Quality review of project deliverables
- **In WP3 - Pedagogical Framework for Creativity and Game-based Learning**
  - Literature review on GBL, internal report "Success Factors for Game-Based Learning"
  - Fifteen focus groups with educators in various LLP sectors (school education, universities and vocational training) and developers of GBL were organised in four EU countries (Italy, Romania, Spain and UK). Outcomes were summarised in 6 reports from project partners. The analysis of all focus groups is available in a report "User Needs Analysis"
  - Psycho-pedagogical Framework Fostering Creativity
- **In WP4 - Adaptation of the Game-Based Environments**
  - Adapted release of EUTOPIA and <e-Adventure> game editors and a collection of templates and libraries
  - Handbook for Production of Creative GBL Scenarios
- **In WP5 - Implementation of Learning Scenarios**
  - Identification and initial contact with pilot sites, which will implement ProActive's approach in 2011
- **In WP6 – Evaluation**
  - Evaluation Framework

- **In WP7 – Dissemination**
  - ProActive Dissemination Plan
  - Project web site (www.proactive-project.eu)
  - Dissemination materials, including ProActive flyer and poster, two issues of ProActive newsletter (September and December 2010, available in several languages)
  - Scientific publications and presentations related to ProActive (updated list could be found on ProActive web site).
- **In WP8 - Exploitation**
  - ProActive Exploitation Plan

4. Partnerships

ProActive consortium consists of six partners from four European countries, as shown in the table below.

Table 1: PROACTIVE consortium

Partner Nº	Acronym	Organisation Name	City	Country
P1	UB	Universitat de Barcelona	Barcelona	Spain
P2	DPPSS	Sapienza Università di Roma	Roma	Italy
P3	CAST	CAST Limited	Bangor	United Kingdom
P4	UNINA	Università di Napòli Federico II	Naples	Italy
P5	UCM	Universidad Compultense de Madrid	Madrid	Spain
P6	UNIBUC	University of Bucharest	Bucharest	Romania

ProActive consortium is built ad hoc to include the necessary expertise to successfully reach the goals of the project. Skills and competences are multidisciplinary and integrated in a consistent way with the tasks and phases of project development. Each partner introduces a specific competence. This will be strongly reflected in the consortium work.

UB, the coordinating institution, brings in ProActive pedagogical competencies in educational use of ICT, and in evaluation. UB has extensive experience with innovative school teachers, as well as in-service and pre-service teachers training (Comenius). Management competencies are also demonstrated by the active role of the UB team in EU funded research.

DPPSS introduces in ProActive the last advances in Interaction Design and competences directed to informing technological innovation with existing practices, participative processes of innovation design, and user-centred methods of technology evaluation. DPPSS is experienced with the Comenius target group from variety of previous national and European projects.

The expertise of the CAST is in the field of game-based environments for education in strict connection with end-users, as well as expertise in the implementation of game-based learning. CAST will implement pilot sites with focus on vocational training (Leonardo da Vinci).

UNINA and UCM play a dual methodological and technological role. UNINA is responsible for the 3D framework for developing learning games (EUTOPIA), while UCM brings to ProActive a 2D environment <e-Adventure> for creating educational game scenarios. The two universities will implement pilot sites related to the higher education (Erasmus).

UNIBUC has experience in professional and vocational training both face-to-face and online. UNIBUC also brings to ProActive the East-European dimension.

Within the first project year, the partnership had shown smooth and very productive collaboration. Furthermore, the wide variation of expertise brought by its members proved to be very useful, producing important discussions, profound studies and high quality results.

PILOTS SITES

At least 18 pilot sites (three per partner) have been selected to participate in the implementation. As shown in Table 2, the pilot sites will be explored by different partners in different countries accordingly to the expertise represented in that site: UB and DPPSS on Comenius, UNINA and UCM on Erasmus, CAST and UNIBUC on Leonardo da Vinci.

Table 2: Implementation in the different LLP sub-programmes by partner

	Comenius	Erasmus	Leonardo
P1 (UB)	✓		
P2 (DPPSS)	✓		
P3 (CAST)			✓
P4 (UNINA)		✓	
P5 (UCM)		✓	
P6 (UNIBUC)			✓

All partners have previous experience and contact with the targeted groups. Furthermore, during the first project year the consortium has tightened the bond with these communities, through the organisation of fifteen face-to-face meetings (focus groups) in the partners' countries (Italy, Romania, Spain and UK). Active communication through various communication channels and regular contact with people who already expressed their interest in ProActive has also facilitated developing strong link with the targeted communities.

5. Plans for the Future

The second year of ProActive activities is related to close contact with the targeted users – teachers and trainers from school education, university education and vocational training. The next steps of the ProActive project include:

- *Design and implementation of training and co-design workshops* - ProActive consortium has already started planning training workshops that take place in the second project year. Indeed, in January/February 2011 more than 100 teachers/trainers from the four participant countries will attend two-days workshops and learn about the pedagogical and technical approaches of ProActive, including the 5 natural learning metaphors. Through co-design process participants will create GBL scenarios with the provided tools.
- *Implementation of pilot sites, follow up and support*: After the training workshops, teachers / trainers will start to develop their own GBL scenarios, and implement them within their educational settings. ProActive partners will actively support the creative process, providing the necessary guidance. ProActive implementation will be completed in at least 18 different institutions in four EU countries. Based on the user feedback, the two game editors (EUTOPIA and <e-Adventure>) might be further adapted and new libraries with graphical objects could be created.
- *Online repository of free GBL scenarios*: The consortium will set-up an online repository for the GBL scenarios developed by the participants in the pilot sites.
- *Evaluation data collection and analysis* – According to the procedures and tools that have been set in the Evaluation Framework, partners will gather in-depth data during the training workshops and the implementation phase, so to evaluate different dimensions, including teachers'/trainers' creativity, pedagogical innovation, game editor usability, etc.
- *Production of the Guidelines for Creativity Enhanced by GBL* – At the end of the project, the consortium will resume ProActive results a set of guidelines that will be widely distributed to all interested parties, including practitioners and policy makers.
- *Final conference:* An international public conference will present the project's outcomes, findings and recommendations to a large and international audience. The conference, planned for November 2011, will be held in Rome (Italy). The organisation of the conference has already started, in terms of identifying the possible premises / dates, initiating discussions on possible invited speakers and requesting additional funds to national institutions. Proceedings will be published at the end of the project.

As an additional activity, the consortium will organize a competition for best GBL scenario and game. All teachers / trainers participating in ProActive will be stimulated to participate. The competition, open also to external participants is expected to further raise teachers'/trainers' motivation and creativity. The prize will consist in participating to the ProActive final conference in Rome, while the winners will be decided by a jury composed of ProActive consortium members and two external international experts.

All activities of project management, quality assurance and dissemination, which last for the entire period of two years, will continue as planned within the second year. Project meetings for 2011 are set in Italy (one in Naples and one in Rome). ProActive will continue reinforcing dissemination to reach largest audiences, not only among teacher/trainers, but among the general public, aiming at raising interest in ProActive activities, as well as beyond the project ends. Resources produced are free to use and will be available at least five years after the project end. Several publications related to ProActive approach and results are planned in high quality journals and conference.

6. Contribution to EU policies

ProActive **contributes to the development of quality lifelong learning and to promote high performance** by promoting an active approach to learning, aiming to increase the quality of lifelong learning, involving three LLP sectors (school education, higher education and vocational education), **promoting co-operation in quality assurance in all sectors of education and training**. The game-based approach, using creative learning scenarios is expected to boost the learners' performance and educational outcomes. Different regions are represented in the consortium which assures European dimension, covering various education and training systems and learning cultures. By promoting innovative pedagogies and creativity for all learning actors, valuing learning by approaching its methods to the digital culture. ProActive leads to more effective learning throughout the LLL ladder in EU, empowering learners by making the most of their knowledge and competencies, and eventually contributing to reducing dropouts. Examples of good practices among sectors, available in 4 different languages (**promoting language learning and linguistic diversity)**, contribute to the creation of a new learning culture close to the digital natives across EU. Example: ProActive is creating at least 60 game-based learning scenarios for three different sectors, ages and languages

ProActive studies the potential for boosting teachers' creativity with the help of innovative ICT technologies, thus aiming to improve the attractiveness of the learning scenarios for students, reinforcing **the contribution of lifelong learning to social cohesion**. The implementation is based on well defined and innovative pedagogical approaches in order to guarantee high quality of the educational methods. ProActive is for instance, developing learning scenarios that can be built into web-assisted education, either in face-to-face or online learning, at school or on the workplace. This increases accessibility and promotes gender, race and age equality, one of the key EU policies. Example: teachers and trainees are directly involved on creating the scenarios, and later validating those learning scenarios with students and trainees.

The stress of ProActive for implementing flexible design in training sessions combined to the potential of using conditioned virtual objects and action will also be an interesting approach for implementing also in the long term ad hoc and individualised special needs training. It has been demonstrated that at-risk students are better kept on the school track using motivating learning tools, as e.g., learning games.

ProActive results are publicly available and widely distributed through the project web site. It involves partners in disseminating its outcomes to a wide public, including national and local policy makers, local interested communities and international research community, **encourage the best use of results, innovative products and processes and to exchange good practice in the fields covered by the Lifelong Learning Programme**. Special attention has been paid on outcomes exploitation, including IPR issues, to increase the potential future use of the ProActive approach.

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