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Rural Learning for Development: Experiences from Europe
Report on Rural Learning for Development, and Book of Proceedings of the 2007 RuraLEARN Conference and Workshops
Mesta, Chios, Greece, 24-27 June 2007



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LIFELONG LEARNING FOR RURAL EUROPE

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Editors: Pavlos Koulouris & Sofoklis Sotiriou, *Ellinogermaniki Agogi, Greece*



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Introduction

Pavlos Koulouris & Sofoklis Sotiriou
Ellinogermaniki Agogi, Greece

1. Lifelong learning for rural development in Europe: concept and background

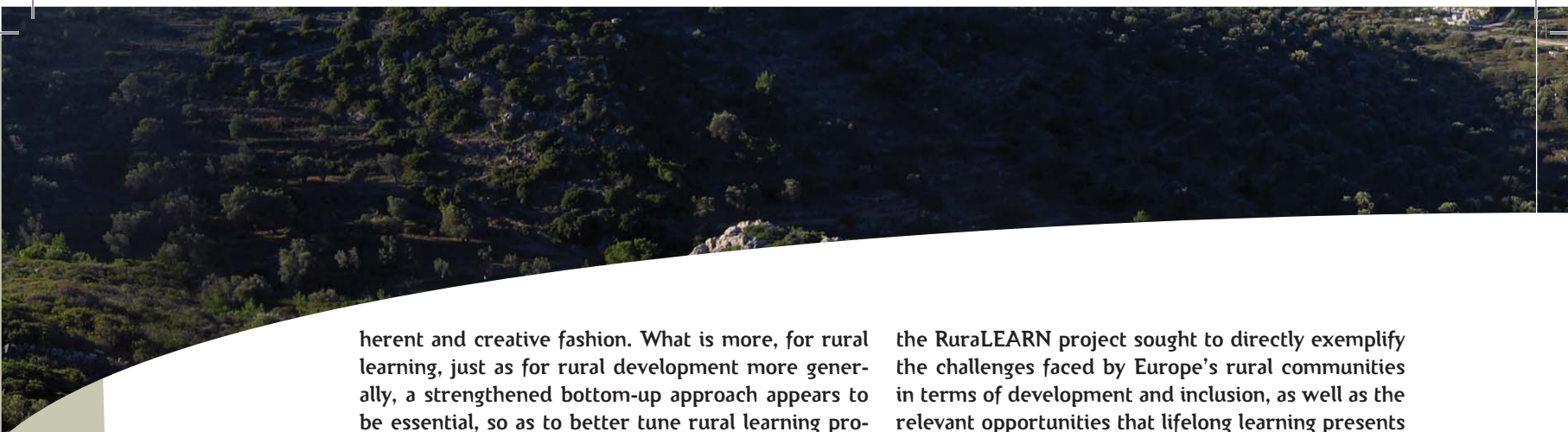
Rural development forms an important pillar of EU's policies and an issue of priority for many European countries. Despite the decline of the primary sector of economy over the last years, rural production is an important aspect of European economy, and rural communities form a proportion of the overall EU population that cannot be neglected. However, the viability of rural areas needs more than agriculture alone. Rural development policies need to place agriculture in a broader context taking into account protection of the rural environment, quality of produced food, increasing competitiveness of the agricultural and forestry sector, enhanced quality of life in rural areas, and, eventually, attractiveness of rural areas to young farmers and new residents.

The role of learning and education, in all their forms, in this direction is crucial: better educated rural citizens of all ages and backgrounds, with ample life-long learning opportunities and access to the contempo-



rary resources of the Information Society and the Knowledge Economy, can resist urbanisation tendencies, protect the natural and human resources of the countryside, understand the new challenges for rural Europe and respond to them with new initiatives, flexibility and adaptability.

In face of this evident need for the promotion of “rural learning”, all levels of education, from primary to tertiary, all forms of learning, from formal to informal, from conventional professional training to open and distance learning, have to respond in a co-



herent and creative fashion. What is more, for rural learning, just as for rural development more generally, a strengthened bottom-up approach appears to be essential, so as to better tune rural learning programmes to local needs.

2. The RuraLEARN response to the challenges

In this context, the RuraLEARN project started in Autumn 2006 aspiring to become a timely and targeted contribution towards the emergence of rural learning as an issue of priority in discussions and planning for learning and rural development in Europe.

Being an Accompanying Measure running across the main Actions of the Socrates Programme, RuraLEARN mainly aims to gather the knowledge, experiences and outcomes of different EU-funded cooperation projects, with an emphasis on Socrates Programme actions, which have been carried out in the field of learning in rural and geographically disadvantaged areas, as well as of other projects analyse them, and present them coherently and systematically to stakeholders and the wider public.

This has been achieved through a carefully designed campaign, which peaked into the organisation of a coordinated cluster of public events on 24th-27th June 2007. The events were organized in remote rural settings on the Greek island of Chios, a mainly rural, geographically disadvantaged, less developed piece of insular land at the south-eastern fringe of the European Union, which however presents a tremendous developmental potential and a challenge for sustainable development initiatives. The location and context of the public events is described in vivid colours in a relevant workshop paper presented on 363 of this volume. By choosing this remote and rural setting for the organization of the public events,

the RuraLEARN project sought to directly exemplify the challenges faced by Europe's rural communities in terms of development and inclusion, as well as the relevant opportunities that lifelong learning presents for Europeans of all ages in rural and geographically disadvantaged areas. The project had the opportunity to present these to the various stakeholders invited to the events, including policy makers in education and development from the local to the national and government level (e.g. a Greek Government Minister for Development), the tourists that happened to visit the island (which is a mild tourist destination in the Aegean Sea during summer), invited visitors from outside Europe (the Turkish coast lying opposite to the island, Southern Asia, South and North America), thus extending the impact of the project far beyond Europe, as well as, importantly, to the local communities themselves, including rural citizens, and students and teachers from all levels of education represented on the island (pre-school to vocational training and university).

3. The Socrates Programme legacy: a starting point for RuraLEARN

The interest and importance of the intersection of lifelong learning and sustainable local development in rural areas seems to have been recognised by a number of players in the fields of education, training and lifelong learning across Europe, who have been involved, with the support of the Socrates programme, in European projects dealing with multiple and diverse aspects of rural development through learning.

The RuraLEARN project has identified forty projects in the ISOC database of Socrates projects which have had a focus on rural areas:

- 8 Comenius projects,

- 20 Adult Education and Grundtvig projects,
- 1 Erasmus project,
- 1 Lingua project,
- 9 ODL and Minerva projects, and
- 1 Joint Actions project.

The full list of these projects is presented below.

Action: COMENIUS (School Education)

- DIS - la disciplina como ambito de mejora escolar
- Innovative approaches to teacher training and inset at primary level in science and technology
- MILTON - multimedia for language teachers over a European network
- MUSE - multigrade school education
- NEMED - Network of multigrade education
- Responsabiliser l'apprenant à l'égard de son propre apprentissage
- The small school - heart of the village in changing Europe
- Together - motivacion por el aprendizaje y prevencion del fracaso escolar

Action: Erasmus

- Rural tourism

Action: ADULT EDUCATION (later GRUNDTVIG, see below)

- ADNET adult education network
- Easy-UE establishment of a methodology for learning the European Union
- European adult learners weeks more useful aspects
- European rural university - session 96



- Les nouveaux pauvres en milieu rural un projet culturel de libération grâce à la formation
- Observatoire etude de faisabilité pour la constitution d'un réseau transnational

Action: GRUNDTVIG (Adult Education)

- Adult education as a tool of rural development
- DELOA - itinerant workshops for assessment, help, orientation and information
- Edu-media, die Verbindung zwischen lokalem Fernsehsender und lokaler Erwachsenenbildung
- FLEUROPE - Handbuch europäischer Erfahrungvergleich alternativer Bildungs- und Ermüthungsstrategien im ländlichen Raum
- Handicraft is common language (HANDISCOLA)
- Landworkerneue Bildungsorte für die Erwachsenenbildung - kleine Ortschaften entwickeln ihre Zukunft -
- L'intervention auprès des 16-25 ans en milieu rural



- Proyecto key soluciones innovadoras para abordar el nuevo analfabetismo en adultos del entorno rural
- Rural education centres for a sustainable future
- RURALPRO - European training course for future professionals of regional and rural development
- SAERA - strategy for adult education in rural areas by means of telecentres
- SEREC - sustainable Europe - rural educational centres
- Wizard tool box- instruments for active participation in a learning society
- Yard-youth and rural development

Action: LINGUA (Language Teaching and Learning)

- Hurra!!! A comprehensive set of polish language teaching and learning materials

Action: ODL (Open and Distance Learning in Education, later MINERVA, see below)

- A-L-L-O - accessible language learning oppor-

tunities

- ARKNET - the ark learning network
- Developing effective community based ODL
- ETP European televersity partnership
- M-E-T-A-F-O-R- midias - techniques agricoles - formation
- The use of ODL in pre-school teacher training
- TICEOD - technologies de l'information et de la communication pour l'enseignement ouvert et à distance

Action: MINERVA (Information and Communication Technology in Education)

- Modelo ensepanza - aprendizaje uno a uno para formacion basica y profesional en el mundo rural
- The use of ICT-ODL in promoting social inclusion

Action: JOINT CALL

- Towards better support systems for integration of asylum seekers, refugees and migrants in rural areas

However, the ideas, experiences and outcomes from the rural-learning-oriented projects remained scattered and generally unknown to the stakeholders and wider public before RuraLEARN, as no initiative had been taken for gathering and coherently disseminating them. Interestingly, also, there seemed to exist an uneven distribution of the interest in rural issues: with adult education and training being the focus in half of these projects, the role of school education had been less attended to, while the recognition of the role of Higher Education in rural learning was scarce in the whole Socrates Programme.

Recognising this potential and the related weaknesses, the RuraLEARN project has sought to become complementary with the various Socrates Actions, highlighting the theme of rural learning, which per se had not emerged as a conceptual platform until then, and thus linking together relevant activities and priorities of all actions supported by Socrates. Thus, RuraLEARN is positioned at the meta-level of Socrates-funded work, aiming to inform, raise awareness, and train stakeholders in a field emerging from the work carried out across Socrates actions – as well as aiming to help towards a shift of focus of rural learning efforts to all aspects of education and training, in a unified, state-of-the-art, lifelong-learning-inspired approach.

RuraLEARN attempted to trace the approaches and outcomes of these projects, and conducted the exercise of categorising, analysing and evaluating them in terms of their originality and, mainly, of their promised or realised impact, hoping to identify the best candidate projects for further promotion, dissemination and exploitation of their results. A set of criteria was decided for this purpose, which highlighted the following as critical factors of success for any project in the field of lifelong learning for rural development:

- Vision for rural development through learning
- Innovative and imaginative approach
- Cross-disciplinary approach
- Promotion of synergies between different education and learning sectors
- User (learner/teacher) friendliness and attractiveness
- User-centred, bottom-up approach / User-involvement in the processes
- Potential and added value for the individuals involved

- Potential and added value for the local community
- Resulting increased competitiveness of the rural space
- Resulting attractiveness of rural areas to the young and new residents
- Resulting better access to the Information Society and Knowledge Economy
- Contribution to the protection of the rural natural and human capital
- New understanding of the contemporary challenges for rural Europe



- Critical mass and measurable project impact
- Availability of results / Presence on the www
- Sustainability beyond the EU-funding period.

Each of the projects was rated against each of these factors on a scale from 1 (least) to 10 (most).

The overall finding of this exercise was rather disappointing. While many of the identified Socrates-funding projects did not lack originality and probable quality of outputs, most of them clearly failed to show any short of continuity and sustainability after the funded period. Information available on the web, both in the Socrates database and in the individual websites of the projects (where available), in many case was not complete, and in most cases was quite outdated. In face of this, the RuraLEARN project made the decision to move the focus of analysis from the identification of the best, to the identification of the active projects. To this end, several invitations were sent, and a specific call was issued, to all coordinators of the identified forty projects relating to rural areas, as well as indeed to all coordinators of projects funded by the Socrates Programme in the last seven years, who may consider their project outcomes as interesting for learners and teachers in rural areas. The response of projects was very low, which, on the one hand, reinforced the first finding, i.e. that projects 'die' soon after their contractual end, and, on the other hand, lead RuraLEARN to the decision to look more widely for projects funded by other EU programmes or other sources which may show a considerable impact value related to the promotion of lifelong learning in rural areas.

4. Beyond the Socrates programme

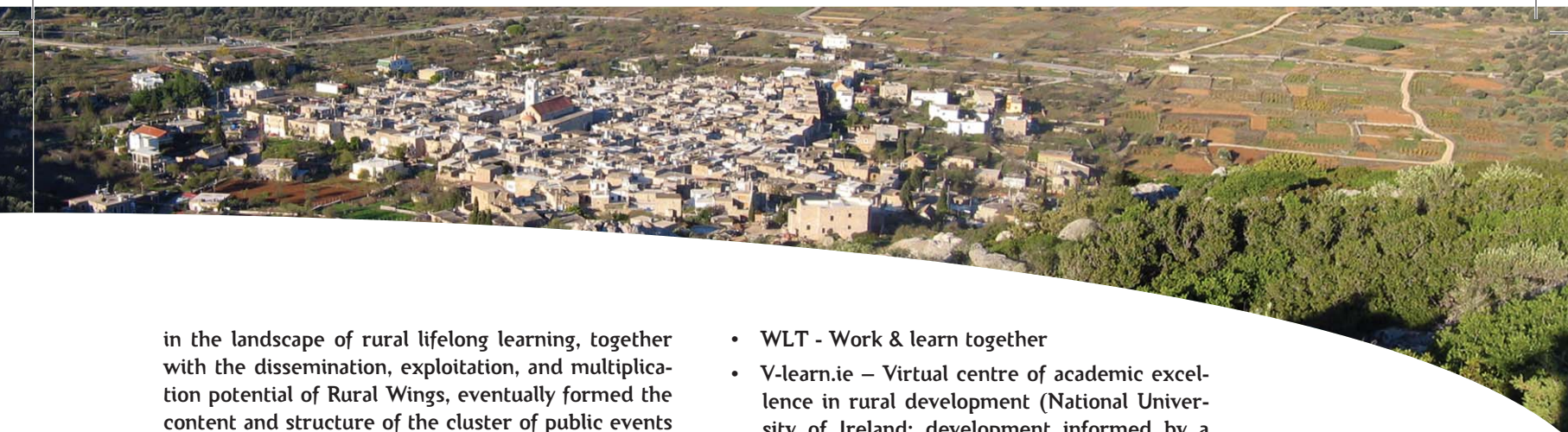
Indeed, further research into the state-of-the-art of projects in the cross-section of lifelong learning and rural development that was conducted, as well as the

response of many researchers and field practitioners to the calls issued by the project, soon revealed that there are many EU-funded or other-funded interesting projects and initiatives realised or going on in this field in Europe, many more than just the Socrates-funded projects. In combination with the considerably lower response and interest in RuraLEARN from most of project partnerships funded at some point by Socrates, this reality lead RuraLEARN to adopt a wider focus, valorising all projects, initiatives, and good practices identified (including the forty identified Socrates-funded projects, which are comprehensively presented in the RuraLEARN web-portal).

The interest expressed by project leaders, and the projects identified by the partnership, revealed the following emerging sub-areas of rural lifelong learning:

- School education
- Adult education
- Higher education
- Professional development
- Better understanding of the rural space
- Fight against the digital divide
- Visionary approaches to learning and development issues

The population of all these categories with the best projects and initiatives known to RuraLEARN became eventually a priority for the organisation of the RuraLEARN valorisation campaign. In addition, the Rural Wings project, an ongoing large-scale FP6 initiative for the provision of lifelong learning opportunities to rural citizens through the exploitation of satellite broadband, presented a particular interest, as it collects various tested and successful project outcomes of EU-funded projects focused on learning, in order to make them available to, and usable by, rural citizens. The above mentioned emerging areas



in the landscape of rural lifelong learning, together with the dissemination, exploitation, and multiplication potential of Rural Wings, eventually formed the content and structure of the cluster of public events organised in Chios, Greece, in June 2007.

After all calls, invitations, detailed communications with project partnerships and the completion of the selection processes, the eventual list of projects and initiatives whose concepts, approaches and outcomes were actively valorized through the RuraLEARN public events is the following:

Socrates Programme projects

- MUSE - Multigrade school education
- NEMED - Network of multigrade education
- SeniorLearning
- ICT4T - ICT training for trainers - Meeting senior learner needs
- CAREERGUIDE - Career guide for schools
- PROSOLVA
- TERECoP - Teacher education on robotics-enhanced constructivist pedagogical methods

FP5 and FP6 projects

- IDARI - Integrated development of agricultural and rural institutions (FP5 Quality of life and management of living resources)
- Rural Wings (FP6 Aeronautics and space)
- BASE2 (FP6 Aeronautics and space)
- C²R – Collaboration²Rural (FP6 IST)
- VEMUS - Virtual European music school (FP6 IST)

Leonardo da Vinci projects

- Rural-eGov

- WLT - Work & learn together
- V-learn.ie – Virtual centre of academic excellence in rural development (National University of Ireland; development informed by a Leonardo supported pilot project)

INTERREG projects

- TELEACCESS - Creation of telecenters to support learning entrepreneurship and access to Information Society in isolated areas (IIIB CADSES)

The LEADER Programme

- Case-studies from Ireland

Other projects and initiatives at the national, regional or local level in Europe

- ZEUS – Satellite web of remote schools, Greece (General Secretariat of Research and Technology, Ministry of Development)
- Innovation Pole of Crete, Greece (General Secretariat of Research and Technology, Ministry of Development)
- GoOnline Programme - Training support, Greece (Operational Programme “Competitiveness”, Ministry of Development)
- Entrepreneurship courses in universities: the case of the Organic Chemistry Lab at the University of Crete (Ministry of Education)
- Ypaithros project, Greece (Regional Program of Innovative Actions CRINNO: Crete – Innovative Region)
- Initiatives of the various culture associations in rural communities, Greece
- Laboratorial centres of natural sciences (EKFE) in remote and rural areas, Greece

- The science museum of Chios, a school-based initiative, Greece
- Rural education project, Romania (Ministry of Education, Research and Youth; co-financed by the World Bank)
- DINSETT - In-service distance training for teachers of English, Romania (British Council Romania, Ministry of Education and Research)
- Universities of applied sciences in smaller provinces, Austria
- GIVE – Globally integrated village environment, Austria
- Various projects of the Rural Economy Research Centre (e.g. the Furniture College), Ireland
- ADOPT - Model to strengthen the community voice in Ireland's local development process, Ireland
- Spatial microsimulation based planning support systems, UK (Universities of Sheffield, Leeds and Manchester)
- CEDER –Group of rural development of the Serranva de Ronda, Spain
- Garantia Social, local action group Ason-



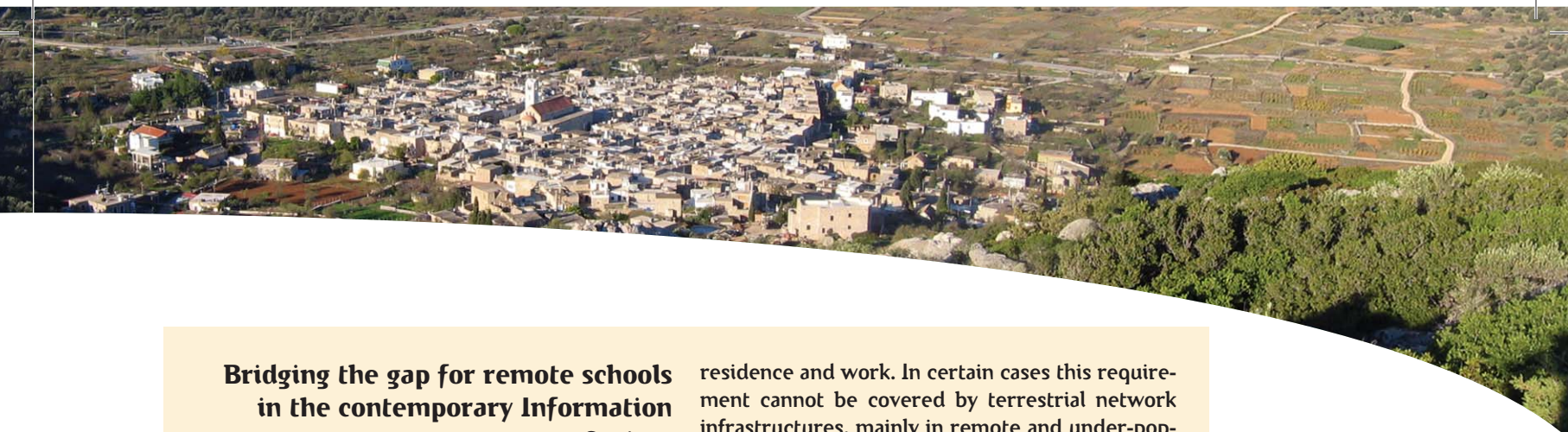
Agóera-Trasmiera, Spain

- Rural partnership programmes, Lithuania
- HR development programmes for rural SMEs by the Swedish Trade Council, Sweden
- Knowledge – a chain between information and development, a local initiative, Romania
- Keep alive our tradition of painting easter eggs, a local initiative, Romania
- Outdoor environmental education in small country schools in Europe, a local initiative, Romania
- European Gurahont – mine, yours and everybody else's, a local initiative, Romania
- “Forest Management Expert” and “Forest Reproductive Sources” – training and certification, a local initiative, Romania

Projects outside Europe

- The One-Laptop-per-Child Project, USA
- Athabasca University's approach to rural development using e-Learning, Canada
- The research projects on rural education of the Instituto de Estudios Peruanos, Peru
- The eco-efficiency analysis program for the area of the Aegean, Institute for Sustainable Development, SUNY SB, USA

As an example of the cross-programme approach that many successful players in the field follow, and which justified a much wider scope for RuraLEARN, we mention here a long series of projects in Greece, which all, each one in a different way, have added valuable input in our knowledge of the field of life-long learning for rural development in Europe. This example is presented in the following case study.

An aerial photograph of a village in Greece, showing a dense cluster of small, light-colored buildings with red-tiled roofs. The village is surrounded by green fields and some trees. In the background, there are more buildings and a road. The overall scene is a typical rural landscape in Greece.

Bridging the gap for remote schools in the contemporary Information Society

A case study of the efforts of Ellinogermaniki Agogi, Greece

The demand for broadband

Broadband, a point where state-of-the-art telecommunication technologies meet with the society, the economy, the various policies, overall with the human nature, has emerged as a terminus of great importance in our times. The term refers to the objective of creating a technologically advanced and socially innovative environment, in which fast, permanent, easy and affordable internet connections will support the growth of new digital applications and services aimed to cover all needs of the modern human being – no matter where people are located, nor what they do. Our access or not to broadband services is therefore emerging as the main criterion for our participation in the Information Society. Those with no access to “fast internet” are considered to be “digitally excluded”, abstracted from all the challenges and opportunities of our times, condemned to marginalisation in modern economy. Therefore, securing broadband for all constitutes a priority for governments and organisations worldwide – and a declared priority of the Greek state.

Difficulties in remote areas

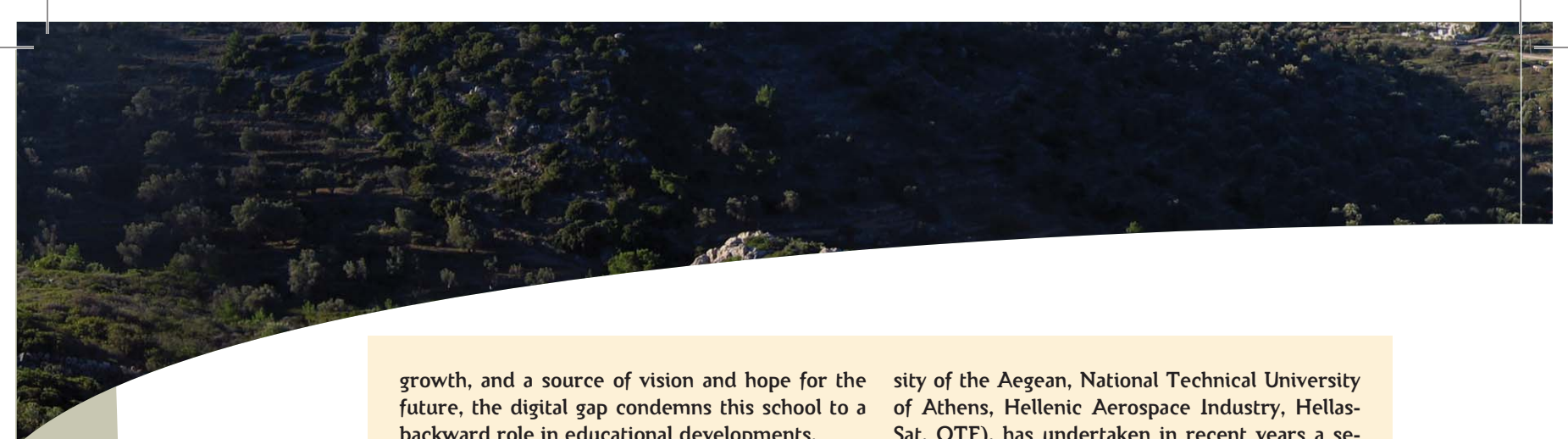
An innate objective of the broadband movement is to cover the entire population, independently from the characteristics of a person's place of

residence and work. In certain cases this requirement cannot be covered by terrestrial network infrastructures, mainly in remote and under-populated regions, where investment in terrestrial equipment is economically disadvantageous.

In Greece, the extensive mountains, the open seas, the great number of islands, and all these combined with the demographic decline of rural areas, compose a picture in which it is difficult for terrestrial infrastructures to correspond to the contemporary demand for broadband everywhere. The digital disadvantage of the country is being recorded in European comparisons, while the digital gap between urban and rural regions is permanently widening, as broadband is developing swiftly in the cities.

Remote schools

The negative consequences of the digital gap become particularly evident in the small remote schools in the Greek provinces, which are generally recognised to carry out work of national importance as they offer to the children living in mountainous and insular regions the access to education which all Greek children are entitled to. Education generally is a space of innovative applications supported by broadband technologies, as the educational system constantly seeks to exploit all possibilities offered by new technologies for more effective and efficient education. Unfortunately, the exclusion of remote communities from the contemporary opportunities first of all affects these “borderers” of the educational system, the small schools functioning in remote areas. At the same time when for each remote community the school constitutes a point of reference, a tool for



growth, and a source of vision and hope for the future, the digital gap condemns this school to a backward role in educational developments.

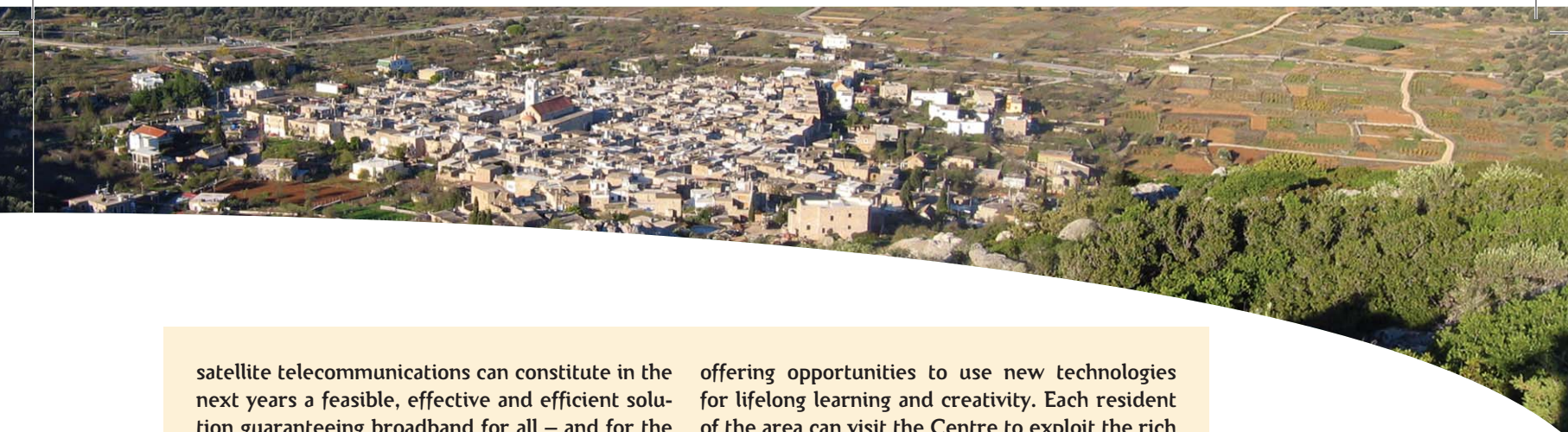
The digital disadvantage of the remote school is only part of a wider disappointing picture. The function of these schools is becoming more and more problematic, as they suffer the consequences of a constantly widening economic and social gap separating urban and rural regions. The problems that these schools face are connected, on the one hand, with the small number of school-age children in today's rural communities, but importantly also with the unwillingness of many new teachers to serve in these schools. In many of the remote schools, namely those known as "multigrade", the small number of students justifies the employment of one only or few teachers, who nevertheless are expected to respond to the needs of a full primary school. These particularly demanding conditions, for which teachers are not adequately prepared through their initial training, as well as the isolation, the lack of support, the exclusion from the usual professional development procedures, and more generally the decline of the remote rural communities, do not offer to the young teacher any motivation to stay in the school and build more permanent ties with the local community.

Reversing the picture: fast internet from the satellite

Recognizing the need to fight digital exclusion and support the remote Greek school, Ellinoger-maniki Agogi, in collaboration with prominent scientific and technological institutions (Univer-

sity of the Aegean, National Technical University of Athens, Hellenic Aerospace Industry, Hellas-Sat, OTE), has undertaken in recent years a series of initiatives for the exploitation of satellite broadband telecommunications for the benefit of students, teachers, and all residents of Greece's remote areas, in the framework of pioneering European and national research projects (ZEUS, RURAL WINGS, TELEACCESS, HERMES). Already ahead of the launch of the Greek satellite in 2003, recognising the core role that satellite telecommunications would be asked to play for a balanced digital development without discriminations, the Research and Development Department of our school started and is still carrying out research testing the possibilities offered by satellite broadband to the Greek provinces. The focus of all this effort is on the remote school.

Approximately 30 small rural schools are equipped with satellite internet and a multitude of opportunities to use rich educational and teachers' training applications. In this way, education in the mountains and on the islands of our country is coming to the first line of developments, for the first time in many decades: broadband is becoming an everyday reality for students and teachers from the Argyri in the Municipality of Acheloos (known as the "most remote municipality of Europe") to some distant beaches of Crete, from Monodendri in the mountainous Zagorochoria down to the islands of Amorgos, Lipsoi, Kalymnos, Karpathos and Rhodos, from the villages of Orestiadia in the northeast to mountainous Messinia, from the mountains of Cephalonia across to Mesta in Chios. The emerging results of this work agree with corresponding international experiences, that the



satellite telecommunications can constitute in the next years a feasible, effective and efficient solution guaranteeing broadband for all – and for the remote educational communities in particular.

The idea in Greece is already mature. The Greek government is planning to supply remote public services with bidirectional satellite broadband access – and it is not a coincidence that 2/3 of these installations will be carried out in about one thousand remote schools. The concept is gaining more and more publicity. In the 2006 International Exhibition of Thessaloniki, in the kiosk of the Hellenic Aerospace Industry, there was a live connection, via the Greek satellite, with the school in Monodendri, Epirus, and the Teacher Training Centre of Ellinogermaniki Agogi in Pallini, Athens. Among the many officials visiting the kiosk who conversed with the teacher and were informed about the needs of remote schools was also the Minister of Foreign Affairs, Ms. Dora Mpakogianni.

With a human focus

These research efforts focus particularly on the human potential and the symbolisms of remote schools. With the school as a point of reference and departure, the possibilities of, and the profits from, satellite broadband are demonstrated not only to teachers and students, but more widely also to each member of the remote community. Integrated broadband services are designed and applied, which upgrade the school into a local Learning Centre, a place of pedagogic innovation and quality educational services addressed equally to children, their teachers, and each active citizen. The school multiplies its functions,

offering opportunities to use new technologies for lifelong learning and creativity. Each resident of the area can visit the Centre to exploit the rich possibilities offered according to their own particular needs. The conditions are thus created for the development of digital applications that will cover real needs of the Greek countryside for better education and training services, but also for better services of administration, health, communication, and generally more favourable conditions for the growth of entrepreneurship and local development.

Among all persons of a small rural community, in the schoolteacher the research team sees a basic recipient of broadband services, as well as an ally in the fight for digital growth and inclusion. Already in 2000, the particular needs of teachers working in remote schools were diagnosed, and efforts were made to provide such teachers with quality training and support services focusing on the use of innovative pedagogic approaches and new technologies (MUSE and NEMED projects). Far beyond this, however, the teacher of the remote school is seen as an agent of change, the person who may instil a new digital and lifelong learning culture into the rural community. Teachers, together with their students, will practically demonstrate and promote the new possibilities, creating vision for the future. Through the provision of support and further professional training, teachers of rural regions are turned into the catalysts of new developmental efforts, not only in their schools, but more widely also in the local communities.



5. The RuraLEARN objectives

In this context, the RuraLEARN project, in its one-year life-cycle, has achieved multiple objectives:

- To valorise the results of EU-funded and other projects and initiatives in the field of rural learning, through a carefully designed and targeted campaign of dissemination, exploitation, and outreach to stakeholders, policy-makers and the wider public. As main vehicles to this end were conceived the organisation of a conference, parallel workshops, and an open fair concerning European cooperation in the field of rural learning.
- To inform the public and raise awareness in Europe, from the local to the EU level, of the challenges and opportunities raising in the intersection of rural development and learning initiatives. An integrated information campaign as a whole was conceived as serving to this end, based not only on gathering project data and outcomes, but importantly also analysing and interpreting them within a coherent conceptual framework. Publications and networking activities were also envisaged helping for the achievement of this objective, while a European competition was seen as the appropriate vehicle for approaching and motivating groups of vital importance for the future of rural Europe, i.e. rural teachers and students.
- To train stakeholders in rural and remote areas how to make best use of the opportunities offered by the contemporary technological and political environment in Europe in order to develop their own grass-roots initiatives for the promotion of rural development through lifelong learning. The project planned to achieve this through workshops integrated into the

envisaged conference in a bottom-up approach tuning rural learning issues to local needs.

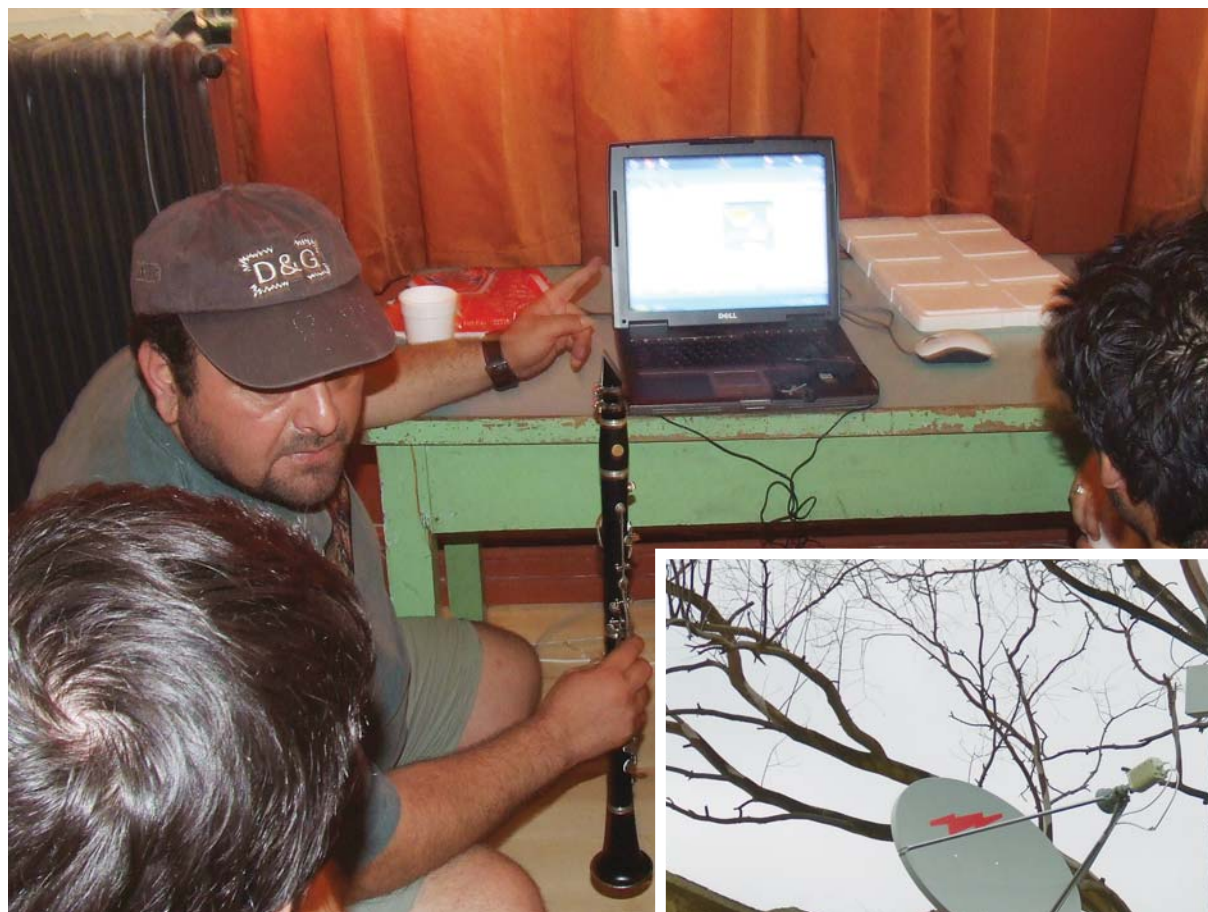
6. The RuraLEARN events and activities

As a realisation of the above described vision and peak of the research on successful rural learning projects, the RuraLEARN international cluster of public events was organised in June 2007. It was hosted by the remote rural community of Mesta on the island of Chios, on the periphery of Greece and the EU, between the 24th and 27th of June 2007, brought together academics, agents of applied research, field practitioners, and policy makers from Europe and beyond who investigate ways of promoting lifelong learning, in the widest sense, in rural communities and geographically disadvantaged areas.

The strong bottom-up RuraLEARN approach should be particularly highlighted. The rationale behind it lies in the aspiration to better tune the RuraLEARN intervention and rural learning initiatives more widely, to local needs. In addition, the public events, as well as the preparatory and follow-up activities before and after their organization, were designed and implemented on the basis of a multimodal approach aiming to exploit diverse media and communication modes to achieve the best possible outreach of the campaign to a wide array of target groups and persons, in order to achieve multiple impact.

The RuraLEARN public events planned and realised included the following:

- An international conference, which brought together academics, agents of applied research, and, most importantly, field practitioners from many European countries, who have been supported by the EU or other funding sources to investigate ways of promoting lifelong learning,




in the widest sense, in rural communities and geographically disadvantaged areas in Europe and beyond. Conference participants presented the outcomes of their projects, shared their experiences from this work, and discussed towards drawing common conclusions and formulating recommendations for the future.

- A series of thematic workshops, each one delving deeper into a major thematic line of the



rural learning field. The seminar workshops particularly emphasized practical issues, aiming mainly to helping stakeholders in rural and remote areas to make use of the opportuni-



ties offered by the contemporary technological environment and the policies of the European Union in order to develop, or participate in initiatives for European cooperation in the education field.

- An open Rural Learning Fair, disseminating the RuraLEARN concepts, as well as the outcomes of all projects invited, to the wider public, in a truly open, attractive manner.
- A competition for the “Most Brilliant Idea for Better Village Life through Learning”, aimed particularly at school students and teachers in rural settings in Europe. These groups have been regarded by the project as a most critical factor for the initiation and take-up of educational innovation and a lifelong learning culture in the rural remote rural communities.

The successful organisation of the events on the island of Chios in summer 2007 required extensive preparations. The preparatory activities, which set the ground for the successful organization of the events, were the following:

- Design and planning of the overall campaign.
- Survey of Socrates and other projects, to identify the candidates for valorisation.
- Evaluation of progress and results, and selection of projects whose outcomes were then valorised through the public events.
- Contact with selected project coordinators and/or partners and invitation to participate in the events.
- Definition of the content for the user-centred workshops.
- Preparation of the programme of events.
- Preparation of the competition.
- Development of the campaign web portal,

www.ruralearn.eu.

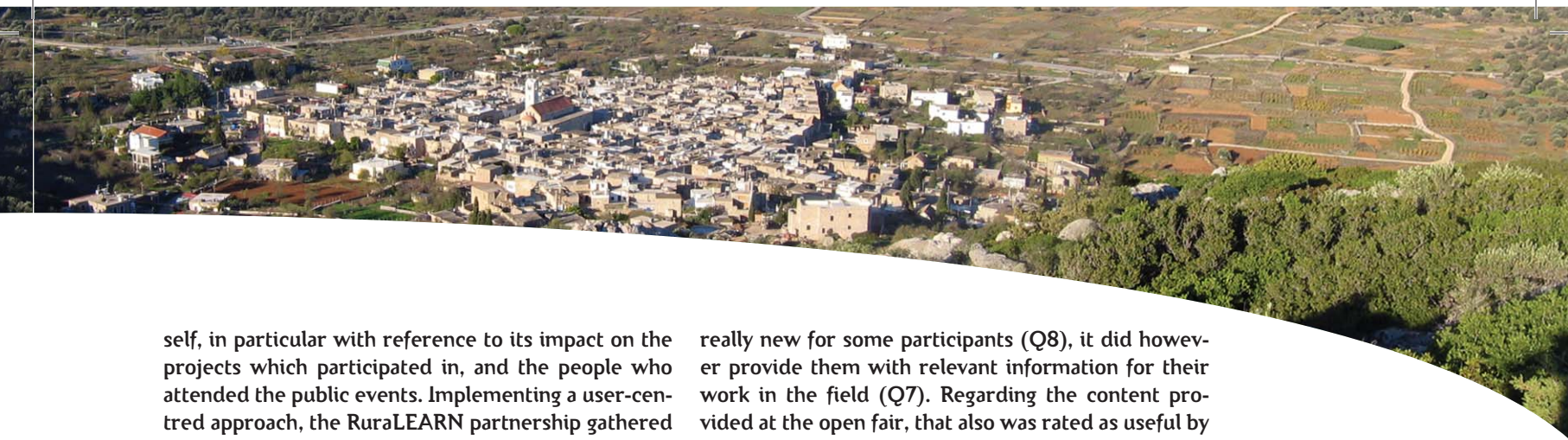
- Development of a plan for the evaluation of the project.
- Development of a plan for the valorisation of the project.

The follow-up activities that took place after the organization of the public events and are concluding the RuraLEARN project have mainly referred to the realisation of a targeted promotional and information campaign disseminating the outcomes of the project, including the following:

- Drafting, publication, and distribution to policy-makers and stakeholders, of a this Report on Rural Learning for Development in Europe, presenting the conclusions and opening roads for further action at the European level.
- Identification of, and dissemination via, existing bodies and networks of bodies involving players in the field of rural learning with a potential for relaying such information.
- Momentum preservation through the initiation of procedures among some of the participants for the set-up and consolidation of a European Association for Rural Learning, as a means for the dissemination and exchange of information and experiences about innovatory initiatives in rural development through learning.
- Development and publication of diverse information material for wide distribution.
- Project final report to the European Commission.

7. Evaluating RuraLEARN: a new common starting point has emerged

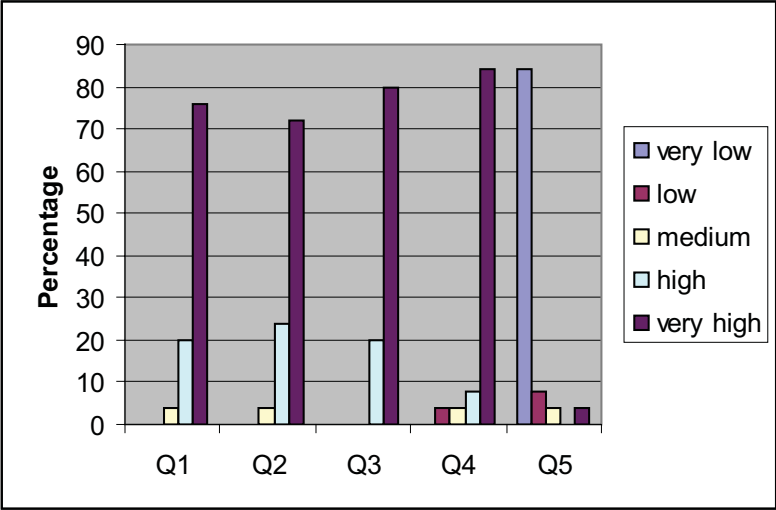
The RuraLEARN project aimed to evaluate also it-



self, in particular with reference to its impact on the projects which participated in, and the people who attended the public events. Implementing a user-centred approach, the RuraLEARN partnership gathered and analysed data through a questionnaire administered to the participants after the completion of the events, as well as by collecting and comprehending qualitative data through interviews with key persons and observation of user involvement at the various stages and sites of the campaign. In this context, of paramount importance was a reflection process that was initiated in the hosting rural community of Mesta in Chios, Greece, after the completion of the public events, from which valuable conclusions were drawn about the impact of the campaign on local rural citizens.

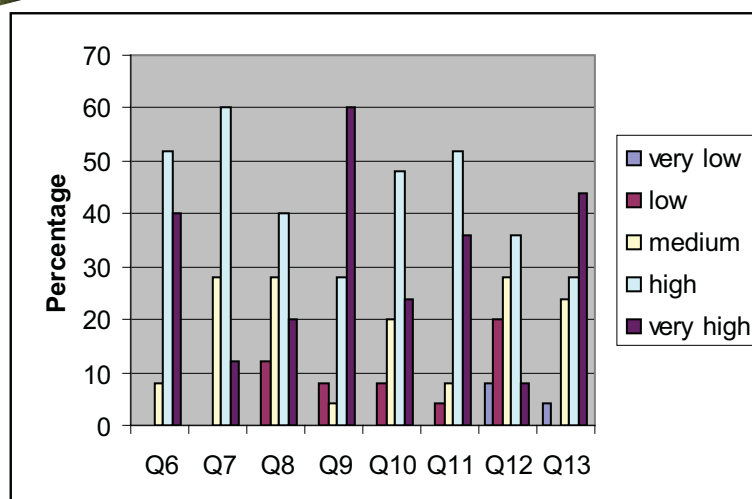
The RuraLEARN experience has been perceived as particularly successful by all people and organisations involved, in any of the diverse ways of involvement in the RuraLEARN initiative. It was indeed a timely intervention, bringing to the lights of publicity on ‘rural learning’, an issue of tremendous importance for the future of rural Europe – and its urban counterpart. The data collected through an evaluation questionnaire that was sent to all registered participants via e-mail in the week after the public events, presented in Figures 1 and 2, show an interesting aspect of this very positive stance. From the rating of the questions 1-3 (Q1-3), it can be concluded that the organisation of the conference and the provision of organisational information to the participants was very good. Additionally, choosing a rural area as a venue was appreciated (Q4) and having one long event instead of two shorter events was preferred by the majority of the respondents (Q5). Further, the time of discussions for presentations (Q6) was adequate for most of the respondents, and chances to discuss with people from other countries were given to the majority (Q9). Although the presented information was not

really new for some participants (Q8), it did however provide them with relevant information for their work in the field (Q7). Regarding the content provided at the open fair, that also was rated as useful by the respondents (Q10). Some variety was recorded in the expressed preferences for more in-depth information (Q12). The use of ICT for presentations was generally reported as appropriate for the content (Q13). In general, the expectations about the conference were met (Q11).



- Q1: The information sent out in advance of the conference was sufficient.
 Q2: The www.ruralearn.eu website contained all relevant information for the conference.
 Q3: The organisational arrangements (accommodation, travel, meeting venue, explanations provided etc.) for the conference were appropriate.
 Q4: It was a good idea to choose a rural area as a venue for the conference.
 Q5: I would have appreciated two shorter events instead of one long event.

Figure 1: Evaluation of Organisational issues by participants: Percentages of rating for each question (Q1-5) on the five-point scale



Q6: There is/was enough time for discussions during the sessions.
 Q7: The presentations provided me with relevant information for my work in the field?
 Q8: The presented information/ projects were new to me.
 Q9: There were enough chances for exchanging experiences with people from other countries.
 Q10: Information provided on the exhibition/fair was useful for me.
 Q11: The content provided at the conference/ fair met my expectations.
 Q12: I would have liked to have more in-depth information on certain topics.
 Q13: The use of ICT for presentations was appropriate for the presented content.

Figure 2: Evaluation of content and presentations by participants: Percentages of rating for each question on the five-point scale

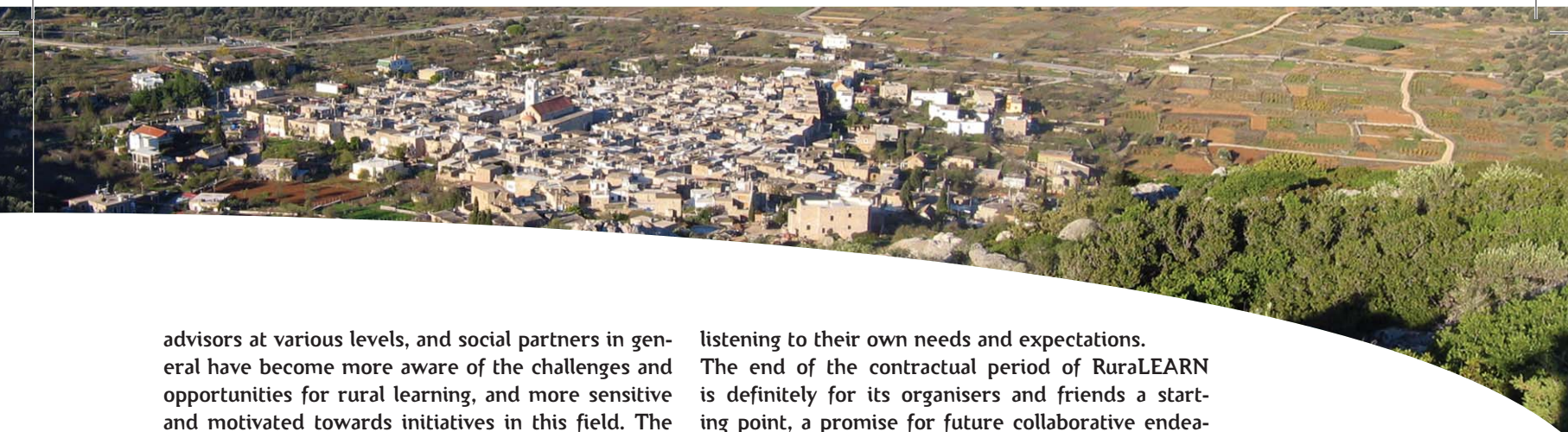
This success, reflected in the comments of all participants, can be traced back to various critical factors. It has been very important that the groups targeted by the project have been many and diverse. Beside the added knowledge value for all participating institutions and their activities and partners in the field of rural learning, the RuraLEARN project achieved further-reaching impact at all levels of stakeholders directly and indirectly involved in rural learning, with a dual focus on both local communities and the wider educational community. The project will had the op-

portunity to reach:

- the various stakeholders invited to the events, including people and institutions active in projects and initiatives, policy makers, inspectors and advisors at various levels, and social partners; importantly, the audience included policy makers in education and development from the local up to the national and government level (e.g. a Greek Government Minister for Development);
- the tourists that happened to visit Chios, a tourist destination in the Aegean Sea during summer, during the campaign;
- invited visitors from outside Europe (the Turkish coast lying opposite to the island, Southern Asia, South and North America), thus extending the impact of the project far beyond Europe;
- most importantly, to the local communities themselves, including rural citizens in their various capacities as parents, adult learners, students and teachers from all levels of education represented on the island (pre-school to vocational training and university).
- In addition, the island of Chios, lying exactly at the eastern edge of EU, is a place frequently hosting migrant and itinerant workers from Asia and their children, who may have also received the messages promoted by the RuraLEARN campaign.

The anticipated impact of the project on the various target groups is diverse, but in all cases leading to advanced opportunities for initiatives promoting rural development through lifelong learning.

People active in EU-funded actions will use this experience to co-develop ideas for further work promoting rural learning, both locally in their countries and at the European level. Policy makers, inspectors and



advisors at various levels, and social partners in general have become more aware of the challenges and opportunities for rural learning, and more sensitive and motivated towards initiatives in this field. The general public has also been informed and mobilised for the causes of rural learning. Through tourists and visitors, the promoted projects and concepts have become known across and beyond Europe, achieving an interaction of the European approach to rural learning with other cultures and approaches. Last, but not least, all local citizens, the rural communities in general - not only those directly involved in Chios, but those in all participating countries and across Europe – have learned more about possibilities for international cooperation, and particularly about opportunities for the promotion of rural development through educational and other learning initiatives, through concrete examples and schemes foregrounding their own local needs and priorities.

In all aspects presented above, there has been a strong innovative nature. The RuraLEARN project may be unique in having looked at a less attended yet crucial aspect of education and learning in Europe, i.e. rural learning as a vehicle for local development, thus opening up new roads for European education and learning policies, initiatives and projects. It has done so by scanning and valorising work accomplished across the Socrates Programme and other EU programmes over the last ten or more years, involving also partners from those areas of education that have so far focused less on rural issues, thus triggering a better distribution of EU-funded efforts connected with rural issues. The communication campaign envisaged took place within rural communities rather than in 'sterilised' urban research communication settings, without losing in target groups and outreach. But most importantly, it involved local people and rural 'players' from all over Europe, and helped them in practice to become active European citizens,

listening to their own needs and expectations.

The end of the contractual period of RuraLEARN is definitely for its organisers and friends a starting point, a promise for future collaborative endeavours in the field of rural learning. "Rural learning" emerged throughout RuraLEARN as a fascinating, emerging and expanding field standing on the cross-section of lifelong learning and rural development, definitely worth of further and deeper investigation at the European level. The manifested interest of various stakeholders, from the rural communi-

Some comments from participants

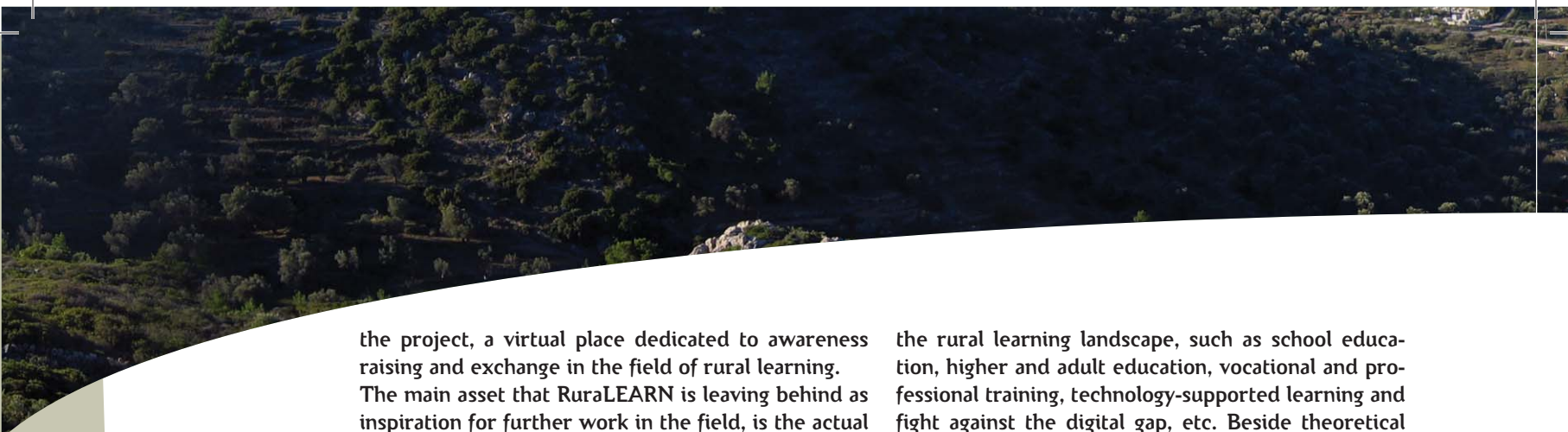
"It was indeed a great success - the discourse that you laid the foundation for is extremely important. And I learnt a lot from this conference - it certainly should lead to further exchange and cooperation."

"The event was exceptional!"

"Very good idea to place the event regarding rural life matters within a rural community. Furthermore, staying in Mesta has been a unique experience."

"It was a very well organised conference and it showed the responsibility and readiness of the organisers to organise such a big conference that can take place in Greece."

ties themselves to high-level academics and national government representatives, clearly demonstrated that this field deserves much more publicity and attention, through further initiatives building on and expanding the RuraLEARN paradigm. As a response to this need, RuraLEARN contributes its promise to keep the RuraLEARN web portal, available at www.ruralern.eu, alive, updated with all information about



the project, a virtual place dedicated to awareness raising and exchange in the field of rural learning. The main asset that RuraLEARN is leaving behind as inspiration for further work in the field, is the actual content of the vivid discussions and active collaborative exchanges that took place among more than 150 participants in the village of Mesta, on the Greek island of Chios, between the 24th and the 27th of June 2007. As evidence and heritage of this kind, the following section of this volume presents selected papers corresponding to the presentations made in the RuraLEARN Conference and Workshops.

8. The conference and workshop proceedings



RuraLEARN conference and workshop participants presented in Chios the outcomes of their applied projects or academic endeavours, shared their experiences from this work, and discussed towards drawing common conclusions and formulating recommendations for the future. The setting encouraged the cross-fertilisation of ideas from diverse disciplines and fields of practice sharing an interest in the theme of the conference. Particular emphasis was placed on bringing academic

research and field-based initiatives and projects into close contact, mutually productive and beneficial exchange. Theory, methodologies, experiences and outcomes were discussed in depth so as to become more widely known to the academic community, the various stakeholders and the wider public. Delegates' presentations were grouped into a series of thematic workshops which delved deeper into major areas of

the rural learning landscape, such as school education, higher and adult education, vocational and professional training, technology-supported learning and fight against the digital gap, etc. Beside theoretical foundations, the workshops particularly emphasized practical issues, aiming mainly to make stakeholders in rural and remote areas aware of the opportunities offered by contemporary technology and policies in the field of education and lifelong learning.

The rest of this volume puts together selected papers corresponding to the presentations made by delegates during the RuraLEARN Conference and Workshops. This part of the volume is organised into eleven major sections, largely corresponding to the sessions and thematic workshops of the conference. After a visionary introduction to the challenges for lifelong learning and development in rural areas, separate sections follow which focus on the various levels of education and lifelong learning activities, starting from school education, through to higher and adult education, and professional development. Then some more general proposals for ways to approach learning and development in the rural context are put forward, followed by a substantial part of this volume devoted to the challenge of tackling the digital divide for the purpose of promoting lifelong learning in rural areas. As part of this, a dedicated workshop of the Rural Wings project focuses in particular on issues of change and community empowerment through the provision of broadband to remote rural communities, as well as demonstrating two of the learning and development activities proposed. Quite appropriately, this volume of the RuraLEARN Conference proceedings closes with some distinguishable local voices from Chios and Greece, who through their theoretical or practical endeavours shed further light onto the questions connected with the vision of learning as a vehicle for sustainable development in rural Europe.



Main Conference





Introducing the challenges for lifelong learning and development in rural areas

The Essence of Being Rural: Reality and Vision

Kostas Tsolakidis

University of the Aegean, Greece

1. Introduction: The rural school as ideal school

If we ask children to draw a house, most of them will respond by drawing the well-known little square house with the triangular reclining red roof. This is a prototype and stereotype that hardly exists in today's reality.

For the people that do not go into depth analysing children's drawing, it is worth asking why kids all over the world are drawing this specific drawing even if they live in towns and stay in flats and even if they have never see in this kind of construction. It seems that this little house in children's world represents the image of an ideal house.

The same occurs with the image of a school. Children's drawings representing a school is a picture of a teacher surrounded by a few smiling kids and she/he is communicating cordially and amicably with them. The building of the school is very near the chil-

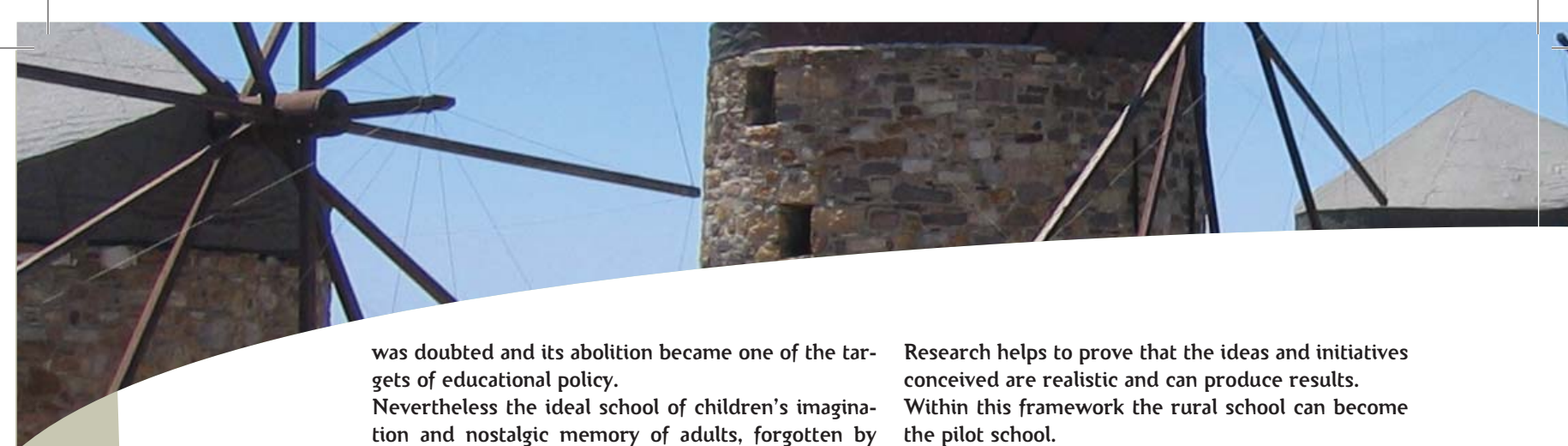
dren's prototype of the house: small, clean, with a reclining roof.

It is impressive how near this picture of the ideal – cell school is to the appearance of a rural school.

This ideal school of the children's drawing, which is the first form of school that two centuries ago started offering mass education, has passed from many stages. The development of mass education in combination with the development of big towns, created the need for abandoning the multigrade school model. Its replacement by schools that could meet the new challenges and needs took place soon.

The ideal school remained as the school of need, present only in remote and isolated parts of each country.

Desertion increased the weaknesses of the small school. The educational system for many reasons gave emphasis and priority to the big school in the town. Multigrade school, the school of need that continued to provide education to the inhabitants of the remote areas became the problematic school. The quality of education that was provided in this school



was doubted and its abolition became one of the targets of educational policy.

Nevertheless the ideal school of children's imagination and nostalgic memory of adults, forgotten by educational policy makers, survived in all countries -irrespective if they were developed or not-, irrespective of changes in the educational system.

The survival of multigrade school can be explained by the fact that in many cases, the conditions in an area are such that no other form of school could operate. We are obliged to accept reality. Multigrade school will continue to be the school of need for remote areas. Having this in mind, is there a way that this school stops being problematic and turns its weakness into comparative advantages? Is there a way that this school becomes the small ideal school that offers quality knowledge, helps in developing attitudes and perceptions and helps its pupils socialise within a climate of cordiality and affection?

An immediate solution of many schools' contemporary problems is sought in technology. Technology has conquered most sectors in life and is about to conquer education.

Contemporary Information and Communication Technologies (ICTs) promise a lot for education. They promise to bring new methods and techniques and to reverse the logic of economies of scale in this field.

Is there a chance that the rural school can exploit the opportunities that technology offers to solve its problems? The theory and the state of the art of contemporary technology today support such a perspective. Rural school can become the prototype school of technology, at low cost.

To materialise such a prospect, one needs the activation and interaction of two components: Inspiration and research

Inspiration helps in conceptualising new methods and techniques.

Research helps to prove that the ideas and initiatives conceived are realistic and can produce results.

Within this framework the rural school can become the pilot school.

It can be the school of research available for the study and application of new contemporary educational methods that rely heavily on technology.

It can become the school of communication conveying the messages and information to the usually technology starved countryside.

It can become the school of education not only for its students but also for the inhabitants of the rural areas that they find access to a new, complex, digital, distant world, worth visiting and investigating.

In this way, a new path is etched so that the small, rural school can become an ideal school and if something like this happens how wonderful and how significant the consequences could be! Misery will disappear, education of high quality will be provided, technological education of students and teachers, communication will become a reality, intercultural approaches, projects, new school atmosphere and a whole new prototype education will be achieved.

The notion that the small school of utopia becomes the contemporary real school is a hopeful perspective.

2. Rural and multigrade schools in rural areas today

Rural areas depend economically on agricultural production; usually the societies inhabiting these areas have experienced only limited shifts from the primary sector into activities of other sectors. In most cases rural areas are located far away from urban centres and access to them is difficult. They suffer from remoteness and isolation. They are low- populated and have shortage of resources and lack of expertise. The rate of development is low in rural areas



Introducing the challenges for lifelong learning and development in rural areas

and the employment opportunities are scarce. Scale economies cannot develop and a general lack of facilities in health, education and entertainment indicate a low quality of life. These characteristics form a typical profile of a rural area and in such an adverse environment there is very little chance for diversity and change.

Multigrade school is the type of school in which the teacher in one classroom has to teach students of more than one grade and more than one age group [1]. Curriculum and educational material differ for each age group or for each grade, hence the multigrade schoolteacher addresses his/her teaching separately to each group, while he/she has to provide other tasks to occupy effectively the other groups in the classroom. Many schools in rural areas are multigrade and this is why the terms rural and multigrade schools coincide frequently.

Multigrade schools are a European and a world phenomenon. Usually they are found in isolated, low - populated, remote rural areas, small islands and villages. In fact they can be found mostly in areas with adverse weather conditions or in areas with difficult access. They exist in Northern Europe (e.g. 30% of Finland's schools are rural schools) as well as in Southern Europe (e.g. 42% of schools in Greece are rural). Although multigrade schools form an alternative educational and pedagogical system, few consider that their existence is (or should be) the result of an attempt to apply educational alternatives. Multigrade schools are simply a realistic solution of necessity in cases where mono-grade schools are not viable or are unaffordable.

The quality of education offered by multi-grade schools is sometimes questioned, providing a case against equal educational opportunities on primary level. There is a number of parameters that act against quality, such as:

- The application in these schools of a centrally

designed analytical programme that is developed with the aim to meet the requirements mostly of mono-grade and not of multigrade schools;

- The geographic and social isolation of rural areas that puts multigrade schools at the low end in teachers' preferences. This means frequent transfers of schoolteachers from the area, inexperienced teachers and limited chances for professional development;
- The multidimensional job that rural schoolteachers have to play in order to meet the educational, social and managerial targets set by the educational system in general and each specific school. The fact that the teacher has not the chance to share with other colleagues these duties makes his/her job very difficult.
- The unavoidable pressure of teaching time, the unfair learning time per student compared to conventional schools, the weak antagonistic learning environment, the absence of specialized teaching subjects (music, foreign languages, sports, technology related subjects, arts etc)
- The small size of the school community, which sometimes is below a critical level, and does not allow the development of scale benefits

In spite of these disadvantages, there is a range of characteristics that act in favour of rural schools. Among them one should point out:

- Development of self adjustment and self-learning skills
- High coherence in the relations between students and the teacher
- Adaptability of teachers and pupils to a more demanding environment and to an alternative pedagogical practice

- Relatively fast and more effective pupils' socialization and integration in a small society
- Stronger bonds of the school community with the local community

3. The educational role of rural schools

It is well accepted that the role of school is to generate and transmit knowledge, to help the pupils in socialisation and to prepare them for their future entrance in the socio-economic life. An evaluation of the above-mentioned features of rural schools, may imply that these schools have disadvantages in some contexts, but are competent as far as other roles are concerned.

With respect to knowledge transmittance, the efficiency of rural schools is debated. Yet inefficiency in this issue may be attributed to the fact that these schools operate following a curriculum that has been developed to fit mono-grade schools and to apply traditional, classical didactic and pedagogical methods. However, it is often the case that such a curriculum and such educational methods are criticised, their effectiveness is doubted and the introduction of alternative methods is proposed such criticisms express the need to change the traditional school. Thus innovative educational approaches that promote creative and cooperative learning, with the use of Information and Communication Technology (ICT), interdisciplinary learning etc, are investigated for efficiency and some of them seem to provide successful alternatives that fit in rural schools. As an example one could mention the extensive use of ICT that in rural schools provide a good time management solution while the teacher is working with some pupils, ICT offer the means for occupying the rest of them.

With respect to socialisation, the small size of the rural school and the school community facilitates the generation of a friendly, small-scale environment

that helps pupils develop good relationships among themselves. In addition, the co-existence in the same classroom of pupils of different age and grade makes easier for pupils to adjust to a diversified social environment. Finally, socialisation of the school community members is facilitated due to the strong bonds between the school and the local community, attributed to the fact that the school in a rural area is one of the very few institutions that exist hence plays an important part in the area's public and social life. Finally, with respect to the rural school's role in empowering pupils for their future economic and social life, the rural school, if properly upgraded, can provide such a preparation. This is so, not only because education in any school –hence education in rural schools- upgrades the quality of human capital, but also because rural school acts as a lever of social, cultural and economic development, as seen below.

4. Rural schools and cultural development

In addition to the above, the rural school can become an ideal school not only for its students, but also for the local society if the interaction between the school community and the local society is strengthened. This interaction –which in rural areas is closer than in other areas, can be achieved in many ways, among which the following:

- Involvement of rural schools in training programmes for the local population.
- Introduction of new technologies into the area and undertaking of initiatives that help in the creation of the “culture for technology”.
- Cooperation with local community in educational programmes that aim to promote local cultural production, local art, entrepreneurship and active citizenship.
- Promotion and dispersion of new ideas, be-



Introducing the challenges for lifelong learning and development in rural areas

yond stereotypes, concerning multicultural societies, environment, gender equality etc.

- Participation in cultural activities.

It should be noted that this interaction is not something new for schools in general and for rural schools specifically. Thus, it is often the case that multigrade teachers organize training seminars for adults, theatrical plays with the contribution and participation of locals, sports activities etc, in an attempt to offer education and culture to the local society. Teaching ICT skills and participation in educational projects concerning environment and culture are common examples of these practices.

Furthermore, schools could act as institutions for the dispersion of new ideas concerning sustainability or multicultural issues. For example it is easier for pupils originated from emigrant families to feel welcome in a small school, where each pupil is a considerable part of the school's community. Moreover in a multi-grade school, where pupils learn to respect classmates who are different in grade and age, it is easier to respect also different cultures. In this sense differentiation does not act as an obstacle either for the pupil's adjustment to the new environment or for the classroom's efficiency, while cultivating (through projects or through an extensive use of ICT) a holistic identity of European identity is a healthy way to help foreign student to adapt easily and efficiently.

5. Conclusions: need for a new approach to multigrade schools

There are significant advantages that act as motives for investigating rural and multigrade schools as viable and realistic pedagogic solution in education as well as an influential institution in rural areas. There are also motives for examining the prospect of the rural school model to become the ideal school model. It seems that the educational system provides means

that can help the rural/multigrade school to operate efficiently and effectively as an educational institution that plays an important role in the area's socio-economic and cultural development.

What seems to be needed by the state is: to have a policy for developing the rural areas in total and to systematically assess all the activities that can be undertaken by a rural school in a rural school-centric strategy, which could include the following:

- Institutionalisation of the multigrade school's role in development
- Reward for the multi-dimensional job that the rural school teacher performs
- Development and application of a rural school curriculum that will take advantage of the positive features that such a school has
- Wide application of ICT and innovative educational methods
- Evaluation of the educational quality offered by a rural school

A rural-school-centric strategy is expected to upgrade educational quality in rural schools, hence to work directly not only towards the implementation of equal educational opportunities for all, but also towards the development of an alternative paradigm in education.

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Introducing the challenges for lifelong learning and development in rural areas

Rural development using Elearning: How learning technologies can help in the adjustment to a knowledge economy

Rory McGreal
Athabasca University

1. Background and challenges

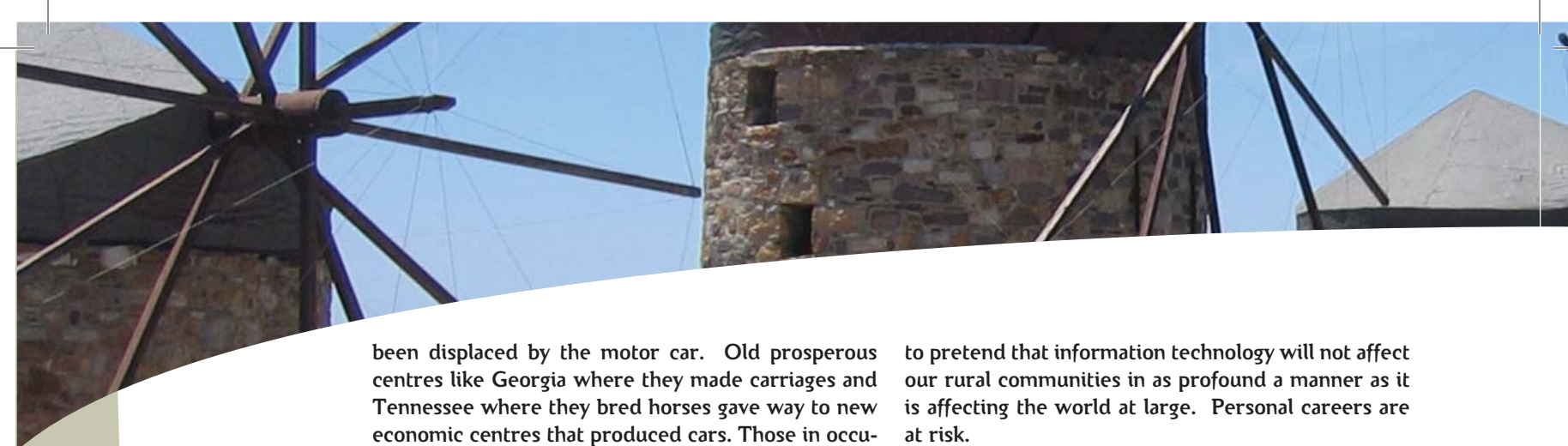
The new technologies are developing at a rapid pace. In the Seychelles Islands of the Indian Ocean, the Australians are known for pulling up their boats alongside a swimming shark, leaning over and easing themselves onto the creature's back. The trick is: They DON'T Let go. No matter where or how fast the shark goes, they have to maintain their grip on the dorsal fin and hang on. Modern technology is like that. It is moving so rapidly and so erratically that all we can do is climb aboard and hang on.

In attempting to understand the rapid changes occurring in this new century, we can look back at historical experience. In the nineteenth century, there were significant technological advances that profoundly altered the economy and culture of the society of the day. The steam engine made modern cities possible. The electric light facilitated working in shifts through the night. Steel made skyscrapers and crowded inner cities possible. And, towards the end of the century, the automobile set the stage for

the growth of suburbs and super highways.

The Canadian province of New Brunswick is an example of a highly rural province that took a conscious decision to climb aboard. For a long time New Brunswickers like other citizens of the Maritime provinces of Canada saw themselves as living on the periphery of the main economic activity which has traditionally been centred on the central provinces of Ontario and Quebec. However with the rapid development of the new knowledge economy which is based on bits of information rather than on physical products, New Brunswick found itself in a fortunate position with access to an advanced telecommunication infrastructure that reached every town and village in the province. Physical location no longer mattered when your product is information and you have the infrastructure. You can be located anywhere and still participate on equal terms with the traditional economic centres.

Entering the 1890s, more than 40% of the North American economic activity revolved around the horse. But, by 1910 this old economy had already



been displaced by the motor car. Old prosperous centres like Georgia where they made carriages and Tennessee where they bred horses gave way to new economic centres that produced cars. Those in occupations involved with the horse had to change their orientations and retool. Detroit was a backwater that happened to have a large number of oddballs tinkering with engines and the new “horseless carriages”. When investors began to realize the potential of automobiles they started moving their money into Detroit and its surroundings. The industrial northeast became the centre of the North American economy and drove the world economy into the 20th century.

Advanced training technologies represent a major growth industry. In NB, they had the oddballs “tinkering” around with training software and web courses. They believed that this industry would drive the world economy into the 21st century. The world economy has changed from one based on manufacturing and transportation to one centred around computers and telecommunications.

The new knowledge economy is developing globally without respect for national boundaries. Canadians learned a valuable lesson a few years ago when they tried unsuccessfully to restrict the smuggling of cigarettes across their borders. If a country cannot stop the importation of cigarettes how can it possibly control the import of weightless, volumeless bits of information.

The new economy is forcing major changes in the marketplace and in our lives. Those who fear for their jobs do so with reason. When we see major struggles among multi-billion dollar companies for market positions, we have to conclude that something is up. New markets are up for grabs and multinationals and other companies that do not understand this will not survive. National fortunes are at stake. In the present climate, it would be irresponsible of us

to pretend that information technology will not affect our rural communities in as profound a manner as it is affecting the world at large. Personal careers are at risk.

However, in promoting the adjustment to the new economy, we must ensure that we make the required structural changes. Otherwise we will be in the position of pulling the new locomotive with horses. This is always more expensive and less productive than changing our structures to support the new technology. The computers are to creativity and thinking what the space shuttle is to walking. Computers expand the power of the human mind exponentially.

The new economy is creating a scissors crisis. The number of blue collar jobs is dropping at an astonishing rate. At the same time, the demand for skilled technical people is rising at an even more rapid pace. A few years ago, it was believed that in the future there would only be two kinds of jobs: highly skilled and MacJobs. In fact, the fast-food outlets are even now experimenting with more automatic restaurants. Even the MacJobs will not be around in the next few years.

The chaos theoreticians tell us that a butterfly flying over the small Greek island of Chios can alter the weather patterns in southern Brazil. This gives us hope that small out-of-the-way places can create major effects. We are no longer insignificant cogs in the industrial process, but rather butterflies that can produce significant effects.

New Brunswick became committed to an information highway infrastructure that is open and shared among all citizens. Province-wide access to the highway is assured through a high speed infrastructure at affordable prices. The provincial vision for economic development is focusing heavily on advanced training technologies. There is an understanding in the province among the public and private sectors that learning and training are major economic activities



Introducing the challenges for lifelong learning and development in rural areas

in the new knowledge economy. It is expected that learning and training will become a dominant sector of the global economy in the next decade. Lifelong learning is not only essential for participation in the knowledge economy, it is the knowledge economy's most significant sector.

In order to participate, however there are major challenges. More of our people must learn more skills. We cannot be satisfied (as we have in the past) with having 20% of our population, predominantly our young people, in learning and training at any one time. We must now be training more than half of our people all the time. We have to do this with higher quality than we have in the past, and we must do it with less money.

Eric Hoffer noted "In times of great change, learners inherit the earth while the learned find themselves beautifully equipped to deal with a world that no longer exists." None of us grew up in this world. The Newtonian universe of linear order has been overturned. We now live in a chaotic universe. The skills that we grew up with are simply not good enough. We must retool and retrain.

In Canada, the information sector of the economy became larger than the manufacturing sector in 1985. It is growing and the manufacturing sector is falling. Today, manufacturing represents less than 10% of economic activity. Farming is less than 3%. The Canadian economy is integrated with the US economy, so these charts are valid for the American experience also at a multiple of 10.

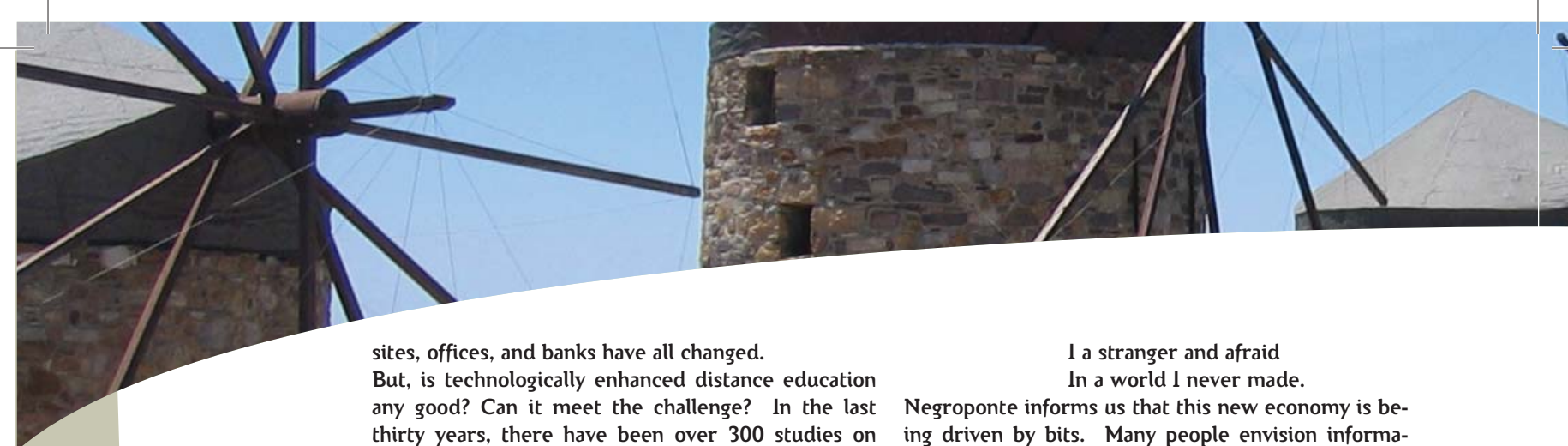
Education and training is a large economic sector in its own right. In fact, some of the industries that the public feel are significant like pulp and paper, mining, manufacturing, fishing etc. are very small in comparison. Public sector education is a dominant sector of the economy along with health, transportation and finance. There are few statistics available for private sector training, but we do know that training is like a

parasitic growth within all other sectors. Whereas in the construction industry 1% was spent on training twenty years ago, ten years ago it was 4% and now it is closer to 8%.

There are two laws driving the rapid changes in technology and the world economy. The first is Moore's law that states simply that computing power is doubling every 18 months. The computer that you buy 18 months from now will have twice the power for the same price. The other law is from George Gilder and refers to the cost of telecommunications. Gilder notes that the cost per unit of bandwidth is decreasing at an even greater rate than that of computers. We must look forward to future where computing power and long distance costs will be almost free.

Traditional education is in crisis. Not because it did not serve very well the exigencies of the old economy, but because it cannot adapt to the diverse demands of people trying to adapt to the knowledge economy. If most of us must be learning all the time, then our needs are different. We cannot deliver lifelong learning to the home, the workplace and to community centres by traditional means. Our spending on education is already higher than anywhere else in the world. We will not be able to double or triple our tax base in order to double and triple the numbers of people who are in training.

Our schools have been sheltered for too long from the new economy. It is significant that our students all live in a telecommunicated world that stops 10 feet outside of our schools. We expect our children to suspend their sense of reality when they cross the threshold of our schools, and pretend that the world of paper and blackboards is the real world. If someone were to have fallen asleep in the nineteenth century and awakened today, the only institution they would recognize would be our schools, where the biggest change has been the colour of the blackboard from black to green. Our paper mills, construction



sites, offices, and banks have all changed.

But, is technologically enhanced distance education any good? Can it meet the challenge? In the last thirty years, there have been over 300 studies on the benefits of technologically enhanced education and distance education. The overwhelming majority show that it is as good as or better than traditional education. (Russel, 1999) Can traditional education meet the challenge? If we believe that we must keep down costs while expanding access to more than 60% of the population all the time, then the answer is quite clearly: No, it cannot.

Developments in the information industries show us the trends for education. In the 1980s a number of separate industries were developing: publishing, electronics, television, computers, information services and telecommunications. These industries are converging and becoming indistinguishable from each other. Cable companies are buying up content companies, computer companies are entering telecommunications etc. This same trend is evident in education. A decade ago distance education, computer training and traditional education were all conducted separately.

The changes that have been thrust upon us in the last few years can be very threatening.

Remember: If you are not confused, you don't understand the situation. In a very real sense this is true. If you have your future all planned out and know exactly where you are going, you have less of a grasp on reality than those who are confused.

Athabasca University is Canada's Open University. It is facilitating change in the new economy. Our institutions have been changing rapidly but taking different directions. Athabasca University's goal is to make people aware that we are all in the same boat, and that we must work together. However, we all feel like the character in Housman's poem "A Shropshire Lad"

I a stranger and afraid

In a world I never made.

Negroponte informs us that this new economy is being driven by bits. Many people envision information travelling down a wire as discrete units of voice, data, or images. But, in fact, these three types of information are all made up of bits. It is only the intelligence at the sending and receiving ends that determines what form the bits will take when displayed on a computer monitor.

Look at these two discs. One of them is worth \$1.50 and the other is worth \$50 000. They look just the same. The only difference between them is that the zeroes and ones are rearranged differently.

If you would have told Bill Gates in the 1970s that his new company would be bigger than GM, he would have laughed. But today, Microsoft is bigger than General Motors. All they produce are bits. But, if you look at what GM is selling, you realize that a shock absorber is not just the metal in the physical object, but also the knowledge that is implanted into the object. That is what we are buying.

I was sitting at a bar with my brother a few years ago at the time when the cigarette smuggling was very popular. I saw my brother pull out his pack of cigarettes and leave them on the bar. In large black letters on a white background there was a label that said "Not for sale in Canada". I told him that he should put them away or someone would see them. He told me to look down the bar and what I saw surprised me. There were at four more packs of cigarettes and each one had the same message emblazoned on the packet. My brother then said: "See the two guys at the end. They're cops" I noticed that each of them had a packet of cigarettes with the same Not for sale message. It was then I realized that you could not stop the smuggling. If you cannot stop voluminous boxes of cigarettes from crossing the border how does anyone seriously expect to stop bits. Bits rep-



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represent more than 50% of the economic activity and the bit sector is growing as fast as the physical goods sector is dropping.

-Stewart Taggart pointed out that transport costs now account for only 1% of the final price of consumer goods. The cost of selling goods globally will fall toward the vanishing point. If physical goods can be exported globally at virtually no cost, then think of the futility of protecting borders from bits of information.

Historically, small regions have been bypassed by the great metropolitan areas in economic development. However, the times are changing and the very features of small out of the way regions that were held against them in the past can now be turned into assets. Athabasca University understands this as it uses its distance education initiative to not only educate the people, but also to promote the economic development of the region.

2. Conclusion

Historically, small provinces and states have been bypassed by the great metropolitan areas in economic development. However, as the new advanced training technology sector of the economy grows, distance from markets is no longer a factor, particularly in the design and delivery of online courses. Small remote areas can participate on an equal footing with the larger centres. The times are changing and the very features of small out of the way regions that were held against them in the past can now be turned into assets. Athabasca University understands this as it offers learning opportunities to its own population, but also to promote the economic development of the region. Using its small size, talented people, innovative businesses and advanced infrastructure, Athabasca University positions Alberta as an internationally respected leader in the new knowledge economy.



Rural Education In Peru: The Role Of Families In Schooling In Andean Communities

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1. Introduction

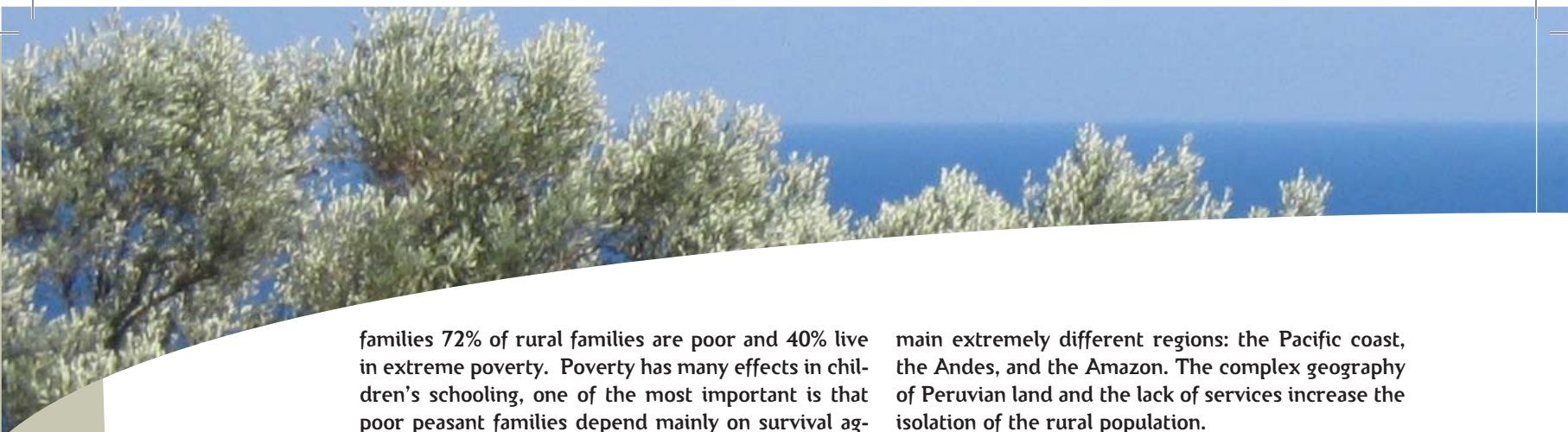
I am glad to have the opportunity to share information about the Peruvian rural education in this important international event. Despite the great differences we may find among rural areas in Latin America and Europe I am sure this Conference is an excellent opportunity for sharing knowledge and experience that would help to understand and, hopefully take action in rural schools anywhere. I hope this presentation would help to appreciate the importance of the relationship between rural schools and communities.

The presentation will focus on the role that peasant families play in schooling. The main purpose is to show the great importance that family conditions and family dynamics take part in children schooling success, specifically for this disadvantaged population. The motivation of the study was to challenge the belief that poor peasant parents are the main obstacle for their children education in Peru.

The paper conference is organized in four sections: first, the context of rural areas in Peru and the fragile relation between children and schools; second, the main characteristics of rural schools; third, the analysis of the role of rural families in schooling; and finally, the paper analyses the limits and possibilities of farmer families on their children education. As a conclusion the study finds that families make great effort and sacrifices for children schooling, but the rural school is not responding accordingly to the families expectative.

2. Rural Context

Poverty, dispersion, and cultural diversity are the three main aspects of Peruvian rural areas that better explain the nature of the relation between children and rural school. 36% of the Peruvian population lives in rural areas, and more than 60% of those, live in poverty conditions. Besides, talking about



families 72% of rural families are poor and 40% live in extreme poverty. Poverty has many effects in children's schooling, one of the most important is that poor peasant families depend mainly on survival agricultural and shepherding activities and therefore, they depend on their children for supporting domestic and productive activities.

The great dispersion of the population is mainly illustrated by the fact that 89% of the rural population live in communities with fewer than five hundred inhabitants. That dispersion is the result of the sparsely populated communities; however, is important to notice that the considerable geographical distance is not only among communities, but also among households within the same community.

The dispersion of the population makes the access to basic services very costly; and most of the rural areas do not have water and electricity services; neither communication nor public transportation. The lack of basic services increases the burden of domestic activities that are usually done by children.

Dispersion also affects children's schooling: first, the long distance between household and school sometimes discourages children's attendance, and specially girl's attendance. In addition, rural schools have fewer children than urban schools, and one main characteristics of those schools in Peru is it multigrade classrooms. In fact, in Peru 90% of rural schools are Multigrade¹.

Dispersion is better understood if we explain the different geography in Peru, where there are three

main extremely different regions: the Pacific coast, the Andes, and the Amazon. The complex geography of Peruvian land and the lack of services increase the isolation of the rural population.

In addition to the geographic diversity, Peru is a multilingual and multicultural country. The majority of the indigenous people live in rural areas and in the poorest areas of the country. The official and the most spoken languages are Spanish and Quechua but there are also other native languages spoken such as Aymara and more than forty other different languages in the Amazon region. Furthermore, poverty and cultural diversity are closely related: Most indigenous people live in the rural and poorest areas of the country. Besides, language and ethnicity, especially the ones associated to indigenous people, are main causes of social, political and economical discrimination.

However, there are a lot of changes going on also in the area, although the changes are uneven and irregular. A great amount of rural population has move into the cities looking for better living expenses or running away from politic violence². Others have even move outside the country, to Argentina, Chile, U.S.A, or Spain and Italy in Europe. Those immigrants play an important role of local rural communities that are beneficiaries of the transfer of goods and money, as well with new values, meanings and expectations.

Then, communities and families are changing their residence patterns -from ones more disperse to others more concentrated; their family patterns -from

¹ Multigrade schools can be defined as schools where groups of students of different grades (two, three, four, five grades) are taught in a single classroom with a single teacher. Unitary schools are the schools where all grades (six in primary and five in secondary level) are taught in a single classroom with a single teacher.

² Sendero Luminoso that means Shining Path is a Maoist terrorist organization that has been trying to overthrow the Peruvian state since 1980. The leader was captured in 1992. The Peruvian Truth and Report concluded that more than 69,000 people were killed in acts of political violence; three out of every four deaths were Quechua-speaking rural peasant. (CVR, 2003)

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extended families to more nuclear families; they are changing the number of children either -from more to fewer children; and some of their production patterns too -from subsistence activities to other productive activities that involve more exchange and interaction in the market.

At the same time, new economics activities are also going on in the rural areas. For example, new process of export of agricultural and textile products are developing mainly in the Pacific coast area, where they are recruit local people. At the same time, the privatization of some extractive inversions (mineral, gas, and oil) has also change the face of some of the rural areas, but badly those activities doesn't recruit many local people.

All those economic changes have usually brought electricity to some rural communities, and therefore, more access to global information through the radio, television, internet and mobile phones.

Taking this rural context in consideration where the schools take place, I will present now the characteristics of the rural schools in Peru.

3. Rural Schools

In order to understand the role of rural schools today is necessary to know something about the history of rural education. Rural schools in Peru have expanded by the great demand of the rural population between 1940 and 1960; between those years the numbers of primary schools increased from 5 to 20 thousand. Rural communities perceived schooling as a mechanism for socioeconomic change. In fact, most of the rural communities, especially in the Andean area, build their own local school and request a teacher

later. The State responded to the social demand by sending primary schools teachers to all over the country, but without considering the student's mother tongue, the children's role in rural family, the agricultural calendar, the curriculum relevance and the pedagogical needs of multigrade classrooms. In addition, the massive creation of rural schools was not accompanied by a correspondent increase in the education budget. Therefore, rural education was expanded with scarce resources and without considering the particular needs of the rural context

Today we have 23 thousands rural schools that represents 72% of public primary schools in Peru. These schools employ 60 thousand teachers working with more than one and a half million of students. Rural schools are public and attend mainly the primary level; Initial and High school education offer is still very limited in the area³. The Rural school represents the most important presences of the State in the area, sometimes the only one.

Focus on the primary level, 90% of those rural schools are Multigrade and 40% of those are Unitary Schools⁴. On the other hand, 23% of rural schools need a bilingual education, but only 28% of those receive a bilingual program.

Rural schools have the support of the community. Parents do regular work like cleaning, painting, and constructing classrooms. In addition, mothers take turns to cook for the school with food send by the State in the poorest areas.

Peasant communities still have the expectation that school will bring about the appropriate knowledge and skills to improve their socioeconomic level. Becoming literate is the main reason for families to send their children to school. In addition, indigenous

³ The basic regular education in Peru is free in the public institutions and compulsory by law. It has three levels: Initial (Pre-school education); 4 years of Primary education; and 5 years of High-school education.

⁴ Unitary school is a multigrade school that works with a single teacher

people look forward to learn Spanish at School. However, rural schools are characterized by low learning outcomes. Results from the national assessment system demonstrate that rural children aren't learning much compared to their peers who attend urban schools. (See next graphic N11) Equally important, is the analyses of those results which show significant differences among gender, school types, language, and regions. Students in rural areas -and particularly indigenous of the highlands and rain forest- attain the lowest scores. In addition, international evaluations showed that Peru is one of the countries with lowest outcomes, and with greater gaps between urban and rural students. Even though, there is a lot of debate about standard test and how well this instrument measure learning, and specially the learning of disadvantage children, what is undoubtedly is that rural schools are developing poor Spanish literacy competences in their students. Thus, the national evaluation system has confirmed and generalized the parent, teacher, and

children's awareness of rural school ineffectiveness in one of the most important social demand: become literate.

After this brief presentation of the Peruvian rural context I want to share a qualitative study of families in one peasant community in the department of Cusco, located in the southern Andean Region. Which I will thereafter named Lasca.

4. A study in an Andean community

At the time of the study the total population of Lasca was 537 people, who lived in 123 households greatly dispersed in the community area. They did not have any basic services. The native language of all the families was Quechua; and only a few men, had limited knowledge of Spanish. The school has been operating in the community for thirty years, but the rate of illiteracy in the community is still very high: 63% of illiterate from which the majority are women.

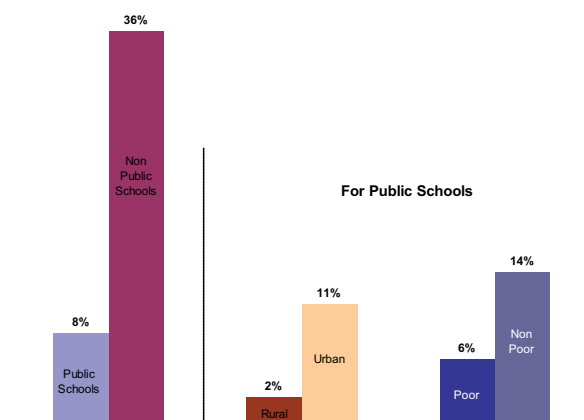
The information has been collected in two different periods. The first fieldwork was done in 1995 mainly with first grade rural students, focusing on family socialization of children, the transition to school and teaching in school. In 1999, I returned to Lasca to see how those children were doing with their schooling, focusing on the role of the families in schooling. The main question that guided the research was: what is the role of peasant families in their children's education?

The methods of collecting data were mainly qualitative: classroom observation, informal and formal interviews with teachers, parents, and children; and home visits and daily family life observations in and out the house.

4.1 Going back

When I went back to Lasca only fourteen out of the

Graphic 1: Literacy Achievement Results for Sixth Grade Students: Perú 2004
% of students with sufficient level



Source: Ministry of Education of Perú

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original thirty children enrolled in first grade in 1995 were still attending school (see table N'11). Then, the main question-reaction was: Why some children do remain in school and others do not? How the family conditions affect the children's attendance to school?

Table 1: Change in Student Enrollment 1995 to 1999

	Enrollment		Drop Out
	1995	1999	1999
Female	17	3	14
Male	13	11	2
TOTAL	30	14	16

The majority of students who dropped out were females: fourteen girls and two boys. The girls needed or wanted to assume her domestic and shepherding activities as if they were adults. But seven out of the fourteen were attending Literacy Program for Adult during the night. These girls had three years of school experience but none of them knew how to write their names. They said that in order to avoid discrimination outside the community they want to know how to write their names, so nobody can call them "illiterate". In this context, being illiterate is associated with ignorance. About the boys, one was studying out side the community, in the nearest town, in a less rural school, which means a "better" school. The other dropped out of school because his father died and he had to help his mother and siblings. The age of 12 was critical. Most of students dropped out around the age of 12, because at this age girls and boys assume more responsibility for the family's domestic and productive activities. School time interferes with children's duties. In this context, repetition and/or low learning outcomes discourage chil-

dren's attendance. The dropped out students have repeated more than once. The dropped out group is a reflection of the dissociation between schools and families.

4.2 The ones who stay in school

Regarding the students who stay in school, only three kids out of the fourteen were found in their expected level; six children were attending 4th grade and five children in 3rd grade. The next Table N'12, illustrates the gender differences among the ones who stay in school, where only one girl is founded in her expected grade, and no one girl is founded two years below the expected grade. It seems like boys are more willing (allowing?) to remain in school than girls under those difficult conditions.

Table 2: The students who stayed in school

	Enrollment 1999			TOTAL
	5 th grade	4 th grade	3 ^{er} grade	
Female	1	2	0	3
Male	2	4	5	11
TOTAL	3	6	5	14

Knowing the school conditions for teaching, the high drop out, partial attendance, and repetition rates this information did not surprise me at all; but the great effort shown by children and families in continuing schooling, surprised me a great deal.

The study focused on only seven families whose children remain in school, in other words the "successful students". Success in this context is defined as permanency in school for more than 4 years. The selected cases were divided into two groups:

1. "More successful students": the ones who had



repeated once or never.

2. “Less successful students”: the ones who had repeated twice or more.

Regarding the group of children that stay in school, we put forward the following questions: Who do well and who do not? How is the profile of the family? How is the out-of-school context of these children and how it affects students’ achievement? How rural schools respond to the family expectations in education?

Three main features of successful families clearly affect the child relation with school: the families living conditions, their believe in education, and the everyday activities.

One common aspect present in all the 7 families is the believe that education is the way to improve their living conditions. Therefore, these families try very hard to continue with their children schooling even after some failures in passing grades.

Apparently, living conditions seem very similar among those families. After analyzing the situation, we realized that some differences regarding the location of the house, the number of rooms and animals, and the type of crops make a difference in the amount of family work. In addition family structure (that is the number of children, number of girls and boys, children age, number of family members) affect the organization of the work.

The every day peasant activities are similar among families, but there are some differences between the two groups of families regarding the school related home activities. The successful students have parents who spend some time reading for the children at home; help them with homework; take them to the town to run some errands and/or to visit the Sunday market; and ask other relatives to help in their economic activities in order to assure the child’s atten-

dance to school.

On the other hand, the family profile has significant influence in the possibilities of the parents to help in their children’s education. The study showed that the more successful students belong to families with some members who know Spanish, and/or parents or siblings with school experience. In addition, parents’ literacy or parents with authority or presence in the community or outside the community play also a role in that success.

The children who succeed belong to families with the characteristics that I have just mentioned, and unfortunately these families are the minority. The majority of rural parents in Llasca community have little or no schooling experience, don’t speak Spanish, are illiterate, and practice survival agriculture or shepherding activities and have limited social networks within the communities.

Therefore, the successful students belong to families that have previous school experience and try hard to meet school curriculum, and in that way help their children’s performance at school. However, not all families attempt that goal, and the family conditions play a central role in that achievement.

5. Summing-up

This research paper demonstrates that families are very active in their children’s schooling, and at the same time, it reveals the limitations of those actions. Rural conditions create a very fragile relationship between children and schools, where tiny differences among families could signify great differences in children’s opportunities.

The families in this study are not only active but aware of their conditions, and the inequity present in the society and the way it affects them. Moreover, most of the families do believe in education and

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try hard to send their children to school, at least for three years, because they believe education is a way for social mobility. Therefore, families play an active role in their children's education but their living conditions limit their actions.

On the other hand, rural schools are not teaching well how "to read and write", which is the principal reason for parents to send their children to school in rural areas. The study demonstrated that children after 3 years of schooling are not able to write their own names. Therefore, repetition and/or low learning outcomes discourage children's attendance.

Children's low achievement is essentially explained by the lack/poor quality of teaching in those classrooms. In addition, children's achievement in school is better explained by the fact that some parents play a crucial role in the education of their children.

In fact, we find that the more successful students have parents that are able to contribute to their children's education as a strategy for social mobility, and on the other hand, the parents of the less successful students do try but have several limitations.

In addition, some parents do believe in education but they look for a better school outside rural areas; and other families doubt that schooling could change their socioeconomic level and look for alternative mechanisms for social change like migration. However, the majority of the peasant families-the majority of students- have urgent needs and they renounce to school and focus on their children survival by means of being skilled in their agricultural activities. Thus, rural schools are dissociated from families' needs and expectations.

Finally, rural schools are not being successful in the objective of providing adequate education for all rural students. The majority of rural children are denied the opportunity to receive good schooling for mainly two reasons: First, the children are not learning in school what they are supposed to. And second, the

harsh living conditions of the poorest makes it very difficult for children schooling.

The study illustrates how rural schools accentuate the previous differences among families inside the community, and of course among the greater society. In this context, the democratic role of the school is limited, because only a small group of students can take advantage of schooling.

The main challenge for rural education is to recognize the characteristics and needs of the rural area; for example, recognized the particular needs of multigrade schools.


However, what is really needed is to take into consideration the lack of real state presence in the rural area; and how rural population has being abandon/forced to remain in poverty and isolation, and how cultural, linguistic and geography diversity have being seeing (only) as an obstacle for the developing of the country.

Governments need to assume the challenge of making the democratic role of the rural schools truly effective by means of increasing the educational budget, provide better training and support to teachers that take into account cultural and linguistic diversity; and at the same time provide infrastructure and teaching materials.

Rural schools in Peru need to do a great effort to break that cycle of social reproduction, and accomplish the potential democratic role of schools: give opportunities to all the children, and especially to the more disadvantage ones.

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Innovative Life Long Learning Approaches Through the Romanian Rural Education Project

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1. Introduction and Background

Rural Education Project (REP) is an important part of the Ministry of Education, Research and Youth (MoERY) strategy to improve the learning opportunities and the students' achievements from rural areas. This is a Romanian Government Project co-financed by the World Bank (the value of the project is of 91 millions USD), whose implementation began with November 14, 2003.

The overall objective of the project is to have rural schools students benefit from improved access to quality education, as evidenced by higher achievement scores and completion and transition rates. The project addresses all rural school units from compulsory education (10,757 schools and more than 2 mill students).

The REP is focused on the major aspects of the Romanian education system within the rural area:

- (i) Professional development of rural teachers

and career development opportunities for rural teachers;

- (ii) Basic education conditions in rural schools and teaching-learning materials;
- (iii) School - community partnerships in rural areas; and
- (iv) Monitoring, evaluation and policy making capacity of the education system.

Within the present work the main aspects related to the professional and career development of teachers from rural area, in the frame of the project, will be presented.

In order to improve teachers' professional skills have been considered two directions:

- (i) School-based teachers' training, through a mentoring process;
- (ii) University based teachers' training, through distance learning academic programs.

2. School based teachers' training

The school-based teachers' training process is supporting a conceptual and practical change in teaching that is critical to the improvement of student learning, by:

- Expose teachers to new ideas on how to improve teaching and learning;
- Provide teachers and schools with a variety of teaching learning resources for use in increasing knowledge of classroom management, instructional strategies, teaching methods and student assessment; and
- Support teachers to design, implement and evaluate experiments in improving teaching.

The elements of the school-based professional development are presented in figure 1.



Figure 1: Elements of the school-based professional development in REP

2.1. Adapting and developing Teacher Training Curricula and Training Modules, and Teaching and Learning Materials

The training curricula, training modules and teaching learning materials (video tapes) for the school-based professional development program were developed by a working group consisting of teachers from all compulsory education levels – primary and lower secondary education – coordinated by a team of experts/consultants from the Technical Assistance side. The team of consultants has played a key role in design activity coordination in order to ensure the consistency between all modules during the training and mentoring processes and between the modules and the tapes.

There were developed the following modules, accredited by the National Center for In-service Teacher Training:

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- (i) Interactive, student-centered teaching;
- (ii) Continuous assessment in the classroom;
- (iii) Learning about student background;
- (iv) Adapting the curriculum to the rural environment;
- (v) Multi-grade teaching;
- (vi) Remedial Reading (primary level);
- (vii) Remedial Math (gymnasium level);
- (viii) Romanian as a second language;
- (ix) Using computers to teach and learn;
- (x) School leadership and management (for head teachers).

2.2. Recruitment, selection and training of the Body of Mentors (and Subject Trainers)

According to the project strategy, the mentor should be a qualified teacher with substantial, successful teaching experience and a senior position, already trained as a trainer, possessing information technology and communication skills, as well as good skills in analysis and should demonstrate an innovative spirit.

The mentors have followed a development program, structured in three stages: direct training, on-line discussions and coaching via an e-Learning platform, and bi-annual meetings focused on the analysis of the mentoring process.

2.3. Mentoring Process

The mentoring process is crucial for achieving the objectives of the in-service professional training of teachers, innovative instruments and methodologies being developed in order to assist mentors in their activities.

The Mentor Kit was designed and realized in a con-

cise and accessible presentation form, a user-friendly format (with clear guidelines) to allow an independent use of materials by mentors and teachers on field. It is constituted of: questionnaires, school reports, teachers and schools self assessment forms. Each team of mentors (2 mentors for each county) uses for field mentoring activities a 4x4 vehicle as a mobile resources' unit, fully equipped with training means (laptop, video projector, flipchart, etc.). Moreover, 463 fixed resources' centers were established for training purposes, equipped with: computers/desktop PC, video and TV station, overhead projector, projection screen, copy machines, laser printers, tape recorders, etc.

In order to be time effective in mentoring implementation process, an operational algorithm has been developed which scheduled the mentors' field activities (school's visits itinerary, number of participants, period of time etc.).

A quality assurance mechanism was also developed by designing initial and final evaluation and data collection instruments, by setting up internal and external monitoring procedures and by implementing a reporting system to be used along the whole duration of the mentoring process. The reporting system refers not only to the reports provided by the mentors themselves and the schools/teachers involved, but also to the feedback of different stakeholders at county/regional level. The school inspectorate from each county, through the specialized inspectors, represents a key factor in a sustainable implementation of the mentoring process. They provided an accurate and efficient feedback, comments and suggestions in order for mentors and PMU to improve the process, its outputs and expected results. The Local Consultant which ensures the design and the implementation of the mentoring process has developed an external procedure for QA, as well. They have hired regional monitors who visit the schools in which the

mentoring process has been implemented and evaluate and monitor the results and the impact of this process, using interviews with teachers, activities' assistance, questionnaires etc.

The mentors entered into the schools in the second semester of the 2004 - 2005 school year (6 counties in the pilot phase) and in the first semester of the 2005 - 2006 school year, at national level (the rest of 35 counties). The number of teachers trained in the pilot phase and in the national phase followed, is presented in the figure 2.

The mentoring activity is structured into three stages and types of training, as follows:

- (i) Activities with the mentor – direct training, at cluster level (a cluster consisted of a number of small schools coupled around a coordinating school): 28 hours divided into:
 - Input (3 days x 6 hours);
 - Follow up (2 days x 5 hours) – the follow up stage will take place after most of the participants would have completed half of the classroom applications;
- (ii) Individual and/ or joint planning – pair/ group work at school level: 16 hours
- (iii) Classroom application and reflection – individual work at classroom level: 52 hours.

The participation in the mentoring in-service training activity entitles each teacher to receive 30 professional credits, formally recognized at national level as part of the compulsory teacher training process. There are evidences as teacher's portfolio, which shows that teachers from rural schools are beginning to work together as a team and that they are applying in their activity the knowledge provided by mentoring process.

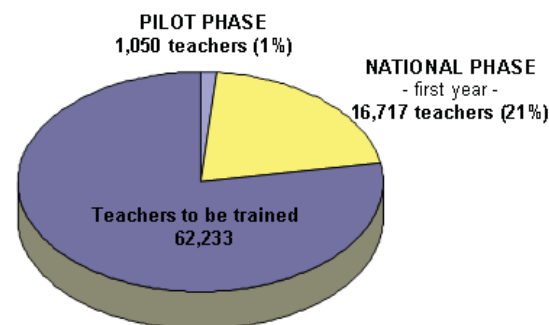


Figure 2: Number of teachers that have benefited of the mentoring process, for the pilot phase and in the first year of implementation at national level

3. University based teachers' training, through distance learning academic programs

The number of teachers that are teaching different subjects from the one for which they are qualified, if they are, in the rural schools, it is not exactly known.

In the rural area the number of pupils in each class and number of classes are often very small, so a teacher can not cover the required number of hours in one school, or at one discipline. That it is why, either they teach in several schools, either they teach several disciplines.

Many of them are tenured for one discipline, so they are officially "qualified", but in fact they also teach disciplines for which they are not formally qualified through academic level training.

Universities are not currently offering training solutions for this category of beneficiaries, so that is why, through the Rural Education Project, first of all there were developed and accredited postgraduate

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academic programs to respond to that need. Additionally, study programs for psychopedagogy and for teachers for preschool and primary education were developed.

Taking into account the profile of beneficiaries (full time teachers, often coming from remote areas) distance education (DL) seemed to be the right solution.

3.1. Development of the distance learning DL training programs

Given the complexity of DL courses, the relatively limited experience of Romanian education institutions in the area and the novelty of the academic programs that were developed, a team approach was used. Experts in education, in curriculum development, in the different subjects approached and in DL courses, including external, were charged with developing the curriculum framework, the distance

education guidelines and the DL courses itself. Over 200 modules were developed, by approximately 180 specialists.

Several steps were followed in order to set up a national DL program for unqualified teachers, presented in figure 3.

The academic programs developed, in correlation with the target group aimed and the diploma granted, are presented in Table 1.

The program's design is based on a competences oriented approach. The curriculum framework of the training programs, which was developed firstly within the project, defines:

- Methodological principles;
- General framework for defining teaching profession related competences;
- A set of specific competences for each subject;

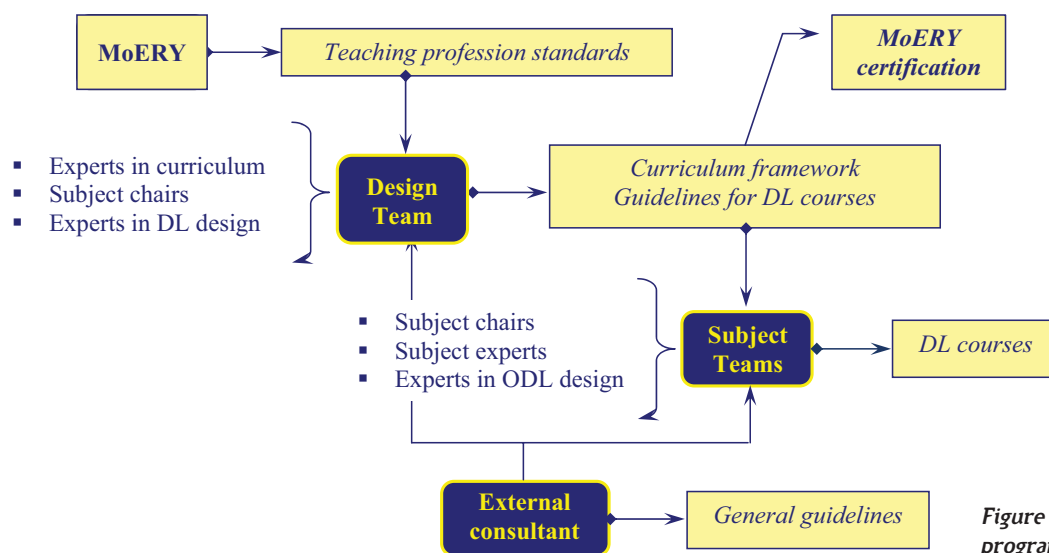


Figure 3: DL training programs' design

- Principles for defining study plans;
- Study plans (disciplines, number of hours and type of didactical activities, number of credits, evaluation);
- Outline of disciplines, structured on: identification data, general presentation, specific competencies, content, evaluation, methodological approach, bibliography.

The content covered by the training materials has to be relevant to the training needs of the participants. Along with the traditional content, the courses are

including modules specific to the training needs of rural teachers, such as teaching multi – grade classrooms.

The training programs are built up of self-sufficient groups, that serve as structural blocks for satisfying qualifying requirements for different training programs, and that can be combined in different ways (figure 4). The packages are made up of specific modules. Collectively, the full array of modules will provide full coverage of the courses needed to qualify teachers according to the three qualification categories.

Nr. crt.	Training program	Technical domain	Pre-requisites and target group	Diploma granted
1.	Postgraduate professional conversion programs (120 or 90 credits)	mathematics, physics, chemistry, biology, technological education, information technology, Romanian language and literature, English language and literature, French language and literature, history, geography	Bachelor diploma / Subject teachers with university degree, who are teaching subjects outside their subject area, as well	Postgraduate professional conversion diploma
2.	Pedagogy for preschool and primary education teachers (180 credits)		Baccalaureate diploma / Graduates of upper secondary education who do not have qualification and training to teach in primary schools	Bachelor diploma
3.	Psycho – pedagogy (90 credits)		Bachelor diploma / Graduates of higher education who have particular subject knowledge, but did not have pedagogical training	Teachers' certificate

Table 1: Academic programs developed within the Rural Education Project

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The training materials are adapted to distance learning technology. Each module's design is including the following:

- introduction: is orienting the participant in what it concerns the learning and evaluation activities specific to the module;
- learning objectives, that a participant must attain for successful completion of the module;
- the content of the module;
- auto-evaluation tests (with feedback loops to the textual materials);
- assignments, required for participants to complete and send to the tutor and that permit the continuous evaluation;
- laboratories, cases and simulations (as appropriate);
- additional readings, either attached to the basic materials or as referrals in a bibliography;
- a conclusive evaluation mechanism for the participant to demonstrate completion of the module (may include tests, a portfolio, a demonstration, etc.).

Beside the elements of content presented, modules are containing icons, illustrations, graphs, etc. and are formatted in such a way that assures an easy and attractive pathway for the reader.

The modules are provided to participants into printed and CD-ROM format. The learning materials are including audio materials for learning languages, as well as educational software packages for ITC disciplines, which weren't developed within the project.

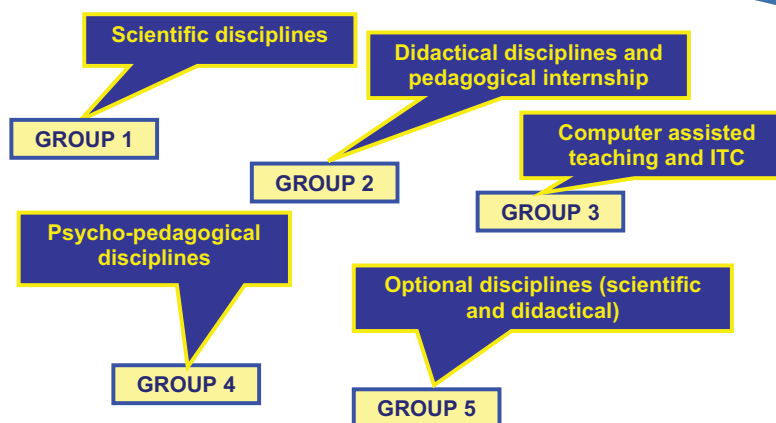
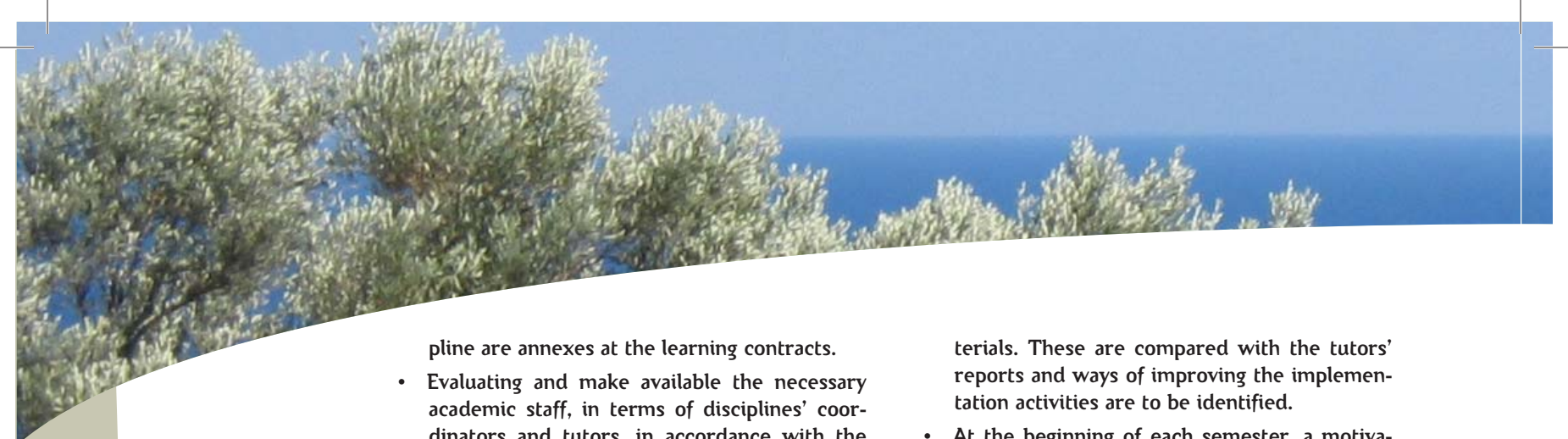


Figure 4: Structure of the academic programs

3.2. Implementation of the distance learning DL academic programs

Seven of the most prestigious Romanian universities, distributed in all geographical regions of the country, were selected for delivering the study programs for rural area teachers. The responsibilities of universities, which are implied by a quality delivery of DL training programs, are stipulated in the contracts concluded with PMU, and are as follows:

- Organizing the submission process, in accordance with the criteria established by PMU. They can be active in promoting the training programs.
- Registering the participants, on the basis of a learning contract, establishing the services provided by the university and the obligations of students. The Regulations for the training activities in accordance with the ECTS system, the study plans and the schedule of each disci-



pline are annexes at the learning contracts.

- Evaluating and make available the necessary academic staff, in terms of disciplines' coordinators and tutors, in accordance with the number of students (no more than 20 students per tutor). Is organizing DL technology training sessions with the academic staff selected.
- Establishing a territorial structure, if needed and possible, according to the geographic spread of students. Institutional accords should be concluded or territorial centers should be opened.
- Distributing the learning materials.
- Establishing concrete procedures for assuring an efficient bidirectional communication between tutors and participants, and among students, taking into consideration the access of each participant at ITC means. A communication agenda tutor – participant is to be kept.
- Assuring the secretarial activity related to the implementation of DL training programs.
- Assuring on-line information and support points for students, within DL departments;
- Assuring a secure electronic administration system for management of students, including their scholar results and activity.
- Assuring the adequate infrastructure and material means, necessary for completion the didactical activities previewed in the outlines of disciplines. Where possible, is offering to participants accommodation and meals on the premises of the university, at prices valid for regular students.
- Establishing a system of quality assurance. A questionnaire, provided by PMU, is applied, in order to evaluate the satisfaction of students related to the training activities and study ma-

terials. These are compared with the tutors' reports and ways of improving the implementation activities are to be identified.

- At the beginning of each semester, a motivation letter, signed by the Rector, is sent to each participant.

According with the universities' responsibilities, the following elements can be identified as delivery components:

- Print and CD-ROM materials in the hands of all participants;
- A orientation face-to-face meeting at the beginning of each semester;
- In group face-to-face meetings facilitated by tutors or disciplines' coordinators, at least 2 times per semester, at a central place;
- Laboratory activities, where needed;
- Regular discussions of the materials, among students;
- Availability by phone and Internet of tutors and disciplines' coordinators for participants.

Specific dates have been established for the didactical activities, for handing over the evaluation tests and for the final evaluation, which are provided in the disciplines' schedule at the beginning of each semester. The disciplines' schedule can be negotiated with a group of participants and is part of their learning contract, conclude with the university.

The implementation started in the academic year 2005 / 2006. From the 3,060 students that joined the study programs at that time, 336 have never frequented the classes or submitted the evaluation papers. 2,432 students have taken all exams and another 218 promoted to the next year according to the ECTS system. Only 74 failed to accomplish the conditions needed for promotion. This high promotion rate is explained by the high level of motivation

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and interest of students, but is also due to appropriate implementation conditions.

In order to assess the extent at which the universities are following the curriculum framework, the textbooks and the responsibilities stated in the contract, a monitoring and evaluation system was put in place. A commission made out of 4 members, national consultants, experts in distance education programs of university level, was constituted. One of the members of the commission is coordinating the activity, and his first task was to elaborate an evaluation methodology. The evaluation methodology is establishing the evaluation criteria, the documents that have to be submitted by the universities and the concrete steps that have to be followed in an evaluation mission: auto-evaluation report; evaluation report; recommendations for a better implementation of DL training program.

4. Conclusions

The present work is describing two innovative life long learning approaches, related to the professional training of teachers in the compulsory education system, from rural areas. The first one is an in-service teacher training national system, based on mentoring

activities, aiming at changing the teaching and learning methodologies, instruments and approaches in schools from rural area. The second one is constituted of distance education academic programs, of post graduated and under graduated level, specially designed according to the needs and expectations of rural schools teachers. They are providing formal qualification, needed for obtaining tenure in the teaching profession.

Both training systems have given very good results so far, that we expect to show impact on the school results of pupils from rural area. Moreover, generalization at national level, also for urban areas, is required by stakeholders that in one way or another have come in contact with this modern approaches to teacher training.

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Creating Virtual Learning Communities of Rural School Teachers

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1. Background

This paper is based on the analysis of the experience obtained in the development of rural teacher communities under the umbrella of the project NEtwork Multigrade Education (NEMED) in Spain. During the past three years, a groups of Spanish rural schools spread throughout different regions and isolated areas have been participating in the European network, together with the University of Barcelona.

Now that the experience comes to an end (although the continuation of the network activities is assured for the following years), we make an account of the key aspects and lessons learnt from the activities undertaken, aiming at depicting how a community of practice (in this case rural school teachers, university researchers) has been growing and evolving based on the initiatives and events that happened during the lifespan of the project.

NEMED is a network of dozens of rural schools from nine different European countries. It started in 2004, continuing operations until 2007. It intends to stimulate an effort to bring multi-grade education to the policy front, and thus contribute to the upgrading of multi-grade teaching and learning. Despite the fact that multigrade teaching schemes represent a usual means for providing “education for all” in remote and rural areas in Europe and the rest of the World, multigrade education remains at the educational systems' margins. The network focuses attention on the phenomenon of multigrade schooling. Under the umbrella of a new European project, RURAL WINGS, it will continue working at the international level until 2009. However it is certain that the networks of schools at national level will continue working after that date, and we envision that the international co-operation will also continue without the support of the EU, given the success of the experience.



1.2 NEMED as a Virtual community of practice for rural school teachers

Communities of practice and activity theory are good frameworks to explain the characteristics of scenario set, a group of teachers participating and building a virtual learning community. Wenger (2001) points out three dimensions of the relation throughout which practice becomes the source of coherence of a community: a) a mutual commitment; b) a common enterprise, and c) a shared repertoire. For this author, practice does not exist in abstract terms. It exists because participants negotiate the meaning of their actions. Teachers in this case share their knowledge and work together, negotiate what they know and what they don't with the others.

At the same time the common enterprise has been the result of a collective negotiation which reflects the complexity of the mutual commitment. It is not to achieve a goal, but that participants build a mutual responsibility which is an integral part of the practice. Furthermore, the community of practice eventually creates a shared repertoire of resources which acquire a meaning in the practice of this community. Under the umbrella of the project NEMED, the network of teachers is in fact a virtual community of practice (VCoP) in the sense of Zarb (2006), which very occasionally has physical meetings; the connecting threads are their participation in NEMED, whereas the virtual learning classroom is the virtual space in which people negotiate meanings. They learn from each other as a result of doing tasks and solving problems, so knowledge is a product of a situated activity (Lewis, 2002).

2. Rural education and NEMED in Spain

The diversity of geographical and political contexts

in which the rural school in Spain required two extended models of schooling in the rural spaces:

- a) Non-grouped rural school, whose operation is self-governing, although the general tendency is sharing activities, and even masterful traveling specialists, with other schools nearby.
- b) Grouped rural school, which constitutes what it is known as groupings. These clusters of rural schools are born in Spain with the following purposes:
 - To break the professional isolation of the rural teacher.
 - To open cultural horizons to rural boys and girls.
 - To strengthen cooperation and team work.
 - To share human, structural, administrative and managing resources, materials and economics to be used by all the schools of the group.
 - To develop unique models of participation for the education community in the daily tasks of the rural school.
 - To collaborate in territorial balance and to dignify the rural population.

In the Spanish State there are groupings of schools that receive different names: CRA (Grouping Rural Schools) in Castile Leon, Castile La Mancha, Asturias, Galicia and Madrid; CER (Rural Educational Centres) in the Valencian Community; CER (Collective of Rural Schools) in the Canary Islands, CPRA (Public Grouped Rural Centres) in Andalusia, and ZER (Rural School Zone) in Catalonia.

2.1 Key issues in rural schools in Spain

During the last 20 years the quality of rural educa-

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tion in Spain has improved considerably. The political and administrative decentralisation of the educational system has brought the development of public policies closer to the needs of the rural territories; however, it is certain that the pace of development of these policies, as well as the legislative deployment, has been diverse. In any case each autonomous regional government has created school structures, educational and support services for the rural school adapted to the needs of each region. Taking into account the diversity of the rural contexts in Spain (there are rich rural areas as well as poor and isolated ones), we can point to the fact that, despite the improvement of the educational structures and resources in the rural contexts, there are still clear needs to be tackled:

- There is a lack of specific initial training of rural school teachers; this does not mean asking only for specific training, but also training to be delivered in the rural school, as is the case of urban schools.
- There is a lack of continuous training for rural school teachers aiming to keep pace with new didactical approaches, with dealing with diversity (growing immigrant rural population), and with use of ICT in the classroom and for professional development.
- Although the creation of certain organisational structures for coordinating resources and specialist teachers for clusters of rural schools based on proximity has contributed to having more shared resources, these continue to be scarce, especially in territories in which immigrants have populated rural areas, with the corresponding increase of a number of children in the villages.
- There is a lack of ICT infrastructures; although

the situation has improved dramatically during the last three years given some State programmes for deploying Internet access, it is certain, that there is still much to do in this respect. As a consequence, there is a smaller number of Internet users in rural areas compared to urban areas.

- The infrastructures and school buildings, either new or renovated, need continuous maintenance.
- There is a lack of basic services for maintaining the rural schools: transportation, soup kitchens for children, and kindergartens.
- Very few regions in Spain have developed adequate legislation for supporting and promoting rural education.

2.2 The current telecommunications situation in the Spanish rural areas

One of the key priorities of the Ministry of Education and of the Ministry of Industry is to provide broadband connection to all rural areas, including the isolated ones. The plan is implemented by the regional governments. The areas of application are 14,560 towns, villages and isolated spots in 3,770 municipalities with about 6.5 million inhabitants.

Currently, there are several regions in Spain in which 100% of the population can access Internet broadband connection. The objective is that by the end of 2007, 100% of the Spanish population will have access to broadband connection. In March 2007, 5,659 towns and villages had broadband access, so 5.5 million of the 6.5 million rural population were covered by the plan. However, access does not mean use, and we can see that the number of users in rural areas



is still low.

The Ministry has also financed the creation of 270 new “Telecenters”, which are community public centres in towns and villages financed by both the Ministry and the regional authorities, who provide broadband services and training. The isolated areas and places with no broadband connection are prioritised. The program started in 2005 and will end in 2008.

With respect to the schools, only isolated rural schools do not have access to broadband Internet connection. This is the target group of Rural Wings. ICT resources are scarce, but the multi-grade schools do have a few computers in the classroom. The plan for providing broadband connection covers also the schools, which means that in a couple of years all isolated schools will have broadband ADSL-type access.

3. The Spanish NEMED network of rural schools

The participation of Spanish schools in NEMED is distributed along 6 regions. The list of the Rural Schools active in the NEMED Local Network in Spain includes 15 schools and more than 30 primary school teachers.

The network is growing constantly and recently several schools in the Canary Islands and in Southern Spain have joined the network. The NEMED activities will continue under the umbrella of the project RURAL WINGS (European Commission, VI Framework Programme).

Within NEMED, an Educational Platform called Virtual Rural School has been created (<http://www.future-learning.org/exchange/course/view.php?id=3>) in both Spanish and English versions. In this space we have placed the training activities designed for the module, as well as some spaces designed for exchanging opinions and ideas among the students (multigrade

teachers), the teachers and the tutors. These spaces are discussion forums, chats, distribution lists, spaces to share documents, etc. The method used is e-learning, understood as distance learning based on the use of computer and telecommunications and within a Virtual Learning Environment.

The Virtual Rural School has been designed using the free, Open Source software package Moodle. This software is a Learning Management System designed to help educators manage effective online learning communities. This system allows an easy interaction between teachers and students, as well as among students. The design and the development of Moodle are based on a “social constructionist pedagogy”, which asserts that learning occurs particularly well in a collaborative environment that everyone builds together. This Virtual Learning Environment includes characteristics that support role sharing, such as permission-based options that allow each participant to be a teacher as well as a learner. Furthermore, the role of the ‘teacher’ can change from being ‘the source of knowledge’ to being an influence, connecting with students in a personal way that addresses their own learning needs, and moderating discussions and activities in a way that collectively leads students towards the learning goals of the class.

Besides this space, a project website has been created with the theoretical contents visually organized and shown in three languages (Spanish, Catalan and English) (<http://www.ub.es/euelearning/nemed/localNEMED/>). This website facilitates the implementation and development of the activities suggested in the Virtual Rural School.

Other communication tools have been used on a daily basis; among them, Skype was always available in the classroom, so children from different regions could communicate at any time, especially during the recess period. Productivity software and video, produced by the teachers and the children, were

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also part of the resources used. This has allowed the teachers of the Virtual Rural School to exchange audiovisual materials among the multigrade schools. The exchange of the material has been carried out through the Moodle platform.

We designed a training module for the Virtual Rural School, with the intention that the teachers participating in NEMED learn to design a collaborative telematic project for subsequent creation and application among the schools. The activities that configured the training module were created to be carried out individually; however, the teachers were asked, specifically, to upload their exercises and resources in the educational platform with the aim of sharing them with their colleagues.

We considered a collective work for the second part of the module, in which there were different activities to carry out together among the teachers of the rural schools. Fortunately, to our surprise, the teachers of the Virtual Rural School decided to overturn the activities scheduled in the educational platform, converting them into collective activities; by doing this they managed to jump forward to what was scheduled for the third training phase. Therefore, the modules had to be quickly restructured in order to answer the need expressed by the teachers active in NEMED. This shows a great involvement and the taking over of the teachers reorganising the programme according to their views and needs.

4. The daily life of the virtual community of practice in the rural school

The teachers' attitudes were very satisfactory, for they have managed to create a relationship that is only possible if are really thrilled and committed. On different occasions, the teachers in the Virtual



Figure 1: NEMED Multigrade School in Teo (Galicia, North West Spain).

Rural School have expressed their wide satisfaction and gratitude for being offered the opportunity to be connected and to generate a collaborative work that fills them with new ideas and stimulating experiences (exchange of photographs, videos, opinions, experiments, beliefs, etc.).

An indication of the success of the project is the incorporation of new schools by the initial team of teachers themselves. An informal network of collab-

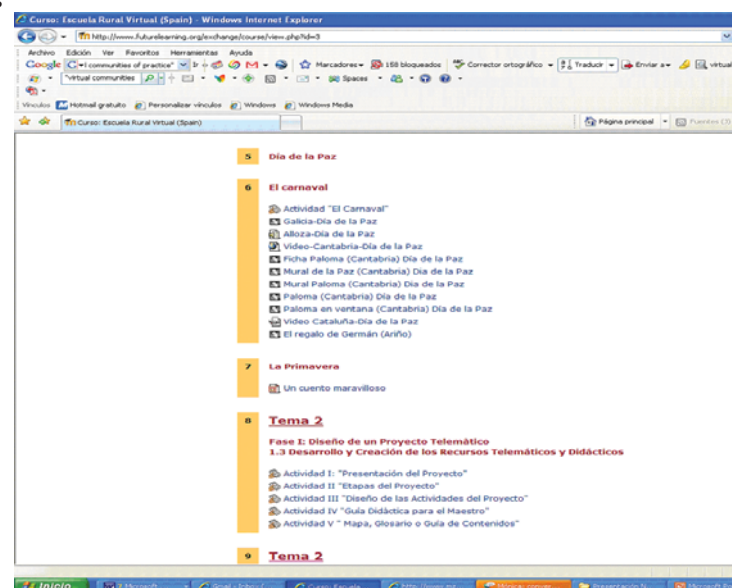


Figure 2: Computer classroom in the NEMED Rural School of Sant Serni (Pyrenees Mountains, Catalonia, Spain)

orating schools was continuously growing to the point that we included double the initial number of schools and others are asking to be included. The introduction of these schools to the project was due to the motivation, enthusiasm and satisfaction of the teachers.

As said before, teachers were able to create collaborative activities (Fig.4) using their own initiatives, as an example of applying ICT to the rural context, and they've got involved in the design through ICT of educational materials adapted to their schools' real needs and wishes. This has been possible mostly thanks to the

Figure 3: The local Virtual Rural School platform in Spain (Moodle environment)



extraordinary personal relationships developed at distance; only very recently have they been able to meet personally. Within a community of practice, as important as sharing goals and doing thing together, is the emotional aspect of sharing interests and concerns, which are very much common in the profession and in the context of being a rural school teacher.

Toward the end of the training period, there were some days of face-to-face training for evaluating the project and consolidating the network already created. During these days we were able to check some of the premises that guided us during development of the training and creation of the network. The face-to-face days served as opportunities for the teachers to express their concerns, needs, and critiques about the design, execution, and development of

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Telematic project “Sharing Traditions”

The purpose of the project is to share the traditions that we celebrate at schools. The ways of sharing them can be different, such as we noted in the meeting via Skype and which Miquel commented on in the Moodle forum.

Two ways of getting in touch will be needed:

Synchronous Contacts (online) to explain to each other what we are doing to prepare activities and to solve problems. We will do the synchronous contacts via Skype.

Asynchronous contacts (offline) to send to each other those activities to carry out and those already carried out. We will do the asynchronous contacts via electronic mail and within the educational platform.

Human resources: The teaching staff and the student body of the participant schools.

Material resources: The traditional resources used at schools.

Technological resources: The ways of sharing them are different, all involving the use of ICT: Internet, Skype, e-mail (teachers' or class' e-mail), Office (Word and PowerPoint mainly), image processing, digital camera, sound processor application), microphone with speakers and earphones with micro, digital video camera, and also possible specific programs as Click, Hot Potatoes, spreadsheets, etc.

Following our e-tutor's instructions, we can keep comparing our listings in this forum and address the needs in a synchronized meeting (Skype).

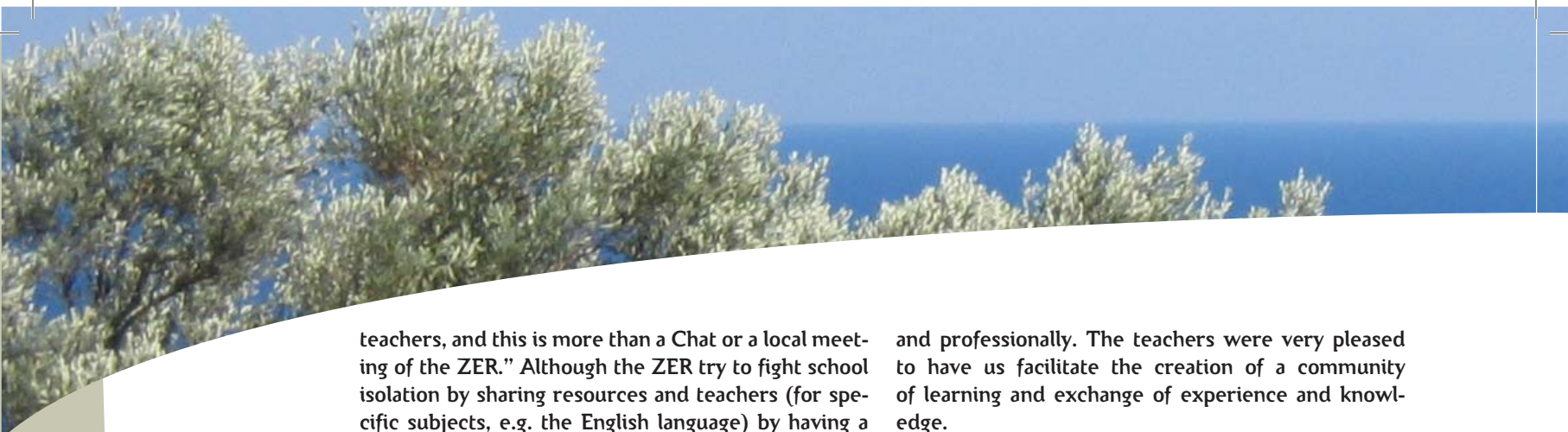
Figure 4: Tasks carried out together by the teachers of Virtual Rural School during the design of the telematic project “Sharing Traditions” (designed by the teachers)

the project. Throughout this period, comments, opinions, and suggestions were expressed.

For the teachers who are members of the NEMED network in Spain the most important thing about the project for them, personally, has been the possibility given them to know each other and to communicate with each other, allowing them to escape the isolation

of the rural environment through the establishment of a large community of teachers and friends. Here we have some examples of the teachers' views:

“For me, participating in NEMED, allows me to do things that I can't do in my ZER (Zone of Rural Schools). But, beyond that is a place for experiencing new virtual acquaintances with other rural schools



teachers, and this is more than a Chat or a local meeting of the ZER.” Although the ZER try to fight school isolation by sharing resources and teachers (for specific subjects, e.g. the English language) by having a common educational project, the environment is still local; whereas, NEMED gives me the opportunity to meet diverse colleagues and make friends, even without meeting them face-to-face.

Without a doubt, the NEMED network has contributed to the linguistic and cognitive development of the boys and girls who have had the opportunity to be part of it. The teachers have expressed their great satisfaction in observing the efforts made by the boys and girls to communicate in Spanish, a language they don't use much in Catalonia and in Galicia. They have seen the need to change languages in order to effectively establish a link with children in other parts of their country. Equally important is the students' enrichment from the cultural exchange generated by the contacts established among the schools participating in NEMED. Children also are aware of the importance of the exchange with other teachers and peers in remote schools:

“The children, when speaking in Spanish (our language in the school is Catalan) with the children of other Spanish regions, engage very much and have fun. They are very enthusiastic about preparing a common activity for the next year”.

This is one of the characteristics of the virtual learning community: the fact that the children are very aware of their participation together with the teachers. The fact of the schools being so small facilitates this familiarity with the project life.

5. Final observations

There is an urgent need of the teaching staff for communication and exchange of knowledge, personally

and professionally. The teachers were very pleased to have us facilitate the creation of a community of learning and exchange of experience and knowledge.

There was a lack of training in ICT especially adapted to their needs, since in our country there aren't any programmes or laws specifically for rural and multi-grade education. We attribute the success of the project in part to this lack, since, within the training aspect of the project, we tried to respond to the needs demonstrated by the teachers. Furthermore, there is the social importance of ICT as a tool of exchange and construction of knowledge, especially for those who, for reasons of place, space, or geographic location, have fewer opportunities for work relationships and collaboration.

There are the many possibilities for creativity and creation of interpersonal links that ICT affords, as much for the boys and girls as for the teachers. We must not forget that learning is a social activity that includes comprehension of languages and cultures, which ICT can greatly facilitate. Being able to share their work and experiences with other colleagues has made teachers value their work more, at the same time enriching and improving it, thanks to the support and suggestions they give each other. It is similar for the children, since they value their work more when they can share and show it. This is a way to strengthen a community of practice.

For the NEMED teachers, the computer has gained another dimension—it isn't only for killing martians or downloading a programme; now it serves to establish links and exchange knowledge and experiences. ICT has converted it into a very important tool of communication that, besides awakening curiosity and imagination, helps students understand that they are part of a global reality that extends far beyond their own community.

Through the computer, it has become possible to

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establish personal connections as important as those created among the teachers and students in their own schools. For this reason, the teachers have come to the conclusion that the emotional factor is fundamental when establishing interpersonal connections, independent of the medium through which they are generated. We then consider the emotional dimension to be the key to all success in education.

It is important to say that the results of this project must be communicated to education administrators, policy makers and educators in order to show them how productive it can be to create a network of rural teachers at the national, or even the European, level. Besides, rural teachers usually don't want to participate in educational experiments, because they hear about projects that haven't been based on their needs and interests, but on the needs of the researchers—that is to say, the theoretical vision they have of how rural teachers should act, be, and teach. But it is a fallacy that teachers are reluctant to incorporate ICT into their classrooms. We have shown that in fact

teachers can be very enthusiastic about projects that allow them to address their concerns and needs. This is the way to build sustainable communities of practice that will last and expand.

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Two Distance Education Projects for Sustaining the Training of Teachers in Remote Rural Areas: the Romanian Experience (A Materials Developer's Perspective)

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1. Introduction

The In-Service Distance Training for Teachers of English (DINSETT) project, run between 2000 and 2002, was an early experiment in training externalisation, initiated by the British Council Romania in September 2000, and endorsed by the Romanian Ministry of Education and Research. It aimed at improving the quality of English language teaching offered to teachers working in disadvantaged areas by increasing their confidence in their abilities as professionals.

The other distance programme which aims at improving the quality of English language teaching in Romanian is PIR (Proiectul pentru Invatamintul Rural – the Rural Education Project) started in 2005, and funded by the Romanian Ministry of Education and Research and the World Bank from 2005 until 2009. PIR aims at improving the quality of teaching in

the rural schools in such areas as Romanian, foreign languages (French and English), sciences (mathematics, physics, and chemistry), humanities (history and geography), technology (IT), and pedagogy. In the Romanian rural schools, teachers often need to teach other subjects for which they are not qualified. PIR offers these teachers the opportunity to qualify in one more subject, and to enjoy the benefits of their new status.

By giving access to continuing education to teachers in the rural areas, these two projects attained several objectives:

- a) reducing the cost of training and making it available to teachers;
- b) encouraging the exploitation of the participants' own teaching as data source;
- c) improving the participants' morale;



d) improving the mode of delivery of training;

e) piloting new ideas (for Romania) in teacher training.

PIR has the added objective of improving the participants' status and allowing them to benefit from the advantages of the newly acquired qualification.

In spite of its success, DINSETT had to be abandoned after piloting. Besides the enthusiastic feedback received from the participants, the main outcome of the project was a printed volume, published at one of the most prestigious Romanian printing houses, Polirom, in 2003 by the British Council Romania: In-service Distance Training Course for Teachers of English.

The project was considered successful for several reasons. The participants developed and extended their professional competence by updating their ELT methodology and reflecting on their own classroom practice while working and maintaining their personal benefits and professional advantages at their work place. Despite the fact that the project put the onus on participants to fit their learning time in with competing demands, they found home-study generally convenient, as it produced little domestic disruption and could be done (to a certain extent) according to each trainee's self-pacing and study options. However, the project faced two major obstacles: on one hand, the numerous potential participants (only the pilot run was subsidised) would not have been able to cover the course fee or the other necessary costs; on the other, the Ministry could not produce adequate certification at the end of the course. Even if the project was abandoned, it showed that distance teacher training was an appropriate form of training in Romania, and that this form of teacher training should be certified. PIR benefited from these two lessons.

2. Target Groups

Both projects targeted teachers in rural regions. Often considered "disadvantaged", these teachers are often far from being "unsuccessful", "ineffective", or "marginalised". The two projects' developers and the materials developers' teams were aware that some of the participants did work and live in unfavourable conditions and that some of them might be less successful or effective than others in their teaching. However, they refused to accept the idea that there might be a direct connection between the quality of one's professional performance and their job context. Consequently, they decided to address these projects to all teachers who felt the need for professional development but could not be taken off the job or leave their home place to study, who showed interest in and positive attitude towards self development and the philosophy of education that lies behind distance training projects. This explains the great success of the volume containing the materials developed by DINSETT. PIR offered funding only to rural residents with at least two years' teaching experience and who were willing to stay in the same workplace for at least another two years, but also accepted all teachers who were willing to pay the fees. Training Objectives and Course Development

Both courses were conceived as innovative rather low-tech systems of distance education. DINSETT was intended as a fully documented and piloted system available for adoption in other regions of the country and for other curriculum areas. PIR aimed from the beginning at national coverage for several areas of study. Both courses aspired at:

- a) initiating long-term changes in the learning habits of the participants: developing their critical understanding of the process of language learning and teaching through encourag-

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ing them to reflect not just on their teaching but also on their own learning and how best to manage it;

- b) stimulating the participants' acquisition of the means through which this process may be achieved: 1) by encouraging them to focus first and foremost on what actually happens in real classrooms – their own, those of fellow teachers – and to start off developing their reflection on teaching from observation and experience, and 2) by encouraging them to value their own teaching and to learn from it;
- c) developing the participants' skills of effective organisation of learning;
- d) building in the participants a feeling of belonging to a group of people open to sharing experience.

The DINSETT team of materials writers consisted of six members: five secondary-school teachers and one university ELT methodologist. They worked with a British Council project consultant during the planning stage, and stayed in permanent contact with her throughout the project. They had various degrees of experience in materials writing, two of them had some experience of distance training as ex-trainees, and all of them had extensive teaching experience (around 20 years), at various levels and in a variety of teaching environments. Each DINSETT materials writer was assigned a course unit. They agreed on the following EFL methodology course syllabus:

1. Distance learning
2. Class Management
3. Lesson Planning
4. Developing Language Skills: Speaking and Listening

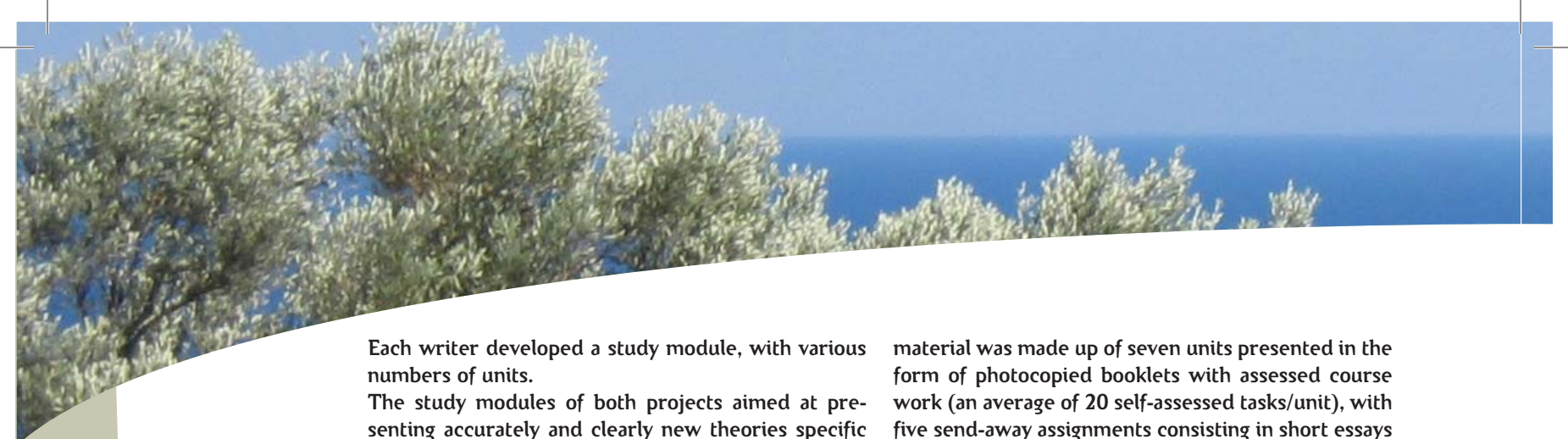
5. Developing Language Skills: Reading and Writing

6. Evaluation

7. Materials

PIR materials writers were almost all academics in various Romanian universities. The English team also included a primary school teacher. They all had written extensively in their field, but had little or no experience in distance training. Starting from the competences formulated as course objectives by the course developers, a PIR syllabus for English was developed, with the following modules:

1. English Morphology
2. British Studies
3. Practical Course in Oral Communication
4. Practical Course in Written Communication
5. Syntax
6. English Literature in the 19th and 20th Centuries
7. Practical Course in Public Presentation
8. Curricular Area Didactics: Language and Communication
9. Phonetics, Spelling and Vocabulary
10. Elective 1: American Civilization
11. EFL Methodology I and II
12. Practicum
13. Computer-aided instruction
14. Elective 2: British Literary Trends – the 17th and 18th Centuries
15. Didactics Elective 1: Teaching English in the Primary
16. Didactics Elective 2: Testing and Evaluation
17. Elective 3: Highlights of British and American Drama



Each writer developed a study module, with various numbers of units.

The study modules of both projects aimed at presenting accurately and clearly new theories specific to each area of study together with teaching suggestions. The presentation of the subject matter was accompanied by reflective, practical, self-assessment or evaluation tasks. The tasks aimed at raising the students' awareness of their present knowledge and skills and at helping them shape their own perspective actively, by constantly referring to their own teaching experience, trying out new solutions and reflecting on how they and their pupils were affected by the new experiences.

Both teams were aware of two inherent features of distance education that they had to counteract: isolation, and delay. In response, they tried to exploit positively reflection and autonomy. They knew that a successful training project should promote steady long-term change and provide reassurance and support for the individual teacher. Many distance projects try to have both, planning a balanced proportion of distance and contact learning, between theoretical and practical elements, and between educational theory and classroom practice. Consequently, a combination of distance learning and elements of face-to-face study and supervised practice seemed to be the solution for both projects.

Both courses developed a highly structured input and required a tightly specified output. To avoid waste of time and energy, the tasks were designed so as not to become too open-ended, or to demand resources participants did not have easily available. The participants were offered study materials with tasks and assignments included in each unit and weekend tutorials. They were asked to compile a personal portfolio consisting in personally-selected written pieces reflecting professional development over the year and logs/diaries. The DINSETT study

material was made up of seven units presented in the form of photocopied booklets with assessed course work (an average of 20 self-assessed tasks/unit), with five send-away assignments consisting in short essays or reports. The PIR materials for English consist of between seven and fourteen study units per module, with at least one self-assessed task every second page, and a maximum of three more extended tutor-assessed tasks.

There was plenty of in-built interactivity between participants and materials. These had to use the course materials in solving the tasks, and also to draw on resources available in the classroom. They were invited to test new theories, and try out in practice new ideas, and reflect on these experiments. The time for reflection on one's own practice habits was meant to lead to deeper, more effective learning. As professional competence is built up from received knowledge and experiential knowledge, and as both components inform professional practice, the participants were encouraged by tasks and, subsequently, by tutors to practise reflection on their own teaching as a way of developing and extending professional competence.

This kind of tightly structured course material created a dilemma for the tutors: were they to encourage exploration and reflection (which can be confusing) or to minimise confusion and maximise positive study time? In other words, they faced the big pedagogical challenge of any distance project: how could they provide enough support to participants in order to motivate, encourage and help them without the latter becoming dependent solely on what the course materials provided?

In addition, both course developers anticipated that the distance learner's relative isolation could help to foster a discipline of learning awareness. Distance can be made to work for the trainee almost in a metaphorical way: distance learning can help to cre-

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ate distancing between the trainee and what is learnt and a more self-reflective attitude (Leach, R. p. 37). Moreover, as speakers of a foreign language, which they feel to be both familiar and distant, EFL teachers can be more focused on the process of learning than the average teacher of other subjects. Indeed, as their feedback showed, most of the trainees managed to create for themselves enough opportunity to develop good awareness of the learning process and to contribute to this.

While DINSETT opted for low-technology – print-based materials delivered by registered mail, PIR opted for both printed and CD recorded materials, and email correspondence. Also, telephone tutorial support was available for trainees throughout both courses.

In the process of materials elaboration the developers started from the idea that making learning difficult does not make it more valuable, while making it more accessible increases the amount of learning that takes place. However, the question remained whether by making the participants' learning easier the course closed down other opportunities for them to explore vital learning skills, of value to them both as learners and teachers. The importance of encouraging interaction between trainees and the writer/tutor was constantly stressed. The units were devised in such a way for the trainees to first 'deconstruct' the text, assimilate information into existing schemata, 'reconstruct' it and produce their own output. The course units were broken into manageable units interspersed ('deconstructed') with revision and reflection tasks. Some tasks helped the trainees to reconstruct the text partially.

Here are a few examples from Unit 5 in the DINSETT volume:

Stop and think. Before reading this section, think about all the materials that you have read during the last week, both in Romanian and English. Make a list

of them. You may wish to reflect on how your reading of them could be classified: was it for getting information (general, specific) or, for pleasure? How many of these different types of reading material would you find in the textbooks you use? (p. 8)

SAQ 7: An English reading programme. The general aim of an English reading programme for the lower secondary school may be formulated in the following general terms:

to enable the pupils^{1/} to read without help^{2/} unfamiliar^{3/} authentic English texts^{4/}, at an appropriate speed^{5/}, silently^{6/} and with adequate understanding^{7/}, and to enjoy reading in English⁸

Starting from this general statement, could you formulate in more specific terms the aims of the English reading programme for your own pupils and the specific implications for your classroom teaching that follow from these? Try to comment on each of the marked elements (1 to 8) of the statement above. (p. 12)

The breaking down of work into clearly defined steps offered highly explicit guidance which was intended to help promote confidence and allow participants to feel that the work set was manageable. However, this may have also encouraged a narrow, uniform approach to the work. Here is what a few trainees had to say about how their perception of the course work evolved over time:

At certain times I lost the course of 'events' presented in the unit because all the time I had to stop and think but this wasn't bad because it obliged me to check the facts and understand them. (Ani Baroni - Galati)

I found the course very useful. I have other books but they are too extended. This course has all the information I need in fewer pages. (Silvia Sandulescu - Bacau)

I think it was the most important thing to stop reading and to begin thinking about what we've read, to



write our opinions and thoughts in our logs. (Nicoleta Vlad - Bacau)

In some units we were asked to devise similar tasks to the ones in the unit. (Oana Blaga - Iasi)

3. Tasks and Assignments

Both projects incorporated a study-skills element as this was identified as one of the needs of the teachers who had been away from formal education for some time. Each course introductory unit included a course orientation map, advice on note taking and guidance on how to organise one's time.

The self-assessed questions (SAQs) and send-away assignments (SAAs) encouraged the trainees to look analytically at their own teaching context, asking them to reflect on and refer constantly to their own teaching context, including their pupils and their own teaching in their analyses. This kind of tasks implicitly encouraged self-evaluation and enabled the participants to set their own agenda for change: the trainees were asked to search for alternatives in their teaching, through reading and reflecting, to integrate theory and practice but also to generate their own theories out of practice. The learning tasks promoted steadier long-term changes in one's teaching in comparison with the tasks with similar content which are delivered face-to-face, where the participants are cut off from their classrooms, and where often the trainees feel overwhelmed by the diet of instruction. Here are some comments collected from the participants' feedback:

The course provides enough support for the tasks, especially if I combine its principles and objectives with my practical experience in the class. (Nicoleta Vlad - Iasi)

There was nothing too difficult as [far as] the tasks are concerned as all the support was given by the

course. The only condition was to study it thoroughly. (Smădu Ramona - Galati)

The tasks come at an appropriate time and their objectives - as I could notice - guided, supported and stimulated the activities. (Radu Monica - Galati)

4. Tutors and Tutorials

Two weekend face-to-face tutorials were organised as part of the DINSETT project, while the PIR students attended as many as 20 hours of assisted activities per semester for each practical course (40 hours allotted to the two practical courses, 12 hours of tutorials in Morphology and 10 in British Cultural Studies) during the first term. In the subsequent terms, the number of tutorials was gradually reduced. These direct contact classes were meant to provide the trainees with support and reassurance, and to offer guidance points to everyone, tutors and trainees alike. Some tutors adopted a proactive attitude, others a reactive one, during these meetings, but the question remains whether tutors should adopt a proactive or a reactive attitude.

Contact with course tutors was maintained in both projects by means of feedback on assignments, school visits and the assessment of practical teaching. The tutors stressed constantly the importance of class exploration, experimentation, and reflection.

One basic assumption that the course materials developers started from was that participants would rely on their own classroom expertise. Practising teachers would be confident about their 'feel' for what works and what does not in the classroom and would approach reflecting on their own teaching through reading and written work with equanimity. However, each tutor reported the difficulties of a number of participants who were questioning their own expertise and ascribing to course tutors the role

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of sole experts. They had to be encouraged to see that within their own classrooms and their own institutions were learning opportunities of greater value than the books.

The tutors' assumption that trainees would have easy access to local mentors and colleagues for support and guidance proved to be somewhat naive. The trainees were given suggestions for where they could find resources but no information about the mentors in their areas. However, they were able to support each other. In several cases, to the participants' surprise, more help was found where they expected less: from the school principals and the teachers of other subjects.

An additional benefit of both projects was that many of the trainees became more aware of the importance of being integrated in the teaching community in their regions and they contacted teachers from larger towns, started to read the *Journal for the Romanian Teachers of English*, and even participated in the activities of the local English Teachers' Associations.

5. Trainees' Anxieties

Initial anxieties were caused by the amount of reading the trainees were supposed to do, by the written work they had to produce, and by the fear that the trainers will have a judgmental attitude. Some participants also had problems with the 'new language' they had to learn, confusing 'jargon' and 'theory'. This problem was partially solved by the existence of glossaries at the end of most units.

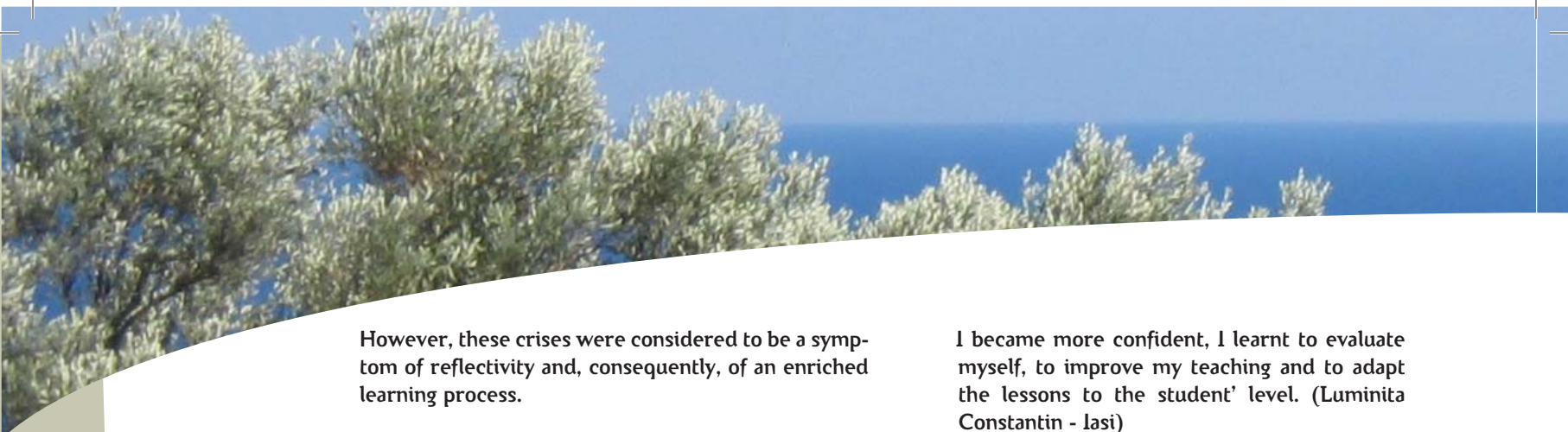
Participants also found it difficult to connect received knowledge to experiential knowledge and practice as they had a long history of undervaluing personal expertise and searching in the literature for prescriptions. They were accustomed to producing work that

had little reference to personal practice. With little opportunity to meet face-to-face (either with other trainees or with the tutors) and discuss their teaching experiences, participants were not able to reflect interactively on what they were reading, and place it in perspective.

Anxieties were exacerbated by the isolation and an apparent emphasis on learning from print. This anxiety led some participants to focus particularly strongly on the 'received knowledge' part of the course as they found especially hard the tasks requiring personal judgment. Some of them were tempted (initially, at least) to downplay the exploration of their own experience as they did not seem to trust themselves and often turned to tutors for guidance.

These anxieties produced an over-critical attitude to their own teaching, and crises of confidence, especially before the teaching practice periods. Their feedback after these periods was very impressive as all the trainees considered the practicum useful and non-threatening. All trainees stressed how much the tutors helped them in reconsidering their status and self confidence.

- At first, participants did not feel very confident about developing their own ideas about teaching in written form and analysing their own practice in a balanced way, but this changed gradually;
- They were uncertain as to how to use the professional literature;
- They felt intensely the isolation from each other and other professionals, and tended to exacerbate these difficulties;
- There was not enough time during tutorials to resolve all their problems.



However, these crises were considered to be a symptom of reflectivity and, consequently, of an enriched learning process.

6. Perceived Educational Advantages of Distance Education Projects

Answers to various feedback questions administered during the projects and the students' performance show that participant motivation started high and then dipped slightly.

Here are a few answers selected from the initial DINSETT needs study:

I am extremely interested in this project which seems a wonderful idea.

This course is like an answer to my prayer.

Congratulations on your initiative... my knowledge of methodology is poor.

I am interested in any project which means continuing education and supports my professional development.

Participation in a distance learning course had powerful implications on the trainees. Here are a few advantages, as they were perceived by the trainees:

1. **Trainee autonomy.** Learner autonomy was very high in these distance learning projects, perhaps even higher than in self-study. Autonomy was encouraged by the basic philosophy of the project, by the support materials and enhanced by positive feedback from the tutors. The trainees who answered the end-of course feedback questions state they improved their autonomous learning skills.

I became more confident, I learnt to evaluate myself, to improve my teaching and to adapt the lessons to the student' level. (Luminita Constantin - Iasi)

Feedback is important for developing your learning skills. (Dorel Comlosan - Suceava)

I began to pay attention to my ability of preparing the English classes. (Silvia Sandulescu - Bacau)

2. **Self-esteem.** As we do not always know if teachers enroll in such courses because they think highly or lowly of themselves, self-esteem also needed to be established and reinforced by tutor feedback. The trainees' self-respect in this regard can be a precursor to their (new) respect for learners and their desire to foster the learners' self-directed learning. Most of the respondents say they have become more confident teachers and more confident persons.

It made me feel important and it gave me a feeling of confidence in dealing with the challenges that life and my profession will certainly offer me. (Ionela Mocanu - Bacau)

It increased my self- confidence, it made me aware of my strong and weak points in teaching. I feel I belong to the English teaching community at a higher degree than before. (Cameelia Bojescu - Vaslui)

My popularity and prestige increased, as well as my own teaching experience and confidence and even my courage to work more or for superior results. I even feel like a man with more personality as before. (Gheorghe Ipati - Botosani)

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3. Quality of learning materials. Distance learning materials have to comply with a number of requirements which can be copied to other types of pedagogical materials: minimal number of words on the page, plenty of white space, bulleted lists, clear hierarchy of headings, simple introduction and clearly formulated objectives. The distance materials developed by both projects were self-explanatory, couched in a language that is accessible to the trainees. The good qualities of the course materials inspired the trainees' own teaching: they developed or adjusted new materials in terms of layout, use of headings, clarity of instructions, contextualization, referral back to previous learning, clear objectives, summarisation and review, consistency of style and presentation.

What I liked most about this course and what I think is the best thing about it is that you have enough time to look at the materials to 'digest' them, you get enough materials (THEY WILL BE YOURS)... (Oana Blaga - Iasi).

These materials gave me an example, useful to my teaching career; they showed me what kind of materials I should use in the classroom (Andreea Mihai - Vaslui).

All the materials were useful because I adopted a few methods in class and they also helped me to make my materials for the lesson (Georgeta Dimitriu - Galati).

The course made me more confident in my

teaching skills. The fact that the materials were relevant to my teaching situations made me feel I was not lonely anymore, that there were some other teachers confronted with the same problems. I had a very strong feeling of being together with other teachers. As for the trainers I have only one word: Congratulations. (Ramona Smîţdu -Galati).

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Providing Training and Support to Rural School Teachers through New Technologies

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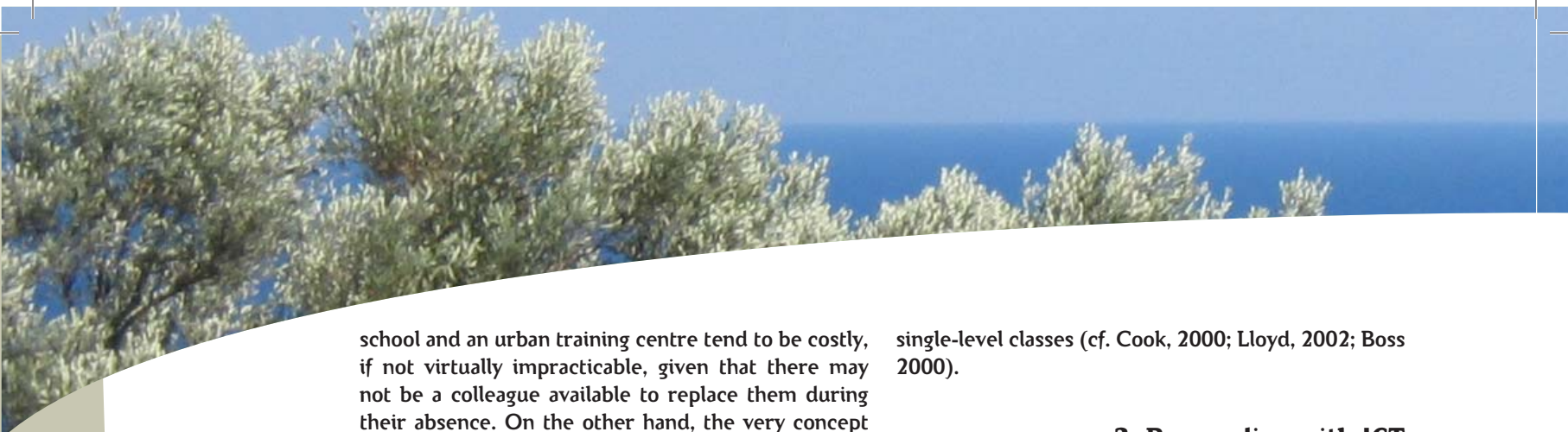
1. Working at the borders of the education system

In many primary schools of the Greek provinces there is not one teacher available for each of the six grades: the low number of students statutorily justifies the employment of less than six teachers –even of one or two–, who nevertheless are expected to cover the needs of a full school. These schools, known internationally as multigrade schools (cf. Little, 2006), fulfil a function of national importance, as they provide the children of remote and less accessible areas with the access to education which all children of Greece are entitled to.

2. Teachers' need for continuous learning

Teachers of multigrade schools are confronted with significant challenges, as they have to teach simultaneously two or more age groups and possibly more

than one curriculum subject in the same class. Teachers' initial professional training does not suffice and the need for competence development is evident – especially in the light of the fact that typically inexperienced, newly-appointed teachers are posted to remote schools for a relatively short term service. Thus the average teacher working in a small rural school needs to acquire new knowledge and skills and continually improve their expertise in teaching in the demanding context of the multigrade classroom. They need to develop personal competences falling beyond the established initial and in-service teacher training curricula, which are oriented towards conventional monograde teaching, in order to develop and maintain the ability to respond to the challenging circumstances of their professional position. However, there exist a number challenges in connection to remote rural teachers' need for competence development. On one hand, offering teachers from remote areas conventional professional development provision, such as in-service training seminars, is not easy. A teacher's round trips between their remote



school and an urban training centre tend to be costly, if not virtually impracticable, given that there may not be a colleague available to replace them during their absence. On the other hand, the very concept of competence in the context of multigrade teaching may not be as straightforward as it appears. In the field of Human Resources Management competence is usually defined as a standardized requirement for an individual to properly perform a specific job, encompassing a combination of knowledge, skills and behaviour utilised to improve performance. However, whether a teacher is adequately or well qualified so as to have the ability to perform successfully in the multigrade classroom is a question with no official, standardised answer. The educational system – in Greece at least –, through its choices for the preparation of teachers-to-be, does not clearly define what good multigrade teaching is. Teachers are more or less left alone to explore and learn multigrade teaching on their own, through their solitary experiences in remote rural schools. What is worse, teachers at remote schools also suffer the consequences of a widening socioeconomic and digital divide which separates the rural from the urban areas in most parts of the world.

The above described difficulties of multigrade teachers working in remote areas are not unique to Greece. Internationally, the shortage of teachers in rural and remote areas, and the weaknesses of the education systems in the provision of training and professional support to these teachers, have been well-documented in the literature (Forbush & Morgan, 2004; Helge & Marrs, 1982; Ludlow, 1998; Miller & Sidebottom, 1985; Ankrah-Dove, 1982; Coldevin & Naidu, 1989; Benveniste & McEwan, 2000). However, these problems appear to be in sharp contrast with a growing recognition of multigrade schools as not only a necessary, but indeed a good-quality option for education systems, believed even to have some advantages over

single-level classes (cf. Cook, 2000; Lloyd, 2002; Boss 2000).

3. Responding with ICT

As a response to the obstacles described earlier, the use of different forms of technology-supported learning and distance education models have been advocated for the enhancement of quality and accessibility of teacher training programs in rural areas (Squires, 1996; Ludlow, 2001). Relevant attempts have followed the technological trends in the field of computer-supported learning, while the content of training delivered via the different technologies varies greatly, from conventional seminar-type lessons to classroom observations at a distance (Kendal, 1992; McDevitt, 1996; Ludlow & Duff, 2002; Kraft, 2002; Forbush & Morgan, 2004). What is more, in recent years a lot of attention is paid to the role satellite telecommunications can play for the bridging of the digital divide (European Commission, 2003; Cohendet, 2003), and distance education is seen as a major field of application in this area, as this technology provides a delivery option facilitating access to new student populations in distance locations (Littman, 2000). Significant experience has already been gained internationally, particularly in the United States and in Australia (e.g. Boverie et al, 2000; Boylan, Wallace, & Richmond 2000), as well as in other less developed countries with populations distributed over large geographical areas (e.g. Al-Sharhan, 2000; Cohen, 2002; Lorenzo, 2002).

4. Our response

This growing mass of international experience clearly demonstrates that emerging technologies offer promising solutions to the challenges of providing appropri-

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ate training and support to rural educators. Adopting this as a proposition in our work in the framework of a number of pioneering European and national research projects, our team has in recent years made efforts to alleviate the isolation of teachers working in remote schools through the provision of distance training, support and networking, using to the full the possibilities offered by new technologies.

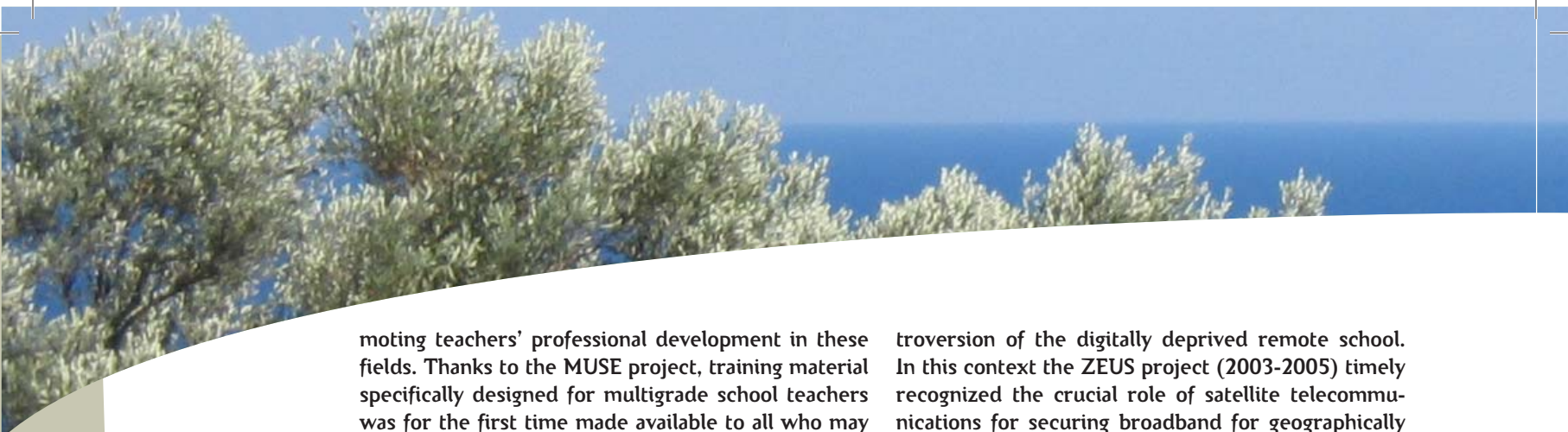
The main questions we have addressed in the course of almost six years of consecutive projects, have referred to: a) the appropriate content of the relevant professional development and support activities; b) the appropriateness of the various available and emerging delivery technologies, given the remote and digitally disadvantageous location of the beneficiaries; and c) the possible extensions to conventional e-learning technologies and practices, which could help the geographically disadvantaged rural educators to learn as individuals and to learn from each other, participating in informal learning experiences within a sustainable lifelong learning network.

This course of work coincided to a great extent with the emergence and swift uptake by the research and technological communities of the concept of ubiquitous learning, as an offspring of the advent and proliferation of wireless networking solutions. Naturally, the vision of learning everywhere and anytime, whereby knowledge is more available and expertise more reachable, with a particular emphasis on place-independence, has been providing us with insight into the best learning solutions for professionals working in such remote and 'unconventional' (compared to the usual urban) settings. Following emerging research in this field, we have made consistent efforts to provide rich e-learning environments with the typical features of ubiquitous learning (Chen et al., 2002; Curtis et al., 2002; Ogata & Yano, 2004). Teacher-trainees in these e-learning environments have permanent immediate access to safely stored

learning content, including their own data. They can introduce and continually form their learning and needs profile so as to be offered tailor-made, adaptable learning experiences, and can interact with experts and peers both synchronously and asynchronously, participating in social knowledge building and sharing. All this happens in teachers' everyday work environment, i.e. in the small rural school in which they work, while special efforts are made to design the instruction in ways that allow the embedding of trainees' learning in daily real life situations.

The whole effort started with a rather greater emphasis on teachers' competence development through training content delivered over the web (MUSE project); it gradually moved into testing more advanced technologies for broadband delivery over satellite, while continuing to further develop the content (ZEUS and RURAL WINGS projects). The 'maturity' brought about through the training experiences and the increasing involvement of remote rural teachers led to the development of a network (NEMED) and an increased interest in concepts and tools related to lifelong learning networks (NEMED, RURAL WINGS). The projects, their interconnections and outcomes are presented below in more detail.

A first milestone in our effort was the European project MUSE (Multigrade School Education), which was supported by the Socrates Programme – Comenius 2.1 Action (2002-2004). In this project, through close international collaboration between teachers and researchers, an innovative, specialised in-service training programme was developed for teachers working in multigrade schools. The main outcome of that project was a realisation of the need of multigrade teachers in Europe for training in innovative teaching and learning approaches that are well-suited to the multigrade school environment, including the use of ICT in everyday school work, as well as the development of a relevant training programme pro-



moting teachers' professional development in these fields. Thanks to the MUSE project, training material specifically designed for multigrade school teachers was for the first time made available to all who may be interested, via the internet.

A follow-up of the activity developed within MUSE has been the networking, at the European level, of educationists and school practitioners sharing an interest in multigrade schools, either as a field of research or as a space of educational practice that deserves attention and support. This contact and exchange is taking place within the European network NEMED (NETwork of Multigrade Education), a trans-national network supported by the Comenius 3 Action of the Socrates Programme (2004-2007). Through its activities in ten European countries and at pan-European level, the network is currently studying the characteristics and the needs of multigrade schools, is actively promoting the upgrading of questions relating to multigrade education in educational policy-making, is investigating and proposing ways to improve the education provided by multigrade schools, as well as offering support to multigrade school teachers and fostering the development of communication among them. What is more, there is a specific interest of the Network in developing the NEMED web portal, which should foster and enhance the functioning of NEMED as a lifelong learning network for Europe's multigrade teachers. In addition, NEMED regularly organises international workshops and conferences, aiming at the widest possible dissemination of knowledge and experiences accumulating within the network, as well as the sensitization of the world of education towards multigrade schools and their issues. At the same time, a lot of the energy and attention of our team has been devoted to securing better channels for the delivery of rich training and support content, as well as for enhanced communication among isolated teachers, so as to drastically combat the in-

troversion of the digitally deprived remote school. In this context the ZEUS project (2003-2005) timely recognized the crucial role of satellite telecommunications for securing broadband for geographically disadvantaged populations. This project offered to remote teachers a rich distance learning environment for participating in synchronous and asynchronous training via satellite networks. This was an initiative at the national level, supported by the General Secretariat for Research and Technology within the Concerted Programme for Electronic Learning. The training programme was attended by teachers at ten sites in the extremities of Greece, via satellite installations made by the project at their schools. The research in ZEUS focused mainly on the appropriateness of the training content (which built on the MUSE content, extending and enriching it), the development of a distance training organisation and delivery method (which is described further below), and the testing of connectivity through DVB one-way satellite links as a channel for distance training delivery to remote teachers. The outcomes of this project in terms of training content and methodology are described in detail further below. As far as the technology is concerned, the DVB satellite link, demanding the use of non-broadband terrestrial infrastructures (broadband downloading from the satellite, uploading through ISDN telephone line), caused some technical problems and relevant user dissatisfaction, which clearly indicated the way forward.

A 'child', in many respects, of the ZEUS project, and the peak of the whole effort is RURAL WINGS (2006-2009), an ambitious, large-scale international research project supported by the Directorate-General for Research of the European Commission (Thematic Priority 'Aeronautics and Space' of the 6th Framework Programme). This project takes several decisive steps ahead, not only in the field of technology, but importantly also by carefully addressing

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the real needs for learning of all citizens living in remote rural areas, and by fostering the development of lively learning communities in remote schools and the villages hosting them. On one hand, DVB-RCS technology is used, which allows for two-way communication between the end-user and the satellite lifting the need for any terrestrial telecom infrastructure, thus rendering broadband really available everywhere, even in the most isolated and deprived area. At the same time, the RURAL WINGS project integrates satellite telecommunications with local wireless networks, thus demonstrating the appropriateness of satellite technologies for the provision of fully integrated services and applications to the whole of the remote rural population. What is more, RURAL WINGS builds on the successful approach of the ZEUS project to develop an advanced technological environment supporting lifelong learning activities in the school, at work, as well as at home. In this way, familiarization of all citizens with the new technologies is promoted, resulting in a reduced resistance to the use of state-of-the-art opportunities for local development. Teachers working in remote rural schools –the main target group in the pilot applications in Greece– undertake a crucial role in this process. Through further support, professional development and networking, teachers of rural areas are encouraged to evolve into catalysts of change and development, not only within their schools, but more widely within their local communities.

5. Training content and technologies

Based on initial analyses of teacher needs, professional development schemes piloted in the above projects aim at helping multigrade school teachers to develop their professional skills along two main axes:

- Use of ICT in their work, both for teaching/ learning and administrative purposes.
- Application of teaching and learning approaches which are most appropriate for the multigrade classroom.

The corresponding e-learning environments have been realised through several technologies, exploiting satellite telecommunications for broadband delivery of rich educational content, in the context of both synchronous (videoconferencing, application sharing, chatting) and asynchronous (web-based learning through structured access to a rich pool of educational content, and networking) activities. Of particular interest is also the NEMED web portal, a networking web space serving all network actors by facilitating communication and exchange, sharing of information and conducting of research, as well as provision of professional development and support opportunities to multigrade school teachers. The portal is divided in six identically structured areas, which correspond to the six working groups of the network: ICT for multigrade schools; classroom management in multigrade schools; society, cultures, and the multigrade school; learning modes in the multigrade classroom; educational resources development for the multigrade school; policies for multigrade education.

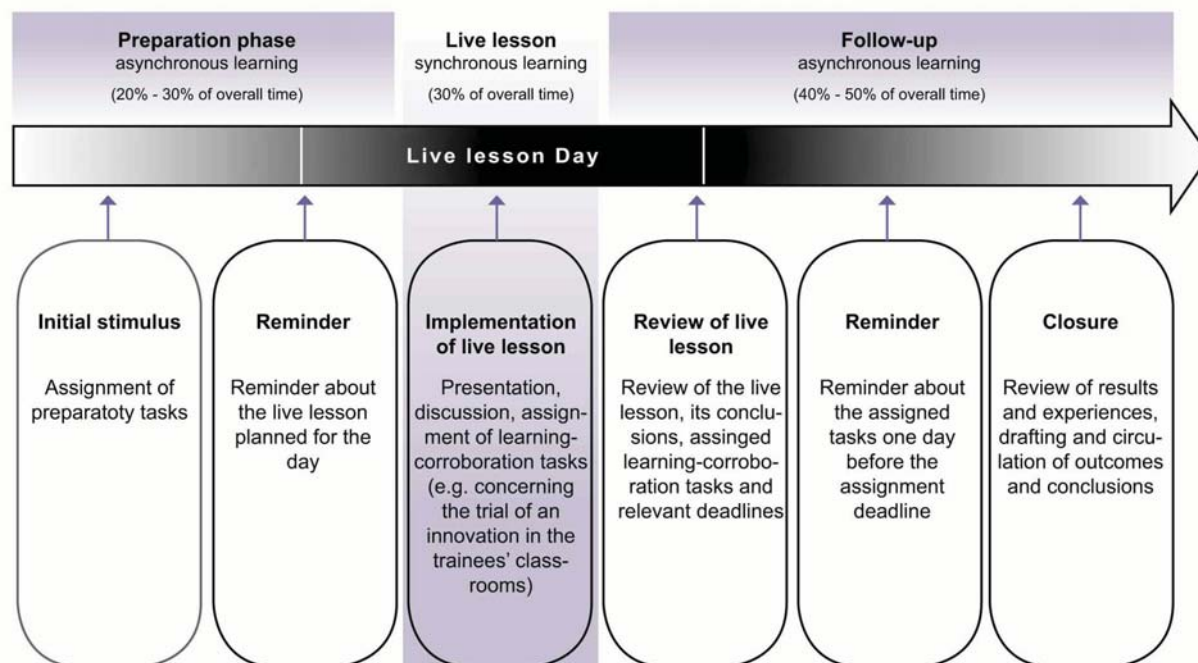
In a working group area, users can access work relating to research, educational resources, and training materials, as well as participating themselves in ongoing work by uploading their own contributions. Users may also view and download the different Reports of this working group to the whole NEMED Network, while there is also a dedicated area to facilitate communication and exchanges within the group in the form of asynchronous forums. On the whole, the NEMED Networking Portal is meant to be a lively virtual space of structured exchange between network partners, participating teachers and schools,

as well as any other users interested in multigrade education.

Figure 1: The ZEUS model of training delivery

ZEUS) (see Figure 1).

In this model, the central event for each lesson is a live videoconferencing session, using a synchronous e-learning tool, thus covering the need of isolated



6. A distance training delivery model

It has been a firm belief of the team that, although technical specifications do play a crucial role in a distance-education scenario, the success or not of the effort mainly depends on the underlying pedagogical design (cf. Lim, 2002). In line with this, the training programmes produced aim to cater for both flexibility and guidance, both interaction with others and self-paced learning. To this end, a comprehensive model for training delivery has been developed and tested in the framework of these projects (mainly

teachers for communication and real-time interaction with colleagues and instructors (cf. Shrestha & Sutphin, 2000, stressing the importance of interaction in similar settings). On average, this synchronous e-learning portion of a lesson takes up about 30% of the overall lesson duration.

As can be seen in Figure 1, however, both before and after the live session there is learning activity taking place independently in the working environment of the trainee. Through the use of web-based instruction techniques course participants are offered on-the-job training opportunities through tasks and ma-

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terials that allow them to work at their own pace, interact with the instructor and other practitioners as needed, and receive individual feedback as they applied information to their classroom settings. For each lesson, there is introductory information on the topic covered, preparatory activities, the outcome of which are then reported by participants in the web environment and during the live session, as well as post-session consolidation and conclusion activities. The training delivery model has generally been well received by trainers and trainees.

7. Evaluation

A major aspect of all the above projects has been multi-faceted evaluation of the piloted e-training solutions. The aim of evaluation in these projects typically is to assess the appropriateness of the choices made during the design stage, and the overall effectiveness of the solution, at least at three levels: the technology used, the content of training offered, and procedures followed.

The views of users (teacher trainees and instructors) on these aspects are collected through a variety of tools, including online questionnaires, interviews, as well as field observations and video recordings in the schools and classrooms of the participating teachers, in an overarching case-study oriented approach, following the development of informants' views, behaviours and stances. Questionnaire responses are analysed quantitatively, while data from the interviews and observations are analysed qualitatively, making use, among other tools, of specialised software for the demarcation and analysis of video data.

For evaluation purposes, as well as for the introduction of improvements at a middle stage of the implementation, the courses offered are usually organised in two consecutive cycles. As a result, evaluation ac-

tivities cluster around three main points on the timeline of the project: before the outset of the course, after the completion of the first cycle, and after the completion of the whole course, at the end of the second cycle. In this way, the evaluation methodology seeks to take record of the conditions prevailing in the participating schools before the programme, after its first cycle, and after its eventual completion, so that any changes effected by the training can be spotted and hopefully interpreted. In particular, the outcomes of evaluation at the end of the first cycle are useful for the introduction of any necessary improvements in the second cycle.

In the following, some outstanding findings and conclusions from the recently concluded ZEUS project are presented, being indicative of the broader tendencies that we have been recording in our various samples.

8. Indicative findings

The effort invested by the ZEUS partnership in the evaluation of the project and of the training programme in particular yielded outputs of considerable value. The quantitative and qualitative data gathered and analysed revealed positive as well as weak points in the design and implementation of the project, bequeathing rich experiences and good practices for future efforts in the field.

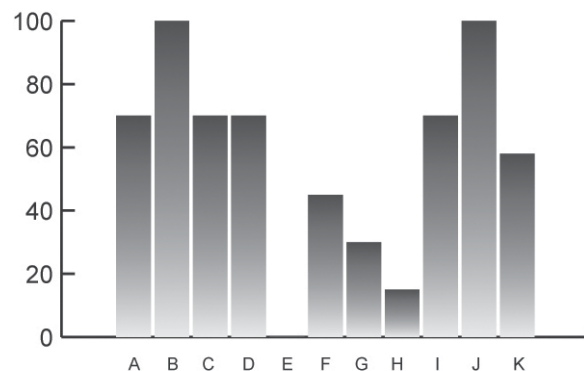
Overall, the trainees evaluated very positively the content and procedures of the training offered; a few technical problems and faults did slightly decrease teachers' enthusiasm, but in the whole they did not lead to a much lower overall appreciation of the deployed technological solution. The ZEUS experience clearly showed that satellite data telecommunications can effectively support the provision of training and professional development at a distance, particu-

larly to professionals such as teachers who work in remote and isolated areas. Nevertheless, ZEUS also clearly indicated that significant technical difficulties, which in some (limited) cases even caused obstacles to the smooth running of training, would have been avoided if a more advanced model of two-way satellite internet provision (DVB-RCS) had been available, not demanding the use of non-broadband terrestrial infrastructures. This technology is now being deployed within the RURAL WINGS project, yielding satisfactory results.

In general, the attitude of the participating teachers towards the training programme was very positive. In their majority, they were dedicated to the course, and prepared to withstand any difficulties arising out of technical or other problems. This interest in ZEUS was found to be due to factors such as a decrease in their feeling of isolation and increased opportunities for communication with colleagues, new opportunities for access to up-to-date information, as well as the good relations and rapport developed between the trainees and the staff supporting them.

In addition, given the situation in schools as recorded before the beginning of training, multigrade school teachers in Greece seem to be in real need for training in the use of ICTs, as well as in new, less conventional pedagogical approaches, which would help them better respond to the particularly high demands and challenges posed by multigrade classrooms. Observations made in schools at the pre-course stage revealed a very low level of use of ICTs, as well as traditional methods of teaching and classroom management that did not appear to offer the best possible solutions for the particularities of the multigrade classroom.

Another very clear outcome of ZEUS was a corroboration of the predominance of the appropriate pedagogical design over mere availability of new e-training technologies via satellite connections. The different



- A Increase live sessions.
- B Make live sessions more interactive and less lecture-like.
- C Record live sessions to make them available for attending asynchronously.
- D Distribute learning materials in printed form too.
- E Put emphasis on asynchronous learning and reduce live sessions.
- F Increase the number of applications developed by the teachers themselves.
- G Increase consolidation activities for each software application taught.
- H Decrease consolidation activities for each software application taught.
- I Give priority to the exchange of materials among teachers.
- J Involve school students too.
- K Teach more software applications.

Figure 2: Teachers' suggestions for improvements

media, tools, and contents need to be orchestrated, according to clear pedagogical planning principles, into frameworks enabling substantial learning experiences and maintaining learners' interest unabated, so that specific training goals and objectives are achieved. The findings of the evaluation confirmed the appropriateness of the procedure proposed by ZEUS for the preparation, realization and support of e-training (training delivery model; see Figure 1 above), which structures a series of asynchronous preparatory and follow-up activities around a central

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live session.

Of particular use are also teachers' expressed suggestions for the introduction of improvements in future realisations of the training programme. Figure 2 depicts teachers' response to various relevant items in a list, revealing the respondents' preference for more synchronous interaction and exchange as well as the involvement of school students too in the training process.

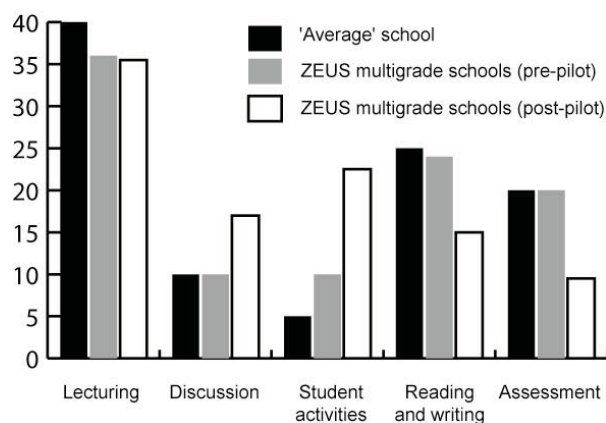


Figure 3: Profile of classroom activity

An equally interesting and useful conclusion of the project refers to the unique opportunities for better understanding multigrade education through close observation and in-depth analysis of the video recordings of multigrade classrooms. To illustrate this point, reference can be made here of the findings of the analysis, in terms of lesson time allocated to the different types of activity, of the video data from the classrooms observed in the framework of the case studies conducted (see Figure 3).

As can be seen in the chart, the distribution of classroom time in the five activity categories was found to have changed after the training: from a strongly teacher-centred, lecture- and assessment-oriented

approach, typical of most schools in Greece –including multigrade schools–, the experience of the training programme may have lead teachers to experiment with more student-centred approaches.

On the whole, running ZEUS was a rewarding experience, which, on the one hand confirmed the usefulness of satellite telecommunication systems for the provision of support to remote and isolated communities, starting from teachers working in such communities; and on the other hand, suggested ways for introducing improvements into, and furthering our work in this field.

9. Outstanding questions: emerging issues of lifelong learning networks and competence development

In all the work described above, our efforts have led us to provide teachers working in remote small rural schools with opportunities for continuous professional development, through a number of different training initiatives, which foster the improvement of personal competences in rural teachers. In parallel, we have been experimenting with methods aiming to develop and foster a learning network of teachers, which will hopefully provide a framework for the acquisition and sharing of knowledge in an informal communication process (informal learning) lying beyond and supplementing teachers' formal professional education.

Realising the issues and challenges arising, our team has started investigating further the characteristics of tools and methodologies which can foster the improvement of personal competences in rural teachers (competence development), and encourage and facilitate a teacher's contributions to the development of the other teachers (lifelong learning network). In this context, we are currently revisiting the training

delivery model mentioned above (Figure 1) at the micro level, aiming to identify, adopt and/or adapt methods and tools which could be incorporated in this general model in order to facilitate and support informal learning through peer interaction. In other words, we are currently investigating ways of effectively combining competence development and life-long learning networking priorities and initiatives.

At the level of technology, too, our team has come to realise the limitations of the conventional e-learning technologies and models, when the issue at stake turns into how to promote and facilitate competence development through networking with peers – a life-long learning experience of multi-site and episodic nature. What is crucial at this stage is to identify the features and clarify the main issues connected with the technology/-ies which will be able to support rural teachers, both as individuals and as members of teams within the educational system (an 'organisation' in itself), to further develop their competences making use of the distributed knowledge and learning resources available. The NEMED portal is our current attempt in this direction, which has so far managed to develop into a repository of teaching and learning resources connected to multigrade education, jointly created and update by the teacher-members. It clearly needs to be further developed in the light of contemporary advances in social software. What is more, the newly-started RURAL WINGS project provides ample opportunity and challenge to organise the numerous learning resources and diverse learners in rural communities worldwide into meaningful, working networks fostering lifelong learning and competence development, within its own learning-enabling portal.

In the endeavour to better understand and enable our vision of lifelong learning networks of rural teachers, we have found the notion of communities of practice (Wenger, 1998) to provide a powerful

conceptual platform. According to Wenger, communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. We are then aiming in this case to enable the development of a community of practice of rural teachers, which is defined by a shared domain of interest, that of the development of multigrade teaching competences. We need to establish members' commitment to the domain, and facilitate community development by assisting them to engage in joint activities and discussions, help each other, share information and learn from each other, while pursuing their interest in their domain. This will be indeed a community of practice rather than a mere community of interest, as members of the community will be rural teaching practitioners developing a shared repertoire of resources – a shared practice: experiences, stories, tools, ways of addressing recurring problems in their small rural school, etc.

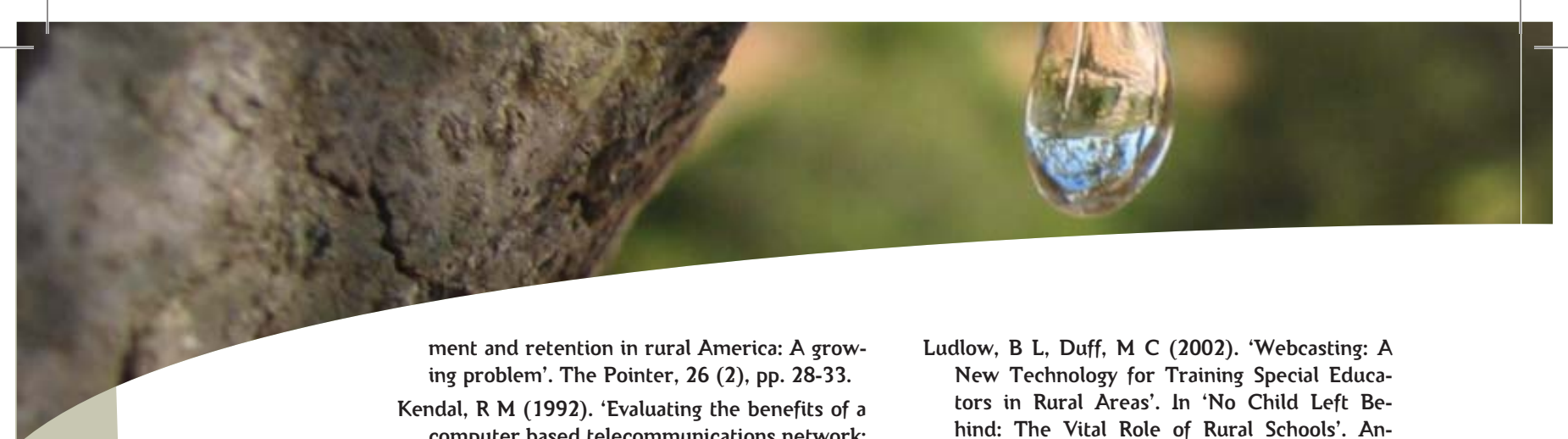
This kind of learning of course takes time and requires sustained interaction – which are some more of the things that the technologies we are envisaging have to afford. Likewise, the technologies will need to support and facilitate a variety of activities through which communities develop their practice, such as problem solving, requests for information, experience seeking, reusing of assets, coordination and synergy, discussion of developments, mapping of knowledge and identification of gaps, etc (Wenger, 1998). How this can be designed and realised given current technological developments remains for us an open challenge.

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The Role of Regional Universities and Research Centres in Economic and Human Capital Development: The case of Crete

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1. Crete Profile: Main demographic and economic features

The island of Crete comprises one of the 13 Greek Regions, covering a total area of 8.335 sq. km. (that is, 6,3 % of Greece's total area) with a population of 601.131 ('5,5 of Greece's total population) according to the most recent demographic census (2001). The urban population comprises 57.98 % of the total population in 2001 (up from 42 % in 1991). The employment rate for Crete is higher than the national rate, with a strong employment trend towards the tertiary sector, which absorbs the highest rate of employees, a rate increasing with time as the number of people employed in the primary sector diminishes. Crete generates about 5% of the total national GDP. In the last decade, Crete has experienced a change in its economic structure (OECD 2005). In 1995, 21.4 % of the Gross Added-Value (GAV) of Crete

was produced in the primary sector, 11.2% in the secondary sector and 67.4% in the tertiary sector (the corresponding national figures were at that date 9.9% for the primary sector, 22.4% for the secondary sector and 67.7 for the tertiary sector). In 2002, the share of primary sector GAV had dramatically fallen in Crete (11 %) and the secondary sector receded slightly (10.7 %) while the tertiary sector leaped to 78.3%, being for the latter much higher than the national average of 70.8 %.

According to a recent OECD Report (2005), Crete's primary sector is characterized by long-term infrastructural weakness due to the small and dispersed nature of agricultural land, cultivating mainly traditional produce such as olive trees and viniculture. Market gardening covers only 3 % of the total cultivated area, but Crete contains almost 50 % of the country's greenhouses, with advantages in vegetable and flower production. Concerning the secondary sector, manufacturing is mainly connected to processing primary sector products (food and drink), and also to

the construction materials and plastics sectors. In the tertiary sector, administrative, education and financial services, as well as transport services, are chiefly concentrated in the large urban centres. Tourism is the most dynamically growing sector in Crete with a market-share of 25% of total foreign guest nights in Greece.

2. Entrepreneurship in Crete

Greece joined the European Union (EU) in 1981 as its 10th member state and has since been following an economic path leading to convergence to EU levels, with annual economic growth rates of ' 3%-4%. Such an effect is manifested in the increase of entrepreneurship rates observed since 1984: the "young" firms (that is, firms established after 1983) comprise more than 50% of the total number of Greek firms and contribute more than 50% of the total tax-reported income by firms. Cretan firms comprise 6,7% of the entire number of Greek S.A.-type of firms -as well as 2,9% of the LLC-type of firms and 5,5% of the sole proprietorships and partnerships- (Neofotistos, 2003). The majority of the enterprises in the Region are located in the Prefecture of Heraklion, followed by Chania, Rethymnon and Lassithi. The size distribution of the Cretan firms is skewed toward smaller firm-sizes.

Figure 1 presents the net number of Crete's S.A. companies established each year since 1984. Being a primary tourist destination, Crete's companies gravitate toward this sector. However, as other areas of rapid tourism development, Crete is vulnerable to crisis. Decline of guest numbers in 1991 were caused by developments in the Balkans and the gulf war (this effect is manifested in the dip in year 1999 in the number of companies established in that year, as can be seen in Figure 1.)

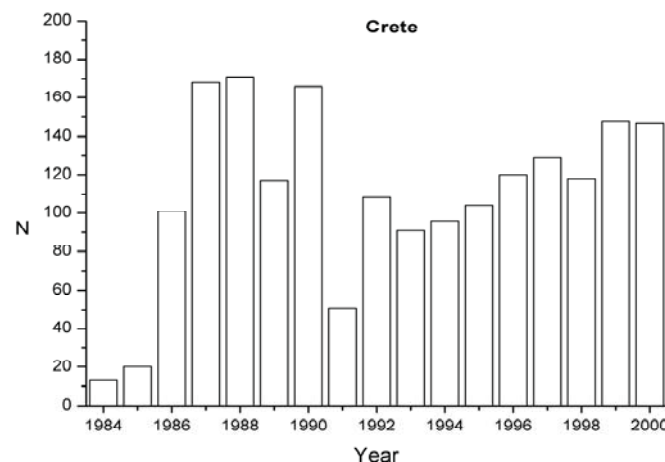


Figure 1: Number of Cretan S.A. companies established each year since 1984 (Source: G. Neofotistos [2003], data from Greek Ministry of National Economy, FY2003).

3. Higher Education Institutions (HEI) and R&D Institutions in Crete

In the 70's and 80's universities, polytechnics and technological institutions, as well as major research centers were established in Crete. Higher education and research activities are located mainly in Heraklion and, to a lesser extent, in Chania and Rethymnon. Crete's participation in basic research activity indices is significantly higher than that of the country's other Regions.

Following twenty years of investments by the public sector, the Region of Crete boasts of significant infrastructure for research and technology, while its results have repeatedly won international acclaim, particularly through participation in EU Research & Technology programmes. Compared with other regions of Greece, Crete now has the highest level of


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R&D in proportion of GDP, more than 1%. This is mainly composed of public R&D (around 50 %) and Higher Education Institutions (approaching 50 %); there is little private business-funded R&D. Crete has a number of international quality research institutes, state subsidized but with significant income from national and EU competitive programmes (OECD 2005).

Crete's HEI and R&D institutions are the following (ibid):

- a) The University of Crete (UoC), established in 1973 and based in Rethymnon and Heraklion, comprising five Schools and enrolling 14 000 students. UoC has significant capabilities in new technologies. UoC supports initiatives for innovative technology transfers to the companies of Crete (A liaison office has been established to provide support to Cretan enterprises in this area), and makes significant contributions to designing and implementing strategies that promote innovation in the Region of Crete through its engagement in the formation of the FORTH institutes and regional programmes.
- b) The Technical University of Crete (TUC), a smaller institution, located in the city of Chania, focusing on engineering, sciences and management, and enrolling around 2500 students. TUC's areas of research include industrial automations, computer applications, materials science, energy, biochemical engineering, environmental engineering and industrial security, mineral resources engineering, innovations management, marketing and business administration. The TUC supports small enterprises, mainly in western Crete and is active in the sectors of the economy and health services. A liaison office for this type of cooperation has been established

- c) The Technological Education Institute of Crete (TEI-C) is a Higher Education establishment with a central campus in Heraklion and 5 branches spanning all four Prefectures of the island. The student population exceeds 15.000. TEI-C is quite active in research and applications concerning the primary sector and in renewable energy resources.
- d) The Foundation for Research & Technology Hellas (FORTH), with five research institutes on Crete and the Foundation has around 1000 staff, mostly on Crete (with satellite centers in the cities of Patras and Ioannina), namely, the Institute of Molecular Biology and Biotechnology, with products available in the Greek and the international markets, with applications in agriculture and medicine; the Institute of Electronic Structure and Laser, with applications in medicine and art works conservation, microelectronics and environmental technology; the Institute of Computer Science: with major activities in the fields of telecom networks -that have led to the establishment of FORTHnet (a listed in the Athens Stock Exchange, major Internet Service Provider, with a market share of around 30%)- and telemedicine/telehealth; the Institute of Applied and Computational Mathematics: active in particular in the production of geographical information systems and regional development applications; and the Institute for Mediterranean Studies: based in Rethymnon, focused on heritage conservation and the humanities
- e) The Hellenic Centre for Marine Research (HCMR) was formed in 2003 from the former Institute for Marine Biology of Crete (IMBC) and the Athens-based National Centre for Marine Research. The new centre employs 400



split between the two locations and enjoys international acclaim in research and technological know-how in the niches of marine species inventory, aquaculture, sea-water quality monitoring, depth measurements, environmental management, molecular biology to improve genetic materials, etc.

- f) The research institutes of the National Agricultural Research Foundation (NAGREF). The institutes of NAGREF play a major role in the efforts of Crete for agricultural development and have developed significant capabilities in improving genetic materials, in disease control, virus-free production, soil analyses and food microbiology. The Mediterranean Agronomic Institute of Chania (MAICh) is an academic institution with an excellent record in agronomic research embracing the broader Mediterranean basin and part of an international organisation with several sites in different member countries. MAICh offers specialist postgraduate teaching and produces around 150 graduates each year.

4. The link between HEIs & RCs and Regional Development: The problems

Global economics is changing and HEI and Research Centres (RCs) are trying to move along these changes, a trend that has implications for everyone, from students to industry researchers to policy-makers in national and regional governments (Alvarez, 2007). Competition is keen among regions, both within countries and internationally, to become known as the international hub for selected high-technology sectors, and the quest for technologies and talents is less bounded by geography than in the past, with universities and research centres playing a leading role

in generating early-stage technologies and producing skilled trainees (ibid).

Crete's HEI and R&D institutions are driven by national priorities, which emphasize research excellence, international research participation and high tech spin offs having little to do with rural needs and concerns (OECD 2005). After all, research and educational institutions are seldom technology transfer mechanisms and remain mostly knowledge and technology generation mechanisms. Disconnection between areas of investment in university research and education and the regional labor and market needs comprises a significant problem. In the case of Crete, the limited university resources devoted to agriculture, the environment, tourism or enterprise training are a case in point (ibid).

With the engines for Crete's development most likely to be those of 1) tourism, 2) technology and IT innovation and development led by Crete's major institutions of higher education and research, and 3) development in agriculture and rural development (directed as much towards social cohesion and equity for rural people as being a true engine of growth), a number of recommendations have been proposed (ibid) to address the problems, namely:

- To facilitate the process of identifying areas in which innovation and research could better serve the purpose of rural development (via the organization of an "Innovation Forum", integrating the prefectures, local authorities, development organizations, universities, research institutions, and professional organizations).
- To keep enterprises and local development agencies well aware of new developments in tourism and technology and of the possibility to spread their benefits to the most rural areas of the island region.

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- To place greater emphasis should be placed on entrepreneurship and management training in the universities (the University of Crete could seek to create a Business School with a specialization in tourism and in SME development).
- To generate an impetus toward organic agriculture with producers being better integrated in the supply chain and better connected to sources of knowledge.
- To enhance the link between business and business oriented R&D by clustering them in an “organic valley” concept by which business R&D and strategic marketing actions can offer positive feedback.

5. Addressing the problems and the challenges

Nowadays, despite the seemingly non-converging “global versus local” dynamics of HEIs and RCs (that is, of pursuing international excellence in R&D v. pursuing knowledge & technology transfer at the local level), “regional cohesion” forces have begun to operate in a more visible way.

A number of initiatives have been launched recently to address the aforementioned problems along the lines suggested: the Innovation Pole of Crete, launched in 2007 with the objective to support scientific and technology areas, which offer Crete a regional comparative advantage at both global and local levels); the Training Support of the GoOnline Programme, coordinated by the University of Crete, with the objective to train 4.000 Cretan SMEs to use internet technology to enhance their business processes and their market presence; The Entrepreneurship Programmes at the universities; and university research work on natural (organic) products aimed toward commercial purposes.


These initiatives are presented in the following sections (furthermore, one should not forget the ongoing business incubating and supporting activity of the Science and Technology Park of Crete (STEP-C), located at FORTH).

5.1 The Innovation Pole of Crete

The Innovation Pole of Crete comprises a partnership of Crete’s HEIs, RCs, business associations, enterprises and public agencies. It was launched in early 2007 with the objective to support 3 scientific/technological areas, in which Crete has a comparative advantage due to the significant performances of the regional scientific community, namely, the informatics/telecom, biotechnology and medical technology fields. Partners include the University of Crete, Technical University of Crete, Technological Educational Institute of Crete, Foundation for Research and Technology – Science and Technology Park of Crete (FORTH/ STEP-C), National Agricultural Research Foundation (N.AG.RE.F), Hellenic Center for Marine Research (HCMR), Chamber of Heraklion, enterprises of the secondary and tertiary economy sector of Crete, and public agencies.

The Pole will help reinforce the innovative technology performance of the region and diffuse the technology and innovation into the fields of social and economic activity throughout Crete, supporting R&D actions on:

- Integrated Electronic Health Meta Records (IEHMR).
- Advanced Broadband Services & e-Business.
- Industrial Application of Microelectronic Systems.
- Integrated software platform for the mapping and briefing in near real time of involved institutions about the repercussions/consequences of the natural or technological hazards on a



structured environment; pilot application in case of earthquake in the City of Chania.

- Provision of multimedia and networking services utilizing a novel digital terrestrial television network.
- Integrated system of surveillance for the protection of the local Ecosystem and the Visitors in the Gorge of Samaria.
- Development of an Innovative Application for Vehicular Fleet Monitoring, Traffic Management and Taxi Call Assignment.
- Sustainable development of Marine Biological Resources.
- Biomass Energy Production Unit.
- Study of Ozone (O₃) technology application in the post-crop phase of treatment (disinfection, maintenance, maturation, storage) of selected fresh rural products (fruits and vegetables) of Crete promoting the creation of modern units with high specifications of packaging, storage and standardization.
- Cretan Vineyard.
- Integrated system of olive oil identification, control and promotion.

The Training Support of GoOnline Programme in Crete

The Training Support of the GoOnline programme is part of the Operational Programme “Competitiveness” of the Greek Ministry of Development and is partially funded by EU funds (3rd Community Support Framework). The Training Support aims at acquainting 50,000 SMEs from the entire Greece with Information and Communication Technologies (ICT) and help them to come in terms with the contemporary market trends, which increasingly lead towards e-business practices. The Training Support has been

assigned to 17 Consortia throughout Greece consisting of academic and technological institutions, industry and Chambers of Commerce, private companies etc., allocated in the 13 districts of the country. As a sine-qua-non condition, regional Chambers of Commerce and business associations participate in the Consortia running the Programme in the Regions. In Crete, the Training Support has been coordinated by the University of Crete. Up to date, 2.612 Cretan companies have received training via 7.800 visits (3 visits per company), by a total of 219 e-business consultants.

5.2 Entrepreneurship Programmes in Universities

Since 2003, the Greek Ministry of Education has funded the introduction of university-wide entrepreneurship courses in all Greek universities. In Crete, the University of Crete has introduced 4 such courses each year. In Heraklion, where the School of Sciences is located, the courses have been specially designed for students in computer science, physics, biology, chemistry, applied mathematics, and materials science. The lectures explore a range of issues relating to entrepreneurship with emphasis on starting and growing a technology-based business. The students obtain a solid understanding of the process of creating new ventures, with examples in selected industries (market analysis, identifying business opportunities, legal and regulatory issues, financing, IPOs). In addition, company valuation methods will enable the students to adopt an investor’s perspective for assessing and valuing the venture, and thus communicate effectively the venture’s value. Students also prepare business plans. In the 2006-2007 academic year, enrollment to these courses has reached 380 students in Heraklion and 190 students in Rethymnon. Since 2005, entrepreneurship courses

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have been introduced to the regional TEL. As more than 25% of the student population stays in Crete after their studies, this knowledge will help cultivate the attitude for more venture risk-taking and business creation. In addition, in 2007 the University of Crete submitted a request for the establishment of a School of Information Science and Management to the Greek Ministry of Education, with Tourism Development designed to be one of the School's main disciplines (Departments).

5.3 An example of university research on Crete's natural products: The Organic Chemistry Lab at the University of Crete

The Organic Chemistry Lab at the University of Crete (OCL-UoC) is focusing on the identification and study of natural products with biological activity, seeking collaboration with academic/industrial research centres interested in large-scale isolation of natural products with pharmaceutical and/or agricultural applications for commercial purposes. Since 2005, the Lab has been awarded 3 student financial awards (in order to develop prototypes) from the University Students Entrepreneurship (UNISTEP) programme.

A number of research programs are in progress in order to exploit the pharmaceutical and aromatic properties of plants mainly from the flora of Crete. OCL-UoC became a member of a National Network on Natural Product Chemistry and expanded its activities in the study of aromatic and pharmaceutical plants with tasks such as:


- Improvement of the methodology for the isolation of the aromatic resin "Labdanum" from *Cistus Creticus* L. by local companies.
- Use of extracts from rosemary, lavender, sage and laurel as pest control agents in the production of grapes as well as the preservation of

raisins.

- Production and quality control of essential oils from sage, dictamo (*O. dictamnus* L.) and the resin of labdanum.
- Securing the certificate of origin of the herb *Origanum dictamnus* L. to the region of Crete (initiative taken by the Co-operative of Embaros, Crete).
- Quality control of local *origanum* species cultivated under controlled conditions.
- Quality control of herbs available in the local market by using the composition of their essential oils as "fingerprint" of each subspecies.
- Identification of components of aromatic plants with anti-microbial and anti-cancer agents.
- Use of natural colorants from the flora of Crete in textile dyeing.
- Preparation of a recipe for the control of effect of *Varoa destructor* on bees using natural extracts.
- Analysis and Study of Biological Activity of Components from the Mastic Gum from the species *Pistacia lentiscus* var. *chia* in collaboration of the cooperative of Mastic Producers of Chios.

6. Conclusion

Global economics is changing and Higher Education Institutions (HEIs) and Research Centres (RCs) are trying to cope with these changes, which are mainly manifested as competition is among regions, both within countries and internationally, to become known as the international hub for selected high-technology sectors.



Crete is a knowledge-intensive area with several high-level scientific research centres of international renown. Concerning technology, higher education and research institutions have strengthened their knowledge and human resources, through international collaborations and the increase of research funding over the last decade. As such, Crete's HEI and R&D institutions are driven mainly by national priorities, which emphasize research excellence, international research participation and high tech spin offs having little to do with rural needs and concerns.

However, despite the seemingly diverging "global" v. "local" dynamics of HEIs and RCs (that is, of pursuing international excellence in R&D v. pursuing knowledge & technology transfer at the local level), "regional cohesion" forces have recently begun to operate in a more visible way. A number of initiatives have been launched to address these problems. These initiatives include the Innovation Pole of Crete, launched in 2007 with the objective to support scientific and technology areas, which offer Crete a regional comparative advantage at both global and local levels); the Training Support of the GoOnline Programme, coordinated by the University of Crete, with the objective to train 4.000 Cretan SMEs to use internet technology to enhance their business processes and

their market presence; The Entrepreneurship Programmes at the universities; and university research work on natural (organic) products aimed toward commercial purposes. These initiatives have been presented in this paper.

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Pursuing Higher Education in the Heart of Europe University of Applied Sciences Burgenland Campus Pinkafeld

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1. Introduction

Thirteen years ago universities of applied sciences were introduced in Austria and offered smaller provinces the chance to provide university-level education. Before 1994 academic education had been restricted to traditional universities of bigger provinces and their capitals. The first two degree programmes authorized by the college of higher education council (Fachhochschulrat) were established in Burgenland, the most eastern province of Austria. It is one of the smallest provinces with the least number of inhabitants in Austria. Due to local conditions and requirements it was decided to install two campuses. One campus was set up in Eisenstadt, the provincial capital of Burgenland with about 11,300 inhabitants (Amt der Burgenländischen Landesregierung, 2007). Today it offers a wide range of business studies, focus-

ing on Central and Eastern Europe (CEE), as well as a range of information and communication technology degree programmes which provide practically and future oriented training to become ICT and knowledge experts. A second campus was installed in Pinkafeld, a municipality with a population of approximately 5,500 citizens. At this smaller campus the focus was first put on building engineering, and, at a later stage, also on energy- and environmental management programmes and on health studies. By installing the two campuses the province of Burgenland managed to participate in the field of higher education in Austria and Europe. Today they are centres for advanced studies and have played an inspiring role in the emergence of Austria's university-level institutes of technology, propelled by the 'Academic Excellence in the Heart of Europe' motto.

2. Strategic Plan

In order to ensure the acceptance of the two campuses some strategic considerations had to be taken into account. First of all, by situating the modern academic facilities of the two campuses in close proximity to the region's technological centres, it is possible to offer an educational experience that combines practice-based components with a modern university setting. At the campus in Pinkafeld the laboratory, which serves both as a teaching facility as well as the promotion of R&D projects in collaboration with the business community, provides a variety of testing facilities, a comprehensive range of equipment for stationary and mobile measurement techniques used in physical, chemical and human-based studies. The internship programmes and degree-related projects facilitate the interaction with the business community, and ensure the regional transfer of knowledge. Second, through their strategic plan, Fachhochschule Burgenland particularly emphasizes the European dimension through its central and east European focus, fostering cross-border collaboration and networking in the areas of study programmes, research and development, consulting services, and continuing education. Third, in line with the principles of the treaty of Bologna to converge higher educational systems towards a more transparent system, a re-organisation started in 2004 to transform all 4-year diploma programmes into Bachelor's and Master's degree programmes, a process which is now nearly completed. Last but not least, Fachhochschule Burgenland has also been offering part-time degree courses since 2004. Using the "blended learning" approach, allowing for a combination of on-site and off-campus study modules, students can pursue a degree in the various key areas of study while continuing to work part- or full-time and/or having to overcome long distances to get to the campuses in Pinkafeld or Eisenstadt.

The new full-time and part-time Bachelor's and Mas-

ter's degree programmes in the key area of study Energy and Environmental Management offer practical and future oriented training to become an energy and environmental manager, energy technician or building technician and manager. Through the reorganisation, it is now possible to acquire a first academic degree in Energy and Environmental Management after the completion of a 3-year part-time Bachelor's degree programme. The aim of the Bachelor's degree programme is to provide a practice-oriented training of students with an academically-sound, problem-conscious and result-oriented approach in the field of energy and environmental management. Students are provided with excellent career prospects by offering a balanced combination of theory and a thorough practical training approach. Graduates will be able to not only identify energy and environmental problems but also to develop efficient interdisciplinary solutions which are both sustainable and economically compatible. Through the encouragement of academic reflection, methodologically sound work, application-oriented project assignments and internships in Austria or abroad, students are trained to develop holistic approaches and solutions, allowing them to scrutinize problems from an interdisciplinary point of view. Graduates from this programme and other qualified academics can acquire a specialization in building engineering and management or sustainable energy systems by continuing studies in a 2-year part-time Master's degree programme (University of Applied Sciences Burgenland, 2007).

3. Part-time Degree Programmes

The introduction of part-time studies which are based on a blended learning approach contributed decisively to a wider acceptance of technical degree programmes in the field of energy- and environmental management offered in Pinkafeld as they

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do not only enable more local people to continue to work alongside their studies but also allow people living in remote areas to participate in the degree programmes. In order to successfully implement part-time Bachelor's and Master's programmes the studies offered in Pinkafeld had to be tailored to suit the particular needs of the target groups. First, new organisational designs were needed to allow students to study alongside work and family commitments. Second, a new constructivist-based didactic framework and its corresponding teaching methods and learning strategies had to be established to help the students acquire the relevant skills and competences for their future field of work. Both objectives could be achieved by technology-aided blended learning settings. They allow for a considerable reduction of f2f sessions and help implement new learning scenarios which are based on open, computer-aided, learner-centred, self-directed and collaborative learning arrangements.

3.1. Organisational Design


The overall design of the part-time programmes in the key area of study Energy and Environmental Management implies two major organisational differences. First, courses only take place at weekends and second, the number of f2f lectures was reduced to a reasonable minimum. Offering part-time programmes at weekends, i. e. Friday afternoons and Saturdays, allows students to pursue a degree alongside their regular jobs as well as to participate in the programmes although they don't live and/or work within easy travel distance. Furthermore, it proved necessary to reduce the required hours of attendance at the campus which, taking into account lecture-specific requirements, resulted in the reduction of the overall amount of on-site teaching by at least one third, providing a range of combinations of on-site and off-campus study modules to be completed

in the course of studies.

3.2. Pedagogic Design

All part-time degree programmes are broken down into individual modules, each one consisting of a specific number of individual lectures which are again split into a series of f2f and online modules. All of these modules are defined in terms of learning outcomes, i. e. what students should be able to do after completing the module. They are supposed to help students understand what they are expected to achieve in terms of knowledge, understanding, skills and competencies at the end of each module. Furthermore, this modular system allows for some flexibility in the choice and combination of modules studied. In this way students are offered individual training routes when it comes to learning foreign languages and choosing compulsory elective modules which best reflect their individual needs and interests.

Even though Blended Learning has become somewhat of a buzzword in education settings, there is some ambiguity about what is really meant by the term. Within the part-time degree programmes in Pinkafeld blended or hybrid learning is the term used to describe learning activities based on a combination of traditional f2f with computer and web-based online learning settings (which also include e-learning), multiple theories of learning and pedagogic approaches (cf. behaviourism, cognitivism and constructivism) and a variety of media and tools employed in f2f and online learning environments, including traditional print materials as well as all kinds of technology-based materials. The constructivist-based didactic approaches and their corresponding teaching methods and learning strategies pursued at Campus Pinkafeld are supposed to successfully help the students acquire the relevant skills and competences for their future field of work. Workshops are



held on a regular basis to help lecturers implement blended learning settings and ideas in their lectures as well as to help them use the online platform provided in a meaningful and efficient way. In this way blended learning is not just an add-on to learning, but fully recognized and incorporated into the curriculum. In order to fully utilize the advantages and effectiveness of a learning management system all lecturers of the part-time degree programmes are encouraged to work together and share resources and best practice examples in an open manner.

3.3. Learning Management Systems

In order to allow for specific organisational structures and to support teaching and learning processes the different learning management systems provided at the two campuses are accessible to all part-time students and lecturers. Depending on the different types of lectures and its specific objectives and contents it is either used to distribute relevant information or to support interaction and collaboration of any kind. It offers improved ways of distributing information (presenting, researching, documenting), supporting communication (interaction, collaboration) and enhancing cognition (visualizing, animating, simulating). However, technology alone doesn't mean more efficient teaching and learning environments. Effective blended learning settings require a lot of commitment of the teaching staff and a lot more self-discipline and motivation of students than traditional f2f programmes.

4. Lifelong Learning

Both, the necessary organisational changes involved in part-time settings and the exploration of some innovative computer-aided, web-based blended learning settings have helped to promote lifelong learning in Burgenland and to make the campus in Pinkafeld

an integral part of Austria's university landscape. According to the European Union's policy, lifelong learning is defined as 'all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competence, within a personal, civic, social and/or employment-related perspective' (European Commission, 2007) and is therefore about valuing all forms of learning (formal, non-formal and informal) in all possible learning settings, from pre-school to post-retirement ages. In this context all degree programmes offered at Campus Pinkafeld and Eisenstadt, part-time and full-time, enable students to participate more actively in social, academic and economic life and to take control of their future professional lives. Professional, responsible and result-oriented actions in the areas of energy and the environment are becoming more and more important as our society needs environmentally sound and financially acceptable concepts to tackle energy and environmental problems and thus provide an important incentive to propel academic excellence in the heart of Europe, now, and in the future.

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Innovation, Education and Partnership in Peripheral Rural Ireland

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1. Introduction

North West Connemara is a sparsely populated rural area on the West Coast of Ireland. Structurally and geographically isolated the region is classified as economically disadvantaged and is peripheral in Irish and European terms. However, the district is the location for a unique educational partnership - The Furniture College¹ - established by a local development organisation (Connemara West) and an Institute of Technology (Galway-Mayo Institute of Technology). The Furniture College provides third-level degree courses in the design, manufacture, production and restoration of furniture for those wishing to work in the industry throughout Ireland and abroad. The location of The Furniture College in this area is unusual as there was no previous history of furniture making or the provision of third level education in the region. This paper examines the experience of The Furniture College, focusing in particular on the

impetus behind its establishment, and the lessons other rural areas can learn from this initiative.

From a rural development perspective, the real interesting questions about The Furniture College include 1) how and why did this innovative educational partnership emerge in such a remote location which has no history of either education provision or industry, and 2) what are the lessons that can be learned from The Furniture College experience for other remote rural areas that might want to use education provision as a development focus. This paper begins to address those questions by outlining the initial findings of a research project that sets out to examine such issues through a series of interviews with key personnel from The Furniture College, and a review of existing studies and documentation. The initial findings presented here are the results of the latter part of this methodology. The remainder of the paper is structured as follows. The next section outlines a theoretical framework drawing on the broad academ-



ic literature on rural community development, skills formation theory and systems of innovation. Another section provides the empirical context for the paper by outlining the region of North West Connemara and the history of The Furniture College project. The penultimate section contains an analysis where the findings suggest that different stakeholders in The Furniture College project have had different degrees of success in achieving their objectives. The final section contains conclusions and suggestions for further research.

2. Theoretical Framework: Rural development, skills formation and innovation

This section of the paper introduces three literatures – rural community development, skills formation theory and systems of innovation. Generally, these literatures reflect issues pertinent to the objectives of the three key stakeholders in The Furniture College experience – the local community, the education sector and the furniture industry².

2.1 Rural community development

Terluin (2003) argues that there is empirical support for the community development approach to the development of rural areas in advanced countries. Theoretically and empirically, a central focus of the classic community development approach is the building among local people of the capacity to plan, organise and implement development projects or programmes, identified by the local community as appropriate to their aspirations and needs. Therefore, classic community development involves a shift from an emphasis on economic development as a solution to poverty and social exclusion, to a recognition of social structures and organisations, or people-centred

development (Fahy, 1991, 7).

More broadly in a rural development context, however, although the importance of the goal of economic development is clear there is less clarity about the significance given to the goals of social or civic development (Shortall, 2004, 111). In other words, there is uncertainty and debate about whether social and civic development (i.e. the bottom-up community development approach sketched above) should be end goals in themselves in the development process as opposed to being viewed as a means to economic development³. This uncertainty is reflected by empirical research. For example, Shortall, (2004, 111) reports that rural development initiatives in Ireland and Scotland adopt converse linear development models – some promote social and community development and capacity building as a precursor to economic regeneration, while others promote economic regeneration in the first instance in the expectation that it will lead to social regeneration.

Narrowing the focus somewhat, Curtin (1996, 262) argues that the process of community involvement in economic development may be defined as that where communities seek either to 1) establish and manage enterprises themselves or, 2) in partnership with state agencies try to bring jobs into the area or 3) in conjunction with other actors and agencies try to promote indigenous enterprise through the provision of workspace and training and educational supports (Curtin, 1996, 262). The particular strategy followed will invariably change over time and across locations.

2.2 Skills formation

Crouch (2002) in a discussion about skills formation theory outlines that there are various governance structures for vocational skills provision – the market, hierarchy, state, association and community.

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These governance structures are alternate responses to two issues. First, the public good nature of many skills means that there is often an under investment in training by firms. Second, due to poor information on the future returns from training and workplace opportunities there is often an under consumption of training at an individual level. In other words, the five governance structures are degrees of responses to the tensions between the public and private good aspects of vocational training. Of particular interest for this paper is the notion of community governance of skills formation – the idea that if the circumstances are right (i.e. the presence of informal community norms and sanctions) public goods such as skills training may be provided (often informally) through the community to the private sector. The classic examples are areas like the Third Italy and Silicon Valley. The important point is that such a governance structure involves a blurring of public and private costs and benefits, and is considered an extremely flexible system. By contrast, the state governance system has greater difficulty in dealing with firm-specific further training (i.e. private goods), may often be more remote from firms needs, but is more suited to overcoming the public goods issues involved with (initial) vocational training.

2.3 Systems of innovation

Innovation, or the generation of profitable novelty, allows firms to establish temporary monopolies relative to their competitors and therefore earn economic profits for a period of time (Bender and Laestadius, 2005). Within innovation studies, the systems of innovation approach examines all the important economic, social, political, organisational, institutional and other factors that influence the development, diffusion and use of innovations (Edquist, 2005, 182).

One of the key activities of any system of innovation – whether at national, regional or sectoral level – is that of competence building (Edquist, 2005, 190). Competence building - leading to the creation of human capital - includes the provision of education and training (through the school and university system), and other learning throughout an individual's working life (in the form of training, learning-by-doing, learning-by-using and individual learning) (Edquist, 2005, 194). Competence building is one of the three key types of learning in any innovation system. As learning is considered critical for innovation, then competence building in the way we describe it here is indispensable for enterprise and industry competitiveness.

There are several key points to emerge from this literature review. First, in terms of the process of rural development it is unclear whether it is possible for rural development organisations to pursue social/civic objectives and economic objectives simultaneously. As discussed below, when Connemara West set out on the Furniture College partnership, its objectives were both social/civic and economic. Second, in terms of skills formation, there are a variety of different governance systems. As outlined below, there was an (implicit) expectation on the part of Connemara West that a community type governance structure might arise in the region in the future, if its education initiative was augmented by the establishment of furniture enterprises in the locality. Third, for the Irish furniture sector, which according to numerous studies lacks design, production, management and marketing expertise, the contribution to human capital creation, learning and competence building within the industry by Furniture College graduates should contribute positively to the sector's innovativeness and competitiveness.

3. Context

As depicted by the shaded area in Figure 1, North West Connemara is located on the Western seaboard of County Galway approximately 100 kilometres from Galway city. A mountainous region covering 790 square kilometres, North West Connemara is bounded on three sides by the Atlantic Ocean.

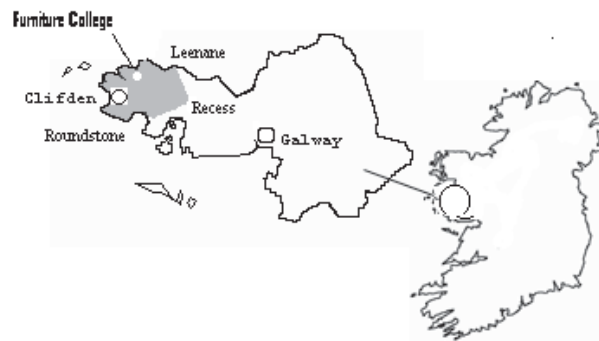


Figure 1: North West Connemara

In 2006, the population of the region was 8,878 persons. The main population concentration is the town of Clifden and its associated District Electoral Division, which in 2006 had a combined population of 2,112. The actual town of Clifden with 1,497 inhabitants is the main urban centre in the region. The population in the area is very dispersed with 10 persons per square kilometre compared with the national average of 51 and a European average of 143. North West Connemara is classified as severely disadvantaged, with little industrial employment and most residents engaged in low-level service employment, the construction sector, small-scale agriculture or public sector jobs. The most recent recognition of such structural problems is the inclusion of the area in the CLAR (Ceantair Laga Ard-Riachtanais) Programme for revitalising rural areas, an Irish govern-

ment initiative that aims to fast-track National Development Plan spending, particularly infrastructural investment, in selected rural areas.

3.1 The furniture college⁴

The Furniture College is a partnership between Connemara West Plc (CW) and the Galway-Mayo Institute of Technology (GMIT). It was established with a dual mandate in mind, which reflects the respective goals of these two organisations – to contribute to the economic development of North West Connemara and develop human capital for the furniture industry. This educational partnership is unique in Ireland and possibly in Europe. CW formed in 1972, is one of the most successful community rural development groups in Ireland and is based in the village of Letterfrack. GMIT established in 1972 and based in Galway city 100 kilometres away, is one of 12 technical colleges in Ireland established to address the skill requirements of industry. The Furniture College was established in the village of Letterfrack in North West Connemara in 1987 and now provides 6 Bachelor of Science Degree programmes in subjects ranging from furniture design and manufacture to furniture restoration and conservation. There are approximately 187 students currently enrolled and there are plans to expand student numbers in the future. The courses are jointly managed by CW and GMIT.

To understand the present position of The Furniture College it is necessary to review its historical development⁵. In 1970 the Ballinakill Parish Development Committee in North West Connemara was set up by a group of locals with the immediate aim of raising finance for a scheme of self-catering cottages to be built at Tullycross. A separate company was formed to run the scheme and hence, Connemara West was created in 1971. Funds were raised locally and con-

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tributions were also received from Galway County Council and the Western Regional Tourism Organisation and nine thatched holiday cottages were built in 1972/73. The subsequent commercial success of these holiday cottages gave CW the financial and organisational base from which to develop other activities. The next major project the company undertook was the development of 'Teach Ceoil' – a centre for social and cultural events - in 1976-77.

The old industrial school⁶ in Letterfrack was purchased by CW in 1978. Again, local shareholding finance was raised and the school was purchased with the assistance of some bank loans. This large building of 28,000 sq.ft. (2,601 m²) needed extensive repairs. It was envisaged that at least part of this building would be used as the location for small (craft) enterprises that would provide training and employment for local people. Although some small enterprises have sporadically used these premises over the years they have had limited impact on local employment or skills development.

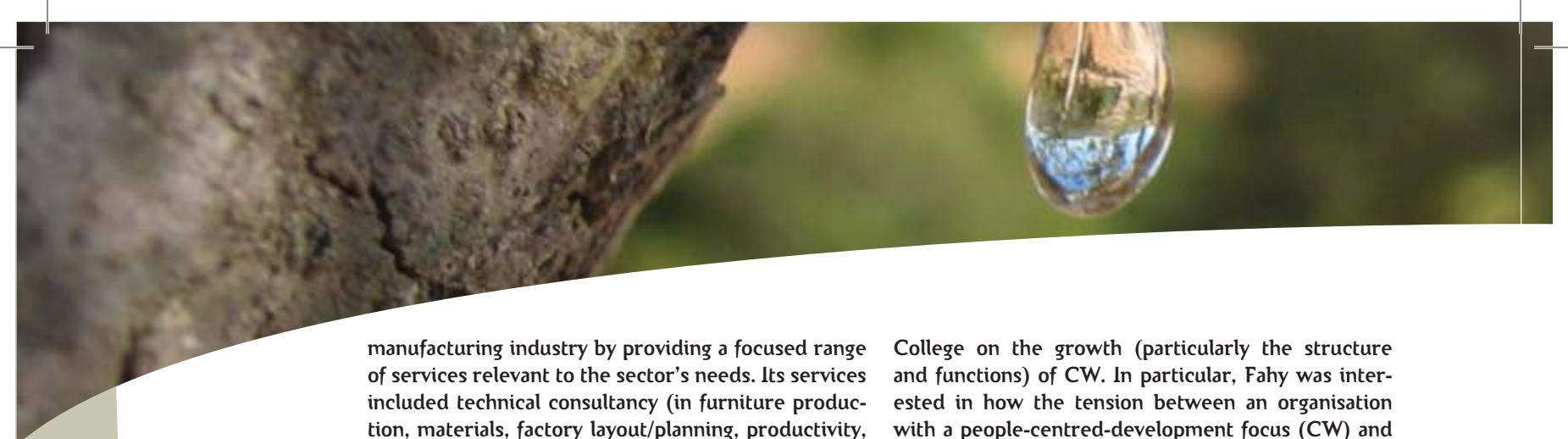
In the early 1980s, youth unemployment, early school leaving and emigration were identified as particular problems for North West Connemara. A Craft Training course was established in this newly purchased building in 1982. The course, geared towards providing comprehensive woodskills training for 15 local young people, was designed and managed by Connemara West under contract with the Youth Employment Agency (now FÁS). This course ran until 1985. CW had sole responsibility for its development and management. The 15 young people obtained City and Guilds Certificates in Furniture Craft. However, this course was a once-off arrangement and it was stipulated by the YEA that it would not be repeated. On the part of CW there was an expectation that some of the course participants might establish local workshops. This did not happen, however, due mainly to a lack of business, design and marketing experience

and the absence of necessary technology and infrastructure support.

After this initial once-off course, CW undertook research on the training requirements of the furniture industry and a proposal for a Programme in Fine Woodworking and Design was developed and circulated to various agencies that were considered possible funding sources and collaborators (Kilkenny Design, Crafts Council of Ireland, Industrial Development Authority, ANCO, Youth Employment Agency and Galway Regional Technical College). The proposal was finally picked up by Galway RTC and in 1987, CW and GMIT jointly initiated a two year National Certificate in Furniture Design and Manufacture. This represented a unique model of education in that, while academic responsibility rests with GMIT, the course is jointly managed and run as The Furniture College. The title 'Furniture College' was agreed upon by the partners to demonstrate the shared interests, but it has no legal standing: the college is part of GMIT.

Around this time period, the idea of developing a permanent education initiative focused on the furniture industry began to emerge. Since that time, that has indeed happened. Critical milestones along the way included an expansion in the number of courses to 6 degree level courses⁷. Two of these courses are focused on letting applicants qualify for a teaching career rather than a career in the furniture industry. There was also an ambitious programme of new buildings costing €4.6m that was completed in 2000. Student numbers are projected to increase to 250 in 2011.

There have been other furniture related developments at the CW site. A Furniture Technology Centre (FTC), funded by Forbairt was established in 1997⁸. The FTC was a separate legal entity from the college. The mission of the FTC was to stimulate and support the technological development of the Irish furniture



manufacturing industry by providing a focused range of services relevant to the sector's needs. Its services included technical consultancy (in furniture production, materials, factory layout/planning, productivity, information systems, health and safety and environmental issues) and technical information provision. The FTC ceased operations in 2001.

In 2000, a unit specialising in furniture restoration and conservation was established at the CW site. The main objective of the Furniture Restoration & Conservation Centre (now called Conservation|Letterfrack)⁹ is to provide a professional service throughout Ireland in the field of conservation and restoration of furniture, wooden artefacts and architectural woodwork to the highest international standards. This enterprise, although a division of Connemara West, is a stand alone commercial operation. In 2006, Conservation|Letterfrack employed 4 full-time conservators and management staff and 3 part-time conservators.

4. Analysis

As outlined in Kelly (1992, 13) the initial objectives of The Furniture College were 1) to use non-agricultural-based education as an empowerment tool to encourage locals to obtain advanced business knowledge and furniture making skills, 2) to encourage graduates to remain in the area and establish enterprises 3) to contribute to the local economy 4) to correct a imbalanced population age profile, 5) to encourage local youngsters to complete their secondary education, therefore, reducing the high drop-out rate from secondary school, and 6) to try to reduce the level of out-migration of young people from the area.

There have been several previous critical analyses of this innovative education provision experiment¹⁰. Fahy (1991) assesses the impact of The Furniture

College on the growth (particularly the structure and functions) of CW. In particular, Fahy was interested in how the tension between an organisation with a people-centred-development focus (CW) and one with an education provision mandate (GMIT)¹¹ affected the organisational structure and operating procedures of CW and how the provision of such education courses contributes to the overall development programme of CW. Drawing on the conceptual framework of structured flexibility (Brinkerhoff and Ingle, 1989) – a development model which attempts to combine joint statutory/voluntary management with flexibility and capacity building – Fahy concluded that the CW/GMIT experience did not reflect such a model because of the centralised nature of financial and policy control within the Department of Education, the lack of face to face contact between all three partners, the serious shortage of funding and the antipathy of the state towards any development of the programme into wider integrated development activities (Fahy, 1991, 66). In particular, Fahy (1991, 3) argued that the Department of Education is primarily concerned with the provision of training, per se, and not with the facilitation of an integrated framework of education, employment and development – an agenda that is central to the development philosophy of CW.

Taking a different angle, Kelly (1992) concluded that 1) the students were having positive economic and social-communal effects on North West Connemara, an assessment that was supported by Rosenfeld (2001a). More broadly, Kelly (1992, ii) suggested that the non-agriculture-related approach to rural development epitomised by The Furniture College could, with appropriate adjustment measures and supervision, be an feasible alternative to conventional agriculture education related antipoverty programmes. In general, Rosenfeld (2001a) also supports the idea of the being able to replicate the partnership under

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the right circumstances.

It is possible, in a very simplistic way, to update estimates of the direct socio-economic impact of The Furniture College in 2007. Table 1 outlines the number of staff from The Furniture College living locally, and an indication of the direct annual spending of students within the local economy.

	Number	Living locally	Annual expenditure
Full-time staff	16	8	N/a
Part-time staff	10	3	N/a
Students	187	187	€891,872*

Table 1: Socio-economic impact of Furniture College Staff and Students

* Student expenditure is based on the average expenditure of Irish higher education students in 2003/2004 as reported in the Eurostudent Survey 2004. The Economic and Social Research Institute, Dublin carries out this survey. Expenditure includes accommodation, transport, food, clothing and toiletries, regular bills, medical expenses, mobile phone, alcohol, tobacco, entertainment/recreation, study books and materials and other.

Although 11 staff members living locally might not seem like a big number (and this total does not include other family members) it must be remembered that the total population of the immediate area where most of the staff live is only several hundred. Similarly, while the direct expenditure of students does not appear very large, most of this occurs in the off-peak tourist season and therefore significantly bolsters other locally generated income. Obviously, such estimates give no indication of the indirect expenditure generated by the student's presence and therefore are only meant to be indicative, not definitive. The present impact on community, cultural and social vitality that the student's residency for nine

months each year has on the small local population should be taken into account also. This is likely to be considerable.

Rosenfeld (2001a) outlined some negative/undesirable aspects associated with The Furniture College. First, the economic boom and desire for holiday homes in the area has contributed to rising housing prices. This has a knock on effects in terms of high rents for students and difficulties in terms of affordability for staff wishing to purchase or build homes in the locality. Second, there is a challenge to be met in terms of meeting the social and consumption needs of the students, while trying at the same time to avoid student-driven homogenisation that could change the nature of the region. Third, most graduates of the college leave the area as there are few local enterprises to employ them. In addition, young people often seek an environment with more social amenities than is available in an area like North West Connemara.

The remainder of this section addresses the extent to which the overall objectives of each of the stakeholders in The Furniture College initiative have been achieved. Figure 2 contains a Venn diagram with three circles depicting CW, GMIT and the Furniture Sector. The common objective of each of these stakeholders is the continued operation of The Furniture College. Each of the stakeholders also has other objectives. For CW it is community development. For GMIT it is the fulfilment of its education remit. For the furniture industry it is the increased innovativeness of its firms.

Figures 2 and 3 try to depict the extent to which the achievement of the stakeholders objectives have changed over the time period 1987 to 2007 - the period from the start of The Furniture College initiative to the present day. The darker the colour of the circle the more the objectives of the stakeholders are being realised over time. For example, in 1987,

the community development objectives of CW were central to its involvement in the partnership – hence the dark colour of the circle containing community development. By contrast, for the furniture sector, the upgrading of innovation capabilities was not yet apparent as few highly qualified Furniture College graduates had filtered into the industry at this stage, hence the light colour of the circle containing innovation. For GMIT, it was in a very direct way, fulfilling its mission to provide education course to address the skill requirements of industry.

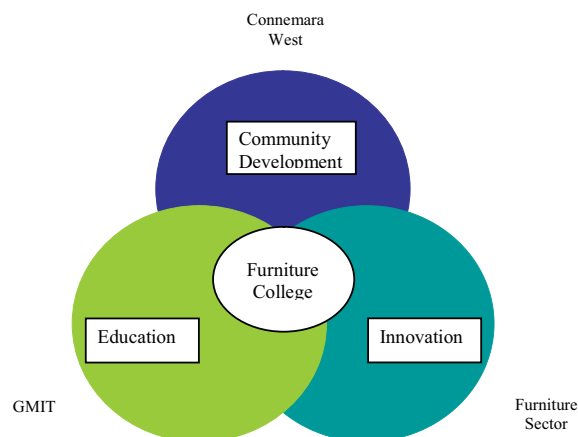


Figure 2: The Partnership 1992

By contrast, in 2007, as shown in Figure 3, the community development impact of The Furniture College from a Connemara West perspective could be argued to have waned (as denoted by the lighter coloured circle) whereas the innovation impact for the furniture sector had increased (as denoted by the darker coloured circle), as an increasing number of highly qualified graduates permeate the sector.

It is argued that the GMIT objectives have been consistently achieved and therefore the tone of the circle in both figures is the same. Perhaps an indication of

this is that in recent years, the title of 'The Furniture College' has been replaced by that of GMIT at Letterfrack, a name that predominantly emphasises the education partner's (i.e. GMIT) involvement. Another indication is that two of the courses at The Furniture College are focused on letting applicants qualify for a teaching career rather than a career in the furniture industry per se.

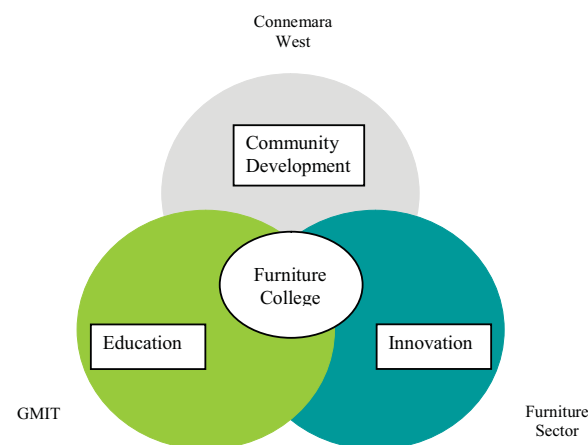


Figure 3: The Partnership 2007

On what basis can it be argued that CW's community development objectives, as envisaged through the operation of The Furniture College, have not been as fully achieved as was initially hoped?¹² First, no significant private furniture related enterprises have established in the locality. Therefore, it appears that, so far at least, the community economic development strategy followed by CW of trying to promote enterprise through the provision of training, education and support services has not proved successful. The fact that there was no history of furniture enterprises in the locality and therefore no critical mass of furniture firms to build upon, probably contributed negatively to the achievement of this objective¹³. The lack of en-

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terprise development also meant that the (implicitly) envisaged community governance system for skill formation, which is viewed as very dynamic and flexible, never developed. There are wider implications to this example, also. Cluster promotion is an important component of Irish industrial and enterprise strategy, and the development of linkages between education centres and enterprises is an often quoted example of the operationalisation of such a strategy. The factors that have impeded this happening in The Furniture College case should be explored. Second, Kelly (1992; 121) cautions us to remember that The Furniture College began as a 'community conceived, funded and initiated development project to assist local persons in obtaining a third level education'. In this context, a certain proportion of places on the courses in the late 1980s and early 1990s were kept for young people from the North West Connemara area. However, by 2005 the places reserved for locals were no longer being filled by people from North West Connemara but by applicants from other parts of Ireland. Nevertheless, the positive direct socio-economic impact identified in Table 1 must, however, be remembered.

Perhaps, as outlined in section 2 above, this overall situation is a reflection of the difficulty that rural development organisations have in trying to achieve social/civic and economic objectives at the same time, especially within one project, and particularly in partnerships with organisations that have diverse objectives. For reasons outlined above, Fahy (1991) came to the conclusion that it was difficult for CW's social/civic objectives for The Furniture College to be realised. Maybe, on a more general level, there was always going to be a limit to the possible fulfilment of the enterprise related objectives given the absence of an industry tradition in the area.


The assumption made about the innovativeness of the furniture sector improving over the time period

1987-2007 due to the impact of Furniture College graduates is just that – an assumption. There is as yet little publically available evidence to assess the impact that Furniture College graduates might be having on the industry's innovativeness, and how this either is or is not happening. This is another area where research needs to be carried out. As outlined above, GMIT appears to be the one stakeholder whose objectives have been consistently achieved. A worthwhile piece of research would be to investigate what ways, if any, GMIT could contribute more directly to furniture related enterprise development in the North West Connemara region.

In a more direct way, however, The Furniture College is of course a significant stimulus to community development efforts in the locality. CW receives rents from GMIT for the use of those buildings owned by CW and used as part of The Furniture College and the provision of a certain amount of administration services by CW to The Furniture College. This finance is an important and substantial income source for CW, particularly as many of its other income sources are less predictable. In this way, involvement in The Furniture College project allows Connemara West to pursue other community development activities, with a certain financial peace of mind. This analysis would tend concur with Rosenfeld (2001) who argued that the effects of The Furniture College on the local economy thus far are attributable mainly to the activities of college itself, not the students or technologies it produces.

5. Conclusions

This paper presents the initial findings of a research project that aims to examine the experience and impact of an innovative educational partnership – The Furniture College in North West Connemara. The



initiative arose out of a desire by a local development company, Connemara West Plc, to provide further education opportunities for local young people, encourage enterprise development, and promote community development generally.

Various stakeholders in The Furniture College have seen their objectives met to different degrees over the period 1987-2007. It is argued here that although The Furniture College is a significant element in the overall community development activities of CW, the social/civic development aspects initially envisaged for The Furniture College itself have not really materialised.

In terms of research gaps, there is a clear lack of knowledge about the impact of Furniture College graduates on the innovativeness of the furniture industry that needs to be addressed. The role of GMIT in being able to encourage enterprise development in North West Connemara also should be explored. The critical factors for enterprise creation and development in peripheral rural areas, particularly in the context of a cluster strategy based on education provision, need to be examined.

There are several important lessons for other rural areas that may look to The Furniture College experience for ideas for their own areas. First, it may be difficult to achieve both social/civic and economic development objectives with education related projects. Second, in peripheral rural areas, trying to use education provision as a stimulus for enterprise creation may be problematic in regions with a lack of an industrial base. Third, the model of partnership underpinning The Furniture College, does, however, by providing crucial financial flows, directly underpin other social/civic activities within CW, by creating stability which facilitates long-term planning and the financing of initial sunk costs for community focused projects. Fourth, although not directly focused upon

in this particular paper, there has been significant capacity building within CW itself due to its involvement with the various stakeholders in The Furniture College over a twenty year period.

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7. Notes

As outlined below 'The Furniture College' name although having no legal standing was initially the marketing title agreed by both partners in the initiative.

Of course, the Irish furniture industry is not a direct partner but rather a stakeholder in The Furniture College. Representatives of some furniture companies sit on advisory boards for course development and fulfil roles as external examiners and advisors at The Furniture College.

The latter view is the essence of the social capital argument of Robert Putnam (see, Shorthall, 2004, 112).

The Furniture College was at one stage called the School of Fine Woodworking and Design. For simplicity, the name Furniture College is used throughout this paper.

Much of the remainder of this section draws heavily upon (Fahy, 1991)

In Ireland the Industrial Schools Act of 1868 established industrial schools to care for neglected, orphaned and abandoned children.

Bachelor of Science in Furniture Design and Manufacture; Bachelor of Science in Furniture Production and Technology; Bachelor of Science in Furniture Conservation and Restoration; Bachelor of Science (Hons) in Product Design (Furniture); Bachelor of Science (Hons) in Manufacturing Technology (Furniture); Bachelor of Science (Hons) in Design and Technology Education. For more information see <http://www.gmit.ie/letterfrack-campus.html>

Forbairt, the forerunner of Enterprise Ireland is the industrial development agency with responsibility for promoting indigenous as opposed to foreign owned enterprise

See <http://www.conservationalletterfrack.ie/index.html>



Usability and Ergonomics Considerations on e-learning of Older Adults


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1. Introduction

Strong emigration of younger people from rural and remote areas leads to a concentration and high percentage of elderly people in those areas. Isolation, solitude and long distance family and friendship relationships are just some of the problems arising from this phenomenon, which ultimately demands for systems which enable the communication and participation in social activities via the Internet as a complementary element to “real” or “offline” communication and participation acts. Moreover, remote areas as a matter of principle do not offer as many learning and further education opportunities as urban areas. This issue together with the fact that elderly people tend to have restrictions of mobility, keeps especially the elderly from access to learning and training institutions. Online learning and training activities are therefore particularly important for the rural 50+ age group since they have a very high potential to support these people in overcoming (at

least partially) some of the restrictions arising from the combination of age and rural environment.

Since more and more people who actually are affected by these circumstances are becoming aware of the potential of e-learning in this context, a change in the proportion of elderly people participating in learning activities can be noticed (Iller 2005). Additionally, some authors identify an emerging communication culture among older adults who use electronic media in order to overcome and compensate restrictions in mobility. More and more elderly people use ICT to keep in touch with friends and family, to retrieve news, organise post and formalities or do the shopping without leaving the house. This change in habits and an increasing interest in the use of technologies for learning purposes make it necessary for training providers to adapt to the changing groups of customers and to their needs and habits (Iller 2005). When taking these positive developments into account, existing e-learning resources do not satisfy the needs of older adults.



The paper on hand presents findings of research activities carried out in the framework of the ICT4T and SeniorLearning projects and makes an attempt to identify needs of the rural 50+ target group in relation to ICT-based learning. Moreover, it points out the difficulties encountered by this group in using existing e-learning resources.

2. Target group rural 50+

2.1. 50+ in general

“Generation50+”, “Best Agers” and “Silversurfers” are some of the terms used when referring to new generations of older adults. This group is expected to grow during the next years and will gain more and more economic potential. Baier and Kimpeler (2006) point out that this group already is the most favoured one, as far as both, available financial means and necessary amount of time to actually “spend money” are concerned.

Redish and Chisnell (2004) point to one of the major mistakes in dealing with older adults in research and practice, namely, neglecting the heterogeneity of this group. In relation to this, Baier and Kimpeler (2006) proclaim the end of “age” or “older” as a homogeneous sociological category, as they observe a differentiation and variation of age groups. This is due to the fact that the period of life of “pension” covers several decades and involves different generations with a multitude of backgrounds, norms, values, consumer behaviours and computer literacy (Baier and Kimpeler 2006).

Based on this assumption, a differentiation of the target group according to the criteria of age, ability, aptitude and attitude as proposed by Redish and Chisnell (2004) is found to be more appropriate and allows designers to focus their work on more segmented

groups of older persons. The following aspects are suggested to be taken into account by designers:

- **Age:** One of the major mistakes made by designers in this context is the unreflected categorisation according to age. Besides chronological age also “experiential age” along with maturity level, life events and experiences have an influence (not only) on the older person.
- **Ability:** Ability is normally referred to as the degree of physical and cognitive limitations or restrictions. Gregor, Newell and Zajicek (2001) divide older adults into three groups by focusing on the positive aspect of their ability instead of focusing on their limitations:
 - **Fit older people:** These people do not appear to be disabled and do not consider themselves disabled, but they definitely are not as able as they were when they were younger.
 - **Frail older people:** These people usually have at least one obvious disability, but often have other limitations.
 - **Disabled people who grow older:** These people have long-term disabilities that are also affected by ageing.
- **Aptitude:** the extent to which users have experience and expertise with technology and does not necessarily correlate entirely with chronological age Attitude – positive (forward looking, risk-taking, and experimental) or negative (fearful or diffident), confidence levels, and emotional need for support from another human being (Redish and Chisnell 2005, 14).

This is obviously only a rough segmentation but it

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may still be useful as a starting point for designers of online learning environments for older adults.

Another important aspect is the fact that the majority of “the older generation” as a whole, consists of women. Even though, direct effects of World War II on this development are diminishing, the number of elderly females is still higher than the number of elderly males. This is to be ascribed to gender related differences in life expectancy. However, requirements of elderly people are not only determined by the characteristics of age, gender, income, education and family status. Also the state of health has to be taken into consideration when dealing with the requirements of professional support services as well as the demand for support by and use of ICT (Baier and Kimpeler 2006). Kirchmair (2006) observed a change of guiding principles of life, ideals and moral concepts in the life style of elderly people: According to him, hedonism and independence are increasing among seniors resulting in the wish to personalise living styles, stay in their home as long as possible and stay mobile (Kirchmair 2006).

The heterogeneity of the target group has been identified as a major challenge for the work in the projects. The project partners intend to provide an ICT-based learning solution that might be used by people with a very low level of ICT skills, which is currently valid for the largest proportion of the target group 50+. Clearly, users need to know at least some basics (e.g. using a web browser) in order to be able to use the learning resources provided by the projects.

In order to describe the target groups and their context of use more in detail and give the designers of the learning environment a better idea of the target groups, descriptions of the target group have been developed in the form of case studies. These proved to be valuable resources for designers to get a clearer picture about their target groups and shape the user interface accordingly.

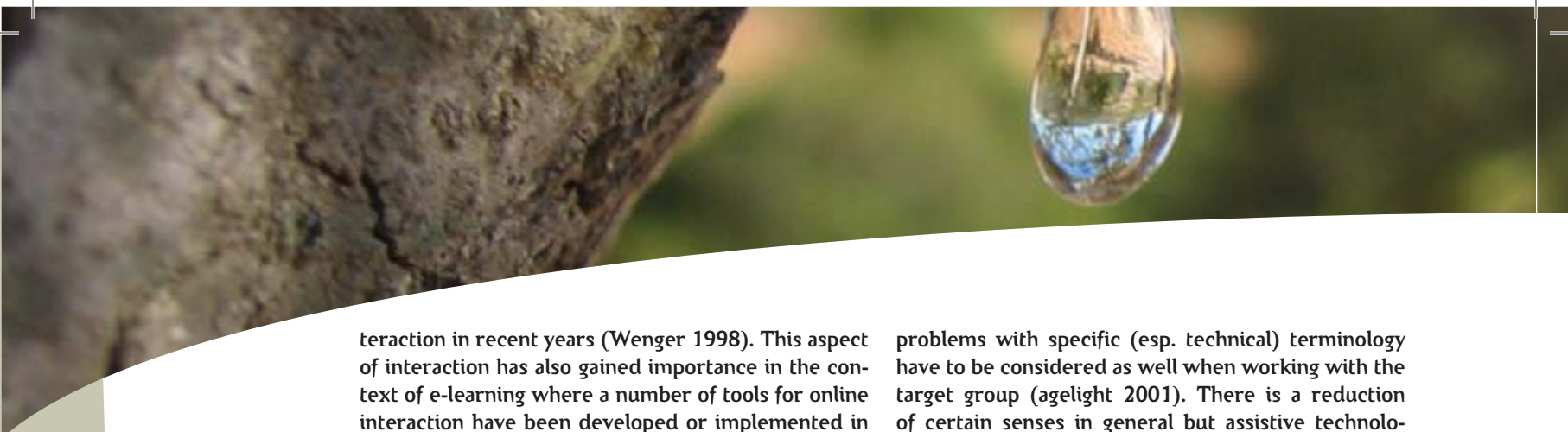
2.2. Elderly people in rural areas

A majority of 57 % of the EU27 area is defined “rural”, however only 20% of the EU27 population live in these areas. Due to a lack of infrastructure and job opportunities most rural EU areas are denoting decreasing population numbers. Mostly well educated, young people and women in particular leave rural areas in search of better opportunities. This leads to a high percentage of 50+ population in many rural areas all over Europe. On average 20% of the rural population in Europe is constituted of elderly people (65 +), most of those are women. Major reasons for this development are higher life expectancy, a decrease in birth rates and as mentioned before, emigration of younger people from rural areas. Within the old European Union member states, 32% of the 65+ population and 45 % of the 80+ population live in their homes all by themselves (Mandl et al. 2007).

Healthy, happy and autonomous ageing is based on a lifelong interdependency of biological, psychological and socio-economic factors that are rooted in the biography of the individual. As employment is not that important any more and many older adults (about 30% of older women and 10% of older men) live alone, the importance of social networks and activities with others increases.

ICT based communication plays an important role in enabling these networks and support communication amongst older adults. This is especially true for rural areas, where long distances and lack of public transport hinder social activities. Therefore e-learning for a rural 50+ target group is not only a means of further training and education but also an attempt to overcome physical restrictions and to allow access to the vast communication and education offer of the Internet.

In parallel learning has been perceived more and more as a collaborative process involving social in-



teraction in recent years (Wenger 1998). This aspect of interaction has also gained importance in the context of e-learning where a number of tools for online interaction have been developed or implemented in Learning Management Systems (LMS). Virtual learning scenarios therefore can be regarded as especially effective and convenient for learning in – often dispersed – rural areas, where the attendance of formal face to face trainings in training centers is often even more difficult than in urban areas. Participants are provided the chance to learn collaboratively without the necessity of face to face meetings for every training session.

Many of the previous issues with older adults (e.g., needing to learn the basics of computers) will no longer be as big of an issue as a larger percentage of baby boomers is familiar with computers and the Internet than the previous generation. This generation of older adults (between 55 and 65 years old) expresses their desire to be in touch with „modern life today“, use ICT “because it’s a good thing to do,” or „to maintain the status as full members of society“ (Githens 2007, 3f).

3. Specific needs of older adults

Although the group of older adults is very heterogeneous, typical degenerative effects are observable: diminished vision, varying degrees of hearing loss, hand-eye coordination and psychometric impairments including difficulty with fine-motor coordination, degenerative diseases including arthritis, osteoporosis or stiffening of the joints, diabetes, cataracts as well as macular degeneration and optic atrophy. Other effects are the result of previous sports and or occupational injuries as well as stroke. Changes of cognitive processes (crystallised / fluid functions and reduced speed of information processing) and finally

problems with specific (esp. technical) terminology have to be considered as well when working with the target group (agelight 2001). There is a reduction of certain senses in general but assistive technologies for learning are not necessarily needed to compensate the series of issues emerging in the ageing process. It is rather possible to address these issues by simply considering them in the design process of learning environments for older adults.

Kirchmair (2006, 35) points to five major difficulties in relation to the use of ICT in general which may be applied to e-learning as well:

- Problems of adequacy: Older adults might have the feeling that IT-products have not been developed for them but for a younger audience, if they are difficult to use or explained by using very complex, technical vocabulary.
- Problems of perception: Problems in this field most often relate to difficulties in visual perception; due to diminishing vision, the handling of IT devices gets difficult, if fonts are too small, contrast is too low, etc.
- Problems of handling: This category is probably the most common category of problems and is due to buttons that are too small, the space between them too narrow or they are placed unfavourably, etc.
- Problems of understanding: Instructions for older adults have to be clear, understandable, logical, reasonable and avoid the use of incomprehensible technical terms and foreign vocabulary. Symbols and pictures should present meaningful information in a fitting format and size.
- Technical problems: To navigate through websites and learning environments, to use

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communication tools etc. demand for technical know-how. In order to facilitate handling, these tasks should be logically ordered and simple but not oversimplifying.

Two guidelines emerge out of the outlined problematic fields: ICT tools and environments have to focus on the basic functionality, which has to be directly accessible and easy to handle. Additionally, it is necessary to take into account the physiological specifics of older adults in relation to reduced sensory perception, limited motor capabilities and changes in cognitive processes. Nevertheless, as Kirchmair (2006) states, older adults demand for good and modern design. They need to have the perception that the design and the quality of the product is up-to-date throughout the life time of the product and is perceived as modern from others as well.

4. Demands on usability

4.1. Usability, ergonomics and accessibility

Usability as defined in ISO 9241-11:1998 is understood as the “extend to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. The term “Ergonomics” has a wider meaning and has been introduced in the ISO 6385 in the year 2004: “Scientific discipline concerned with the understanding of interactions among human and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance”.

In relation to the development of customized learning software solutions, the intention is to enable

older adults to use online resources (e.g. a Learning Management System, LMS)

- effectively
- efficient
- and with a positive attitude towards the medium (Schulz 2004).

In general providers of web resources are themselves responsible how they provide information or tools for their customers. Nevertheless, if providers neglect the needs of older adults they may exclude huge proportions of possible customers from their services. Additionally, designing web resources in a more user friendly way facilitates in most cases usage for larger user groups.

The situation is somewhat different when aspects of accessibility are concerned: Older adults experience age related barriers in the use of web resources, which are similar to those of disabled persons. Therefore, accessibility issues have to be taken into account in the consideration of the design of web resources as well. The legal framework for accessibility issues is based on different national and international anti-discrimination laws. In Europe (for the US cf. Americans with Disabilities Act) guidelines 2000/78/EU and guideline 2000/43/EU on the basis of the Amsterdam treaty Art. 13 TEU have been transferred into national laws in most EU member states (e.g. Bundes-Behindertengleichstellungsgesetz – BGStG in Austria). As a result of the different legal implementation several accessibility guidelines and regulations exist. Most often the Web Content Accessibility Guidelines (WCAG) 1.0, provided by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C), are used, or adapted for the national guidelines (e.g. Barrierefreie Informationstechnik Verordnung - BITV in Germany) respectively.



4.2. General design considerations

The common prejudices, that “Websites tend to be produced by young designers, who often assume that all users have perfect vision and motor control, and know everything about the Web.” rarely hold, even when the users are not older adults. However, as indicated by usability metrics developed by Nielsen (2002), older adults are more affected by usability problems than younger users. Among the obvious physical attributes often influenced by the human ageing process are eyesight, precision of movement, and memory. Many older adults also retired without having used computers and the internet extensively during their working careers. Thus, they have not necessarily learned good conceptual models of how these technologies work, i.e. Nielsen points to older adults finding it difficult to differentiate between a search box and the browser’s URL box (<http://www.useit.com/alertbox/20020428.html>).

Older adults, especially when they are retired, invest time in order to get acquainted to the Internet as well as to other information and communication technologies, but quite often they do so on outdated equipment “inherited” for instance from their children. Additionally, many of them are not interested to invest a lot of money in a tool that does not play a prominent role in their lives. Therefore, as indicated by other results of the SeniorLearning project, it is necessary to design the learning environment for hard- and software that quite often is not the state-of-the-art in the field or even is outdated.

Although no data is available on the screen sizes used by older adults, it is recommendable to design for a smaller screen size than for other users or provide automatic processes to redirect to a design adapted for smaller screen sizes (netaspect 2005).

Overall the design of the learning environment has to be modern, possibly cutting edge in order to attract

older adults, but more important, the usage of the web environment has to take into account the needs of the target group. This is especially true for visual, acoustic, tactile and cognitive issues.

Aspects in relation to the visual presentation play the most eminent role in the design for older adults, but do not only relate to older adults but all people. Most important, designers need to be aware as well that a large proportion of the intended target group has never used a PC before. Therefore, navigation and access to different functionalities have to be as intuitive as possible.

Older adults need more time to get acquainted to new virtual environments as many of them have never learn to navigate in such a complex system as a Virtual Learning Environment (VLE). The attention of the user is selectively focusing on information; therefore information has to be presented in a clearly structured way. Kirchmair (2006) recommends repeating structures in order to stimulate learning processes and allow the user to get familiar with a new environment by using the same structure several times. In order not to overload short term memory, it is recommended to limit the number of items in navigational structures to 5-8 links in the menu. A visual clue for presenting the navigation path is helpful, in order not to get lost in an online environment.

The speed of information processing of older adults is an important aspect to be considered not only in the instructional design of a learning environment, but even more important in the underlying technological basis – the virtual learning environment. Older adults get distracted by short spots, advertisements, quick (flash) animations that demand for user interaction, complex animated navigation menus etc. quickly and frustration, as a consequence, arises as a major problem. On the other hand, older adults get annoyed by long waiting times and useless information as soon as younger persons.

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Overall, designers need to reduce the degree of complexity as much as possible. This applies to the design of the interface as well as the language used (e.g. technical vocabulary, foreign language terms, etc.). Where possible the system should give direct feedback to the inputs of the user in order to give them the certainty that tasks, commands etc. are processed or already finalised and information about the actual position of the user in the system (Kirchmair 2006).

4.3. Design considerations for learning technologies

The design of a virtual learning environment demands for specific considerations in relation to usability. The broad range of materials and tools used for teaching and learning includes paper, audio and videotape, CD-ROM, television, and the Internet. ICT-based learning takes advantage of a variety of technologies to facilitate learning and interaction between participants in order to provide online learners with its characteristic speed and flexibility. Tools used in an e-learning context may include synchronous and asynchronous communication tools, videoconferencing systems, whiteboards, application sharing, learning management systems (LMS), virtual realities, simulations, games etc. Furthermore, online content, for instance presented in a LMS, is varied and can include: text on a website, digital audio, digital video, animated images, and virtual reality environments. This content can be created in a variety of ways, utilizing a variety of authoring tools.


Obviously, taking into account the needs of older adults, not all of these tools and approaches are equally suitable for the target group. Tools and the instructional design have to be adapted to specific contexts (specific group of learners, hardware requirements, instructional design, etc.) and may

demand for different usability considerations in the further development process. It is suggested to follow an iterative design process in which changes and adaptations will be tested and evaluated throughout the development process of the learning materials. Recommendations given by Barstow and Rothberg (2002) on accessible design of learning materials and learning environments include the following:

1. Allow for customization based on user preference: options for customization include display elements, e.g. fonts, font style, cursor screen layout, text size etc. as well as interface features, e.g. timing of events and keyboard settings.
2. Provide equivalent access to auditory and visual content based on user preferences: for people with disabilities all applications should combine equivalent access for all auditory and visual aspects of learning technologies and content by providing text equivalents.
3. Provide compatibility with assistive technologies and include complete keyboard access.
4. Provide content and orientation information and maintain a consistent layout between pages.
5. Follow relevant specifications, standards, and/or guidelines, e.g. WCAG 1.0, Section 508, BITV, etc.
6. Consider the use of W3C recommended technologies (XHTML, SVG, SMIL, etc.).
5. Practical experiences – the case of Moodle

5.1. Methodology

The Moodle (www.moodle.org) Open Source Learning Management System (LMS) has been chosen by the partners in the Seniorlearning project as the starting point for software development. This deci-



sion was based on a criteria catalogue defining basic requirements of the project. An important aspect was the possibility for further development and adaptation of this Open Source LMS.

The usability evaluation of the SeniorLearning learning environment monitored the potential for errors and the difficulties involved in the usage of the application for human resource development. Research questions addressed included e.g. the identification of navigation problems, structuring of contents, layout and style, integrated documentation and help for the target group of older adults.

Specific usability goals were determined from the above concerns. The development of evaluation scenarios - thinking aloud tests and heuristic evaluation - has been based on these goals. This has been done in order to identify whether the concerns are valid, and to determine if participants are having trouble completing a task.

The selection of test persons whose backgrounds and abilities are representative of the products' intended end users is a crucial element of the evaluation process. Valid results can only be obtained, if the selected test-taking person is a representative end user of the product, or at least matches the criteria as closely as possible. Test persons were selected according to a predefined set of criteria, assuring that the background and abilities of these persons are representative of the products' potential end users.

The proposed methodology for the usability tests consisted of three testing phases focusing on different aspects of usability implemented in an iterative design process.

- Initial testing on a standard Moodle environment including selected learning materials. Tests to be applied include a thinking aloud test with 2-3 persons out of the target group and a heuristic evaluation using the AARP heuristics.

- Thinking aloud carried out with three persons out of the target group on a prototype of the learning environment.
- An adaptation of the AARP heuristics applied to the draft versions of the four courses that are to be developed.

5.2. Results

The initial testing made clear that major problems of the system consist, amongst other, in the following points: a lack of clarity in structure, extensive use of unknown and far too complex methodology / learning material (e.g. screencast/movie), obscure task instructions, lack of guidance while tasks are carried out, unrealistic prerequisites regarding computer literacy (e.g. uploading files to the system) and extensive use of unknown terminology (e.g. Skype, AIM, blog etc.).

One of the most desirable changes regarding log in and log out, is the fact that the button "log in to course XY" should definitely appear on the front page, while the "login as a guest" should be eliminated since it has been described as "distracting" by both test persons. Moreover, it would make sense to place the "log out" button in a more prominent position. Another essential change that has to be made is the fact that buttons connected to the user profile should also be positioned more centrally in order to make them more visible.

According to the test results, users demand more clarity and simplicity in the personal settings, which means first and foremost that unknown and unnecessary terms such as e.g. Skype or AIM are to be avoided. Generally speaking, a simplification in language is desirable also in other aspects such as e.g. "update profile" could be easily changed into "safe changes". Simplification is also the keyword in connection with

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the general task presentation, a button “Course XY” should be available on each page, in order to allow users to navigate back to the course overview, this could be done e.g. with a menu bar at the top of the page. Moreover, tasks should be labelled according to topics instead of providing them in extra sections, which are labelled as “assignments” or “resources”. It appears also that the possibility to either show or hide topics does not support users in any way. This means that this option should be deleted. In the Forum, the “send message” button should definitely be placed in a more prominent position, while the “how to write texts” section is of no use and should much rather be substituted by a section on technical support.

This leads to another important point, namely “help and support”. A section on help and support should be provided in the learning materials. It is desirable to focus on applications such as e.g. how to use zip-files, how to process texts or how to save documents on a hard drive. Help and support pages should generally be well structured and should not contain too much text.

The fact that terms like “feeling lost”, “unclear”, “can’t find”, “don’t know” and “what now” dominate the thinking aloud part of the test procedure, make it even more obvious that the system does not meet the needs of the target group in any way.

In order to change this, it is of great importance to apply some essential modifications in the points listed above.

6. Conclusion

As far as the results of the usability tests are concerned, it has to be said that all three testing processes revealed that a basic Moodle system is not suitable for elderly people in general. This finding is


not really surprising but the amount of issues and problems observed were astonishing and demand for a fundamental redesign of the interface, in order to reduce barriers for older adults.

The list of usability problems summarised above can be easily extended but highlights the amount of issues arising in such a complex system as an LMS. The situation is further complicated when learning materials and very basic considerations of instructional designs are taken into account in the evaluation processes as well!

Requirements in a nutshell: avoid an overwhelming amount of information, avoid too high prerequisites, avoid unknown terminology and material, stick to the essential and arrange material in a clear and well structured way. The further development process in the SeniorLearning and ICT4T project will hopefully help to further shape a fitting tool that is intended to act as reference point for other software tools in the field.

To sum up with, it has to be said that the system does not only fail to meet the needs of older adults, but has a rather low level of usability in general. Of course some of the points, such as e.g. unknown terminology (Skype or blog) would most probably be less of a problem for other age groups. However, other points have to be considered for users from all age groups as for instance the far too complex personal settings page. This leads to the conclusion that users of all age groups would benefit from and welcome a modification of the system. A “design for all” with a strong movement into the direction of simplification would be a desirable and sensible approach.

Moreover it has to be stated once again that to a rural 50+ age group ICT solutions should not only provide a possibility for lifelong learning, but should also have the potential to support elderly in rural and remote areas in keeping up social contacts. However, in order to make these systems work for elderly people,



it is indispensable to design them according to their needs. As technologies have already done in other fields, ICT-based learning can assist enriching the lives of many people by opening up access to new ideas and insights, raising self consciousness, allow self-fulfilment, open up new chances in private and business life, facilitate interaction and communication with others and share common interests. However, the downside of this optimistic picture of the future of older adult education is that it will leave many behind. Those privileged by earlier college education who can afford user fees and tuition will discover a wealth of opportunities while those with lesser levels of prior formal education, who lack skills for accessing educational programs and/or cannot afford to pay for them, will have few resources to draw on if nothing is done to care for equal chances.

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Personal and professional empowerment in rural areas

One career pathway from a remote rural school to a professional career


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This case study describes my own pathway from a real multigrade school. I grew up in a remote place called Roedlas, comprising just three farms, in the region of Upper Palatina in the east part of Bavaria, close to the Czech border. (The wonderful green surrounding countryside and the unabused natural environment brought me later to a career in biological sciences and environmental education). Despite its remoteness I grew up within a large group of children (including my siblings). At the age of six years a major adventure was to go together with my mother to the nearby village to enrol at the primary school. For the next five years, my daily struggle consisted of walking the distance to the small schoolhouse in the neighbouring village, regardless of the weather conditions, to attend school where all the kids were taught in one single classroom (judging from my first year class photograph we were 36 children altogether aged from 6 to 14 years). Some memories are still strong: I remember the most challenging place to sit was close to the big stove which was the only heating system in the huge classroom. Another memory is

of a very harsh winter when for days it was snowing heavily, completely cutting off the site from the rest of the world and closing down the school entirely. One place which I still remember well was the small school court where we spent all our breaks out-of-doors mostly running around and playing sports and games (when I look at it today this playground looks a tiny spot and it is hard to imagine how 30 pupils could have fitted in!).





As the oldest son of a farmer, normally my career would have been pre-determined; I would also have become a farmer. My parent's farm was family-owned since the early 15th century and, of course, I was supposed to follow in the family tradition and take over the land. I no longer have possession of any of my primary school certificates. However, apparently I did very well since from the age of 10 the school teacher started talking to my parents convincing them to send me to a middle school (which at that time meant me boarding away from home). After some months of negotiations the decision was made that I should attend a boarding school about 35 km south of my birth place. For the first time in my life I left



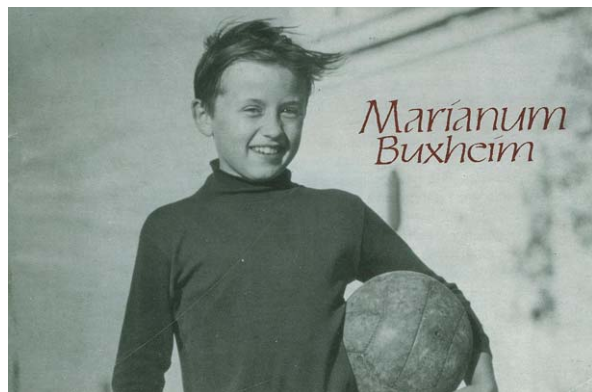
home, just coming home for holidays. Despite my young age, up to now most of my out-of-school time I had been working my parents on farm duties and I had not invested a lot of effort in school work at all. As for most of my peers, school was not the most important element in our young lives. Originally I was unconvinced of my chances of success with the new curriculum requirements, which included the languages of Latin, then, later-on classical Greek and English. However, I apparently managed the new challenges well. Three years later, I moved on to a high school, again a boarding school (even further away from home and leaving for the first time the small county where I grew up). More years at a boarding school followed, with ups and downs, of course, by finishing the different school years sometimes with the best grades, sometimes with less creditable ones. Finally, 13 years after I had first attended that remote rural school in my neighbourhood village I finally graduated with one of the best final central certificates in the entire

school, the Bavarian Abitur.

I next began studying Biology and Chemistry (see above) at the University of Regensburg with the professional goal of becoming a high school teacher. In Bavaria, this requires altogether 7 complete years of education and preparation. What is even more important was that immediately after that I managed to get a state position as a teacher. Three years of school practice followed until I entered a PhD programme as I wanted to complete a PhD in neurobiology. Following that, I accepted a postdoctoral position in the U.S. and moved together with my family across the Atlantic working for 2 years at the Cornell University in Ithaca NY in the field of chemical ecology. Nevertheless, despite of excellent research promises from an American ivy-league university, I consistently resisted any "brain-drain" temptation and returned to Europe. I therefore continued my academic career by completing my habilitation (which is something like a major second PhD) at the University of Munich in biology education. Immediately afterwards, I was appointed to my first full professorship at a teacher education college in Stuttgart/Ludwigsburg. Seven years later, I decided to come home to Bavaria by agreeing to second full professorship at the University of Bayreuth. Due to the decentralisation policy in Bavaria with its 12.5 million inhabitants, the Bayreuth University chair is the only one Bavarian within the field of biology education. In my current position, I am also the director of the Z-MNU, the Centre of Maths and Science Education, responsible for teacher education and enhancement.

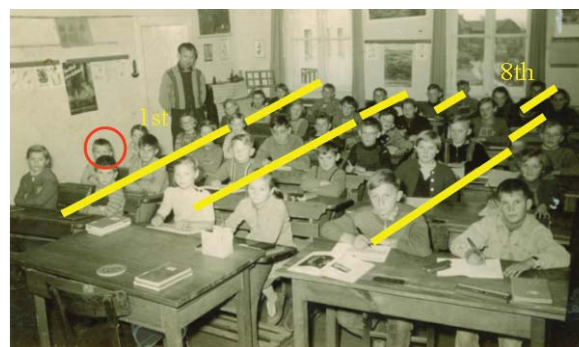
What was the impact of a multigrade school on my career (or to a career in general)? Objective statistical data of the actual school that I attended are not available anymore (the school was closed some decades ago and individual data were not traceable at all). Subjectively responses can be given, of course. Firstly, the pupil-teacher ratio was ideally small and

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the teacher knew his/her few pupils very well (enabling them to give in-depth individual advice, and, what was even more important, to convince parents of decisions with regard to their children's future school career). Secondly, an intensive social learning with older and younger cohorts took place everyday within the common classroom. Thirdly, the position of a teacher in a rural community at that time was an important one (alongside the local priest) which gave him/her the authority to intervene with parents (see above); the only teacher of the school lived within the village and was an important part of the local community (a daily commuting would have been not feasible at that time). Without an intensive intervention of both, the teacher and the priest as well, my parents would never have decided to transfer me to a boarding middle and high school. Almost all of my peers completed their regular school time in such a similarly remote rural school. Just three of my peers left, as I did, and moved on to secondary schools somewhere else. One became a lawyer and served for two periods as a member of the federal parliament, another became a medical doctor and is now the appointed director of a specialised hospital, a third one decided after successfully finishing the high school to come home to the village and to become a carpenter

and a cabinetmaker. Therefore, the overall majority of the pupils finished their schooling in this remote village school and remained in the close vicinity. The school itself was finally closed less than a decade after I left, as the Bavarian state policy began to favour bigger school units to which the children were transported every day by a complex school-transport bus system. The decision makers' argument at that time was that an overall improvement of school standards would occur despite the loss of local identity, the discomfort of the everyday bussing business or the previously better care of individual pupils afforded by the matchless teacher-pupil ratios. Remote rural schools did a wonderful job and they prepared us for life (maybe better than the contemporary larger and more anonymous school centres can do). The decision makers were just not aware of its advantages and served other interests. Remote schools did their job very well although teachers were not specifically trained beyond a normal pre-service training (which normally focussed on a didactical, pedagogical and psychological groundwork)! Multigrade-teachers were just wonderful with their multi-tasking talents. For me, it is a great pleasure to look back to the few years of attending a multigrade school which managed to prepare me so well for life and a unique academic career!







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From Distance Learning to Blended Learning A programme Incorporating Multiple Objects to Facilitate eLearning – Examples from V-learn.ie

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1. Introduction

Higher education today operates in a new era, an era that is much more conscious of the market place. The product it sells is knowledge. The principles that underpinned the Ivory Tower have weakened. Excellence, efficiency, customer base, international linkages, unit costs, interdisciplinary research, FTE's and quality are the new drivers as universities position themselves in the increasingly competitive world of education. Like any business universities are not immune to the impact of technological developments and it is in this area that the most profound changes may yet occur. The "Virtual Classroom" is now a reality and universities are gearing themselves for this new challenge. The purpose of this paper therefore is to outline the changing nature of university education and in particular to detail the current situation regarding e-learning. It will draw on experiences gained over a ten-year period and describe a model

of "Blended Learning" which can challenge traditional curricula in terms of its pedagogy, its educational outcomes and particularly its accessibility.

2. The Changing Environment

Globalisation and advancement in electronic communication has created a new environment for the delivery of educational products. These changes are occurring at a rapid rate and as is the case with all technology, it is young people that gain proficiency the quickest. Most faculty in universities were hired and have operated for a considerable number of years before the advent of the world wide web (1992) and thus may find it difficult to embrace its implications. This fact is clearly noted by Caplan 2004. However, in spite of reluctance at the beginning, academic staff and institutions are slowly beginning to appreciate the opportunities presented by these new technologies. According to Elloumi 2004 however, a vision

of excellence for online learning in academic institutions “is not a choice, but a market reality”.

Considerable philosophical change has also occurred in approaches to teaching and learning. The learning system of the past has been characterised as a teacher centred top down learning system. Today there is a significant move from traditional lecturing to approaches that are much more student centred. Cooperative learning, participative learning, reflective learning and experiential learning are terms that appear with greater regularity in almost all curricula. There is also a move away from the traditional approach of universities focusing on knowledge to one where knowledge, knowledge application and skills are more prevalent.

The change in philosophy has meant a greater focus on students. This has also been necessitated by a significant change in the student base. Students now come to university with a great diversity in background, ability and interest. Many must work to be able to attend college and increased opportunities in the work place have meant that work is more available. Also there is greater emphasis on life long learning and while traditional undergraduate areas may contract, this area presents great opportunities for expansion. This is particularly important given the rapid changes in Irish society over the past two decades. Many adults are returning to the workplace while many others are availing of educational opportunities, which were not available to them two decades earlier. While most students in Ireland still enter university mainly through the CAO (Central Applications Office), increasing numbers are entering from linked programmes where students obtain credit for work done in their previous programme. There are also increasing numbers of certificate, diploma and taught masters programmes, as the focus on life long learning increases. In addition there is increasing mobility of students across Europe and this is strongly

supported by the EU ERASMUS Programme.

3. Theories of Learning

Blooms taxonomy has long been used as a guiding influence in educational development. The competences to be developed are: knowledge, understanding, application, analysis, synthesis and evaluation (Bloom 1956).

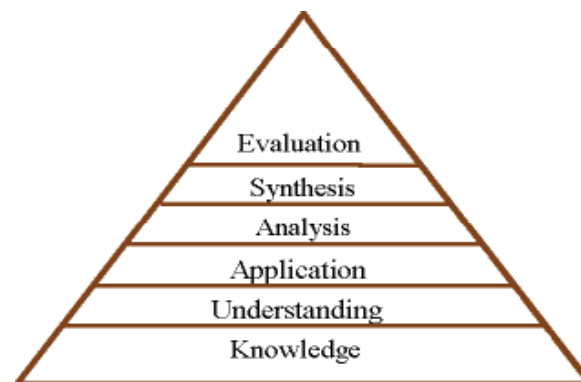


Figure 1: Blooms Taxonomy of Educational Objectives

Later the Affective and Psychomotor domains were added. Similar type models were developed by Chickering and Gamson (1987) and by Fleming 1987 with these latter models focussing more on feedback. Traditionally Blooms taxonomy and its derivatives were used in a top down manner, with little participative involvement in the development of curricula. While Blooms taxonomy and its additions are still very relevant today, modern curricula are more student centred and focus more on learning outcomes. These are clear statements of what the student will be able to do after completing the learning activity. A focus on learning outcomes should help the teacher or tutor to select the most appropriate learning activity.



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Learning outcomes focus on knowledge, cognitive skills, subject specific skills and transferable skills. This approach has in many ways been driven by the Bologna process, which seeks to harmonise curricula design across Europe, in order to create greater transfer of students. It is also driven by a greater focus on “employability” of students emerging from the educational process. In addition, the focus on learning outcomes provides a better framework for the evaluation of courses, as learning outcomes are more easily assessed than learning objectives.

4. The Evolution of Distance/E- Learning

The term distance learning has been applied to a great variety of programmes, providers, audiences and media. Its hallmarks, as recognised by many researchers, are the separation of teacher and learner in space and/or time (Perraton 1988). The earliest form (Generation 1) of distance learning took place through correspondence courses. Here the main focus was on providing learners with text, which they could study at home. However, studying alone can be a very lonely experience and only the highly motivated succeed. Thus the early years were characterised by a significant drop-out rate as the systems were not able to create favourable conditions except for the most ardent learners. Distance learning received a significant boost with the founding of The Open University in the 60's in the belief that it could, using modern communications, create greater access to education. This institution has continued to embrace new technologies as they have come on stream and is now a very significant supplier of adult learning courses. It also provides a framework for public private partnerships in the delivery and accreditation of learning.


The next generation (Generation 2) saw the intro-

duction of television and videocassettes to complement the written word. However, very often one found that academics who were expert in the subject matter area were not the best communicators. In addition early systems provided little opportunity for feed-back leaving the learner isolated. The material was also very often not user friendly and again only the most ardent persisted to the end. Videocassettes were also costly to produce and very quickly became outdated. Similar to correspondence courses, there was little opportunity for feedback and learning remained largely a top down process.

Generation 3 with the advent of the computer began to show real opportunities for distance education. However, it also introduced a new set of learning experiences for students, that of learning the new technology as well as the subject matter. The combination of these two factors combined with limited access meant that progress was not as fast as anticipated and fall out rates were still high. All courses suffered from the lack of access to material, other than what was provided directly as course materials and these were often not specifically prepared for electronic delivery. There was also a lack of critical mass and thus no or little opportunity for contact between learners.

5. The New Era

The greatest leap in the development of distance learning (Generation 4) has come with the advent of the World Wide Web. The developments in computer technology and the advent of the World Wide Web have created new and challenging opportunities for both traditional and distance learning education. This and the reduction in cost combined with the enhanced capacity of computers means that many homes now have access to computers. The Wall



Street Journal of February 4, 2004 for example quoted that 54 percent of US adults use the web on a regular, while 90 percent of 15-17 year olds are regular web users. Where computers are not in homes, they are available in schools, local training centres and more recently in rapidly expanding internet cafés. For educators the W.W.W. provides exciting new opportunities for teaching and learning. In contrast with traditional distance learning systems it provides an opportunity for feed back and brings to life the concept of the “virtual classroom”. The main advantages put forward for learning through the use of on-line systems are that it enables a large audience to be reached without the limits of geographic location. It is accessible at any time so students can learn at their own pace. It reduces the workload on the lecturer, once the courses have been developed. It allows students the opportunity to explore a wide variety of knowledge and can link students to a catalogue of libraries as more and more articles are being published on the web. Many agencies that collect statistics are making those statistics available on the web. Students can contact each other via the web, which can greatly increase collaboration between students thus negating the sense of isolation that many distance learning students experience.

Commercial companies have seen the opportunities for e-learning and we now have a number of well-developed learning platforms. Although technology is an integral part of distance learning, any successful programme must focus on the instructional needs of the students rather than on the technology itself. (Sherry 1996). Saettler (1990) quoted in Sherry (1996) found that the mental effort a learner will invest in learning depends on his or her perception of two factors. The relevance of the medium and the message which it contains and the ability of the learner to make something meaningful out of the material presented. Inquiry learning which is a critical compo-

nent of what is involved in web based distance-learning means that the teacher is no longer the “sage on the stage” but is the facilitator of discovery learning. Phelan (2002) has classified e-learning approaches into three categories as follows:

- “Dumping model” Lecturers simply dump their traditional lecture notes or handouts on the web, thus providing students with access. No effort is made to adapt them for electronic learning. It does, however, facilitate access, although some argue that it transfers the cost of photocopying to the student.
- “Home video model” Course materials are designed especially for e-learning. Efforts are made to incorporate sound pedagogic principles, thus it is learner centred. Efforts are also made to use modern technologies, however, these are limited to what is locally available. Efforts are also made to use the “virtual classroom”, but due to lack of finance and support, the attractiveness of the material is limited.
- “Hollywood model” This model employs all the latest communication technologies and expertise to make the materials and the system fully interactive. It first requires a content review and development to ensure that content delivery can take full advantage of the new technologies. It also requires intellectual and technical investment to ensure high quality learning methods as well as a framework to support the learner.

The same author also notes that first efforts with the new media were minimal and largely involved placing traditional lecture notes etc on the web. This to some degree explains the slow take up of e-learning. He also notes that many institutions have moved beyond the dumping model and that courses are now beginning to be specifically written based on self learn-



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ing principles, incorporating practical examples that link theory with practice and that provide a range of learning stimuli (text, audio, visual etc.). One of these examples are courses developed by V-learn.ie, a virtual learning centre of the National University of Ireland (NUI) involving a partnership of four universities in Ireland, UCD, Dublin, The National University of Ireland, Galway (NUIG), The National University of Ireland, Cork (NUIC), and The National University of Ireland Maynooth (NUIM).

6. Blended Learning - the V-learn Model

The constituent colleges of the National University of Ireland (NUI) have worked together over a ten-year period to create a Diploma and Degree in Rural Development using distance learning methodologies. Early efforts focused mainly on bringing the tutor to the learners rather than the learners to the tutor. The development was informed by a LEONARDO supported pilot project, which evaluated the use of E-Learning methodologies to deliver a short course in project management to participants in Ireland, Greece and the UK. The project used the Blackboard platform and the only physical contact with learners was a one-day introductory workshop. All other support was provided electronically. The project was evaluated internally by the core partners, by the tutors and by the course participants. The method of on-line learning was endorsed by all evaluators. It was a valuable experience and much was learned by all involved. The conclusion was that e-learning represented a very real alternative to conventional learning methods, particularly for adult professional training. All evaluators, however, stressed that the system had difficulties in terms of gaining access to blackboard online, moving through some areas of the course and use of the virtual classroom. How-

ever, these were viewed as problems that would quite quickly be solved, thus opening the way for e-learning. Of the 52 that registered, 23 received certificates. Lack of time, difficulty with accessing the course, and general technical difficulties were the main reasons for non-completion.

The project provided a number of important pointers. Firstly the cost of developing top quality courses is very demanding in terms of academic and technical time and substantial investment is required to create good courses. Because of lack of mass in any one university, this demanding technical input is most likely to be met through collaboration. Secondly, learners need support in terms of real contact with tutors and with one another. This enhances the learning process and provides the necessary body contact and support to retain learners.

Supported with this knowledge and experiences gained from implementing a diploma the four NUI colleges agreed to collaboratively develop and deliver a BSc in Rural Development using a specifically designed e-learning model and the Blackboard platform. The model is built around: 1) Development of a text document oriented towards distance/electronic learning; 2) The development of a set of interactive slides with voice over as an additional learning tool; 3) The provision of voice over in MP3 format (which can be played on car CD players or on MP3 players; 4). The use of strategically placed tutors as learning facilitators for the learners; 5) The encouragement of local learning cells; 6) A programme coordinator at each institution; and 7) An academic management team consisting of key academics from each institution. Because of difficulty and slowness in using the Internet in some areas, all learning materials are made available through CD. An audio (MP3 voice) CD was also supplied to each student. The model developed is based on the "Blended Learning" principle, which uses electronic methods, but also draws

on good learning principles from more traditional teaching methods. The model also incorporates critical interactions as outlined by Laird 2003, learner-learner interaction; learner-tutor interaction; and learner-content interaction. The model is presented diagrammatically in Figure 2.

the encouragement of local learning cells, where students learn together and through the provision of a tutoring system at the local level. Opportunities are provided for all students in an area to come together for a number of one-day seminars, which are provided throughout the year. The model fulfils three

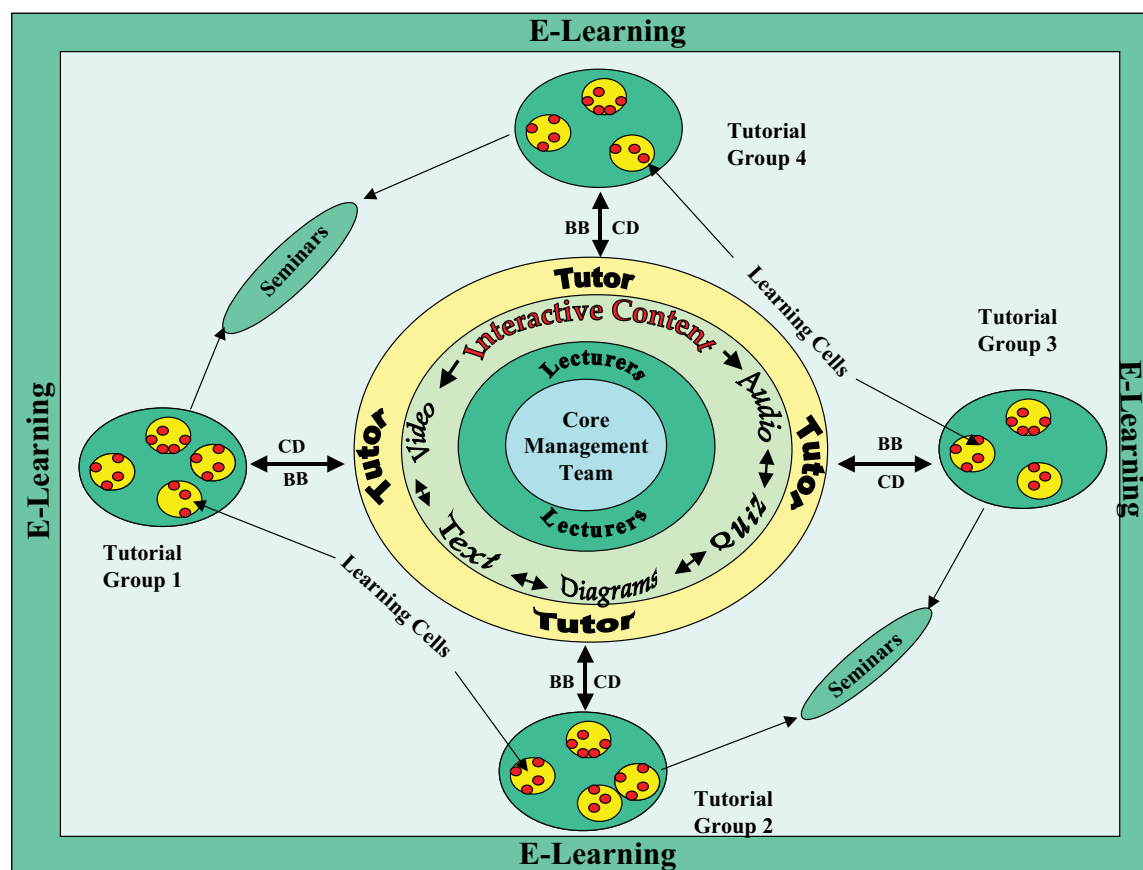


Figure 2: NUI (V-learn.ie) Blended Learning Model

A key aspect of the model is contact with and between students. This contact is provided through

important principles put forward by Garrison, Anderson and Archer (2000). These are that a learning model should display a "cognitive presence", a "social presence", and a "teaching presence". The cogni-



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tive presence and the teaching presence are supplied through using specifically developed e-learning texts supported by voice over PowerPoint type presentations, which incorporate video clips, animations, interactive learning objects and self correcting quizzes. The social presence is provided through an active tutoring system, the use of seminars and the use of projects, which encourage the formation of local learning cells that involve both a physical and electronic presence. A typical local learning cell would involve 4 to five people.

The model also fulfils the requirements of an effective learning environment as put forward by Bransford, Brown and Cocking (1999). They state that an effective learning environment is learner centred, knowledge centred, assessment centred and community centred. There is a very strong sense of community within the programme. This is developed by having an open access system to tutors, lecturers and the core management team. It is also supported by seminars, which are attended by both staff and students. Thus the model strongly values interaction, the importance of which has been highlighted by many authors (Anderson 2003, Wenger 2001)

The model is referred to as a “blended learning” model as it incorporates both face to face and electronic contact. Blended learning (Rovai and Jordan 2004) is a hybrid of classroom and online learning and they also contend that blended learning creates a stronger sense of community than either traditional classroom learning or e-learning.

Of primary concern for any learning model is its affect on the learning process. There is considerable debate in the literature about the value of e-learning and regarding what actually contributes to improved outcomes, is it the technology or the content? One school of thought is that technology is only the vehicle (Clarke 1983, Schram 1997) and it is the improved content that is the main causal factor (Bonk

and Reynolds 1997). Several others have listed the advantages of online learning over traditional methods (Landau 2001, Cole 2000). In reality improved outcomes are probably a combination of both. The fact that students can learn at their own pace and are not time bound as well as the possibility of viewing lectures a number of times seems to present logical advantages. In addition, because universities are based in cities and many students live off campus; time saved travelling can be enormous, thus allowing more time for productive work. On the other hand e-learning content, when developed properly, presents coherent well-linked material, which often is not the case with traditional curricula.

7. Evaluating the Model

The first group of students on the BSc programme are now well into their second year and a number of observations can be made. Forty six percent of respondents were aged between 41 and 50, while 24 percent were younger and 30 percent older. Sixty six percent stated that they were familiar with IT from their work experiences, while the remainder were not. Only 2 percent had completed a degree already, thus for the vast majority it was a return to education and their first venture into 3rd level.

The first important point to note is that there has been minimal dropout from the programme and much less than with the pilot project, which was delivered almost totally through e-learning. A small number of people who were interested at the beginning did not pursue the programme, but of the 55 students who registered for the programme only 2 have dropped out. These results are similar to that reported by Carr 2000, who states that online courses experience higher attrition rates than blended learning courses. It is important to remember that blended

learning can fit almost anywhere on the continuum of classroom based learning with a small amount of e-learning to courses that are almost all e-learning with a small amount of face to face contact. In the V-learn model face-to-face contact is provided mainly by tutors and involves 5 hrs of face-to-face contact per 5 ECTS credit module (60 hours contact per year).

In order to support further development of the programme a detailed evaluation of one module (module 25) was undertaken in November 2005. The purpose of this evaluation was to support further development of the programme as well as to assess learner's views on the current system. Fifty respondents completed a detailed on-line questionnaire. While it is not the intention here to present the findings of this study, a number of points are relevant.

Module 25 dealt with socio-economic research methods, as well as research approaches and encompassed components on statistics and SPSS, areas that students often find difficult. However, as figure 2 shows very few students had difficulty in understanding the learning materials provided

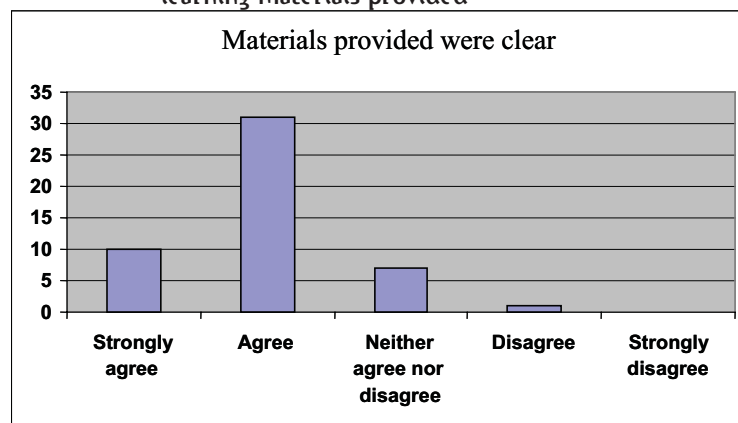


Figure 4: Clarity of Materials Provided

As mentioned earlier a key principle of the V-learn

model is to provide as many learning stimuli as possible, in particular text, PowerPoint slides with voice over, diagrams and MP3 voice files. In addition module 25 used interactive clips, video clips and quizzes at the end of each unit. Student's perception of these items as learning supports is presented in Figure 4.

The first point that can be made is that all methods contributed substantially to learning. A critical outcome of the analysis is a clear recognition that students learn in different ways. Some for example rated the text very highly and relied on it as the main learning method, while others rated it more poorly in comparison to other methods. The same in fact was found for all methods. It is also clear from Figure 4 that text, diagrams and the slides with voice over were the most successful learning methods. What was somewhat surprising was the value given to the text, but it does clearly show that a text prepared specifically for a topic, incorporating good pedagogic learning practices specifically developed for electronic learning is an extremely useful learning tool.

Rating of Different Learning Methods (1 low, 10 High)

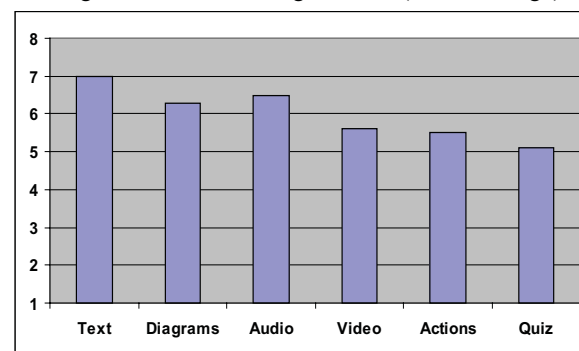


Figure 3: Students Rating of Different Learning Methods

On the other hand, it was somewhat surprising that the self correcting quiz received the lowest rating



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as this was developed as a summary mechanism for each unit and as a means through which students could self test their knowledge.


Finally students were asked if they felt hindered in any way through having to learn on-line and what they liked best and least about the module. Sikora and Carroll (2002) reported that on line higher education students tend to be less satisfied with on-line courses than with traditional methods. In this survey twenty-nine students stated that they were in no way hindered by having to learn on-line while 13 stated that they were. Most comments regarding what students liked best were related to content being relevant and well presented, however a number did mention the usefulness of mixed learning methods. Again the greatest dislikes also related to content and particularly unit 7, which dealt with quantitative data analysis. Other comments related to language and that some areas should be given greater depth. There were no criticisms of the methodology other than respondents wanting more time to complete the module, while some felt it might be better as two 5 credit modules rather than the 10 credit module which it was.

8. Conclusion

Distance learning has advanced significantly over the past 20 years and real alternatives to traditional learning systems are now beginning to emerge. High quality e-learning systems are expensive to develop and top quality systems can best be developed through institutional collaboration rather than each institution repeating the process. Well developed e-learning models will challenge traditional systems, while poorly developed systems contribute little to the learning process and are more likely to damage the reputations of institutions than enhance them.

The Distance/e-learning model developed by the NUI universities provides real learning opportunities for distance students and for mainly campus-based students. It has overcome the major problem of many other models i.e. that of significant student drop out. The local support networks and the tutors are critical factors in this regard (each 5 credit module received 6 hours of direct tutor support as well as electronic support). The incorporation of a number of different learning methods reinforces learning and is particularly important as different students learn in different ways. The preparation of material incorporating sound pedagogic principals and geared specifically to e-learning (as demonstrated by the evaluation of module 25) can achieve outcomes which are superior to traditional learning systems. The cost of delivering courses in this manner (once developed) is much lower than in traditional systems, while the advantages for the student in terms of flexibility of learning, access to materials and time saved in commuting is significant. The time is approaching when there are no logical reasons for totally campus-based courses. Internationally competitive universities will be those that invest in and support the e-learning process. They will also be the universities, which are in themselves big enough to support these developments or who through strategic partnerships can amass the necessary expertise and resources. Universities must also question their current investment strategies where investment in buildings and concrete is more important than investment in pedagogy and new methods. While universities will still need facilities, future demands may differ significantly from past and current experiences.

Universities are not the only institutions that need to embrace these new technologies. Government Ministries that support education need to take cognisance of these changes and develop appropriate support systems for students, which are course based rather



than campus based. Courses nowadays are constructed based on learning outcomes, which require an amount of student work time, not on where and how they are delivered. More and more businesses are following the e-learning route. Universities should be leaders not laggards in this regard. This however, will not happen without significant financial support and without a real commitment to the development of e-learning both on and off campuses.

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Career Guidance for Schools: A different Approach

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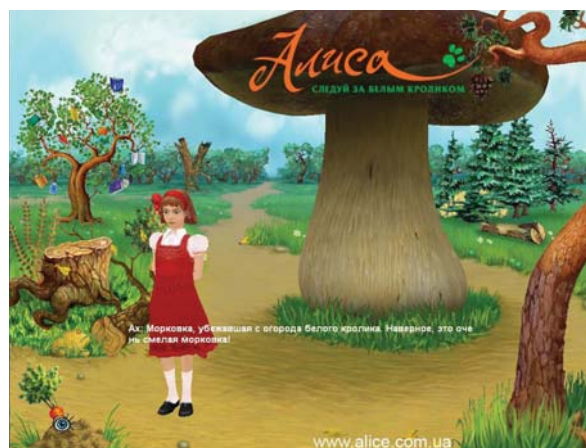
1. Introduction


Do you remember a sweet fairy tale from your childhood, “Alice in Wonderland” from Lewis Carroll? As Alice is walking around, she gets lost, she gets confused and she had no idea where to go. She was standing in the middle of crossroads and she didn’t know which direction to choose. Then a cat came up, looked at her and told her:

“North, east, south or west
which direction is the best
if the choosing gets confusing
maybe it’s the map you are using”

Career Counseling provides to individuals the map, to find the best way for professional and personal success, in a world following continuously changes in all fields. Career counseling is a continuous process beginning from the early age by the period after the retirement! Actually, career guidance refers to services and activities intended to assist individuals, of

any age and at any point throughout their lives, to make educational, training and occupational choices and to manage their careers. The activities may take place on an individual or group basis, and may be face to face or at a distance, including help lines and web based services. Counseling from a distance is a quite new pattern, offering services especially throughout web lines, when the face to face section is impos-





sible. Rural Schools could be an excellent example of accepting and implement such services, adapted to specific needs.

2. Necessity of Career Guidance

The 'new era' of information and knowledge which is characterized by unexpected and rapid changes in technology and in the labour market often shocks individuals who feel lost and vulnerable in the midst of the flux created around them causing insecurity and anxiety. McLuhan (1964) has already suggested that we live in 'an anxiety era', whereas Giddens (1994) uses the term 'manufactured uncertainty', which has been developed in the last four decades and needs to be analyzed in the context of globalization. In this context, that is, in the process of connecting the local with the global, through the new methods and channels of communication, new forms of uncertainty and risk are emerging and anxiety is intensified. According to Habermas (1987), the extension of interaction in the time-space context may lead to further anxiety which creates a sense of loss. Rapid changes in multiple contexts (educational, socio-economic, cultural) often invalidate predictions and 'investments' one makes for one's future and cause disappointment, insecurity and anxiety about the uncertainty which seems to be a dominant characteristic of today's world. Giddens (ibid) supports the argument that globalisation creates new forms of uncertainty and new kinds of social stratification.

The sense of uncertainty can be even more intense for young people who try to build their future and have to deal with an unknown world of work, full of changes and various educational and occupational dilemmas.

The demands of the labour market have multiplied in terms of skills (especially technological), experi-

ence, flexibility and mobility. Getting a job is a basic step towards becoming fully integrated in society. But today's young people are concerned not only with avoiding unemployment, but also with finding a job that offers some satisfaction. They realize that employment is a key factor of social cohesion and the basis for financing social and intergenerational solidarity. The transition between school and work is filled with obstacles and young people are becoming more depended economically. The area which significantly influences and will more and more influence the harmony between education and labour market is the area of career education and counseling. There is no part of life where the need for guidance is more empathic than in transition from school to work--the choice of a vocation, adequate preparation for it, and the attainment of efficiency and success.

At present, we may state insufficient transformation of career counseling to new socio-economic conditions, to crucial changes in the world of work. The career guidance in education sector has a principal significance not only for the choice of educational career of pupils and students but also for the transition of school-leavers to the world of work. It increases the probability of their success, interest in further education and will of retraining, that means, the preparedness for change of employment.

Studies of guidance and counseling programs, reports by the business community, and feedback from parents have raised concerns that many young people do not have the necessary knowledge, skills, and attitudes to make a successful transition from school to the world of work. Career planning is not instinctive. The educational system must provide to students information and taught basic knowledge, skills and attitudes to facilitate a smooth journey from adolescence to adulthood. Life career development is self-development over the life span. It occurs through the integration of the roles, settings and events in a per-



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son's life. The word life in life career means that the focus is on the total person -- the human career. The word career identifies and relates the roles in which individuals are involved (worker, learner, family member, citizen), the settings where individuals find themselves (home, school, community, workplace), and the events that occur over their lifetimes (entry job, parenthood, job change, retirement). Finally, the word development is used to indicate that individuals are always in the process of becoming.

According to the concept of life career development, it is practically unthinkable to prepare young people for their life of work without occupational exploration. This is accomplished through the student's school subjects and extra curricular activities with the help of parents, teachers, friends and representatives of the world of work and the community. This way of proceeding not only allows the students to explore who they are but to explore their surroundings. Thus, the students can be exposed to a whole range of occupational opportunities, establish a relation between their personal characteristics and those of occupations, and acquire more information about the knowledge, skills and values required in the world of work.

The life career development of young people should be a process of planned intervention whereby educators, parents, government agencies and community members work together to provide students with hope for the future and to empower them to believe in themselves. Young people need help to keep their eyes open for opportunities in the world that will allow them to fulfill their values, beliefs and interests and to reach their fullest potential.

In Europe, there are various differences in the career guidance interventions. These include, for example, differences between educational systems with strong early-streaming and tracking mechanisms and those with more flexible pathways: guidance services tend


to play a more important role in the latter than in the former. They also include differences between countries in which most public services -- including career guidance services -- are delivered by the state or state agencies, and countries in which there has been a strong policy to deliver services through the private and voluntary sectors wherever possible.

School vocational programs that are comprehensive and proactive are more often successful. A comprehensive school vocational program includes a guidance curriculum which is the shared responsibility of teachers, counsellors, parents, and community members. It is particularly important for schools to take advantage of vocational guidance services providing up-dated information on the labour market, on occupations and training opportunities, as well as information on possibilities of using one's intellectual and personal potential, according to individual interests.

Reviewing all the above mentioned facts one could conclude that it is absolutely necessary for actors implicated in the educational system to empower students to acquire the knowledge, skills, information, and attitudes to understand and positively enhance their own life career development. Young people must be prepared to cope with the changing trends of our days, by having the capacity to be resourceful, adaptable and flexible amidst change and ambiguity. It is in this context of constant change that adolescents must make decisions regarding their life careers. Co-operative efforts of the school, home and community are needed to help young people successfully make the transition from school to the world of work.

3. "Career Guide For Schools" European network

Career awareness has to be an integral part of the comprehensive career guidance program in schools.



Developing a positive attitude towards careers can show children that the future is theirs for the taking. Opening their eyes to the possibilities of what they like and what they might like to do...is exciting. Career development is a life long process. It is the total constellation of psychological, sociological, educational, physical, economical and choice factors that combine to shape a young person's life. In order to help guide young people in their career paths, the CareerGUIDE for Schools network try to promote career education as a central theme in all schools through experts' collaboration in order to offer substantial and complete orientation to school children as well as to those who support them in this process. The work of the proposed network aims to promote effective career education in European schools.

In order to meet its ambitious objectives the proposed network brings together experts in pedagogy, psychology, technology, labour market, teachers and students. The partnership of the CareerGUIDE for Schools network form collaborative working-groups throughout the entire network's lifetime. The working-groups include different-subject scientific experts, sharing the same interest in researching a specific aspect of career guidance (e.g. competencies and skills, psychological factors, ICT tools as means of guidance, standardization and quality issues, teachers training and professional development). There are three working groups which indicate the main areas or steps of career guidance, adopted at the career counseling at schools. The first working group, titled "Find out about yourself", concerns the personal development. Personal development is a long life process, is an essential hard continuous process, vital part in the procedure of Career Guidance. Actually helps pupils to understand and articulate all aspects of their personality, helps pupils to make specific plans for a stable future achievement and connects their emotional, educational and the vocational

aspects of self. At last but not least helps pupils to clarify their strengths or talents, their weaknesses and their "will" and then helps them to find the appropriate educational and occupational environment, according to their personal values. For Career Guidance Personal development is student's first step in a long life path, in a path of realizing and acting. That's way we give great importance at the development of life skills. With the term of "life skills" we mean Communication skills, Career Design skills, Decision making skills, Problem solving skills, Leadership skills, Time management, and Information skills.

Apart from any educational or occupational choice a successful transition from school to college or university and then to a workplace, demands strong life skills. These are the skills that will make the difference and guarantee a successful vocational and personal life.

In this stage various exercises and activities have been collected or created concerning the identification of personal traits, and then have been implemented in schools, in order to choose the best practices that a teacher/ counselor can use and the same time help effectively pupils.

The second working group includes the area of information and has as a title "Find out about the job market". The part of collecting significant educational and occupational information it is a very important step at the process of career guidance. Actually the educational options, specific job description, the every day life of professionals, duties and rights are some of the questions that a pupil has to face. Concerning the rapid and repeated changes in the world of work mostly, but and in the educational field too, the demand of accurate information is becoming unsustainable. For example, a lot of pupils have in their mind a specific occupation but actually they do not know a lot of details that concern it, such as the difficulties, the perspectives, how they can obtain that title..etc.



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In many cases when pupils learn more details and information about the job that are interesting, change their mind and confess that they had something completely different in their mind.

The third group titled “Develop yourself for your career path” concerns exercises and activities which help individual to develop personal and life skills and to make right educational and occupational choices. Actually pupils learn to deal with every day dilemmas and to make choices according to their beliefs, values and dreams. In Career Guidance, to make the right decision is a process that mostly concerns the responsibility of choosing the individual by himself, according to personal criteria. In this framework, there are a lot of exercises and activities adapted to pupils’ every day life, which bring pupils front of dilemmas and ask them to make a decision.

In the framework of “Career Guidance for Schools” network, there are plenty activities that have been taken place and some more that have been planned for the future.

The 1st International conference took place in Athens, on November 2006, with great success. The afflux of participants in great numbers confirmed that the core of career guidance appears a great interest for teachers, career counsellors and parents. Specialized experts from the field of education, counseling, psychology and labor market presented their own view concerning career guidance.

The first Newsletter of “Career Guidance for Schools” network was published on December 2006, including topics concerning the importance of career guidance, personal development, career guidance functions, services provided by career offices.

On April of 2006, Ellinogermaniki Agogi, as the coordinator, organized a “Career Day”. Students had the opportunity to discuss with professionals from all fields of the labor market. Seventy professionals answered all the questions and presented their every day job life. The same time, experts from the field of counseling, pedagogy, psychology and labor market gave speeches to parents. At the end, students and their parents were excited having attended the event.

4. Epilogue

Year by year, students, parents, teachers and counselors realize more and more that career guidance is not a luxury but a necessity. A life plan seems like a cornerstone in the professional and personal life of individuals. Personal Development, information management, awareness, setting goals, decision making, decision implementation, career change, are some of the main steps of career counseling. Concluding in two words, we can say that the two “magic” words are adaptability and flexibility in new circumstances.



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Rural Development in Serrania de Ronda, Andalucia: Projects and Activities

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Gerente del Grupo de Desarrollo Rural de la Serrania de Ronda

1. What is the Group of Development of the Serrania de Ronda?

The Group of Development of the Serrania de Ronda is a non-profitmaking Association whose aim is to promote the sustainable development of the Serrania. It was formally constituted on November 13, 1991.

The objectives of the group are the following:

- Promoting and to coordinate actions to plan, to develop and to improve the rural environment.
- To compile, to analyze and to devise documentation about strategic respected sectors as the infrastructures, the transportations, the sports, the tourism, the craft and the food and agriculture industry.
- Promoting and to support the commercialization of local products prompting the marks and certifications of pertinent quality.
- Supporting and to carry out every action that can contribute to the promotion and development of the mountain Range of Round.

1.1 Composition

Number of members: 52 (48% Public/ 2% Private)

Public sector:

City Hall of the Serrania, Provincial Delegation of Junta de Andalucia, J. R. P. N. Sierra de las Nieves, Patronage Municipal of Culture and Tourism.

Private sector:

Syndicates:


- CC.OO.
- Confederation Businessmen Andalusia (CEA)
- UGT
- Small Union Farmers (UPA)

Financial Company:

- Unicaja

Associations:

- Of Women:
"Artecrea", "Alhambique", "Alborada de la Sierra", "Banu Rabbah", "La Llanada" y "Renacer"

- 
- Agricultural and cattle raiser sector:
“A.C.A.”, “Agrupacion y Defensa Sanitaria y Ganadera “, “ APROCAR”, “La Huerta”, “Serrania SAT, RL “
 - Craftsmanship Sector:
“Productores Ind. Corcho de Andalucia”,
“Prom. Artesania Serrania de Ronda”.
 - Sector businessmen: “APYMER”
 - Sector tourism: “CIT”
 - Cooperative Sector: “FAECTA”
 - Other:
“Promocion y desarrollo Serrania de Ronda”,
“Grupo de Trabajo Valle del Genal”, “Silvema”,
“Asociacion Juvenil Correvedile”
 - To Approve the Regulation of Internal State of the Association.
 - To Approve the Plan of Activities.
 - To Approve the budgets of the exercise and the balance.
 - To Study and to approve, in its case, the proposals presented by the board of directors.

Cooperative: Suragro

Other: Consejo Regulador D.O. Malaga- Sierras de Malaga

1.3 Organization

As a non-profitmaking Association, the CEDER has a General Assembly and a board of directors.

General assembly:

It is the maximum organ of representativeness of the Association and it is formed by all and each one of the associated members. It gathers, with general character, once a year and, with many extraordinary character, each time the board of directors or 2/3 of its members request it. The Presidency, Vice-presidency and the Office of the secretary of the General Assembly are it also of their board of directors. The functions of the General Assembly are among others:

- To Approve the Annual Memory of the activities carried out in the preceding period.

Board of directors:

Is the organ of management of the Association with full competences on the operation. It is formed by 16 representatives of the socioeconomic weaving of the Serranva, 50% of which are public and the other 50% private. The members of the board of directors are: six representatives of the local City Hall, one of the Delegation, one of nature reserves, one of financial companies, one of agrarian companies, two of regional associations and one by each sector of activity; craftsmanship, tourism and food and agriculture.

Functions of the board of directors:

Deciding the concrete application of the available funds. Concocting the Plan of Activities. Developing the activities approved by the General Assembly. Devising the budgets and balances. Appointing and to coordinate as many Commissions of Work or Sections considered opportune, each one of them being presided by a director of the board of directors. Devising the Regulation of Internal State and other norms of operation and organization.

The members of the board of directors, besides, they conform the Committee Evaluator of the programs and Iniciativas Comunitarias (Leader Plus and Producer of Andalusia). They are responsible for valuing and to resolve the expedients of request presented and to determine the amount of the subsidy respecting the limitations established in each program.

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1.4 Preceding

The Group of Rural Development, of the Serrania de Ronda (CEDER Serrania de Ronda) arose from a series of regional groups that had the anxiety to act jointly in cultural initiatives and of self-employment with the objective to set to the population in their towns, to promote an enterprising culture and to transform and value the endogenous resources, among others motivations. The starting point can be established in 1981, when the Modulo de Promocion y Desarrollo de la Serrania de Ronda y el Centro de Iniciativas Socioeconomicas de Cortes de la Frontera (Module of Promotion and Development of the Serranva den Ronda and the Center of Socioeconomic Initiatives of Cortes de la Frontera), they acquire the commitment to work for the socioeconomic development of the region supporting sectors as strategic as the formation for the employment and the promotion of the Associations and the cooperativism. In January of 1988 a Patronage was created "Socioeconomic Initiatives of the Valley of Genal" formed by four municipalities of the Valley of Genal (Atajate, Benalaurva, Jubrique and Genalguacil), the Central Association of Socioeconomic Initiatives of Cortes de la Frontera and four Educational Centers of Adults. The result was the creation of three groups of social economy, that received technical aid and a support to level of management and formation in the Educational Centers of Adults. In the following year, 1989, they added three municipalities more (Benadalid, Algatocin and Benarraba). In 1991, some courses of the European Social Fund were obtained to finance activities for youths as well as a School workshop joined among all the municipalities of the Patronage. In this way a dynamics of periodic meetings was initiated to perform a monitoring of the actions put in operation and to try to find lines of sustainable development for

the Valley of Genal. By the end of 1990, they have the first news about the recent european initiative of rural development, Leader, and devises a work plan of six months carried out by the Module of Promotion and Development of the Serranva de Ronda with the supports of the Institute of Promotion of Andalusia, the Departments of Economy and Agriculture and the City Hall of the Serrania de Ronda, all they coordinated The Patronage Socioeconomic Initiatives of the Valley of Genal.


In 1991 the agencies and institutions to regional level implied in the project are constituted like non-profit-making association called Center of Development of the Serrania de Ronda (CEDER Serrabia de Ronda)

1.5 Programs or actions managed by the Group

They have been carry out several projects by de CEDER, beginning for those referred Initiatives Leader I and II, by the european initiatives Adapt, Youthstar and Now and by multitude of provincial, regional, and European programs. The thematic they undertaken they are likewise various, covering generic from approaches as the regional development to concrete and more specific themes like the equality of gínero (male-female) , the youth and the organic farming, among others.

For the period 2000-2006, the CEDER manages the european initiative Leader Plus and the regional program Proder of Andalusia, both programs aimed to find creative solutions to the management and put in value of the cultural and natural patrimony of the region.

The CEDER has collaborated actively in the creation of diverse collective and institutions in order to carry out, with them more ambitious projects of interest supracomarcal:



Asociacion TIERRA. It is formed by 9 groups of development; nature reserve of the Alcornocales, Alpujarra and Sierra Nevada, Sierra del Segura, Sierra Aracena and Picos de Aroche, Sierra de Cadiz, Sierra Morena Sevilla y CEDER Serrania de Ronda. Their objectives are to promote and to favor the sustainable development of the associated zones, to promote the integration in networks and associations of rural and local development, so much at home as abroad, to favor the formation and the professional recycling of the technical staff of the Association, etc.

Mesa de Formacion y Empleo (Negotiation Table of Formation for the Employment). It was prompted in 1993 by the CEDER Serrania de Ronda to confront the need to count with an unique instrument of promotion of the formation and the labor insertion and it is formed by:

- Ayuntamiento de Ronda (City Hall of Ronda)
- Patronato Municipal Sociocultural y de Educacion (Educational and Sociocultural Patronage of Ronda)
- Escuela Taller (Workshop School)
- Unidad de Promocion de Empleo (Employment Promotion Unit Workshop)
- Escuela de Empresas de la Serrania (Businesses School of the Serrania)
- Asociacion de la Pequeña y Mediana Empresa de Ronda y su Comarca ((Small and Medium Business of Ronda and its Region Association)
- Comisiones Obreras and Union General de Trabajadores (Sindicates)
- Modulo de Promocion y Desarrollo (Module of Promotion and Development of Serrania de Ronda.)
- CEDER Serrania de Ronda

Association Malaga Innovation and Rural Develop-

ment. It was created in 1999 by the groups Guadalteba, Axarquía, Region of the Guadalquivir, Northeastern Region of Malaga, Region of Antequera and mountain Range of Ronda, with the objective to promote the socioeconomic development of the rural zones of the province of Malaga.

Rural association of Andalusia. Likewise, the CEDER belongs to the Rural Association of Andalusia that is formed by 50 groups of development that manage the aids Proder of Andalusia and the 20 that besides, negotiate also the aids Leader Plus.

2. Educational community programmes and projects

The Group of Rural Development Serrania de Ronda contemplates among its strategic lines the incorporation of the youth in the rural development, generating dynamism and social articulation, improving the quality of life of our population and favoring the equality of opportunities, for thus, to guarantee a fair development.

We consider that great part of the young population to which we want to arrive is found in the Educational Centers of the Serrania de Ronda and it is because of it that, the Group of Rural Development Serrania de Ronda decides to carry out a participatory process with all the educational community in the Educational Centers of the zone, developing the following programs and projects:

2.1 Consolidation of a network of coordination and exchange of experiences and good educational practices in the Serrania de Ronda

Favouring the joint work or in network of the CEDER with the centers and point of youthful information,



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by means of a real and effective coordination with the Educational Centers of the Serrania.

The coordination of the CEDER with the Educational Centers of the zone it is present in the development of programmes as School of Peace, Ecoescuela, etc. One of the projects already consolidated is the referred to the environmental education "Agenda 21 Student".

The good practices reveal the importance of the participation to all the levels among the different sectors implied in the work with youth. The detection and identification of good practices can be a prior requirement to develop services coordinated and integrated, promoting new forms of work, new strategies, new relations and new ways of thinking.

Through the development of this project, the CEDER Serrania de Ronda tries to write down the bases for the consolidation of a coordination and exchange experiences network and good educational practices what is going to allow us to establish the bases to deep in the development of a work of joint coordination and of mutual broadcast of information not only in the province of Malaga but the regional, national and not forget, the european level.

We have established agreements of contribution with High Schools and Educational Centers of Serrania, to carry out activities with the youth of the municipalities. One of the challenges that are presented at the moment of to undertake the work with youths, continues being to create mechanisms of dialogue and coordination of permanent character among the different social agents from the territory to Local, Regional, Provincial, and Regional level and to enable the transfer of good educational practices as an advance, with a view toward the next actions with the youth in the period 2007/2013; Although, this Group intends to bet on set in motion of joint actions with the Educational Centers in relation to

the subject "Education for the citizenship" during the period 2007/2008.

2.2 Analysis of the situation of the youth in the region


Promoting workshops and participatory forums in which the different sectors implied (students, schoolmasters and schoolmistress, parents...) give their opinion on the situation of the youth in the Serrania de Ronda.

The analysis of the youthful reality is the knowledge of the reality to overcome it. It is a matter of knowing where is itself, to know where to go and how to do it. It begins from the own identity of the Group of the conception of the world, ideology, world view... that orients us to act in the territory.

The analysis of the youthful reality of the Serrania de Ronda is not collecting simply "cold" data, without face and with a quantitative character, but is collecting also qualitative data, that give voice to the youths of the Educational Centers. In it has been acceptable the speech of the youth of the Serrania: their opinions, their perceptions on the reality that live. For the CEDER, the words of the people have more forces of analysis and explanatory capacity that one can imagine.

We emphasize likewise, that the analysis of the youthful reality has approached with a critical way to the reality of the youth, questioning the reason of this reality and proposing alternatives. Our intention is being useful for the young population, to look at their reality in other way.

The students of the Educational Centers have a real prominence participating in forums of opinion and debates, to divulgue the conclusions of the analysis of the youthful reality of the Serrania de Ronda.



2.3 Projects of Co-education: Promoting the COEDUCATION in schools of the Serranía de Ronda, among the students, the teachers, parents and mothers

In this framework, we have planned different activities related to the equality of genre (male-female) in the conviction that, is through an education in values as we will manage to be participants of the change that society needs.

The possible solutions are still far from being reached, since they need joint actions in which all the society be involved. The governments have to contribute viable alternatives solutions and the citizenship should be sensitive to these questions. It is of vital importance that the Group of Rural Development Serranía de Ronda works with the youth of the zone keeping in mind the perspective of genre, applying it in each one of the contemplated actions. Also, we add that, in the application of our work methodology, we employ several actions establishing perspective of genre (male-female) like using a not sexist language in the elaborate documents by the own Group, analyzing in a continuous form the relations between girls and boys, observing the assimilation of roles and stereotypes, etc. All it since a real and effective coordination with the direction, with the teachers, through our advice in the school counsel and with the Ampa of the Educational Centers of the Serranía de Ronda.

We firmly believe in the value that takes the development of this project since only facilitating conscious and basic instruments to enable processes of taking decisions, commitments, pacts, structures and collective representations, we will be able to be producing a change of mentalities on the equality of real opportunities between men and women. Although the theme is not simple, we understand that, with

the development of this project, the students of the Educational Centers begin to walk towards a more egalitarian future...

2.4 Resolving conflicts

Promoting workshops among the students to form them in Social Mediators in the Educational Centers with support of all the educational community and promoting the creation of the Mediation in Conflicts Classroom figure in the Secondary Schools of the Serranía de Ronda in contribution with the Andalusian Institute of the Youth.

This project is carried out since the perspective of the social integration, therefore its development is based on Social Abilities, the Education in values and the Integration.

In this sense, we consider of vital importance the establishment of a real coordination among the sectors affected (Students Parents Association, Teachers, Family and Social Environment, Administrations, etc).

Our opinion about our role in this environment is that the Group must serve as link for the educational community, the families and the social services. Working in a direct way with the parents and mothers, to know in-depth the problematic and acting from this knowledge. In order to intercept the situation we face, we think that the union among these three institutions is fundamental. For that, our work has been centered in the contribution with the Schools of Mothers and existing Parents in the municipalities, carrying out interventions with the families.

2.5 Information on the situation of the collective most disadvantaged

Promoting, among the students of the Serranía de Ronda, the KNOWLEDGE and the CONSCIOUSNESS



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RAISING on the situation of the collective disadvantaged existing in the zone. We have the premise that we should be sensitive to the inequality suffered by a collective in social exclusion risk situation; a sensibility that itself does not remain in mere lament, but carry to the action. It is necessary not only efficacy and social justice, but also an ideological option: is the moment to surpass the fragment, the partial points of view, we should create networks that permit to combine complementary efforts after a better world.

Since this perspective, the Group of Rural Development Serrania de Ronda, by means of this project, has carried out workshops with the students of the Educational Centers, to reflect on the present situation of the most disadvantaged collective. Like the difficulty of a big group of youngs to find an employment.

We have intended to promote values of solidarity and tolerance toward the collective most disadvantaged of our environment. Because of it, we have established the execution of participatory workshops with the students of the Educational Centers where have known the different collective and associations implied in the improvement of the quality of life of these collective, also they have known the difficulties and the needs these collective have to be recognized and kept in mind.

The youth is not only the future, it is also the present, for that reason it is necessary, in the Serranía de Ronda, to make compatible the right to the access of these collective to the quality services and an efficient management of the resources.

2.6 Social Participation and youthful partnership


Impacting in the **CONSCIOUSNESS RAISING** of the students of the Serranía de Ronda on the sense of

the social participation in its municipalities and the meaning of the youthful partnership in the zone.

In the last decades we have observed that the youth have had a gradual loss of illusion and motivation in the existing proposals of participation. This Development Group has the conviction that the participation is fundamental to achieve the young population intervene in the processes of development and be benefited of it. The necessary integration of the youth in its context, it is seen from time to time conditioned by aspects as the dispersion, the non-existence of an adequate information to agree to the resources and mechanisms of participation or by the socialization agents networks absence (fundamental function of the partnership youthful). To surpass this situation is done necessary the cooperation and the solidarity between them and between these and the public administrations.

Certainly, we are not speaking of form generalized of the youthful participation of the Serranía de Ronda, but of significant actions started in by groups of youths, whose implication and prominence have a great social repercussion, establishing and multiplying among others young, the illusion by participating in the actions of youth of the Group of Rural Development Serranía de Ronda.

Of course, it is very stimulant for the young people the playful dimension of the events, the development of the socialidad and its convivial character, the prominence sensation of the public diffusion of their activities, the fact to be in other people's sight, valuing or censuring the work, but unfailingly looked at, a sensation of centrality and recognition. Next to it, the activity in the street, the place of it public by excellence, guarantees some type of so much, social repercussion to social as media level. We should organize us, voluntarily and in a different way as we often propose or think. Organize us since the own territory building networks. Because is in the own



territory where the possibility of the group, of the project, of the action evaluable, of the exchange and of the coordination arises: the network.

Because of it, we believe necessary to remark as an important aspect in the development of the youth projects carried out in recent years, the role of the Serrania de Ronda Development Group like development entity of the work in network placed in motion with numerous Educational Centers of the Serranva. Result of this network has been the dinamizacion of the Service of Youthful Information of the Serranva de Ronda, in contribution with the Andalusian Institute of the Youth, through the creation of the Center of Youthful Information "Irua", located in the municipality of Benadalid and where students of Educational Centers have been indisputable protagonist thanks to its implication transferring the information to other youths of around.

2.7 Youthful Volunteerism in the Serrania de Ronda

Promoting the Volunteerism among the students of the area, in activities carried out by the Group of Rural Development Serranva de Ronda.

The Youth project of the CEDER, could remain easily diluted in statements of intentions respect to the direct youth participation, if it does not count on the necessary mechanisms for its opportune put in practice. By this, it is necessary the promotion of the participation of youths through its incorporation as voluntary personnel of the Group of Rural Development, so that it assures the youthful participation in the elaboration, design and execution of its actions based on their own interests and needs. It is very necessary the coordination of all the social agents of the territory. In this sense, we should advance in the quality of our actions doing to the young population, truly participant of the processes of development,

from the beginning of the idea to the execution of it, and not, passive people that only interests them to participate in the suggested activities by the agencies and the institutions.

So that, we are invigorating the supportive and civic participation of the population of the Serrania de Ronda, in general, and of its young people, particularly, through forms of voluntary action. Likewise, we are developing mechanisms of coordination and strategies of network with the Educational Centers to promote strategies of voluntary action with youths that are interested in acquire a profitable experience in the work with youth.

2.8 Network of youthful volunteers

Promoting the student PARTICIPATION in the youthful network existing in the zone, so that they will act as key reporters in its municipalities promoting values of solidarity and tolerance.

We part from the need to bring up to date the model of the youthful participation in the Serranva de Ronda and, for that, we have contemplate as something necessary, the informal networks of youthful correspondents, having present another kind of participation individualized and personalized of youths interested in the development of its municipalities, and whose more significant motivation is the new technologies and the mass media.

The Group of Rural Development mountain Serranva de Ronda, in the framework of its projects of youth, is collaborating with the Educational Centers to generate a network of youthful correspondents that help to discover new ways of working with the youth through simple actions of participation whose purpose is to generate changes in our environment, taking advantage of the teamwork with other youths.

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2.9 Alternative Leisure for youths

Reporting on set in motion of the pilot experience of alternative nocturnal leisure in the mountain Serrania de Ronda “Bailando en el Tejado” (Dancing in the Roof) and collecting contributions among the students on activities alternatives for youths in the nocturnal schedule of weekends.

With this project, we intend to promote leisure alternatives in the youth with participatory and playful character during the nights of weekends in which develop some edition of “Dancing in the Roof”, trying thus to reduce the demand and the abusive use of drugs among the youth in the moments of greater consumption is, and to promote ways of life (healthy and positive diversion). Of course, the common denominator of “Dancing in the Roof” is, the alcohol and another type of drugs consumption absence, besides also is the fact of leaving from the ideas, interests and inclinations of the youths with the Educational Centers of the Serrania de Ronda, with the contribution of the City Hall, with the support of the Provincial Delegation of Malaga, through the Program of Central Guadalinfo, with the Andalusian Institute of the Youth, with the Asturian association youthful “Abierto Hasta el Amanecer” (Open to the Dawn,) with the area of Youth of the City Hall of Alhaurv de la Torre, and with the Rural Group of Development of the Oeste de Granada.

2.10 European Volunteerism. International exchanges

Promoting the Volunteerism of youths in European projects among the students of the Serrania de Ronda.

Nowadays, a key point to obtain the participation of youths is, certainly, the possibility to participate in a process of learning, that involves the design of some activities, its organization, its management and its ex-

ecution. By means of the development of European volunteerism exchange projects we intend to approach an opportunity to the youths of the zone and turn them into absolute protagonists besides having a great impact in the Serrania de Ronda since it is an attractive project for a great number of youths.

The Group of Rural Development intends to establish a contribution with the Educational Centers for the execution of exchanges with other countries in order to be able to develop projects with youths in which they be promoted values of solidarity, tolerance and integration.

2.11 Radio program “La Escalereta”


Promoting among the students its participation through the mass media.

We consider that the radio is a very nearby middle and our intention has been and will continue being, to reinforce its possibilities to be an instrument of communication between the young people and the society. It is a matter of doing a program of radio containing youthful information, music and interviews to people that can contribute ideas of interest and positive attitudes to the boys and to the girls of Serrania de Ronda and its participation in the development of the program.

“La Escalereta” works as a catalyst for the voices of the youth of the Serrania de Ronda. We consider that it is a very dynamic and effective way to diffuse the information, allowing many variations in the format and to flee the routine and the monotony of diffusing the information. We emphasize that the experience is very positive since has a direct repercussion in young intervening and participating in the radio.

2.12 Audiovisual media

The use of the audiovisual media to carry out a critical reading of the reality of the youth in the Serrania



de Ronda. For it, we have collaborated in the execution of a short about the School Failure, made by the students of the Valle del Genal Highschool, parents association, the City Hall of Algotocin and some CEDER volunteers.

One of the objectives of the Group of Rural Development Serrania de Ronda is to invigorate to the youth population to use current tools of audiovisual media, in order to motivate and excite them, by managing them.

The development of this project consists of the elaboration of a short on the school failure and its implication in the Serrania de Ronda, seeking the participation of all the social actors implied (students, faculty, family, politicians, ...).

The main axis of the short is based on the following points:

- A) Analysis of the possible causes of the school failure interviewing to considered responsible: teachers, parents and mothers, school counsel, professionals of the education, direction of the educational center, social services, local political...but, above all, giving prominence to youngs and teenagers.
- B) Concreteness of the problems that help to detect the conflict of critical and objective form.
- C) Regulation of the conflict in a positive form with possible solution.

Once elaborated the short, this will serve as educational material to utilize it for other institutes of secondary education, by Associations of parents and mothers of students, mothers and parents Schools, etc.

2.13 Spread of the cultural and natural patrimony

Promoting the KNOWLEDGE of the cultural and natural patrimony of the Serrania de Ronda among the students of this area. For it, the CEDER has designed and created the Play of the Serrania de Ronda, besides other workshops and playful activities.

Through this project, the Group of Rural Development mountain intends to approach the cultural and natural patrimony of the zone to students in a simple way by means of the play.

The Play of the Serrania de Ronda is an amusing and dynamic instrument that proposes an exciting traveling through its geography to discover, in a exciting form, all the treasures that hide its spots, its towns and its people. It is a mixture among the Trivial, the Pictionary and the traditional play of the Goose, although "with a content and clearly mountain flavor". The Play has also an integrative function, for which the play also counts on the tongue of signs to be able to be communicated with the deaf people, as well as the alphabet "Braille" for the blind people.

2.14 Diffusion of activities for young people

Reporting to the students of the School Centers of the Serranva de Ronda about the different programs and activities by the blog cederjoven.blogspot.com and by the digital magazine of youth.

One of our targets, with the development of this project, is bringing the information closer to the youth, particularly, in places where they spend big part of his time (free time and formation spare), by means of an intermediate device of access to the information of the Group of Rural Development Serranva de Ronda. This informative decentralization is supported also in the coordination and collaboration supported with



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youthful correspondents and social mediators as well as with volunteers of the Town halls of the Serrania de Ronda.

All it, is possible keeping in mind that is done necessary likewise, to channel informations and proposals of youthful interest toward the Services and Programs that develops the Group of Rural Development mountain Range of Round. Thus same, we consider that the success of the project is insured if we facilitate the exchange and the youthful interest initiatives diffusion arisen since the/ace young own/ace of the Educational Centers, as well as since the existing youthful social weaving in the municipalities through the new technologies.

2.15 Contribution with the Educational Centers of it set in motion of the Traveling School of Youthful and Childlike Participation

Promoting the participation of the infancy and the youth in the different actions developed in its municipalities, and educating in the participation of the citizenship.

We know that the infancy has a future, but above all has a present in which one must work today and to keep in mind the importance to integrate to the children and girls in the world of the adult people, that in which decisions make. In our opinion we offer them few spaces and opportunities so that they express their own ideas and opinions. The need to consider to the children and girls as active subjects of our company is increasingly more large and, also, the need to form capable people to decide on its own development and to contribute judgments and solutions in its families, schools and communities.

We intend to include a space where to devise a directed action/intervention criteria series al local environment strategies design of Infancy and Adolescence, to initiate participatory processes of citizenship.

The creation of the Traveling School of Youthful and Childlike Participation counts on the support of the Educational Centers of the Serrania de Ronda and its approach in the territory passes among others, by the execution of a diagnosis on the state of the infancy and the adolescence in the zone and strike among its main objectives, to sensitize on the rights of the infancy in the Serrania de Ronda.





Empowering the farmer and the tourism small entrepreneur

The YPAITHROS project

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1. Introduction

The Ypaithros service aims to provide quick and accurate business information to residents active in the countryside, in rural and outlying regions of Crete, through the collection and delivery of digital content and the development of innovative information services. The Ypaithros information platform utilizes content relevant to the main countryside activities, the technological progress, and the national or European subsidizations, providing a sophisticated information source for the rural businessmen. [2]


2. Objectives

The main objectives of Ypaithros are:

1. Information provision and technology transfer to rural enterprises
2. Setting off new enterprising concepts which will be based on the efficient exploitation of the special characteristics of rural areas.
3. Motivating the organization and development

of alternative tourism enterprises, such as agro-tourism and geo-tourism, in less evolved rural areas. The development of such business activities could make possible the exploitation of specialties and advantages which come out as results of the cultural or social features of the rural areas.

4. Contributing through agro-tourism and geo-tourism to the creation and development of small and medium local enterprises which are involved in the production of traditional and local products (e.g. vintage cultivation and wine production). These business activities may promote local products and motivate local economies.
5. Establishing a framework where businessmen will have equal opportunities to participate in the information society. The results of every research activity as well as information about new techniques and issues concerning resource exploitation will become available to everyone.



The achievement of Ypaithros' objectives such as information dissemination, the interconnection of local authorities' services and the development of regional offices will make possible the rendering of value added services to residents of rural areas.

3. Methodology

Ypaithros is a service that aims to supply information to rural people who normally live and work outdoors. The attempt of developing an information platform like Ypaithros has started a few years ago as an information tool for farmers. That very first attempt was named "Agro-Message" (Αγρομήνυμα) and its main operation was sending short informative messages to farmers and cattle raisers directly on their mobile phones. Since the early stages of the Agro-Message, the idea to develop an integrated, more intelligent information platform had risen. The Ypaithros project started in early 2003, supported and co-financed by the EU Regional Program of Innovative Actions CRINNO (Crete – Innovative Region) [3].

One main issue for the "Ypaithros" platform is users' profiling and news filtering methods. The innovation of Ypaithros lies on the efficient matching between the submitted information and the registered users' interests. Services like "Ypaithros" should pay a lot of attention in understanding user's information demands, current as well as future interests, according to their occupation, residence and personal preferences. Thus, an advanced user profiling mechanism is required in order to comprehend the users' needs. This profiling mechanism should be coupled with an information delivery mechanism and data validation algorithms in order to achieve sound content delivery to registered users.

Ypaithros aspires to evolve into an information source for every businessman who needs accurate and up to

date information but has no time or means to seek for it. Ypaithros could be considered as a pioneer application because of the audience that is intended to. It is quite unusual for information technology novelties to be first applied in rural areas. Rural population is not familiar with new technologies while the communication infrastructure is limited in rural areas. That is why the need for services like Ypaithros is stronger for the less technologically developed areas. The evolution of mobile phone networks and wireless Internet together with the development of new standards for information dissemination by conventional means like mobile phones, open new perspectives for the development of new innovative services.

Most of the rural businessmen are mobile workers. This means that they work away from fixed line phones or computers. For this reason, Ypaithros was designed to deliver the information via widely used communication means such as normal mobile phones. The information supplied by Ypaithros mainly concerns the tourism, agriculture, cattle-raising, and cottage industry. Businesses or individual businessmen may register to receive filtered and properly categorised information. This information is available as voice messages on fixed/mobile phones and as text (SMS) or picture (MMS) messages on mobile phones. The World Wide Web (WWW) and email is also used to disseminate information to registered users of Ypaithros.

4. Technological Description

Ypaithros is an information system that consists of a web portal and a central database. The "Ypaithros" platform has been developed using a Content Management Tool that provides easy information submission and management. All data is stored in an SQL database where a number of tools and APIs are re-



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sponsible to extract and format information in XML. Consequently the XML document is forwarded to different servers according to the delivery method selected. The core of the system is the web portal, which is used to evaluate process and store the information to be disseminated. It is also used as an access point for outdoor activities' people and specialized personnel of academic and research institutes involved in agricultural development. They may use the web portal for communication and for knowledge sharing purposes.

Four different methods may be used to access the Ypaithros information platform:

- Web interface – Agricultural Development Regional Offices.

This interface is used for new subscribers' registration and access to the system. It allows specialized personnel to perform all the appropriate procedures required to satisfy rural people needs for information, to create new registrations and to provide general information for the system organisation and operation.

- Voice interface (Voice system)

This interface is a voice portal which can easily provide information about the system and the available services. One may use this interface to arrange meetings, listen to weather forecasts, or to access other general voice services. Voice services may be combined with text message (SMS or MMS) services. Quite often text message services redirect users to the voice or web portal.

- Mobile phone interface (SMS system)

Most of the rural – outdoors professionals use their mobile phones to communicate. The mobile phone interface utilizes the SMS [4] and MMS capabilities of the mobile phone networks to provide information in a direct and


personal manner.

- Public Web interface (Ypaithros Portal / email system)

Through this interface, rural people may search for information, register to lists for receiving text (SMS) or voice messages, or participate in discussion forums.

The main functionalities of the Ypaithros portal are information searching and sorting. Information may be collected and stored automatically (using RSS technology) or manually. In the case of automatic information collection, information (formatted with predefined standards) is extracted from specific network data nodes. After the information has been collected it is properly formatted as a voice or text message (or both) and it is then available for dissemination. During the information formatting stage, various filters which have been set by the system administrators are imposed. According to these filters and the importance of the information the Ypaithros' users will be automatically informed. In case of manual information collection, the Ypaithros' content providers upload the information into the system by using information management applications accessed through the web portal. Under the guidance of these applications, information uploaded by content authors is structured and classified according to well defined specifications. Then, the administrators evaluate the information and store it into the central database.

New information stored into the Ypaithros database will be automatically disseminated to registered members according to their preferences. Recipients of information will be informed only about the topics of interest that were declared during their registration. This maximizes the informational value of the messages and reduces or nearly eliminates non-relevant and unwanted messages. For every member of Ypaithros a profile that determines their identity and



defines their preferences is created upon registration. Occupation and communication details of each member are considered of high significance.

A typical user profile contains the following details:

- The geographical area where the user lives and works
- User business details
- Age group
- Contact details
- Preferred way to be informed

Information searching and retrieval processes are performed quite efficiently with the Ypaithros' databases because of the advanced indexing and classification techniques used. In this way, subscribers or information that matches specific criteria may be retrieved rapidly.

In order to ensure the continuous and reliable operation of the platform, a number of self-checking mechanisms have been developed. Emphasis has been given to the QoS of the outgoing SMS messages where a number of threats may affect the correct operation of the service and cause failures to message delivery. For that purpose, a range of GSM modems continuously monitors the platform by receiving test SMS messages every 1 to 6 hours according to the network traffic. This activity continuously assesses the correct operation of the delivery mechanism and the correct encoding of the messages. In case of failed delivery, alternative routes are activated in order to ensure the successful message delivery.

1.4 Developments

Rural areas are characterised by significant diversity, ranging from remote rural areas suffering from depopulation and decline to peri-urban areas under in-

creasing pressure from urban centres.

The Prefecture of Heraklion, Crete, Greece, populated with about 300000 residents was selected as the application area of Ypaithros. A network of eight regional offices has been developed covering the whole administrative area of the Heraklion prefecture. Controlled access to various kinds of information is given to specialized personnel via the Ypaithros infrastructure, so they can retrieve and disseminate it to enterprises located in the most remote areas. This information may come from government and private carriers or enterprises, research institutes or other governmental resources. Ypaithros collects, organizes and classifies all this information and then makes it available through the web portal and the network of regional information offices. [5]

The results of the Ypaithros service implementation have mostly targeted local businessmen and other professionals active in remote rural areas.

Rich and diverse content is collected and disseminated through the Internet, mobile phones and fixed-line networks. Moreover, novel technology (such as voice messaging) is used to improve the quality of the services provided and make them accessible by people not so familiar with electronic devices such as computers or mobile phones. Ypaithros services allow remote and agricultural workers to participate effectively in the information society. Rich media content is becoming available in new, diverse formats and can be delivered independent of location or time, personalised to individual citizens' preferences or requirements. The Ypaithros information platform can be used by various organizations in order to deploy new value added services for rural and distant area population.

ICTs make a crucial contribution to growth and jobs in Europe. The ICT sector is a major contributor to the economy, while the adoption and skilful application of ICT is one of the largest contributors to pro-



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ductivity and growth throughout the economy, leading to business innovation in key sectors. Ypaithros services contribute to the creation of work places in the countryside encouraging young people to live and work in rural areas, preventing or discouraging desertification.

Support is provided to businessmen in rural areas through a systematic information procedure about topics concerning business opportunities, important news, national or European subsidizations and news about important sectors of economy.

Accessing information sources became an easier process so that young people are better motivated to stay and work in rural areas. Environmental services and animal friendly farming practices are promoted keeping businessman in rural areas well informed.

Ypaithros' business and citizens' benefits at Heraklion Prefecture have come out as the results of the quick, accurate, and timely transfer of knowledge and information from urban to rural areas. Within 3 ½ years of operation, Ypaithros counts more than 2900 registered users (1% of the population). Every week, 4-6 new pieces of information are submitted to the platform, 2-3 of which are considered urgent and important and are thus forwarded to the users' mobile phones.

Business concepts such as agro-tourism and geo-tourism that are promoted by Ypaithros, contribute to the creation and development of small and medium local enterprises which are involved in the production of traditional and local products (e.g. vintage cultivation and wine production). These business activities promote local products and motivate local economies.

Some real examples of SMS messages which have recently been sent to Ypaithros users' are shown below:

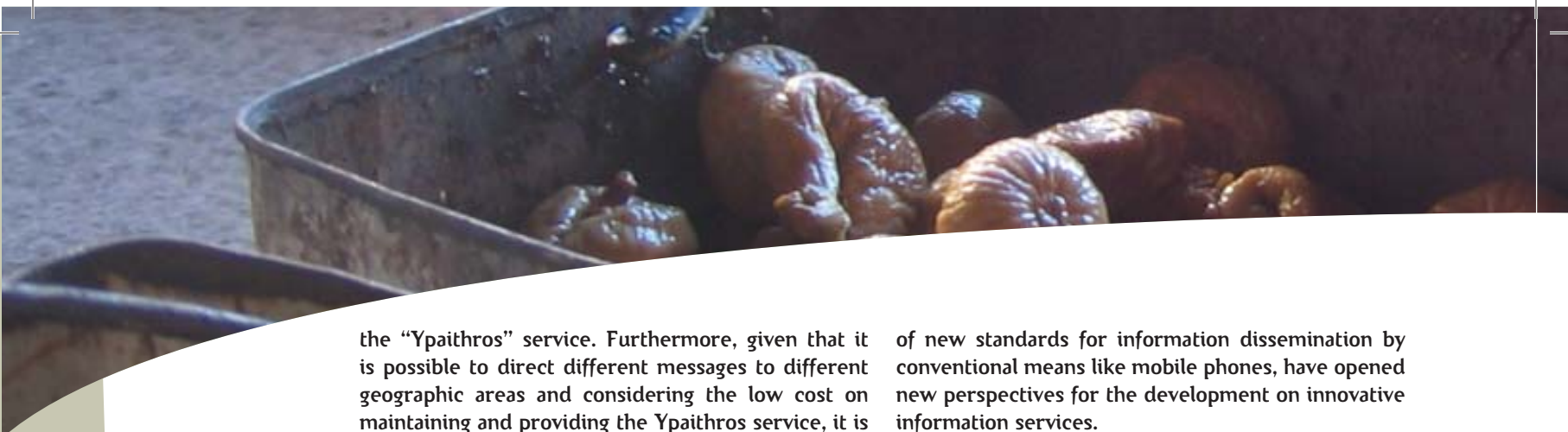
- Enterprises' financing up to 50%, for the installation of an "Environmental Management System" according to ISO 14001. Applications

will be accepted until 20/01/06. Information www.ypan.gr

- "Environmental Plans Support" Programme from the General Secretariat for Industry, referring to Manufacturing, or Touristic Enterprises. Financing will be up to 55%. Applications will be accepted until 20/01/06
- Enterprises' financing for the creation of Wireless Hotspots. Applications will be accepted until 21/11/05. More information www.w-hotspots.gr
- Small Enterprises' (2-10 employees) financing up to 50%, for the provision and installation of Informatics' equipment and applications. More information: Telephone number 210-9286048
- Crete Regional Programme: Financing of New enterprises in Crete up to 60% for development of industrial research in all thematic areas. More information: 210-7458136

Apart from the services described above (technology transfer, opportunities, important news, national or European financial opportunities etc), the "Ypaithros" platform can be used as an alternative mass media service capable to distribute short messages to large numbers of recipients within a short timeframe. The combination of the content management tool (CMT) and the Application Program Interfaces (APIs), results to a flexible platform that can be used with various types of content under an ASP model.

Due to the flexibility of the platform and the advantages that result from the CMT dynamic platform, a number of different services can be provided using an Ypaithros-like application. Mass information and alerting services (e.g. emergency situations, extreme weather conditions, etc) are ideal case studies for



the “Ypaithros” service. Furthermore, given that it is possible to direct different messages to different geographic areas and considering the low cost on maintaining and providing the Ypaithros service, it is possible to provide services for everyday, low scale emergencies and notifications such as public utility information, like for example doctor visits to specific rural regions, or temporary suspension on the distribution of the electric power or water in some zones.

5. Conclusions

The key to an inclusive information society is to ensure that citizens from all the demographic groups have the opportunity to participate. Ypaithros aims to bridge the digital divide in rural areas by bringing information to people instead of bringing people to information. Based on an advanced context management system, Ypaithros may propagate messages rapidly covering the always increased needs of people, no matter where they live or what their job is, beyond any age, culture or geographical limitations. The information society is at a turning point: there is huge recent technological progress and ICTs are entering a phase of mass deployment which may fundamentally change the way in which we work, live and interact. [6] The evolution of mobile phone networks and wireless internet along with the development

of new standards for information dissemination by conventional means like mobile phones, have opened new perspectives for the development on innovative information services.

The vision of Ypaithros is to motivate and provide a new, alternative mass media service for targeted groups of mobile users, or rural area residents with limited access to traditional mass media. The positive feedback from the existing users and the continuously growing number of subscribers shows that the users are now mature enough and the conditions are favourable for the deployment of alternative, personalised information services like Ypaithros.

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The Impact of Education on the Productivity of Farmers: A Survey Analysis

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Introduction

Agriculture is the largest sector in Turkey in terms of employment with more than 30% of the workforce in this sector. Farming in Turkey is more labor intensive than in developed countries therefore human capital of the farmers and their schooling and technical trainings are more important. (See Rainer, 1998). The lack of infrastructure and investment in agriculture creates a barrier to achieve low cost-high yield production. The agriculture is practically the only income source for the rural population. The low level of human capital and geographic position in the countryside constitute significant handicaps that hin-

der movement of agricultural labor to other sectors in Turkey

Table: 1 compares the share of agriculture in Turkey with the EU countries. Comparing other EU countries, agriculture is the largest sector in Turkey in terms of employment and the share of agriculture in GNP. Turkey's competitiveness of agricultural products depends on farmers' productivity. For the purposes of this analysis the effects of formal education and training on Turkish farmer's productivity is investigated in 7 regions in Turkey. (Source: <http://www.tarim.gov.tr/arayuz/1/icerik.asp?efl=uretim/istatistikler/istatistikler.htm>)

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Countries	Share of Agriculture in GNP (%)		Share of Agriculture in Exports (%)		Share of Agriculture in Imports (%)		Share of Population Employed in Agriculture in Active Population (%)		Total Agricultural Land (1000 ha.)	Employment in Agriculture (1000 people)
	1998	2003	1998	2003	1998	2003	1998	2003	1998	2003
Germany	0,8	0,7	5,3	4,9	9,5	8,3	2,8	2,4	17.008	871
France	1,8	2	12,5	11,4	8,8	8,1	4,4	4,3	29.430	1.042
Italy	2,5	2,2	6,8	7,2	11,2	9,4	6,4	4,7	15.097	1.040
Belgium	1	1	10,9	9,3	10,7	8,9	2,2	1,7	1.392	70
Luxembourg	0,6	0,5	10,9	5,7	10,7	9,5	2,9	2,4	128	5
Netherlands	2,5	2	19,8	17,7	11,8	11,4	3,5	2,7	1.924	218
England	0,5	0,7	6,3	5,9	9,3	9,2	1,7	1,2	16.352	356
Ireland	2,7	1,9	12,4	1,5	7,9	8,8	10,9	6,4	4.370	113
Denmark	1,8	1,6	20	17,6	10,7	10,7	3,7	3,3	2.641	89
Greece	5,8	5,4	27,4	22,7	13,9	11,2	17,7	16,3	3.897	654
Spain	3	3,6	14,7	14,6	9,8	8,3	7,9	5,6	25.270	934
Portugal	1,9	2,5	6,2	6,7	11,7	11,2	13,7	12,8	3.745	657
Sweden	0,4	0,6	2,3	3	6,6	7,3	3,1	2,5	3.129	111
Austria	0,9	1,2	5,1	6,1	6,9	6,7	6,5	5,5	3.374	204
Finland	0,6	1	3,1	2,6	7,1	6,3	7,1	5,3	2.246	126
Poland		2,3		8,1		6		18,2	16.136	2.485
EU (25)	1,5	1,6	7	6,5	7,7	6,4	4,7	5,2	163.479	10.082
Turkey	17	11,5	10	10,3	4,6	6,1	43	32,7	26.578	6.799

Table 1: Comparison of Selected Agricultural Indices in Turkey and the EU



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2. Literature Review

The effect of formal and informal education on farmers efficiency and income levels have long been analyzed in economics literature. Hussain and Byerlee (1995) pointed out that returns to schooling in agriculture may be as high as for urban wage earners. Lockheed, Jamison and Lau (1980) indicated that a positive effect of education upon output, though the results were mixed. They noted that a significant positive relationship was more likely to be found in areas where farmers are modernizing. Phillips (1994) found that the average increase in output owing to an additional four years of schooling in the studies Appleton and Balihuta (1996) pointed out that education was not found to be significant. Mirotchie (1994) investigated technical efficiency in cereal crop production in Ethiopia using aggregate data for the period 1980-86. He reported that primary schooling tends to increase productivity, while secondary schooling has no effect. Wear (1999) found positive and significant returns to additional years of formal schooling in terms of increased output of cereal crops. Ashenfelter and Kyuger (1994) showed that omission of ability did not cause upward bias in returns to education in the U.S. Civan, Bayyurt and Serin (2007) indicated that the link between education and farmer's income in Turkey.

Serin, Arican, Yucememisoglu, Civan and Isil (2007) investigated the agricultural producers' productivity and efficiency in Turkey Including visits/ interviews with Turkish agricultural education and training service providers, producers and the representatives of agricultural unions, the study estimates the effects of benefits of schooling on the competitiveness of fresh fruit and vegetable sector in Turkey. It also involves research questions concerning to the levels of education of agricultural producers, education/ training/ extension methods in a consultative process;

production techniques, marketing in Turkey

3. Survey

The results of face to face interviews conducted and results of surveys with farmers during the study have displayed the similar findings for the purpose of highlighting the problems which require attention. Firstly the results of surveys are indicated by tables.

3.1 Farmers' Situation

Survey study conducted in connection with farmers in 23 provinces and 78 districts and centers reporting to them have displayed some detailed and interesting conclusions about agriculture sector in Turkey. First the formal education level among the Turkish farmers extremely low; 63% of the farmers did not get any formal education beyond primary school. Even more troublesome is the fact that there is a high rate of illiteracy which is as high as 33 % in South-eastern Anatolia region.

On agricultural lands, there is no planned production selection strategy and it is seen that the same product is repeatedly grown. At this point, the importance of education of farmers in line with productivity and type of soil is a striking conclusion.

It is seen that modern watering methods on agricultural is not used except for Marmara and Mediterranean regions where there is intensive industrialization and where technological novelties are used.

It is seen that soil fertilizers are used intensively and requested knowledge level about fertilization techniques and results is not formed yet.

It is an interesting finding that farmer makes the fertilizer selection by means of traditions inherited from ancestors.

Though Turkish farmers give importance to medication through producer dealers, it is also interesting

that the number of those having support from agriculture directorate is very close to one held by those receiving support from dealers and it is a promising fact. The agriculture directorates seeking to increase education level at society and working stability which is in line with purpose seems to bring even better results with each passing day.

It is seen that generally no worker is employed on agricultural sector and that families work on their own body due to the crowded population structure and they work on their fields and that in some regions their fields are not wide. Similarly, it is observed that farmers are not provided with sufficient training about non agricultural activity as well and that they are not very knowledgeable.

In Figure 1 indicates that the farmers have obtained support with a rate of 49 % for agriculture support policies and they have got support for new production technologies with a rate of 35 % means considerable result for the purpose of making the farmer more knowledgeable. Such a case is important fact because it shows that farmer may invest in new production Technologies and marketing techniques if he is provided with supporting means. Especially, in areas where there are industrial products required to be processed, the new production and rate of support for technology have increased.

Figure 2 shows that farmers in agriculture sector are informed about novelties, from agriculture region directorates, medicine and fertilizer dealers, cooperatives and Agricultural Chambers.

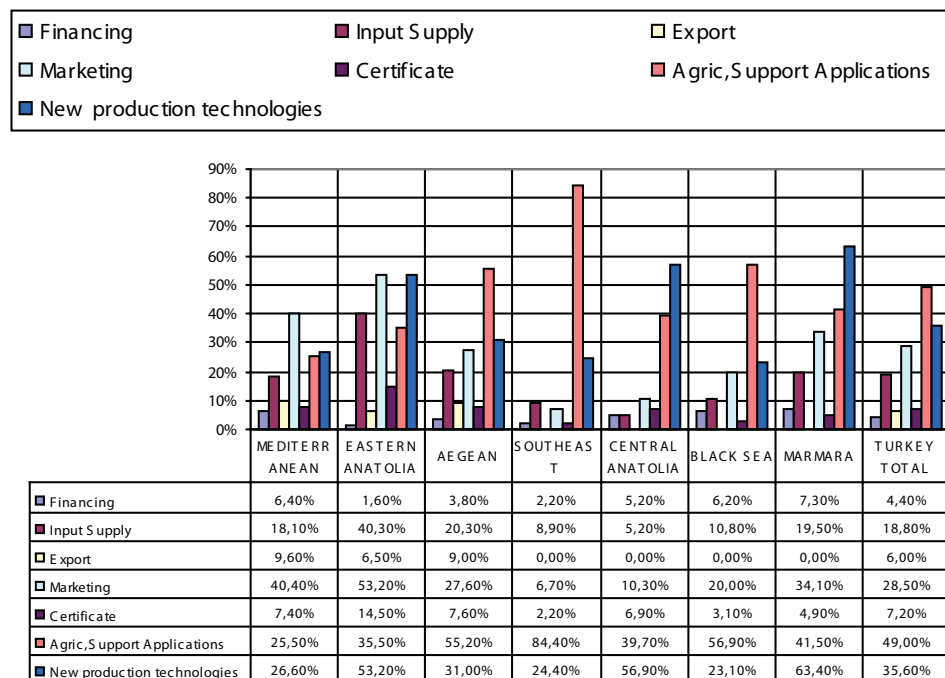


Figure 1: Distribution of Farmers' Consultancy Areas

The results of this study are stated below

However, accordance to the results of Figure 1 it is seen that knowledge provision regarding the agriculture is performed, though at minimum level, in accordance with products grown in areas where especially climate conditions are suitable. Such a case displays the importance of providing the farmer with financial and technological support and motivation in addition to making him knowledgeable about

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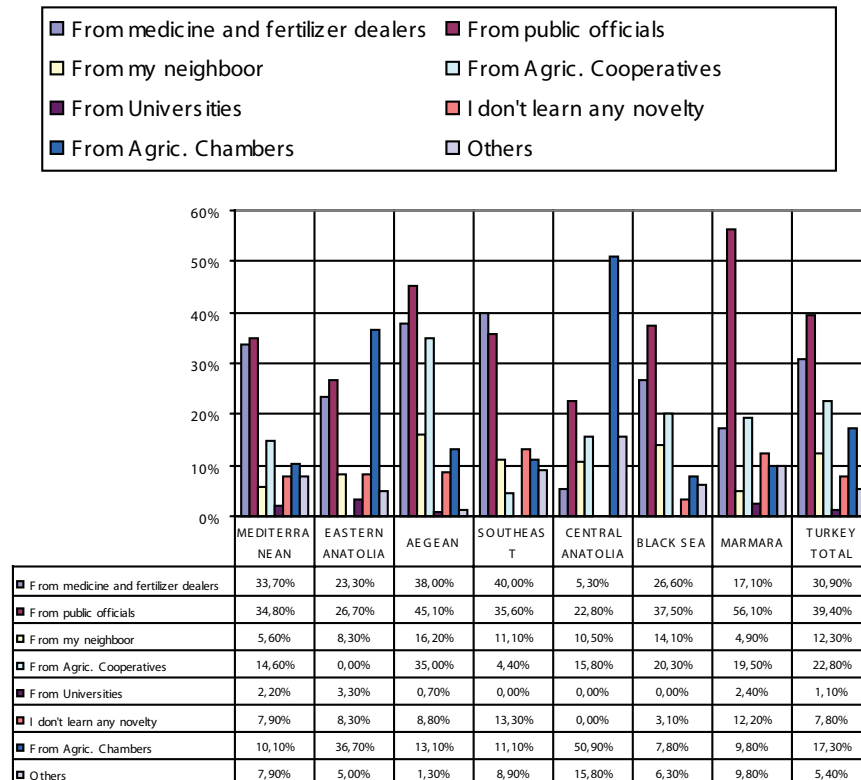


Figure 2: Sources of Information

organic agriculture.

- The farmer is alone and unconscious. Soil is generally very limited. Most of them could not make professional production. Due to the technical obstacles, our Turkey's grape export was refused by 70 countries.
- General problem is to failure to obtain training in this field due to the fact that farming is not seen as a profession in Turkey. Farming performed traditionally and in a manner inher-

ited from father results in unproductiveness in agriculture.

- Such diversity of dispersed agriculture establishments running on the form of family enterprise prevents application of modern agriculture techniques and limits the technology use in agriculture.
- Ignorance about moldiness and medication results in technical problems in export and at the same time, toxin wastes constitute a considerable problem for food safety for domestic producer. In this regard, producers are required to be informed and audited.

- Producer should be encouraged for performing

Organic apricot production and free of charge consultancy should be provided.

- Cooperative trading system is not developed in the region.

3.2. Effects of Education on Farmers Productivity

Descriptive statistics, including means and standard deviations are summarized in table 1. Our sample includes 387 farmers who had valid responses to each of the independent variables. The average annual

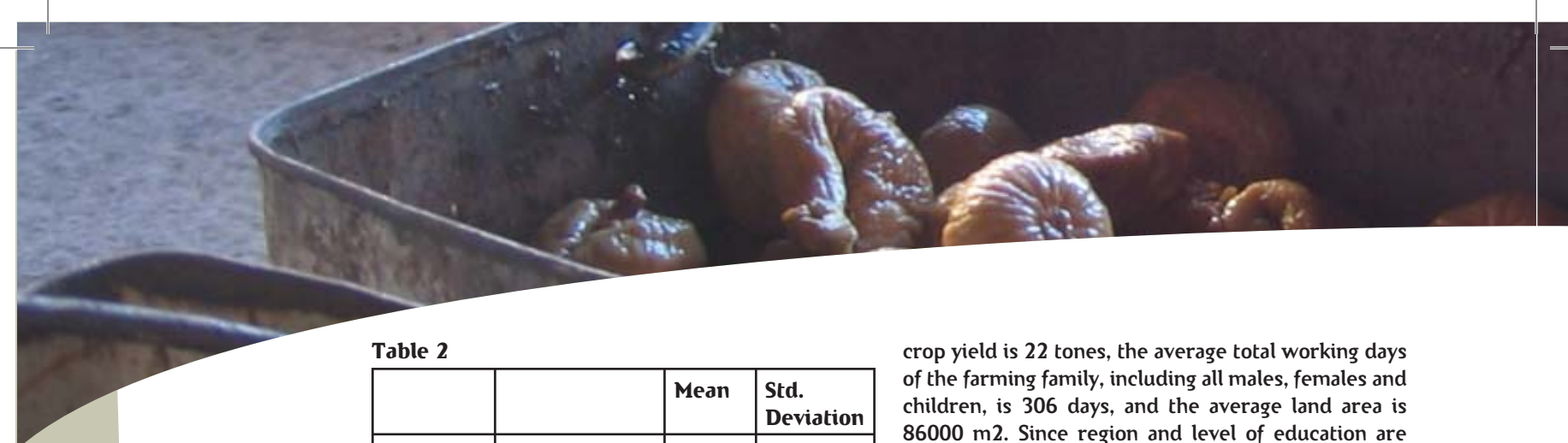


Table 2

		Mean	Std. Deviation
Crop yield (ton)		21,70	35,40
Workdays (day)		306,39	380,97
Land size (m2)		85910	103,79
	Mediterranean	10%	
	East Anatolia	8%	
	Aegean	42%	
	South East Anatolia	11%	
	Inner Anatolia	13%	
	Black sea	7%	
Fallow		0,35	0,48
Education		1,53	0,95
Education square		3,26	4,05
Education Dummies	No education	5%	0,22
	Primary school	58%	0,49
	Middle school	20%	0,40
	High school	11%	0,31
	University	6%	
N= 387			

Table 2: Descriptive statistics

crop yield is 22 tones, the average total working days of the farming family, including all males, females and children, is 306 days, and the average land area is 86000 m2. Since region and level of education are coded as dummy variables (0-1), the means of them show the percentages of the group in the sample. In other words, in our sample 10% of the farmers are from Mediterranean district, 8% from East Anatolia, 42 % from Aegean, 11% from South East Anatolia, 13 % from Inner Anatolia, 7 % from Black Sea and the remaining 10 % are form Marmara. %5 of the farmers in our sample have no education, 58% have a primary education of 5 years, 20 % have a middle school education which contains an eight years education, 11 % have high school and the remaining 6% of the farmers have a university degree.

4. Results

We basically want to analyze the relationship between crop yield and education, and training in Turkey. For this purpose we have used four models (table 2). In the first model education is included by using a five point Likert scale, from 1-no education to 5-university degree. There seems to be no statistically significant relationship. In the literature non-liner effects of education on the farmers productivity is suggested. So in the second model square of education is also included in the regressions. In this model education still has no effect on crop yield at a 10% level of significance. In the third model education was coded as dummy variables and in the last one the main effects of education and region are included by adding variables which are obtained by multiplying region and education. In the third model dropped level is the university education. So we expect negative signs on the dummies, and the coefficient on the no school dummy would be biggest in absolute terms. The co-

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efficients are inline with theoretical considerations but they are not statistically significant. So this model also suggests formal education has no effect on crop yield. Allowing education to have variable effects at different regions due to cultural, institutional, or geographical reasons; in the last model we used education region interaction dummies. It is found that education has positive effect on crop yield only in Aegean region. Significant coefficients are marked.

According to our results formal education has no im-

pact on productivity of farmers. Maybe education in formal institutions is so far away from the necessities of farming. The skills required for efficient farming is not taught in the schools. However; that does not mean farmers would not benefit from learning but it might mean they need more practical training. Governments generally offer expert consulting services free or at very subsidized prices to farmers. Universities, occupational organizations, agricultural equipment companies, fertilizer companies are also

Dependent variable: Crop yield				
	1	2	3	4
Land size	,18* (11,23)	,18* (11,14)	,18* (11,09)	,18* (10,98)
Fallow	-9,00* (-2,51)	-8,98* (-2,50)	-8,9* (-2,44)	-9,6* (-2,63)
Workdays	,007 (1,43)	,007 (1,42)	,007 (1,41)	,007 (1,48)
Training	-2,90** (-1,83)	-2,91** (-1,83)	-2,9** (-1,83)	-2,9** (-1,84)
Education	1,39 (,83)	2,75 (,41)		
Education square		-,33 (-,21)	-5,33 (-,52)	
Primary school			-3,30 (-,48)	
Middle school			-1,36 (-,18)	
High school			-,27 (-,03)	
Edu*Med.				-1,77 (-,44)
Edu*EastA.				-2,29 (-,36)
Edu*Aeg.				6,8** (1,95)
Edu*SouthE.A.				2,94 (,73)

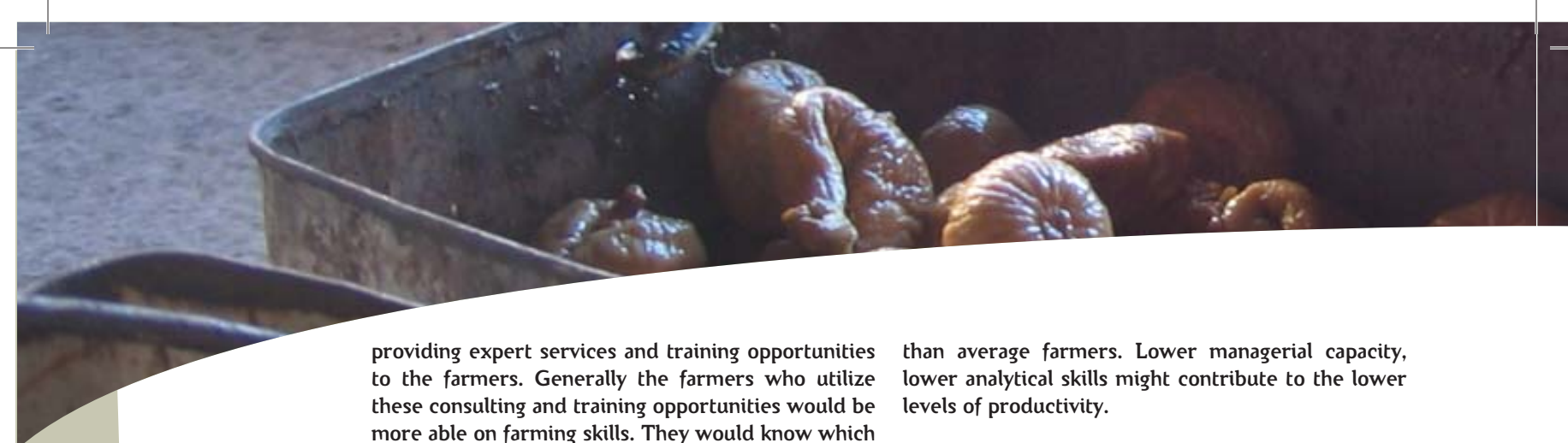
	1	2	3	4
Edu*In.A.				-1,94 (-,44)
Edu*Blacksea				-,039 (-,008)
Mediterranean	9,21 (1,25)	9,26 (1,25)	9,27 (1,25)	14,02 (1,25)
East Anatolia	4,27 (,54)	4,31 (,54)	4,35 (,55)	7,85 (,67)
Aegean	17,09* (2,86)	16,99* (2,83)	17,0* (2,82)	7,85 (1,01)
South East Ana.	1,17 (,17)	1,51 (,20)	1,41 (,19)	-2,27 (-,27)
Inner Anatolia	6,93 (,96)	6,89 (,95)	6,88 (,95)	11,35 (1,08)
Black sea	-4,33 (-,50)	-4,18 (-,47)	-4,12 (-,47)	-4,30 (-,36)
Constant.	-4,36 (-,69)	-5,37 (-,68)	,28 (,03)	-2,38 (-,40)
R2	0,30	0,30	0,31	0,31
F	14,05	12,85	10,95	9,90

Numbers in parentheses are t statistics.

*: significant at 1%.

**: significant at 5%.

Table 3: Model summary



providing expert services and training opportunities to the farmers. Generally the farmers who utilize these consulting and training opportunities would be more able on farming skills. They would know which type of fertilizer should be used at various soils, how much, when etc... So in our survey we asked the farmers whether do they consult with the experts when they face a problem related with their business, and code it 0 if the answer is yes and 1 if no. The same question is repeated about the fertilizer choice, if the farmer asks the expert it is coded as 0 and coded 1 if he does not consult with the experts. We take the average of these two answers and created a variable called training. A priori the expected sign is negative. In all of four models the farmers who gets consulting from the experts (or training) gets significantly higher crop levels.

As expected the land size has the biggest effect on crop yield. Its coefficient is the same in all four models. Normally it is expected that more hardworking farmers would be able harvest more. However in our results this proposition is not confirmed. The coefficient for the total work days of farming family is not statistically significant. When we looked at the survey answers, many male farmers indicated that they were working more than 360 days per year. Maybe they don't know how much they are really working or even if they don't have any real reason to on some days, they go to their farms anyway and involve with light jobs. In either case the crop yield might not be related with reported working days. Farmers who still implement the traditional fallowing practice have significantly lower crop yields. This might be due to two reasons; unobservable soil qualities, unobservable human capital. If some soil is very unfertile, even with the state of the art fertilizers, the crop yield might go down; in these soils fallowing could be economical. Second we can safely presume the farmers practicing fallowing have lower human capital level

than average farmers. Lower managerial capacity, lower analytical skills might contribute to the lower levels of productivity.

5. Conclusion

Survey study conducted in connection with farmers in 23 provinces and 78 districts and centers reporting to them have displayed some detailed and interesting conclusions about agriculture sector in Turkey. The formal education does not affect the farmers' productivity levels. A farmer with a high school degree does not get higher crop yield than a farmer without any formal education. This suggests that education skills attained at schools are not useful at farming. However, in the survey has information on only education level of head of farming family households. Even if the head of household does not have formal education other members of the family might have some education. The skills attained by these educated members might have been utilized on farming decisions. This might explain the irrelevance of education on productivity level of farmers in our regressions.

On agricultural lands, there is no planned production selection strategy and it is seen that the same product is repeatedly grown. At this point, the importance of education of farmers in line with productivity and type of soil is a striking conclusion.

It is seen that modern watering methods on agricultural is not used except for Marmara and Mediterranean regions where there is intensive industrialization and where technological novelties are used. The farmer in the entry and growth stages might display increasing productivity with improved managerial ability and experience along with increased farm unit size.

However, formal education is not only method of

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learning. Training sessions or even consulting with experts can contribute to the knowledge levels of farmers. Some might argue this type of education is even more useful than formal education, because it is practical thus easier to comprehend and easier to implement. However it is seen that farmers in our survey when they face a problem or a choice related with their business they mostly try to solve by themselves or by asking help from their fellow neighbors. However, since it is not possible for farmers to follow the latest technological and scientific developments in the field, the solutions or choices they implement to solving such type problems decreases productivity. Thus the farmers who utilize consulting or training services provided by the government, universities, occupational associations, or private companies are expected to be more productive. Our analysis confirms that for the farmers who get that kind of practical education the crop yield is higher.

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Empowering the farmer and the tourism small entrepreneur

Virtual Communities of Practice for SMEs: Opportunities and Implications for the Tourism Sector in Rural Areas

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1. Introduction / Rationale

Communities of practice (CoP) have become a very popular concept especially when it comes to learning at the workplace. The awareness that most work-related information is passed on informally at the workplace led to the support and fostering of CoPs. Additionally, the almost ubiquitous availability of the Internet contributed to spread the idea of sharing knowledge and interests with like-minded people online. The establishment of virtual CoPs (VCoP) combines these two principles and allows the sharing of knowledge without the restrictions of time and space, which may be regarded as a key factor for learning on-demand or just-in-time.

The CoP concept can be considered as especially promising for small and medium-sized enterprises (SMEs), as they can be seen as the backbone of regional prosperity and employment in Europe (ENSR,

2004). This is especially true for rural areas. Employees' professional development is often seen as a precondition to achieve innovations and to compete with other companies. However, small enterprises are often not able to develop or finance learning initiatives individually. Recent ideas on ICT-based learning include a blend of learning and working, resulting in the concept of learning at the workplace. These kinds of informal learning processes in organisations are aimed at learning around concrete problems and can be supported by the establishment of (virtual) CoPs, avoiding the need of formal training processes.

A basic assumption for this is the observation that CoPs seem to have a positive influence on the learning processes of their members especially when these communities address work-related issues or are rooted in daily-work practices. Several fields within the tourism sector were detected in which VCoPs could be established to support existing structures of



communication and learning as well as meet learners' needs. One central motivation for the implementation of VCoPs is the fact that there is a need for tools which allow learning during working hours, and thus avoid the attendance of structured training sessions in external training centres. This can be regarded as especially relevant for SMEs operating in rural areas, since it helps them to share and learn from each other without the need to attend structured trainings in training centres, which are mostly located in urban areas.

The project Work & Learn Together (WLT), funded by the LdV programme of the European Union, aims at the establishment and fostering of VCoPs in the tourism sector. Most tourism SMEs involved in the virtual communities established in the framework of the WLT project are located in rural - often quite dispersed - areas and in fact show a general interest in sharing work-related experiences and good practices. One central aim of the project is to facilitate communication and cooperation among the involved SMEs with the help of ICT. For this purpose online platforms were established which offer participants a variety of Social Software tools that are meant to support the establishment of Communities of Practice. Based on the assumption that Social Software tools and models are well suited to support collaboration within virtual networks, this paper aims to present and analyse the experiences made in the process of establishing and fostering VCoPs. Research findings underline the assumption that Social Software can indeed facilitate and support communication processes for CoPs. However, these tools are often rather to be seen as a further channel of communication added to the face to face interaction. The idea of establishing purely VCoP in the tourism sector actually proved to be quite difficult. There is much more to CoPs than sharing experiences online.

2. Characteristics of Online Communities

Before telecommunications technology became accessible to a large number of users the term community referred to a group of close-knit people who mainly lived in the same place. With the emergence of online tools that enable people to exchange ideas in a virtual environment, this concept of face to face community interaction has been further enriched by virtual interaction. These online communities may involve people from the same area who know each other personally, but at the same time interact on an international level with anonymous participants. Whittaker & Issacs & O'Day (1997, p. 137) identified the following core characteristics of online communities, which however can also be considered valid in a face to face (offline) context:

- Members have a shared goal, interest, need, or activity that provides the primary reason for belonging to the community.
- Members engage in repeated, active participation and there are often intense interactions, strong emotional ties and shared activities occurring between participants.
- Members have access to shared resources and there are policies for determining access to those resources.
- Reciprocity of information, support and services between members is important.
- There is a shared context of social conventions, language, and protocols.

Communities in general are seen by their members to serve specific purposes. These purposes may be primarily of private nature, but communities are also a central concept to describe ties between professionals. In order to distinguish communities for professionals and people who share their knowledge and resources from special interest or support commu-



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nities the term Communities of Practice (CoP) was introduced. Wenger & McDermott & Snyder (2002, p. 4) define CoPs as

“groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.”

The most prominent definition of a Community of Practice was originally proposed by Wenger (1998) who defines a CoP according to three core dimensions: Joint Enterprise, Shared Repertoire and Mutual Engagement.

The perspective of Joint Enterprise is concerned with the objectives the community members set for themselves or which emerge in the process of community development. The Shared Repertoire involves the communal resources that have developed over time like routines, vocabulary, styles, etc. Mutual Engagement, finally, focuses on the interrelations of community members and the group identity that may be developed along the way.

The term Online Community of Practice thus involves an online platform where people share their knowledge and interests (primarily) on a virtual basis. Communication and knowledge sharing in this case are meant to be supported by software tools, often referred to by the term “Social Software”. These tools allow cooperation and collaboration without restrictions from time and space. As described above, members of Online Communities of Practice may not even know each other personally but still fit the core dimensions of CoPs proposed by Wenger (1998).

3. Virtual Communities of Practice in the Tourism Sector - the Case of WLT

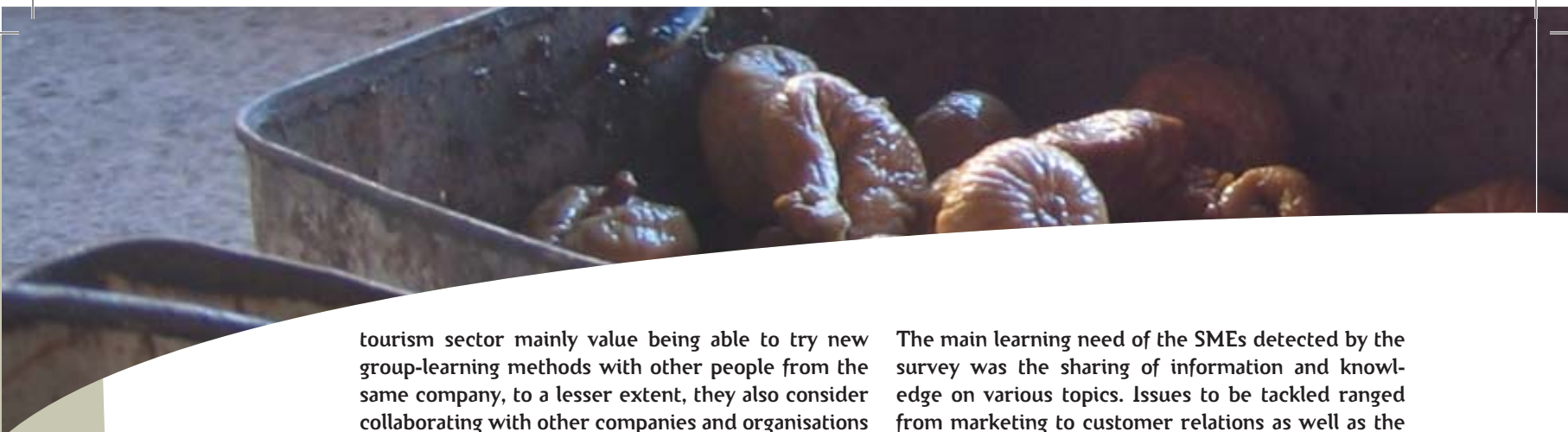
CoPs are not a new concept in the realm of workplace learning. However, only in the last couple of years

did companies realise the importance of informal learning processes. This led to discussions on how knowledge communities could be actively supported in the workplace. In the 1990s CoPs were more and more regarded as the “invisible key to success” in human resources development and gained support in companies such as McDonald’s, Hewlett Packard, Siemens, IBM or Shell (Johanning et al., 2005).

Learning in the workplace is primarily characterised by social interaction and informal ways of learning. This process of learning through interaction can be seen as an integral part of CoPs. Consequently, CoPs may be an effective way of providing information on-demand and support the solution of problems just-in-time. Besides that, ongoing discussions and the exchange of knowledge and resources within the community may also lead to the creation of new knowledge.

Taking into account the aspects mentioned above, the tourism sector provides several fields in which VCoPs could be established to support existing structures of communication and learning as well as meet learners’ needs. Due to an often limited amount of resources available for structured training within SMEs in the tourism sector (both time and money), a more flexible and effective approach towards learning and training is needed. This is especially relevant for SMEs located in often dispersed rural areas. Therefore, CoPs may provide an opportunity to solve problems and support learning processes at the workplace through the exchange of knowledge and experiences.

Data collected in the initial WLT survey on the needs and requirements of tourism companies shows that a culture of learning, sharing, problem solving and one in which informal learning takes place often already exists in the SMEs. This culture can serve as a basis for the implementation of a virtual community in a professional environment. Further results, however, also indicated that although people in the



tourism sector mainly value being able to try new group-learning methods with other people from the same company, to a lesser extent, they also consider collaborating with other companies and organisations in the sector. This may also be due to the fact that they regard their peers as competitors, and often do not consider the advantages of sharing information and experiences with other organisations in the same sector.

3.1 Evaluation Data – Methodology

Initial data collection in the form of questionnaires focused on the learning needs of managers of SMEs operating in the tourism sector as well as their employees. These data then helped to detect the potentials for the establishment and fostering of CoPs within the targeted SMEs.

For the purpose of evaluating the processes involved in the establishment and fostering of the virtual communities mainly qualitative data from the initiators and moderators of the supported CoPs was collected and analysed. These persons were asked to deliver descriptions of the individual processes and factors with regards to the context (regional, social, technological, etc.) and the activities conducted in the course of establishing the CoPs. Additionally, interviews and focus groups helped to identify key issues and problem areas associated to the process.

3.2 Learning Needs of SMEs involved in VCoPs

The SMEs targeted involve B&Bs, restaurants, hotels, spas, tourist farms as well as producers of local specialities. The majority of these enterprises are situated in often quite dispersed rural areas. VCoPs therefore can be seen as a reasonable approach to enable the businesses involved to share their knowledge despite their lack of face to face interaction.

The main learning need of the SMEs detected by the survey was the sharing of information and knowledge on various topics. Issues to be tackled ranged from marketing to customer relations as well as the exchange of current information in a field which is subject to constant changes. Other issues of interest involved health and hygiene standards.

Another part of the SMEs - and probably the ones with the largest potential for a working CoP - saw the main purpose of the virtual community to be established in the possibility of sharing information with potential clients or collaborators, which is meant to strengthen tourism offers in remote areas. A successful example for such a community is the collaboration of rural tourist farms and producers of local specialities. Members of the community use the established (virtual) network to jointly work on the marketing of the whole rural region.

The establishment of a virtual community that enables SMEs to share their knowledge and experiences would thus allow them to improve their businesses and to develop common strategies also for regional development. The issue of marketing regions can be seen as especially important for SMEs in the tourism sector. More and more emphasis is laid on the branding of whole regions rather than individual businesses (cf. e.g. fusions of local tourist associations in the Tyrol region of Austria). In the light of these developments a CoP model to share knowledge among various related SMEs of a region gains even more importance.

3.3 Support of VCoPs through Social Software Tools

In order to fully develop the potential of the concept of CoPs learners need suitable pedagogical models as well as tools that fit the needs of social learning processes. “Learning on demand” and “just in time” need



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sufficient flexible and individualised learning tools and settings. Within the last couple of years “Web 2.0” and “Social Software” have become buzzwords that characterise the transformation of the Internet from a so called “read-web” to a “read-write-web” (O’Reilly, 2005). Social interaction and collaboration can be regarded as the main features that characterise the Web 2.0 concept. Because of their social and collaborative character, applications associated with Web 2.0 are often called Social Software. This collaborative character of Social Software tools makes them especially promising for the establishment and fostering of CoPs.

The targeted SMEs were initially offered a forum and in most cases an additional blog based on the open source CMS Drupal. These platforms were then also adapted to the respective needs and requirements of the tourism companies involved. The online platforms were meant to foster communication among the target groups and serve as a channel to inform each other on new and relevant developments in the respective field. Additionally, people were asked to share and discuss best practices that could be useful to the tourist companies operating in the same region. In some cases Instant Messaging software (e.g. Skype) proved to be quite helpful as an additional medium to share information in a quick and effective manner.


It is quite important to mention, however, that the software tools offered were rather to be seen as an additional channel of communication within the CoPs. In most cases – probably the more successful ones – “conventional” forms of communication were found to be even more fruitful and important in the formation of the community than the online tools provided. Regular face-to-face meetings of the group as well as reminders on the telephone for people to get more involved online proved to be necessary and effective in order to establish and foster a working

online community.

In terms of digital literacy it turned out that although many tourism employees use the Internet or computers for tasks like hotel reservations and travel bookings, they have a lack of knowledge when it comes to online applications apart from that. Generally speaking, thus, the concept of blogs and forums was quite new to them and they had to be taught how to use these tools for the purpose of knowledge sharing. This lack of knowledge obviously resulted in resistance towards the usage of such technology and potential participants were not able to see the actual advantage it could bring them. Besides, the concept of online interaction was perceived as somehow cold and distanced by some and therefore also less suited for knowledge sharing than face to face interaction. Consequently, a great amount of (technical) support had to be given to these people in addition to explanations why the usage of this technology would be particularly helpful to them.

Besides the technical problems encountered by individuals, one should not neglect the restrictions or lack of adequate technical infrastructure especially in rural areas. One major drawback concerning online communication in rural areas can be found in the very limited broadband penetration. This does not necessarily have to be an issue for forums and blogs, but e.g. synchronous communication via VoIP is almost impossible in these areas. The same applies to the sharing of documents with a certain file size.

The process of getting people involved in the online communities to be developed and fostered, generally speaking, proved to be quite difficult apart from the lack of technical knowledge already mentioned above. Although the initial survey conducted among tourism enterprises detected a need for a flexible approach towards learning which incorporates informal learning and problem solving, they did not really see learning as a collaborative process that involves their



peers. Other tourism companies in the same region were rather seen as competitors with whom knowledge sharing was not found to be sensible. Therefore, potential participants often did not see a need for an online CoP. Although informal learning possibilities are generally regarded valuable to learn within the businesses, nevertheless the fear of giving away one's knowledge seems to be stronger than the prospect of gaining additional knowledge through collaboration with businesses in the same field.

4. Conclusions and Implications for the Tourism Sector in Rural Areas

Communities of practice are meant to support the sharing of information and to foster processes of informal learning. Social Software tools on the other hand enable participants of CoPs to expand their communication processes onto a virtual environment. Virtual Communities of Practice therefore seem to provide an effective way of sharing knowledge and experiences among peers especially in rural surroundings, where the attendance of structured trainings in training centres, which are often located in urban areas, is found to be even more time consuming and ineffective.

Research showed that tourism enterprises are in fact in need of effective informal ways of learning and knowledge sharing. However, the quite ambitious aim to "create" a number of VCoPs from scratch turned out to be even harder than envisaged. Generally speaking, the CoP itself can hardly be created; however, community building processes can be fostered and supported also by providing virtual communication and collaboration technologies. Social software, though, should rather be seen as an additional tool to facilitate community building processes besides the

often necessary face to face interaction among community members.

The advantages of sharing knowledge in VCoPs may be quite clear to the researcher, the targeted SMEs in rural areas of the tourism sector, however, were often not able to see an actual advantage in such a community. The feeling of competition in the sector proved to be much stronger than the need to learn collaboratively. Additionally, some people felt quite reluctant to use online tools for sharing and learning, which were unfamiliar to them, and considered online contributions as extra work on top of their daily business.

The most successful communities, on the other hand, were the ones that managed to clearly define the advantages generated by collaboration. They realised that they can learn from each other's experiences and gain from a joint marketing of the whole region and its distinctiveness. The complementary nature of businesses – e.g. a collaboration of accommodation facilities with producers of local specialities – proved to be an important factor of success for the community building process. Therefore, using a CoP model to foster regional development through the collaboration and knowledge-sharing of SMEs in the tourism sector can be regarded as a fruitful path to follow, if one succeeds in engaging individual enterprises in the community.

Building on the experiences made in the process of establishing and fostering regional virtual communities, an attempt to develop VCoPs of tourism enterprises in different regions on a national or even international basis appears to be even more promising. In this case the issue of direct competition between enterprises could be avoided. Furthermore, SMEs of rural areas with similar problems could learn from their (inter)national peers.



Empowering the farmer and the tourism small entrepreneur

5. Acknowledgement

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Lifelong Learning, Empowerment and the Internet

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1. Basic terms

1.1. Lifelong learning

The idea of lifelong learning has been mooted as opposed to the so-called 'front-end' model of education, i.e., that people have to complete a limited process of learning in order to embark on a long period of implementing the knowledge gained. In contrast, lifelong learning generally takes two forms. One is a continuous line of learning from birth to death, without any breaks. The second form is that of learning 'islands', or a fragmented line of learning over the timeline of life. It is usually agreed that the first form - continuous lifelong learning - is not very realistic. It is the second form of 'islands' of learning throughout one's lifetime which is more applicable (Jarvis 2004). Yet,

whether it is the continuous-line model or the islands model, a necessary condition for lifelong learning is the relevance of what has been learned in the past to the present and the future.

1.2. Empowerment

Empowerment is the ultimate goal of the process of lifelong learning. By empowerment, we understand any process through which an individual or group¹ gains higher levels of control over themselves or their reality, thus increasing their prospects for well-being. It should be noted that there are differences between empowerment and force. 'Force' is a neutral resource, i.e. without a predefined end, while 'empowerment' pre-supposes the end of well-being. Not every increase of control is empowerment. One reason is that by increasing our control, we might

¹ The question as to whether the object of empowerment is an individual or a group, can very easily enter the meta-physical realm. Although this is an important discussion, this is not the place to conduct it.



harm our surroundings. Another reason is that increased control could adversely affect one's well-being. For example, increasing a young teen's control over himself by means of a driving license might, in some cases, reduce his level of wellbeing. So not all processes leading to an increase in control are empowering (Berger & Neuhaus, 1996).

Conversely, not every increase in wellbeing derives from increased control. We can think about increasing wellbeing without increased control: consider a family with two children, and a third child has just been born. Many consider that the third child's birth is likely to increase their well-being levels, yet it is highly probable that the level of their control is going to fall.

To sum up the main idea, empowerment consists of two separate elements - control and well-being - and both, independently, are necessary for it.

1.3. Well-being

Well-being is a psychological state characterized by (relatively) high levels of structural, ongoing and deep satisfaction and happiness (The emerging research on happiness; Lane, 2000; Diener et al., 1999; Positive psychology; Seligman and Csikszentmihalyi, 2000). Three main conditions for well-being can be identified. The first is a sense of autonomy, that is, a feeling that, relatively, an individual controls his/her life. A second condition is the sense of acceptance. This means that the individual has confidence in his/her belonging to a group. One manifestation of that is a person acts without fear of isolation or rejection from the group. The third condition is a sense of competence (Self-Determination Theory; Ryan & Deci, 2000.) By that we denote the basic trust people have in their ability to act and play a role in (social/political) life.

2. Enhancing Empowerment

After reading the above, it may appear that the need for well-being is self-evident and does not require justification. Nevertheless, we note here two basic reasons for a policy intended to enhance well-being. First, the well-being of individuals, as well as their whole empowerment, is one of the main origins of democracy and a central obligation of democratic governments. Weak citizens cannot be sovereign nor can they fulfil the democratic creed of pursuing liberty and happiness. Ill-being restricts people's capacity to become involved in the public domain, and thus it undermines the ability to maintain and develop a democratic culture. A second reason for enhancing wellbeing and empowerment is that it increases people's awareness and commitment to the community. In turn, it increases social solidarity and democracy (Zimmerman, 2000; Zimmerman & Rapaport, 1988).

2.1. Conditions for an outside intervention for empowerment

It should be noted, of course, that empowerment is not necessarily the result of an outside intervention. In many cases the empowering process is a spontaneous one, such as increased levels of attachment to friends or neighbours through some 'uniting meaningful experience' that contributes to well-being, to the sense of belonging, to the ability to face life's challenges and hence to the level of control. On occasion, moreover, an outside intervention may disrupt the spontaneous empowerment process for the short- or the long-run, simply because the intervention itself may disrupt the feelings of capacity, autonomy, and acceptance.

There are cases, however, where there is very little chance for a spontaneous process of empowerment.

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They call for an outside planned intervention, directed at enhancing empowerment, for example, in cases where someone is completely unaware that they are capable of overcoming a barrier that causes suffering. We can also allow ourselves to intervene in cases where all or most of the conditions for well-being are at low levels, such as a low sense of capacity, low sense of autonomy and/or low sense of acceptance.

3. Learning levels

Once the decision to educationally intervene in the empowerment process has been taken, we distinguish three main levels of learning process (i.e. a process of intervention) that are aimed at increasing one's control: (A) Learning and training; (B) critical learning; and (C) reflective learning.

3.1. Level A - Training and Learning

The first level is increasing control by learning and training. These two processes are aimed at increasing, so to speak, the amount of knowledge and skills a person has. 'Learning' in this context is aimed at increasing control by cognitive knowledge which, in Ryle's² distinction, means that a person has come to "know that..." which s/he did not know before the process. 'Training' in this context is aimed at increasing control by developing skills; in Ryle's distinction, it means that a person has come to "know how to...." - which s/he had been unable to do before the process.

3.2. Level B Critical learning

The second level of a learning process is that of critical learning as defined and developed by Paulo Freire and followers such as Henry Giroux. This process

increases control at a deeper level than learning and training. It is characterized by the ability to analyze (social) situations and create reasonable assumptions concerning the different forces operating therein. It goes without saying that this kind of learning empowers individuals and helps them gain more control over their lives. While the first level of learning increases control over the surface of reality and the skills that must be activated, the second level - critical learning - increases control by creating a path to processes that govern the surface of reality. For example, at the first level of learning and training, we would teach people to use a web application such as Gmail. We would teach them what an email is, its uses, and how to create an account, as well as training them to do so. At the critical learning level, we would teach them a general theory (critical pedagogy, neomarxism, Freudianism, liberalism, and so on) and then instruct them in analyzing the use of Gmail applications from a critical position, i.e. seeking reasonable assumptions about the forces underlying the phenomenon itself.

3.3. Level C – Reflective learning

The third level of learning is reflective learning. While critical learning targets the external reality, reflective learning is directed towards the internal reality and its relation to the external one. The ability to reflect depends on one's having ideas and concepts that can be used to observe internally - these can include concepts relating to interests, capacities and the learning style. The more familiar people become with their mode of self-conducting, learning style, and patterns of working and understanding, the greater control they achieve over themselves and over reality. To return to our example - at the reflective learning level,

² See: Ryle, Gilbert. (1949) *The Concept of Mind*. London: Hutchinson & Co. pp 25-61.



we would teach people to find the best computer application to use. This could be an e-mail application for users who prefer to classify their mail by folders they created themselves. Other mail applications could be for users who prefer to search mail messages by words. Users who are aware of their learning and working styles become far more focused regarding their needs and options, and hence more effective at self-control.

4. The role of internet in the process of empowerment

Enhancing empowerment through internet is not an automatic process. In itself, using the internet does not guarantee empowerment. The internet and digital reality may also set off alienating and suppressing processes (Gordon & Alexander 2005, Bargh & McKenna 2004, Gergen 2000). However, once we understand the meaning of empowerment and the types of learning needed to achieve it, the internet can be harnessed to exponentially enhance it.

4.1. Two roles of the internet in an empowerment process – plans for Hura

We discern two roles for the internet in an empowering process. The first is learning to use the internet as a learning subject for its own sake. The second role is learning to use the internet as a complementary skill for a different subject. Regarding the first instance, we plan Hura's users to be trained³ in using simple and sophisticated functions of the internet; they would learn the history, sociology and psychology of the internet; they would critically analyze its benefits and dangers from several points of view

(personal, professional, familial, social); they would reflect on their own needs (personal, professional, familial, social, emotional) and how mindful use of the internet can supply them with new means for fulfilment.

Regarding the internet's complementary role in the empowerment process, the starting-point would be opposite to the one noted previously. The users would start with reflection over their own needs or learning goals, and then over *prima facie* ways the internet can help in fulfilling them; users would then learn about the internet, its history and sociology, the various functions it can supply, and understand these ways on a more specific and substantiated level; afterwards the users would be trained to use the internet's relevant functions in the context of their unique needs and interests; in the next phase, users would critically analyze costs and benefits in light of these needs and interests and would try to formulate reasonable assumptions about the forces governing their situation; at the end of the learning circle the users would recheck their conclusions after gaining real experience in using the internet for their needs. This may result in the need for a new training process in using new internet functions.

5. Rural Wings Israel – an educational plan for enhancing lifelong learning and empowerment in the Bedouin town of Hura

The educational process outlined above is planned to be performed with two groups of teachers from two high-schools in Hura – a small Bedouin town in the Negev desert of Southern Israel. The two schools

³ Words in italic refer to the three different levels of learning which are mentioned above.

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were selected by The Center for Futurism in Education in Ben-Gurion University, as part of the project Rural Wings⁴.

5.1 Israel's Bedouin citizens – a short background⁵

The process of selecting the specific Bedouin communities to take part in Rural Wings and then the specific sites within them to be provided with an Internet connection was preceded by the initial decision to choose the Bedouin inhabitants of the Negev desert as the Israeli user-group of the project.

The Bedouin citizens of Israel, a minority among the Arabs and a minority in Israel, are indigenous inhabitants of the Negev and represent today approximately 12% of the Arab minority in Israel. Bedouin have been living in the Negev desert since the fifth century BC. They were traditionally organized into tribes, and earned a living by raising livestock.

The process of integrating the Bedouin into Israeli society takes place on two levels – the formal, i.e., by government policy; and the informal, i.e., by changing relationships towards Israeli society in general and Jewish society in particular. As may be expected, the process is fraught with various difficulties that are attributable to two principal factors:

- the transition from a traditional, conservative society (which was nomadic only a generation ago) entails relinquishing values, customs and a traditional economy;
- the urbanization process, encouraged by the government, poses further challenges to Bedouin society.

5.2. The Bedouin town of Hura

The town of Hura was established in 1990 on the lands of local Bedouin communities, which then belonged to the Pzura – outlying areas of habitation without legal recognition. In 1996, Hura was officially recognized by the State of Israel as a town and entered the 'closed circle' of Bedouin sedentary settlements in the area, joining already existing towns such as Rahat, Laqya and Segev-Shalom.

There are four elementary schools in Hura, including one devoted to specialized education and directed by the present mayor, Dr. Muhammad Alnabari; in addition there are three high-schools and ten facilities devoted to infant-care and kindergartens. Hura's population is currently around 8,000.

5.3. Educational plan

The work in Hura would be conducted in accordance with Roni Aviram's approach to empowerment and learning, which was introduced above, and by implementing the ideas of Barry Zimmerman's theory of Self-Regulated Learning (SRL). A workshop has been planned and, as stated, it will be carried out in the context of the Rural Wings project. The project's primary goals are increasing empowerment in rural places and, through an educational process and technological means, helping local communities to perform the social change they are seeking.

The educational process would be performed at three levels: training, critical learning, and reflective learning. At the training level, we intend to work on strengthening two basic skills: (1) Self-Regulated

⁴ The Integrated Project Rural Wings is funded by the European Commission, Directorate General of Research Aeronautics and Space, 6th Framework Program (2002-2006).

⁵ The background information about the Bedouin and the town of Hura (in the next section) was taken from Nimrod Matan's report that analyzes the needs of participants in the Rural Wings project in Hura.



Learning skills; and (2) ICT literacy. The two other levels of learning (critical and reflective) would be learned and practiced as an aspect of enhancing the level of SRL skills, which includes the levels of critical and reflective learning.

6. A workshop enhancing lifelong⁶ learning and empowerment

6.1 Rationale and main goal of the workshop

The main assumption of the workshop is that the core goal of education is to empower individuals through an educational process. The personal empowerment of individuals heightens their social awareness and involvement, hence it has a direct influence on the power of the community and society. These empowerment processes are strongly linked to motivation, willingness, and individuals' ability to learn and develop by themselves, throughout their lives, using tools such as the internet and SRL skills.

The workshop's goal is to empower participants⁷ by providing them with learning tools and an opportunity to better understand themselves and the reality they live in. In terms of internal factors, the workshop focuses on interests, motivation, goals, fears and other obstacles, while the external factors it focuses on are political and economical forces, cultural interests and other constraints. It is aimed at encouraging participants to pursue their learning goals and helping them to develop SRL skills

6.2. The structure of the workshop and its units' subjects and objectives

The workshop is divided into six units, each one directed to specific goals derived from the educational principles set out above. Although the proposed order of the units has its own logic, it can be changed in accordance with different contexts.

6.2.1 Unit 1 – Introduction to ICT

The subject of the first unit is an introduction to ICT. The decision to start with that subject results from didactic or tactic considerations. Since the beginning of the workshop would follow the installation of new internet infrastructure, starting with an introduction to ICT would be a straightforward and clear need which hopefully would help to motivate participants. On the basis of this starting-point, we intend to broaden and deepen the objectives of the following units.

The objectives of Unit 1 are that the participants should -

1. get to know each other, coordinate expectations, and receive a general introduction to the whole process;
2. obtain an overview of ICT and its uses;
3. see a demonstration showing the simplicity of using the internet; they will come to realize that many of the required skills can be learned by 'playing' with the applications.

6.2.2 Unit 2 – Why learning? Clarifying motivations for learning

The second unit deals with clarifying the motivations

⁶ For a more detailed description of the workshop see: <http://www.bgu.ac.il/futuredu/rural-wings/documents/Rural%20Wings%20Workshop.doc>

⁷ As stated - teachers from two high-schools in Hura.

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for learning. After participants get to know the new technological tool in the first unit, it is time to define the goals for using it.

The objectives of unit 2 are that participants should-

1. acquire an understanding of the relation between installing broadband internet and issues connected to learning and personal / professional development;
2. clarify their motivation regarding learning and empowerment in general;
3. identify past obstacles in achieving learning and developmental goals.

6.2.3 Unit 3 – Introduction to learning approaches and strategies

Learning approaches and strategies are the focus of the third unit. After the participants have articulated their learning interests and clarified their motivation to learn, the third unit is dedicated to the field of learning itself, and the options it offers to those who want to enter it.

The unit's objectives are for participants to -

1. get acquainted with the idea of three learning levels: learning and training, critical learning, and reflective learning;
2. become familiar with different learning strategies;
3. try and apply the new knowledge to better understand their own learning style.

6.2.4 Unit 4 – Introduction to the idea of empowerment and the idea of SRL

The fourth unit highlights the workshop's philosophy. After participants have got acquainted with ICT, the personal motivation to learn, and the field of learning, and before practicing and implementing the knowledge they have acquired, this unit gives them

a wide conceptual tool that can increase their awareness to the learning process and increase their control over it.

The unit's objective is -

To clarify the core concepts of empowerment, well-being, lifelong learning, sense of autonomy, sense of belonging, as well as the basic concepts of Zimmerman's SRL theory and the characteristics of each phase - forethought, performance and reflection.

6.2.5 Unit 5 – Practicing SRL and levels of learning

In the fifth unit - with the coordinator's support and help – participants will apply what they have learned. The purpose of the supervised practice is to construct among the participants a preliminary experience of self-regulated learning. This experience will hopefully assist participants in developing efficient learning habits and independent learning skills.

The object of unit six, the final unit, is to give participants an opportunity to sum up their experience, evaluate the process, suggest conclusions, and adapt their learning goals and process.

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VideoBridge: Learning where we live, learning what we want

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The VideoBridge project is an offspring of the GIVE (= Globally Integrated Village Environment) project. This project was conceptualized more than 20 years ago on the Greek island of Samos, out of the experience of rapid decay of mountain villages and sparsely populated areas. The concept was evolving and confronted with many circumstances, inspired research and conferences. GIVE is about a new synthesis between rural villages and global culture that emerged from cities. The idea is to combine peace and tranquility of rural areas with empowering people to work together in the most rewarding way locally and globally, and transform their rural villages into “Global Villages”.

The GIVE project is a very complex idea, nevertheless one could say there are three main pillars:

- start a transformative process from educational institutions to show people the opportunities of local development - and emphasize on education and global collaboration.
- build on local matter/energy cycles and integrated space use, use environmental technolo-

gies as main source of wealth and integrated resource management. Try to discover deep links with human - supported nature, combine architecture and horticulture, automation and appropriate technologies.

- although the lifestyle of Global Villages is thus totally different from urban lifestyle and they tend towards informal economies, there should be lots of connections with urban centers as the hubs of formal economy. At least some “villagers” should be able to participate in the “knowledge economy” and get the means to acquire necessary tools and technologies.

The idea came to partial realisation 3 years ago in the village of Kirchbach in Styria. It was by chance that a group of five entrepreneurs bought a 150-year-old courthouse building in their home village, and that they adopted the idea of the GIVE project. Not only they would work in their home village, but they would work hard to involve local people and show them the opportunities of revitalizing the village by knowledge exchange and co-operations.



In the course of events, Kirchbach became a satellite site for university programs from Styria's Capital Graz, and the local promoters gathered lots of experiences with new media. Out of this, VideoBridge was born. It started as a public virtual lecture from the University of Graz every two weeks and as a virtual seven days conference with another educational place far in the west of Austria. The discovery was that such "remote events" can be made "local events" with the help of the right screening and setting. From there it was only a small step to think about a "Virtual university of the Villages"!

The VideoBridge project thus aims to realize permanently available affordable group communication possibilities, preferably live and in both directions with high quality video/audiostreams via the Internet.

Wherever broadband connections are available, we want to use these connections to transmit and share interesting events, speeches, conferences and

workshops between "Places of Access and Learning" mainly in the peripheries. It's also essential to turn this content into open learning materials for later use, and try to emphasize free licenses.

The term "videobridge" instead of "videoconferencing" signifies that there is something happening at local scale, which we are simply enhancing (or enabling) by a "bridge" and emphasizing on sustainability of each local learning community.

We want to reach beyond the borders of Austria as soon as possible and win a worldwide community of collaborators. Our topmost principle is: to document everything and to build on or create open standards. This way we want VideoBridge to grow into a network of social tele-cooperation between groups and local centers (Places of Access and Learning, UnityCenters). We want to focus on the "unlimited potential of local resources, when they are in synergy and mutual re-enforcement".

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The Problem Solving Methods To Support Teacher's and Student's Life Long Learning

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1. Introduction

With the land abandonment and the depopulation of some geographically disadvantaged rural areas, the challenges of vocational and general schools are changing :

- in order to survive, they have to attract a new public, creating and suggesting new types of curricula ;
- simultaneously, and paradoxically, they manage more and more students without any professional project, usually drop-outs from the general educational system.

Confronted with these two challenges, the educational staffs have to imagine new types of learning organisation, new styles of pedagogy, to take new types of position, to develop new skills, in order to :

- help students who intend to be project man-

agers, to create sustainable projects in rural areas in an unclear employment market; this means to allow them to learn during all their life so they can adapt themselves to changing contexts.

- to reduce the number of drop-outs, trying to re-motivate students in huge difficulties.

The teachers, who have been considered dealers of knowledge, are becoming tutors, leaders, facilitators, “inspirators”. They have to adapt themselves continuously, constantly resolving new problems and giving students the skills to resolve their problems by themselves.

2. How to support the teacher to manage these new challenges

The support systems and organisations, created by each country to help teachers, are more or less ef-



ficient to answer to concrete and frequently urgent problems submitted by the schools. Within the eight European countries* participating in the Comenius project "Prosolva"², three types of support system profiles are distinguished:

- a system which proposes an offer mostly for in-service trainings ; these offers are determined according to references defined by the supporting institutes, or by the national/regional administrators.
- a system which proposes an offer according to the requests of the teachers and the educational teams ; these requests are synthesised and serve as a guide for the creation of a national frame, within which the support organisations will define an offer.
- a system which will answer directly to the requests of the educational staffs and school teams. Usually the assistance is carried out in situ, with the whole educational team or with a part of it. The objective is to resolve directly the difficulties.

This latter system is beginning to be very usual in some countries, and in emergence in some others. Even if each system is relevant and can be combined with the others, our hypothesis is that, if we want to allow a change in teachers' or students' behaviours or values, the resolution of concrete problems is more efficient than finding answers to needs defined externally, or than suggesting solutions to problems

which have been so conceptualized that they become abstract. Moreover, to resolve concrete problems, it will be more suitable to work with the educational team of a school than with a group of people from different contexts.

This approach to supporting teachers implies that the teacher trainers/the supporters implement specific skills : if it is better for them to be a little expert in some kinds of problems, they also have to be able to animate various problem-solving methods that will make solutions emerge.

3. Various problem-solving methods

A support to these challenges, Comenius 2.1. project « prosolva », which will finish in 2008, aims at giving an overview of problem-solving methods helpful for teachers with difficulties; its aim is also to introduce problem-solving methods in schools, as a main approach to allow teachers and students to develop their personal and professional awareness, autonomy and adaptation ability influencing on their professional practice, and eventually to develop lifelong learning skills.

The participants of the project, that are general and agricultural secondary schools or teacher training centres, have collected an exhaustive list of problem-solving methods which can be used by teachers and teacher trainers; three types of methods can be distinguished:

¹ Bulgaria (Аграрен университет of Plovdiv, Agricultural High school "Tzantza Yoanna" of Pzardjik, High Mechanical school "prof.Cvetan Lazarov" of Plovdiv), France (Metafor enterprise of Avignon, Agricultural school of Saint Gimis Laval, SupAgro Florac), Greece (Panepistimio Paton of Patras, Filekpaideftiki Etaireia Arsakeo Lyceo of Patras), The Netherlands (STOAS of Dronten), Norway (Universitetet for miljø- og biovitenskap of Aas, Valle videregående skole of Lena), Poland (V Liceum Ogólnokształcące imienia Wspólnej Europy of Olzstyn, Zespoll skol ogólnokształcacych of Olzstyn), Spain (IFAPA of Cordoba, CIFA de Malaga, Greguerias secondary school of Cordoba), The Czech Republic (Česká zemědělská univerzita v Praze, Stredni zemedelska škola a Stredni odborna skola)

² European Comenius 2.1. 226675-CP-1-2005-1-FR-COMENIUS-C21 about the problem-solving methods for teachers

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- reflexive methods usable by one person : video-observation, log,
- methods usable by two-person teams or very small peer groups: mutual observation, log, cross-analysis,
- peer groups methods which require at least

seven people: forum theatre, intervision, Bono's six thinking hats,

The objectives of these approaches can be either to analyse the situation, or to suggest new solutions, or to test new solutions or a mix. Table 1 clarifies the specificity of a few of the main problem-solving methods.

name	objective	Main steps	Main interests
log	- to be reflexive about your own professional experiences	<ol style="list-style-type: none"> 1. remember a recent event which posed problems 2. write down the facts, and your feelings 3. exchange your writing with others, who will do a small feedback (optional) <p>(the process has to be realized several times)</p>	<ul style="list-style-type: none"> - to formulate the problem through writing - to observe the kinds of situations which cause you problems.
Video-observation	- to observe and be reflexive about your own experience	<ol style="list-style-type: none"> 1. film your own professional situation 2. observe the recording and analyse your professional behaviours (alone or with peers) - to analyse teacher- learner interaction or students in learning situations 	<ul style="list-style-type: none"> - to analyse teacher- learner interaction or students in learning situations - to have an objective mirror of your own behaviour
name	objective	Main steps	Main interests
Mutual observation	- to develop a mutual observation and feed-back between at least two teachers/students in their respective activities	<ol style="list-style-type: none"> 1. observe respectively the course of a colleague, or a learning situation of a schoolfriend 2. give them a feedback 	<ul style="list-style-type: none"> - the questioning comes from a shared reality

Table 1: description of some problem solving methods



Cross-analysis and inter-vision	to analyse the problem of one person, give a feedback and suggest solutions (cross-analysis per group of 3 peers), intervision (larger group)	<ol style="list-style-type: none"> 1. let someone describe a problem 2. the other participants ask questions about the situation for clarification 3. the other participants make an hypothesis about the problem 4. the other participants suggest new solutions 	<ul style="list-style-type: none"> - to change the point of view of the person about their problem - to enhance creativity
Forum theatre	- to test different solutions / proposals for one problem-situation	<ol style="list-style-type: none"> 1. let someone describe a problem 2. with some of the other participants, script the situation 3. play the scene in front of spectators 4. suggest spectators to test potential solutions, taking a role in the scene 	<ul style="list-style-type: none"> - to test the impact of new potential solutions - to enhance creativity
Bono's six thinking hats	- to allow a group to resolve a common problem	to solve the problem of a group in 6 steps: description of the facts (white hat), proposal of new solutions (green hat), selection of some of them through advantages (yellow hat), disadvantages (black hat), motivation /feelings (red hat), organisation of the process (blue hat)	<ul style="list-style-type: none"> - to share the process of creation in steps, avoiding a confuse discussion - to open creativity

All these methods find their basis in the tradition of humanistic psychology. The characteristics of this tradition have been described in five postulates by James Bugental in 1964 : 1. Human beings cannot be reduced to components, 2. Human beings have in them a uniquely human context, 3. Human consciousness includes an awareness of oneself in the context of other people, 4. Human beings have choices and responsibilities, 5. Human beings are intentional, they seek meaning, value and creativity. Nevertheless, if these methods carry the same values, they don't have the same psychological orienta-

tions : some of them take root in the systemic approach , others are more behaviorist, or more related to a psycho-analitic background.

4. Action research: the introduction of the problem-solving methods in schools

All these methods have been introduced and tested in school problems and challenges. The main aim is to give educators/teachers and students the ability to use them by themselves as important tools of learning, allowing them to adapt their professional

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behaviours in changing contexts. Moreover the aim is to analyse how the problem-solving methods can contribute to make the school a real learning organisation.

To improve the way to resolve a problem, Palo Alto's approach³ has been introduced in the project as a metamodel which can be used with any problem-solving methods ; it helps the questioning of a problem, and is useful to assess the impact of a problem-solving method.

In practical terms, in ten general or agricultural secondary schools, mostly rural, the project has been suggested to the educational team ; voluntary educators (usually teachers) have tested from one to three methods, during one year, with the purpose to introduce them in the school organisation.

The research teams (teacher trainers/researchers/teachers) from each country with the participants had to :

1. find way to attract the teams
2. analyse the situation according to the autonomy of the teachers with their problems/challenges: knowledge about their problems, methods already developed to resolve them,(a tool to describe the initial situation)
3. find a way to make the challenges or problems emerge, favour their expression
4. find a way to choose the strategy of solving

problems, the process of answer

5. adapt the methods
6. analyse the efficiency of the solution proposed; or the interest for the solution proposed (to fight against the resistance to change)
7. analyse the autonomy of the teachers ; their awareness about problems, ...
8. analyse impact of the introduction of the methods at school

5. Introduction of problem-solving methods: first results

We can only propose the first results of the action research, which is still running. Anyway we can already give a first analysis about the strategies that are used to introduce the problem-solving methods in schools, the first impacts and the main problems expressed by the teams.

5.1. About the strategies to introduce the problem solving methods at school

According to the situation, the type of support system existing in each country, or the origin of the request (the school or the research institute), the approach to motivate educational teams and to allow

³ Created by a team of researchers from Palo Alto (whose originally Gregory Bateson, Milton Erickson), the Palo Alto approach was developed at first to manage different types of persons' problems through systemic therapy (better known as brief therapy). Palo Alto metamodel gives a clear frame to analyse a problem and imagine new solutions to resolve it. Totally different from the other schools of thinking, this approach does no pathologization and doesn't tag the persons in difficulty; during the problem-analysis process, the analyser doesn't try to understand the causes of the problem, but the dynamic of the problem in the context, the relations in a systemic way. Last specific point about the metamodel : the solutions 'attempts' : the analyser will look for the attempts that the problems' owner tries to develop to resolve his problem without success. According to them, he will propose a new attempt in the opposite way, usually out of the logical mind. Used in different problem solving methods, it is finally an excellent approach to analyse and understand a problem, in any psychological or sociological situations and to change deeply the attitude of the person



them to appropriate problems solving methods is not the same; it seems useful to explain our own experience to the schools support institutes which would like to implement it. Table 2 shows the strategies developed by the support institutes participating to the action research :

The need for help and the requests come from the school	The request comes from the headmaster	It is compulsory for the staff to participate in the activity	The teacher trainers have to analyse the headmaster's request, confirm the motivation of the participants, analyse their motivation and demands, negotiate between the demands of the teachers and the headmaster ; they will start to solve directly some problems to show the interest of the PSM*
		The participants are volunteer	The teacher trainers have to analyse the request, collect the different points of view, make sure that the participants are free to speak about their problems, promote the project to all the educational staff, analyse the motivation of the participants, negotiate with them the objective to resolve problems and learn PSM to make them autonomous ; then, they will communicate constantly about the evolution of the process and allow everybody to integrate the activities during the process.
	The request comes from a part of the educational staff	The participants are volunteers	The teacher trainers have to analyse the request, then present the project to the headmaster and be sure to be understood and accepted, collect the different points of view, make sure that the participants are free to speak about their problems; they promote the project to all the educational staff, and then communicate constantly about the evolution of the process and allow everybody to integrate the activities
The proposal to discover PSM comes from the support institute	The proposal is done at first to the headmaster	The proposal is done to all the educational team based on voluntary participation	The teacher trainers explain to the headmaster the interest for a team to be taught about PSM, ask for the interests that the headmaster could imagine, make sure that the participants are free to speak about their problems; next step will be to present the interest of PSM to all the educational team (to solve problems, to be autonomous about PSM), analyse the fears, interests, suggestions and negotiate a process. The process will focus at first on the problems, on the challenges or on the PSM. They will communicate constantly about the evolution of the process and allow everybody to integrate the activities.

Table 2: strategies developed to motivate educational teams to appropriate problem-solving methods

**PSM : problem solving methods*

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5.2. About the main problems at school

During the action research, different problems have been presented. To have an overview of the problems existing in rural schools, a survey was proposed to educational teams and students, and gave the following results :

5.3. About the problem solving methods tested by the educational teams

During the action research, the participating educational teams had to test some problem solving methods and give their preferences. The criteria which

Problems analysed by the educational team	Problems analysed by students
<i>in the teacher-student relationship</i> <ul style="list-style-type: none"> - Lack of motivation, of interest; lack of will to make efforts, reject of the school system, absenteeism - conflict in intercultural relation - management of a big number of student, of group (development of differentiated pedagogy), - management of dyslexia 	<i>in the student – teacher relationship</i> <ul style="list-style-type: none"> - teachers' treating subjects with too much importance - subjective way of treating students, unfair assessment and marks - too many requirements and too much homework - lack of cooperation, tolerance and proper contact
<i>in the student – teacher relationship</i> management of intercultural diversities, racist and sexist behaviour	<i>in the student-student relationship</i> <ul style="list-style-type: none"> - lack of tolerance - negative competitiveness - inability to cooperate - bullying
<i>in the relationship between students with their own self</i> Prevention of specific risk (alcoholism, drug consumption, sexuality,)	<i>in the relationship between students with their own self</i> <ul style="list-style-type: none"> - student's personality, private problems - stress - problems at home - laziness - inability to organize the process of learning - addictions - deteriorating manners
<i>in the teacher-teacher relationship</i> difficulty to create a team	
<i>in the teacher - headmaster relationship</i> Refusal to permit new pedagogy (risky, financially expensive)	
<i>in the teacher-educational system relationship</i> <ul style="list-style-type: none"> - Inability to develop active pedagogies because of a heavy curriculum - Divergence of ethic between the teacher and the program, the school, inspector values - Lack of hierarchic support - Constraint of result - difficulties to answer to the demand of the government changing from a teacher centred approach to a student ones. - Awful learning context (buildings) 	<i>in the teacher-educational system relationship</i> <ul style="list-style-type: none"> - wrong timetable - too much theory, little practice - constant changing of the curriculum

Table 3: main problems analysed in secondary schools



justify their choices are :

- To exchange with others or to develop a self-reflexivity : the problem solving methods which allow self-reflexivity and self-assessment are less appreciated ; the feedback of the others, the possibility to speak about a problem are more efficient (cathartic effect), allowing the persons to express their emotions, and to clarify the problem.
- To play or to speak about the problem : the problem solving methods which allow to speak are usually better considered by the adults (certainly less involving), instead of the methods which necessitate to act and play (forum theater) considered more interesting to implement with students.
- The approach of the problem-solving methods : the problem-solving methods whose the approach is fixed (interview for instance) in comparison with others which require adaptability and flexibility (as Bono's six thinking hats) are better considered
- The number of participants : usually the problem-solving methods which require few people are more suitable ; they can be developed more easily without heavy organisation.

method	interests	limits
log	It's an easy and quick approach	The impact will appear after a long maturation
interview	The approach is appreciated as a simple one; gives an interesting overview about new solutions	Supposes a important number of participants
Mutual observation	The approach allows to mix different subjects	The presence in a class of another colleague/ observer changes the context and specifically the students behaviours
video-observation	The observation of a recording is objective	It requires some technical skills to film the professional activity
Forum theatre	It allows to test the impact of a new proposal	The fictional context created by the scenario can be different from the reality
Bono's six thinking hats	It allows to analyse a problem group; it shares the process of creation to avoid confusion.	It needs flexibility and adaptability ; difficult to be used by neophytes

Table 4: interests and limits of problem-solving methods according to teachers

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5.4. Main impacts of the introduction of problem solving methods at school

We can distinguish different impacts which have been observed by all the participants of the action research.

- Introduction of the problem-solving methods at different levels

The wish of the project Prosolva was to create, in the schools, a coherent educational team who could autonomously use problem-solving methods to overcome challenges and difficulties. It was definitely too ambitious. In one situation, the team decided to create a specific space where to meet each other periodically and try to resolve specific problems on their own. In the other cases, the participants in the action research created strong relations between them, without considering it suitable to maintain the group's dynamic without external leader.

Nevertheless, the problem-solving methods have started to spread in all the school activities : some teachers use them with their students to teach them respect, empathy, to help them to resolve problems (including some problems which arose during professional trainings). They have been introduced to lead usual school's meetings.

- (Re)-Creation of motivation

During the action research, most of the teachers felt more powerful than they had supposed to be and found a new booster in their professional activities. They expressed the feeling of being freer to test new teaching ways, to have

a more opened mind, to feel more creative, to find new players in themselves. Some students themselves observed a positive change in the teachers' behaviour, which helped their own motivation.

- Redistribution of responsibilities

Often, teachers felt less stressed, ready to accept some realities and less under the pressure of their own utopia. They became aware of the real responsibilities they have in their activities, (avoiding to take responsibilities which don't necessarily fall to them, participating more in the school's life) and felt less guilty.

- Creation of an educational team

The discussion between teachers from different subjects during the implementation of problem solving methods, the atmosphere of respect allowed the development of interdisciplinary projects and new types of cooperation.

In some cases, administrators and/or non-teachers participated to the action research. When integrated to the teachers team, they became aware of their own role in the education of the pupils and finally a real educational team was created. It allowed the implementation of an global and coherent educational school project.

- The learning of new skills

Globally all the participants gained new skills during the action research : active listening, empathy, respect, cooperation. Such transversal skills are absolutely necessary for a social and professional citizenship, and useful to im-



prove the adaptability.

Although our action research is still running, it is already possible to conclude about the integration of problem-solving methods at school. They are certainly not the only approaches which allow lifelong learning, but their contribution is effective. If they are a little worrying (a small part of the educational team in each school accepted to discover them) it's certainly because they are very implicating ; if they allow a big change for the user, they create a big resistance to change too.

It would be utopian and wrong to try to make teachers and students totally autonomous with the problem solving methods use. If such methods participate to create a learning school, they usually require to be implemented by a neutral leader. They should allow to create a new type of relation between educational teams and teacher trainers, new types of support and help.

During the action research, a lot of problems that were dealt with concerned the students in difficulties (with a lack of motivation, a lack of professional project). The problem-solving methods gave a new booster to enhance solidarity, autonomy, and « responsabilisation » between teachers and students,

abilities that are essential to develop a project in disadvantaged rural areas.

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Robotics-Enhanced Constructivist Learning: The TERECOP Project

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1. Introduction

During the last few years popular interest in educational exploitation of robotics has increased (Johnson 2003). Robotics in education is seen as a transdisciplinary, project-based learning activity drawing mostly on Maths, Science and Technology and offering major new benefits in education at all levels (Alimisis et al 2005). Robotics uses 21st century technologies and can foster problem solving skills, communication skills, teamwork skills, independence, imagination and creativity (Karatrantou et al 2005). Taking into consideration that students have a better understanding when they express themselves through invention and creation (Piaget 1974), robotic activities are considered to be a valuable learning tool that can contribute to the enhancement of learning and to the development of student thinking.

The LEGO robot, an outgrowth of Papert's LOGO programming language created in the 1960's, partners technology with the ideas of construction-

ism (Papert 1980). The LEGO Mindstorms system (<http://www.legomindstorms.com>) is comprised of building materials (regular blocks, gears, pulleys and axels), sensors (light, touch, sound etc sensors) connecting the robot with the external environment and programming software with an effective graphical interface for writing instructions to the robot. The LEGO Mindstorms system provides a flexible medium for constructionist learning, offering opportunities for design and construction with limited time and small funds (Resnick et al 1996).

Before teachers and educators at all levels hurry up to exploit robotics in education, it seems inevitable that new ways need to be found to integrate it into the school curriculum, given that most schools lack both the resources and the freedom to do this and must work with a national curriculum (Johnson 2003).

The educational meaning of Robotics in school education, the methodology that should be used to introduce Robotics in school and teacher education and



the design of robotics-based educational activities within a teacher training curriculum are among the main problems that the TERECoP project ("Teacher Education on Robotics-Enhanced Constructivist Pedagogical Methods") intends to copy with. This paper describes the theoretical context, the aims of the project and the different stages of the TERECoP project. Finally some aspects of the project that could be of interest to the education of rural and remote communities are discussed.

2. Theoretical context

The TERECoP project is inspired from the constructivist theories of Jean Piaget arguing that human learning is not the result of a transmission of knowledge, but an active process of knowledge construction based on experiences gained from the real world and linked to personal, unique pre-knowledge (Piaget 1972). The constructionist educational philosophy of S. Papert (1980) is a natural extension of constructivism and emphasizes the hands-on aspect considering that the construction of new knowledge is more effective when the learners are engaged in constructing products that are personally meaningful to them (Papert 1992). The learners in a constructionist learning environment build something on their own, preferably a tangible object that they can both touch and find meaningful. Students are invited to work on experiments or problem-solving using available resources selectively according to their own interests, search and learning strategies. They are seeking solutions to real world problems, which are based on a technological framework used to engage students' curiosity and initiate motivation.

In this theoretical frame a socio-constructivist view is adopted, where learning is not an individual, but a particularly social and societal activity that means

that learning always takes place in a social context (Vygotsky1978). Under such a framework the use of educational technology can contribute to the realisation of meaningful learning based on students' team work with teaching materials. The available e-learning environments can support collaboration between fellow students and educators, who can be at different schools, at home or abroad.

3. Aim and objectives

To engineer a desirable learning effect with or of a technology requires more than just introducing the technology. A crucial factor for the successful introduction of robotics-enhanced constructivist teaching and learning in school education is teacher who is required to play a new role different from that of a traditional transmitter of knowledge to a passive audience. Teachers need to be provided with opportunities, like exposure to a number of critical examples and experience in designing robotic activities and integrating them in their classroom practice in constructivist ways. They need to be convinced by their own personal experience for the potentiality of robotic technology as a learning tool.

Based on this principle, the overall aim of our project is to support teachers' professional development in this field developing a framework for teacher education courses in order to enable teachers to implement the robotics-enhanced constructivist learning in school. Course participants, who will be practicing or in-service teachers, will be provided with opportunities to examine how robotic technologies can be used to promote a constructivist approach to learning under a co-operative and collaborative frame of work and to reflect on their experiences from the implementation of this framework. Striving for a collaborative learning environment is based on the belief that

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the inherent dynamics of a necessary mutual process are likely to be more conducive to meaningful transformation, carrying so a sense of greater potential for development. This is highly supported by the development of e-learning communities.

More specifically our objectives are:

- To select and organize a repertoire of appropriate robotics-based learning environments that can support robotic activities and produce a set of critical examples for using in a constructivist way with teachers of secondary level in science and technology subjects.
- To test and evaluate the practical implementation of the selected tools both in training courses and in real classrooms situation (by the trainees).
- To develop a methodology of innovative collaborative strategies supporting social constructivist teaching and learning, applied both in the teacher courses and in students' teaching and learning.
- To create a community of practice between educators and teachers for facilitating and sustaining teachers' professional development in using robotic tools to support their students' learning by active exploration and social construction of new knowledge.

The training curriculum design will follow an innovative constructivist perspective with an emphasis on aligning computer and robotic technology with learning objectives and learners' needs for the purpose of constructing meaning in social learning environments. Key issues to be addressed during the project in order to accomplish the pre-mentioned objectives are:

- The integration of technological, cognitive, pedagogical, and social aspects to design and develop learner-centred technology-enhanced learning environments regarding that technology alone cannot affect minds.
- The design of a rich interactive learning environ-

ment encouraging constructivist learning where the focus is not on the individual but on the mindful engagement of learners interacting with each other, instructional materials, subject matter, and tools. The implementation of the project

4. The project in action

The project TERECoP started in October 2006 in the frame of the European Programme Socrates/Comenius/Action 2.1 (Training of School Education Staff) and its total duration will be 3 years. 8 institutions from 6 different European countries participate in the project: School of Pedagogical and Technological Education (GR, coordinator), Institut Universitaire de Formation des Maîtres d'Aix-Marseille (FR), Department of Information Engineering – University of Padova (IT), University of Pitesti (RO), IT+Robotics srl (IT), Museo Civico di Rovereto (IT), Charles University Prague, Faculty of Education (CZ), Public University of Navarre (ES).

During the 1st year a methodology for designing robotic technology-enhanced constructivist learning will be developed and teacher education courses will be designed. During the 2nd year a pilot and a final teacher education course will be implemented including testing of trainees' teaching activities in school classes. Finally during the 3rd year the evaluation of the courses and the development of dissemination activities will take place.

The target groups of the project include:

- student-teachers expected to be educated in a way that robotic technology-based learning will play an important aspect of their future work as teachers or professional educators
- in-service teachers expected to become aware of the robotic technology-based learning and of different classroom uses and activities for improving



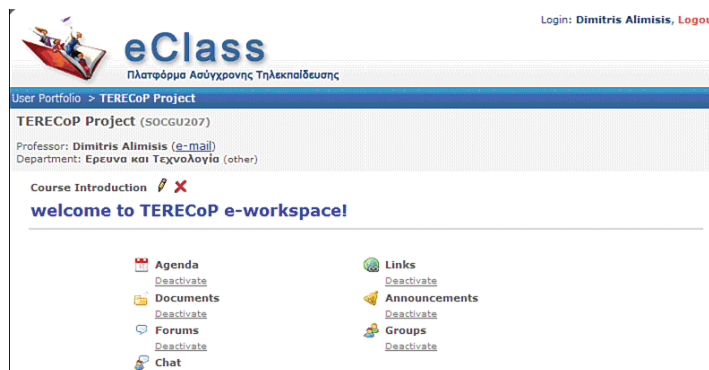
- their students' learning in science and technology
- teacher educators expected to be informed for providing similar courses in local level and
 - educational authorities expected to undertake future action on teacher technology-based education and further training

An e-community (<http://eclass.gunet.gr/>) has already been created to offer for the partners (from the beginning of the project,) and for teacher-students (during the 2nd and 3rd year) a communication platform including:

- a public space available for all the members of the community (educators and student-teachers) to post their messages and to upload their files;
- forum to facilitate the dialogue on selected topics related to the project subject;
- synchronous and asynchronous communication services (announcements, chat and e-mail).

The main function of the e-community is to support (during the 2nd and 3rd year) the development of a learning community engaging the teacher-learners in social learning, supporting meaningful conversations among learners and between educators and learners, promoting new perspectives and helping them to construct knowledge in a collaborative way.

Figure 1: the main page of the TERECOP e-workspace



A project web site (<http://www.terecop.eu>) presents the whole work done in the frame of the project and connects the project with the broad educational community.



Figure 2: the homepage of the TERECOP website

The partners are currently working to develop a methodology for designing robotics-enhanced constructivist learning that could be applied both in teacher training courses and in students' teaching and learning. Our methodology, incorporating results from relevant research literature (<http://www.terecop.eu/downloads/synthesis0107.zip>) including books on subject, educational journals, proceedings of educational conferences, web resources and educational software tools), outlines basic principles, learning objectives and strategies and appropriate technology-based environments. Our methodology describes in details learning activities and some critical examples of robotics-enhanced constructivist learning. The whole design of the teacher education courses, includ-

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ing learning materials and evaluation tools, will be based on this methodology.

At a first experimental stage the pre-mentioned course design will be implemented and evaluated with student-teachers in three different countries by the corresponding partners. From the beginning of the face to face course student-teachers will be invited to participate in an e-community and will have access to e-learning materials. They will elaborate on the development of robotics-based constructivist teaching activities and materials for their students and will be encouraged to create and present joint projects on constructivist teaching activities planned to be implemented with school students, and to argue for their choices. The student-teachers will also be encouraged to implement their projects in real school classes, where it is possible, and to evaluate them in cooperation with their tutors. The projects and the evaluation results will be published and discussed in the e-community where educators and teachers will have the opportunity to share and reflect on their experiences.

collected from the implementation of students' projects in a real school class will be presented to all the partners and will offer feedback for designing a revised curriculum and new learning materials. After that, 3 new teacher training courses will be organized in the other three of the participating countries using the revised curriculum and learning materials. The results and findings obtained from a new evaluation process will allow the project consortium to produce a final curriculum and improved materials.

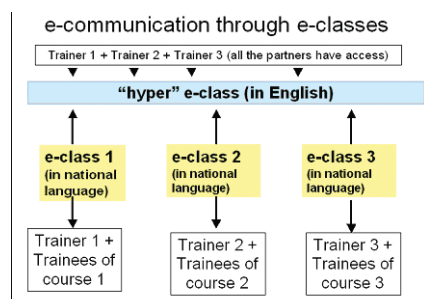
After the end of the project (September 2009) the final course, as it will have been refined then, will be available through the Comenius Catalogue for in-service training of secondary science and technology teachers from the whole European educational community.

5. Aspects of the project that might be of interest to rural and developing communities

The growing demand for technological innovation to enable empowerment of rural and developing communities requires new and creative educational initiatives. Thus, well designed educational initiatives geared towards appropriate technology for rural and developing communities can have a significant impact on their education and development (Dias et al 2005).

A few robotics projects and workshops have been developed with a key focus to enable children in rural communities to participate in robotics education (for instance "Robotics for Technology Education" <http://www.ittee.uq.edu.au/'peta/-RoboticsForChildren.htm>) or to build capacity and expertise in robotics (benefiting mostly subjects like Maths, Science and Technology) and online learning in teachers in rural schools even when the local teachers have little

Figure 3: the structure of e-classes running during the training courses



An evaluation report on each of the pilot courses based on data collected in the courses and on data



knowledge in this cognitive area ("Robotics Online", <http://www.simerr.educ.utas.edu.au/>).

Educational change is not simply a matter of access to new technologies. Technology cannot act directly on learning. Other important elements to the educational success for rural communities include an appropriate education philosophy, new curriculum and learning environment, and appropriate teacher education and training programs.

Although the target group of the TERECoP project includes secondary school teachers at European level in general and doesn't focus on rural communities, the proposed robotics-enhanced learning methodology and technology is important for rural communities since it offers some critical advantages or possibilities to teachers and students in rural settings.

In our project's constructionist view, robotic technologies are not seen just as tools, but rather as potential carriers of new ways of thinking about teaching, learning and education. Projects inspired from constructionist spirit take into account the importance of local knowledge and culture, as well as people's interests and different learning styles. They therefore have the potential to lead to appropriate actions in rural communities relevant to their needs, problems and interests (for example: better transportation, water sanitation, preservation of scarce resources, etc.) and to their community assets (agriculture, livestock, recreation, etc) (Urrea 2007).

Our project's constructionist approach encourages learners to participate in decision making, implementation, and evaluation of the project. Our constructionist philosophy tries to empower the learners with active involvement, designing, and making decisions about their own learning. So, students and teachers are expected to become responsible for their own learning, to work at their own pace and to be provided the tools to reflect upon their communities. They therefore are invited to see themselves as ac-

tive participants and creators of their own educational and learning realities. This is in turn expected to give them a sense of ownership and responsibility not only for their learning but also for their lives and communities. In addition, it is expected to give them skills that they can use well beyond the timetable of the educational projects. For example, the collaboration between members of the school and the community can make a big impact on the ways in which people in the community see themselves and are seen by the developing world (Urrea 2007).

6. Acknowledgements

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E-Government and Simulating Rural Regions: Towards Microsimulation-Based Socio-Economic Spatial Decision Support Systems

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1. Introduction

Simulation-based spatial modelling is an expanding area of research, which has a lot of potential for the evaluation of the socio-economic and spatial effects of major developments in the regional or local economy. Geographers and regional scientists have traditionally been involved in building models that investigate and analyse the role that these entities play in urban and regional systems. Recently, these modelling efforts have been aided by an accelerating growth in the volume, variety, power and sophistication of the computer-based tools and methods available to support urban and rural analysis and policy-making. New developments in hardware and software systems have enabled significant advances to be made in the storage, retrieval, processing and presentation of spatially referenced data. There has

also been significant progress in the development of Geographical Information Systems (GIS) for socio-economic applications (Scholten and Stillwell, 1990; Longley et al., 1999; Martin, 1996). Further, there has been an increasing availability of a wide range of new data sources in both the public and private sectors and an increased power and portability of personal computers bringing high quality computer graphics and presentation facilities (Bertuglia et al., 1994; Birkin et al., 1996).

In this new environment there have been many spatial models that have shed new light on patterns and flows within cities and regions. These models, when combined with relevant performance indicators have been very useful in measuring the quality of life for residents in different localities. However, relatively little is known about the interdependencies between household structure or type and their lifestyles, in-



cluding the events they routinely participate in and hence their ability to raise and spend various types of income and wealth. The modelling of interdependencies requires a different level of urban and rural system representation. In this context, spatial microsimulation offers a potentially powerful framework for the representation of the urban and rural systems and entities outlined above. The remainder of this paper introduces spatial microsimulation modelling methodologies and discusses their potential to be combined with GIS frameworks to aid local decision-making in an e-government context. In particular, section 2 briefly introduces the microsimulation method; section 3 presents efforts to develop a system that incorporates a spatial microsimulation model with a planning support system (PSS) to assist decision making at a range of spatial scales for a large metropolitan area of the UK; sections 3 and 4 discuss the possibility of linking these models to e-government frameworks which could potentially involve all citizens through public participation/local democracy schemes. In addition, they discuss the possibility of building spatial-microsimulation e-government software tools that can be used to analyse local and national policy scenarios and how these tools can also be linked to Virtual Decision-Making Environments (VDMEs). Section 5 outlines how these technologies and ideas can be relevant in a rural development and rural learning context. Section 6 offers some concluding comments.

2. Spatial microsimulation

There is a long history of modelling work in geography and regional science that focuses on the assessment of the various short-term and long-term effects of major socio-economic regional or local developments. Amongst the most common meth-

odological approaches has been the use of economic base models and input-output models. Further, there has been a long history of modelling work aimed at evaluating the effects of social and regional policies upon the quality of life of the population. There are several methodological tools that have traditionally been used for the assessment of the effects of social and other government policies. Nevertheless, it has been argued (see for instance Ballas and Clarke, 2000) that there is a lack of work on the estimation of these effects at the individual, household and small area levels. More recently, it has been argued that spatial microsimulation has a great potential for socio-economic impact assessment (Ballas and Clarke, 2001) and for the geographical analysis of the impacts of social policies (Ballas, 2004; Ballas et al., 2005) and rural policies (Ballas et al., 2006). Traditionally, confidentiality concerns have been the main reason why demographic and socio-economic data on individuals, despite being collected from censuses and surveys, have not been available to researchers and policy makers. Spatial microsimulation is a methodology that attempts to estimate the demographic and socio-economic characteristics of human behaviour of individual people or households (Ballas et al., 2005; Clarke, 1996). Spatial microsimulation builds on a long successful history of traditional microsimulation models, which have been used widely to analyse re-distributive effects under different policy scenarios. In particular, microsimulation has been broadly developed and used by economists over the last 40 years. Microsimulation methods aim to examine changes in the lives of individuals within households and to analyse the impact of government policy changes for each individual and each household (Milton et al., 2000). In an economic and social science context, microsimulation can be defined as a type of computer program that simulates how a social policy would operate under proposed changes and how

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particular types of individuals would be affected or react. Static microsimulation involves the analysis of a population microdata set at one point in time for policy analysis. For instance, economists have been involved in the development of static microsimulation models that are capable of answering questions like:

- What would be the impact of a particular social policy scheme upon different types of households and individuals in its initial year of application?
- What would be the redistributive impacts of the government budget changes at one point in time?
- What would be the impacts of alternative policies upon child poverty?
- How could new Social Policy schemes (e.g. tax credits) be funded through taxation?

The results of microsimulation models are widely quoted in the media when covering the possible impact of government budget changes upon different types of households. However, traditional economic microsimulation models do not take geography into account. Adding spatial detail to traditional microsimulation involves creating a microdata set, as well as using it. Such a microdata set refers to a particular locality, to a geographically well-defined and restricted area. There are very few sources of geographically detailed microdata sets, so there is a need to create these datasets using static geographical microsimulation techniques. The latter involve the merging of census and survey data to simulate a population of individuals within households (for different geographical units), whose characteristics are as close to the real population as it is possible to estimate. They can then be used to answer questions pertaining to the geographical, as well as the socio-economic impacts of government policies. Although

spatial microsimulation models have a relatively successful history so far, it can be argued that they are relatively inaccessible to policy makers and the general public.

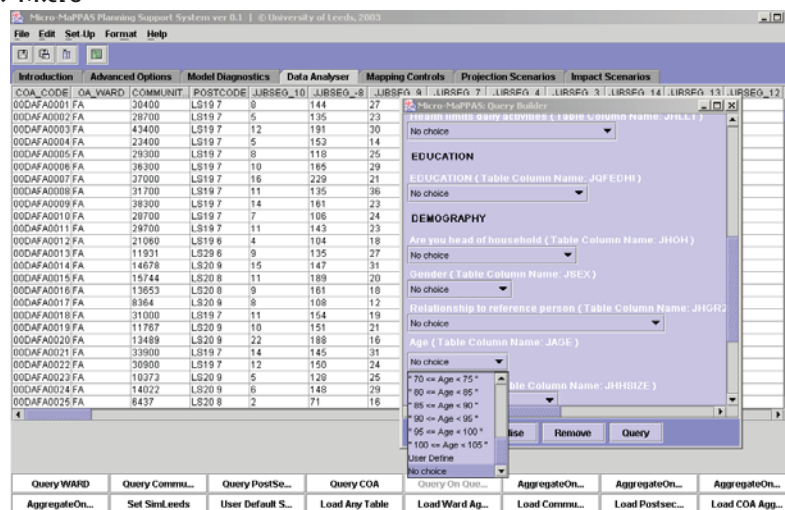
"It is not enough for a handful of experts to attempt the solution of a problem, solve it, and then apply it. The restriction of knowledge to an elite group destroys the spirit of society and leads to its intellectual impoverishment."

(Einstein, 1931).

The following section describes one of the first attempts worldwide to make GIS-based spatial microsimulation more accessible to policy makers and the general public.

3. A spatial microsimulation-based Local Government Planning Support System

This section briefly presents one of the few attempts worldwide to build spatial microsimulation Based



Planning support System (PSS). In particular, it presents a spatial PSS which was built for Leeds City council, by researchers at the Universities of Sheffield, Leeds and Manchester (Ballas et al., 2004; Ballas et al., 2007; Stillwell et al., 2004). In particular, this PSS was based on a geographical microsimulation model, which is capable of constructing a list of 715,000 individuals living within households along with their associated attributes for any point in time, past or future. Previously the software has been run from a Command prompt and required the 'hard coding' of parameters and data tables together with some knowledge of Java programming – not a desirable task for the average policy or decision maker. With the development of Micro-MaPPAS (Microsimulation Modelling and Predictive Policy Analysis System) we now have an interface which is much more user-friendly and suitable for decision makers who can utilise the power of the spatial microsimulation methodology.

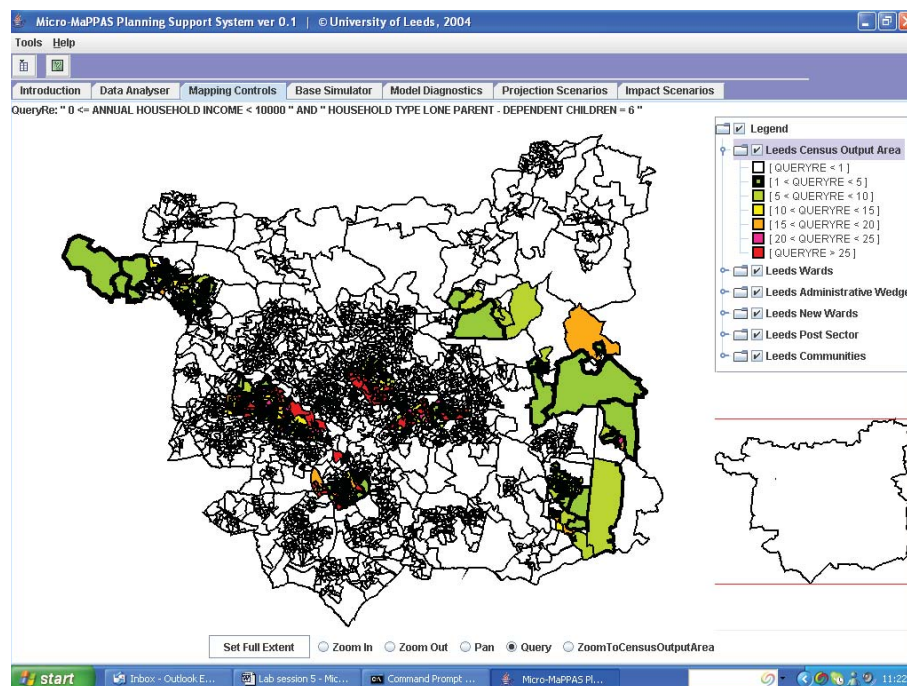
The MicroMaPPAS PSS utilises a spatial microsimulation model which links a wide range of data sets, including 2001 Census data for UK output areas (OAs) and sample data from the BHPS. The Micro-MaPPAS software is written in the Java programming language version 1.4, which means that it can be installed and operated on any computer system and platform. A default set of simulations generated for OAs is load-

ed when the system is booted up. The architecture of the Micro-MaPPAS system is illustrated in Figure 1. Through a GUI, the user has access to various modules: the base simulator, the model diagnostics, the data analyser, the mapping controls, the projection scenarios and the impact scenarios.

For instance, the data analyser module (see figure 1) provides a table view of the data that the software produces. The microsimulation model generates a simulated set of data of individuals but these are never visible through the interface. The simulated data are aggregated to OAs and the data analyser module provides a table view of this information.

Figure 1 Data analyser and query interface with age drop down menu in use.

Below the table are a number of buttons that enable the user to run queries on the data to select the information required but also to aggregate the



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data to another spatial scale if required. The query builder interface is shown in the figure above and, once a query has been constructed, the results are returned to a table in the bottom half of the data analyser window.

The MicroMaPPAS software also provides some basic mapping functions include panning and zooming and symbology editing. The mapping capability in the software is provided by the GeoTools (www.geotools.org) open source Java mapping library, which has been written by a group of researchers independent of the MicroMaPPAS project. GeoTools is a versatile Java library, which conforms to the Open GIS Consortium standard specifications in relation to GIS open operability. The library can be adapted to work in any Java based GUI or web-based Applet.

The mapping controls module allows the user to select a variable from a query and map the results at any of the geographical scales of OA, community area, ward or postal sector. The figure below illustrates the mapping of the query relating to simulated lone-parent households with an annual income of less than 10,000 Great Britain Pounds. Mapping functions include panning and zooming and symbology editing.

Figure 2 Mapping query results using Micro-MaPPAS.

4. Planning Support Systems, e-government, Public Participation GIS and microsimulation for policy analysis

As seen in the previous section, it is possible to develop spatial decision support system, underpinned by microsimulation, which can be used as a Planning Support System. The Micro-MaPPAS GUI was built in Java as a standalone application. While at the moment the software is linked to internal datasets future development will enable the software to be linked to central Leeds City Council databases across an Intranet. This will provide a data integration framework that will enable individual policy makers and services to use a common database structure thus reducing data replication. The advantage of building the application in Java is that it will operate on any computer system and is easily adaptable to end-users' needs.

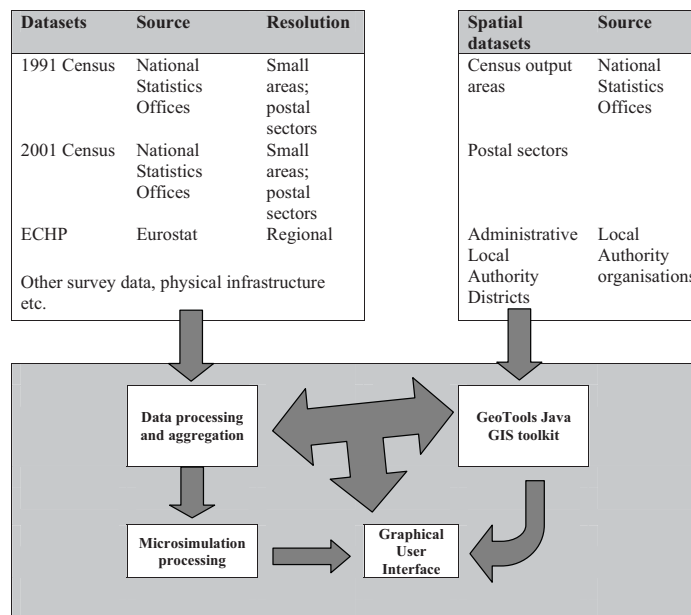



Figure 3: Data sets and system architecture of a generic spatial microsimulation-based PSS.



In addition, it can be argued that systems such as MicroMaPPAS can have an “e-government” dimension by using networking technologies including the Internet to be used by policy makers as well as the general public. In particular, these systems can be converted into web-based GIS to enhance public involvement and participation in environmental planning and decision-making processes. Such systems are typically referred to in the literature as Public Participation GIS (PPGIS) and are based on the belief that by providing citizens with access to information and data in the form of maps and visualisations they can make better informed decisions about the natural and built environment around them.

It is possible to build on the existing infrastructure and knowledge in order to combine GIS and PPGIS frameworks to enhance e-government, local democracy and public participation. In particular, GIS and spatial microsimulation models can also play a very important role in the on-going debates on the role of potential of new technologies to promote local democracy and electronic decision-making. It can be argued that a system such as MicroMaPPAS developed in JAVA, which, as noted above, is a platform independent programming language, can be put on the World Wide Web and linked to Virtual Decision-Making Environments (VDMEs). The latter are Internet World Wide Web based systems that allow the general public to explore ‘real world’ problems and become more involved in the public participation processes of the planning system (Kingston et al., 2000).

The City Council of Leeds recently launched a local statistics web site (<http://www.leeds-statistics.org/>) and further development of Micro-MaPPAS will allow policy makers to provide simulated scenarios on this web site. This will give access to other organisations and the public to data and models previously only accessible to decision makers. Web based systems such

as this allow others to explore real world problems and become more involved in the policy processes of planning for the future of urban and rural regions. Systems such as Micro-MaPPAS can potentially be used not only to provide information on the possible consequences and the local multiplier effects of major policy changes but also to inform the general public about these and to enhance, in this way, the public participation in policy making procedures.

There are a number of geographical datasets that can be used across local governments in Europe to build spatial microsimulation PSS. Both the spatial microsimulation model and the GIS system can be incorporated into a generic software toolkit. Figure 3 schematically depicts the architecture of a generic spatial microsimulation based PSS that could be adopted by any European local government authority, building on the research conducted in the context of the MicroMaPPAS development. It can be argued that such an approach could eventually approximate simulation environment similar to that of the popular game SimCity but based on real data! Such an environment could have numerous applications in local participation and rural learning context.

5. GIS-based spatial microsimulation frameworks and rural development

There have been considerable efforts to analyse rural regions and build typologies utilising GIS technologies and available secondary data (e.g. see Blunden et al., 1998; Labrianidis et al., 2005; Leavy et al., 1999). These research efforts have and their outputs can stimulate debates on the definition of “rurality” and “rural development issues”. It can be argued that spatial microsimulation frameworks such as the one described in this paper can further enhance these efforts. In particular, GIS-based spatial microsimulation



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methods can be used to provide information on the quality of life in rural areas, as well as build indicators of how “attractive” different rural areas may be to young farmers and potential new residents. They may also be used to estimate information on how diversified the local labour force is in different rural areas and to identify learning needs of the population. In a “rural learning and education” context, the role of Public Participation GIS and spatial microsimulation can twofold:


1. Spatial microsimulation methods can be employed to identify the education and training needs of rural citizens of all ages and socio-economic backgrounds in different areas (and for various geographical scales), under alternative definitions of “rurality”. They can also be used to identify disparities and inequalities in educational attainment between rural regions, as well as in relation to urban regions. By doing so, it is possible to inform
2. PPGIS and spatial microsimulation frameworks and technologies, such as MicroMaPPAS, can be used to enhance local decision-making processes by utilising Information Society and Knowledge Economy resources. Technological tools such as MicroMaPPAS can also be seen as e-learning tools, as they enable rural citizens to learn more about their localities and how they fit in relation to other urban and rural regions. Such technologies may be ideal for rural areas, as they may enable rural citizens and/or their local representatives to take part in local and regional decision-making processes, irrespective of where they live. In this context, it can also be argued that there is a strong need to extend and consolidate projects such as the European Union programme “Rural Wings” in

order to provide the enabling environment for web-based local decision making systems to be developed in rural regions.

So far there have been most of the spatial microsimulation research pertains to urban areas. Amongst the notable exceptions are research programmes led by the Irish Rural Economy Research Centre in the Republic of Ireland (e.g. see Hynes et al., 2006; Ballas et al., 2006 & 2005). It can be argued that in order to address the above issues there is a need to build upon these efforts and combine them with the spatial decision making technologies that have been already developed in urban contexts.

6. Concluding comments

The research presented in this paper can be extended in order to provide a new enabling framework for e-government with the analysis of the short and long-term impacts of social, regional and rural policies upon different geographical areas and segments of the population. This paper demonstrated that by providing new information at a detailed small area scale, spatial microsimulation based Planning Support Systems can be used to support decision making and policy formulation. In particular, it briefly introduced microsimulation technologies and it then argued how they can be combined with PSS in order to improve public services, by aiding public support. In particular, it was argued that systems such as spatial microsimulation based PSS can play a very important role in the on-going debates on the possibility of new technologies to promote local democracy and new forms of decision-making. For instance, the MicroMaPPAS system discussed in Section 3 has been designed to be as flexible as possible so that it can be adapted to work for any other city or region by changing the appropriate spatial and attribute data to match the



appropriate locations. It should also be noted that the MicroMaPPAS system (without the associated data) is a free open-source piece of software. This means that it can be redistributed and be modified under the terms of the GNU General Public Licence as published by the Free Software Foundation (<http://www.fsf.org/>). Therefore, there is a great opportunity to build more generic models on the basis of the architecture depicted in Figure 3 and apply them in an e-government context in order to move towards spatially enabled e-Government. On this basis it is possible to develop advanced software toolkits that would potentially enhance public participation and local electronic democracy. In a rural context, systems such as MicroMaPPAS can be used by adults living in rural areas in order to extend their knowledge capacity of rural development and intending to make an ongoing contribution to rural development.

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Establishing an Eco-efficiency Analysis Program for the Area of the Aegean

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1. Introduction

Since its introduction at the Rio Earth Summit in 1992, the concept of eco-efficiency has been internationally recognised as the way business can contribute to the sustainable development of our society. Eco-efficiency is strongly supported by those who envisage the production of economically valuable goods and services while reducing the ecological impacts of production. In other words eco-efficiency means producing more with less and its main objective is to combine the achievement of economic and environmental objectives in a single process.

A number of practices and processes have been identified to encourage eco-efficiency, including life-cycle analysis and management, environmental management systems, environmental supply chain management, and environmental product design which can create value-added opportunities. However, the key component of a concrete eco-efficiency analysis is

the adoption of practices and processes that simultaneously create economic growth opportunities while reducing environmental impacts. In this way, it promotes the creation of a competitive advantage for businesses and industries while maintaining a commitment to the principles of sustainable development. At present, the most complete version of a methodology that encompasses the above objectives is the Eco-efficiency Analysis developed by BASF.

BASF Corporation adopted an analytical tool to help identify products and production processes that consume less energy, produce fewer emissions and less waste than alternatives, while maintaining or improving the products' commercial value. The Eco-Efficiency Analysis, first introduced by BASF AG (NYSE: BF) in Germany in 1996, assesses the life cycle of a product or manufacturing process from the "cradle to the grave", aiming to give BASF's customers a total picture of both the economic and ecological impact of a particular product or process. Therefore, the main



asset of this methodology is that it is customer oriented and developed around one single concept, the customer benefit.

The region of the North Aegean Sea consists of a unique ecosystem in terms of functions and products. Unfortunately the aggressive rhythms of development of the region during the last decades put on jeopardy the natural system in the name of economic growth. In this race for competitiveness and achievement of the market demands, the businesses of the region should not oversee their responsibility to preserve and protect the environment for future generations. This is why the eco-efficiency concept appears as the ultimate solution for these regional medium-class businesses to develop a competitive edge in markets characterized by customer demands for improved environmental and performance attributes, while in the same time secure their economic autonomy.

Bearing this in mind, the Laboratory for Physical and Computational Sciences of the Financial and Management Engineering Department of the Aegean University initiated a collaboration with BASF and the Institute for Sustainable Development SUNY SB USA, in the framework of the ENTER program. The main objective of this collaboration is to address the concept of eco-efficiency in the Northern Aegean reality. In this direction, the first aim is to introduce to the educational mainstream the Eco-efficiency Analysis methodology as a relatively simple, standardized and quantitative way of generating studies where economic and environmental parameters are equally weighted. At second stage, it aims to adopt and adjust it to the regional conditions and the specific characteristics of the area in order to further on apply it to realistic and practical cases relevant to the local environment, businesses and society.

This paper is an effort to outline the objectives of

the Aegean Eco-Efficiency Group. The first part introduces the initial methodological background as developed by BASF, which will be the initial base of study reference. The second part discusses more specifically the scientific goals of the group, the possible areas of application in the region and the expected milestones of the study.

2. The Methodology of the Eco-efficiency Analysis of BASF

The aim of eco-efficiency analysis as performed by BASF is to provide a quantitative basis for the comparison of the levels of sustainability of products and processes. In this direction a well defined and pragmatic approach ensures high quality of results in short times as well as low project costs. Furthermore, the flexible modular framework of the method enables the valuation of ecological and economic impacts at all cases and facilitates validation and plausibility of the system. Finally, the approach is end-user friendly since it allows the easy and clear communication of results and thus, opens fields for further discussion.

Definition of Customer Benefit and Alternatives

The main precondition in eco-efficiency analysis is the definition of the specific customer benefit which lies always at the centre of the approach. Based on that, it is possible to offer a list of comparable solutions that serve as alternatives. In this context, eco-efficiency analysis compares the economic and environmental performance of each option at first over its entire life cycle and later on the specific steps within each alternative's system that differ. In this way, it suggests the most appropriate solution combining both standpoints, which is the eco-efficient solution defined as functional unit under ISO 14040.

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2.1 Total Cost Calculation

In the eco-efficiency analysis both financial and environmental dimension are assigned equal weight. While environmental profiles of individual products or life cycle sections of all considered alternatives are prepared, total costs are also summarized for the same steps. Such costs may refer to the real costs but also to the ones that may occur in the future in an effort to obtain the broadest calculation possible. The methodology suggested by BASF combines the environmental profiles of all individual products and life cycle sections with the respective economic assessment data to provide the eco-efficient profiles of all alternatives. However, it does not utilize the avoidance costs or other approaches in order to facilitate the separate computation and assessment of economic and environmental impacts.

2.2 Determination of Environmental Impacts

Environmental impacts are determined on the basis of the following categories: consumption of primary energy, consumption of raw materials, resulting emissions (air, water, soil), toxicity potential, risk potential and area use as depicted in Figure 1. Under these categories results are neither combined nor weighted. Data sources that may be utilized during the assessment processes are life-cycle inventory databases, existing studies, questionnaires performed on production plants, publication, analogies and expert judgments. During the calculation process, all alternatives are normalized with respect to one another, with the least favorable alternative being given the value 1 and the rest lining up from 0 to 1 in relative forms of ranking.

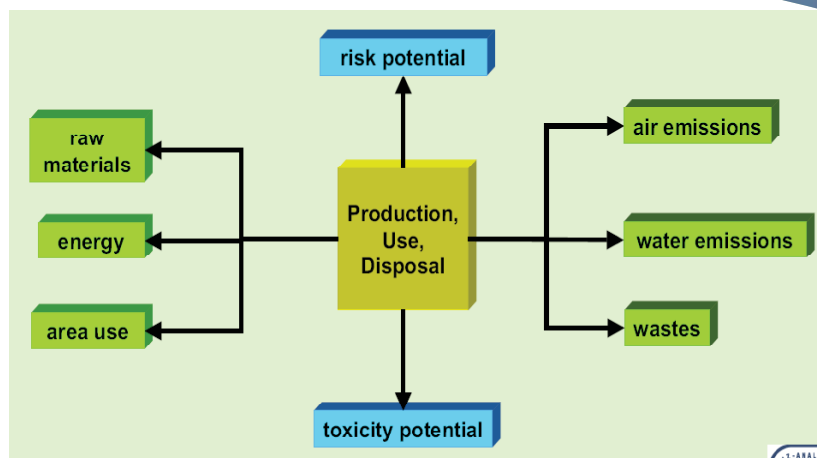


Figure 1. Impact audit of environmental categories through the overall life cycle [7]

In the category of primary energy consumption the assessment of environmental impact refers to all energy sources utilized to fulfill the customer benefit. In most of the cases the energy resources considered are coal, oil, gas, lignite, nuclear energy, waterpower, wind and biomass. Fossil energy media are included before production and renewable energy media before harvest or use, in an effort to allocate respective energy consumptions to the individual energy media.

The mass unit (kilograms) of all raw materials needed over the entire life cycle of the alternative processes is included under the raw material consumption category. Individual materials are weighted according to their reserves based on the statistical calculations of the U.S. Geological Survey. They predict the time a specific material will remain producible counting on today's economic methods for extraction and assuming that consumption remains constant. After evaluating individual raw materials on the basis of their years of reserves the eco-efficiency analysis produces

weighting factors for each mass stream to produce the 'resource factors'. In the case that renewable materials are sustainably managed the respective factor assigned is zero.

Initially emissions values are estimated separately for the air, water and soil compartments. They include direct values resulting from the processes but also indirect referring to the production, extraction and transportation of materials and products. At next level, individual values are aggregated through a weighting scheme to formulate the overall emissions values.

Included categories in the evaluation of air emissions are the global warming potential (GWP), the photochemical ozone creation potential (POCP), the ozone depletion potential (ODP) and the acidification potential (AP). Table 1 summarizes the specific emissions and impact equivalents for each category, which in the end are all aggregated to define the potential factors for each air emission category.

Table 1. Arithmetic values for impact potentials in the case of emissions to air [1]

	GWP	ODP	POCP	AP
CO ₂	1			
SO ₂				1.0
NO _x				0.7
CH ₄	11		0.007	
HC*			0.416	
Halogen HC*	4500	1		
NH ₃				1.88
N ₂ O	270			
HCl				0.88
HF				1.2

At present there is no comparable standardized, scientifically documented method to calculate the impact potentials for emissions to water. For the inventory of emissions to water (COD (chemical oxygen demand), BOD (biological oxygen demand), N-tot (total nitrogen), NH₄⁺ (ammonium), PO₄³⁻ (phosphate), AOX (absorbable organic halogen), heavy metals (HMs), hydrocarbons (HCs), SO₄²⁻ (sulphate), Cl⁻ (chloride)), BASF uses the method

of critical volumes or critical limits for discharges into surface waters. This method assumes that each pollutant emitted into water contaminates sufficient water until the statutory limit for this substance is reached (critical load). In this regard, the lower the limit for an emission, the higher the factor used to express the impact.

The results of the inventory on solid wastes are aggregated to form three main categories: special wastes, wastes resembling domestic refuse and building rubble/gangue material. In the absence of other criteria, impact potentials for solid wastes are calculated on the basis of the average costs for the disposal of the wastes. Factors are also proportionate to the hazard-ousness of the content.

The calculation of the toxicity potential is not included in most of the Life Cycle assessments. In the eco-efficiency methodology developed by BASF

though, it is considered the specific criterion which constitutes an important factor towards the evaluation of sustainability. Since the exposure data used for the calculation of the toxicity potential are often missing, inaccurate and incomplete, the BASF eco-efficiency analysis calculates the maximum possible hazard (worst case scenario) instead of the existing risk considering that an actual increased health risk is only after exposure, usually as a consequence of improper handling.

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Following the fundamental approach of eco-efficiency analysis, during the calculation of the toxicity potential each product under consideration is balanced from the cradle to the grave based on the toxic effects classification system and the assignment of R-phrases of the Directive 67/546/EEC. Exposure factors of the substance (raw materials and reactants needed during the manufacture process) are added to give a total for each alternative considered in the study. The process steps of production, use and disposal are captured separately and weighted with the appropriate factors.

The risk potential considers possible dangers from accidents during all the process steps of the life cycle (production, use and disposal). The risk value is calculated as a function of the probability of accident occurrence and the estimated level of impact (severity). The quantities used for the assessment are based on statistical data from the employers' accident insurance associations on workplace accidents, transportation accidents, abuse risks, plant safety, production and usage malfunctions, fire behaviour etc. The risk is assessed using comparative evaluations and not absolute values. It is expressed as numerical ratios which represent the relative risk of each alternative in the respective risk category.

Finally the area use refers to those parameters that affect directly or indirectly the ability of the area to perform its natural functions (ecosystem functions, loss of habitat for fauna and flora etc). The area requirement includes production sites, transportation and treatment/ disposal plants that depending on the type, scope and intensity of the use may jeopardise more or less its functions. The area is included for all materials used throughout the life cycle and it is valued through a weighting of the various area categories affected in each alternative studied. A sample of the evaluation factors used depending on the principal types of land is presented in Table 2.

Table 2. Land Use: Evaluation factors of principal types of use [7]

Land Category	Evaluation Factor
O. natural	0
I. close to natural, forests	1
II. semi-natural, bio-agriculture	1.5
III. conventional agriculture, far from natural	2.3
IV. sealed	5.1
V. roads, tracks, canals, sealed & splitting	7.6

2.3 Normalization and Weighting Factors

The representation of a number of individual results at different steps of a product's life cycle is in most of the cases difficult to compare, interpret and communicate, while it does not allow the suggestion of integrated and holistic solutions. The eco-efficiency methodology suggested by BASF combines all the ecological parameters for each alternative so as to provide only overall comparative information and not absolute values for each stage or category.

The first step in the compression process is normalization, where the least favorable alternative is assigned the value of 1 and the rest follow up a relative ranking. The final values of the environmental categories are calculated through a relevance scheme of the already normalized values. The parameter of relevance indicates the particular importance of each environmental category in the eco-efficiency analysis. The relevance factors automatically determine the main influences during the calculation. The more important a category is in the assessment of a prod-

uct or process, the larger is the relevance factor. In order for these to be objective, they are calculated in reference to the data of the respective analysis, and the published values for total emissions in the balance region under study (Germany in the specific case).

Societal weighting factors on the other hand reflect the social views of the individual ecological impact category and therefore vary depending on the region under study. They can be assessed through surveys, public opinion polling, expert interviews etc. In the end, the multiplication of the calculated relevance factors of the eco-efficiency analysis with the societal weighting factors gives the overall weighting factors that are used in the final stage of the environmental assessment.

According to the methodology used for the calculation of the environmental relevance factors, the total costs of a system can be related to the total sales of the industry in each alternative and the respective relevance factor will reflect again total costs. Even though such value might reflect the extent that the alternative under study contributes to the gross domestic product of a country and thus, be relatively small, it still serves for comparative purposes.

2.4 Environmental Fingerprint by BASF

Once normalized and weighted the corresponding arithmetic values of environmental categories are summarized in a special plot, the environmental fingerprint. This graphic depiction shows the environmental

advantages and disadvantages of the considered alternatives in a relative comparison with each other. The outermost alternative, assigned the value 1, indicates the least favorable alternative when the most eco-efficient alternative is situated further inward in the plot. All axes are independent, so it is possible to follow the individual values of each environmental category per alternative independently from the others. An example of the environmental fingerprint developed for an automobile study is depicted in Figure 2. The example was presented during the BASF's Eco-efficiency Analysis Method Training Seminar in 2007 [7].

In this way, the environmental fingerprint as developed by BASF facilitates the identification of environmental impact drivers per alternative, while it suggests categories that require specific attention for improvement in order to optimize the overall performance of the system.

2.5 Eco-efficiency Portfolio

Up to this point of the methodology, the total costs

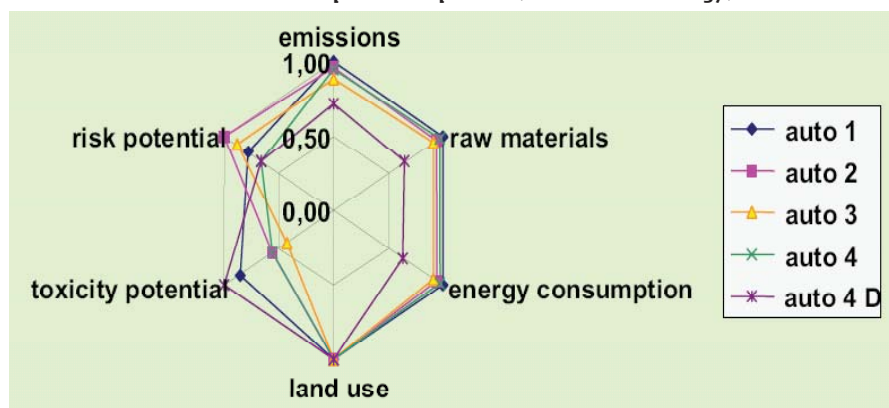


Figure 2. Environmental Fingerprint by BASF in an automobile study [7]

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and environmental fingerprint constitute independent calculations of the economic and environmental assessments of the different alternatives within a system. Considering that economy and ecology are equally important for the achievement of sustainability, as assumed in the eco-efficiency analysis of BASF, it is possible that a system less advantageous economically more profitable may compensate for its environmental disadvantages and vice versa.

In order to illustrate this concept BASF developed the eco-efficiency portfolio. No absolute values per alternative are calculated here. Instead costs are assessed against environmental positions and plotted together in a diagram. The environmental input values, normalized according to the previous steps, are multiplied this time with the overall weighting factors, resulting in a metric portfolio where each individual criterion contributes to the total sum per alternative which is then depicted as respective total environmental impact in the one axis.

The total costs based on average of all alternatives are then plotted on the other portfolio axis.

The result is a balanced overall system, based on the respective averages in the form of a portfolio plot. The most favorable alternatives are located in the top right part while the least favorable ones in the bottom left. The distance of each individual alternative to the portfolio diagonal is a measure of the eco-efficiency level of each alternative. Figure 3 depicts the final Eco-efficiency portfolio as developed by BASF in an automobile study presented during the Training Seminar of 2007 [7].

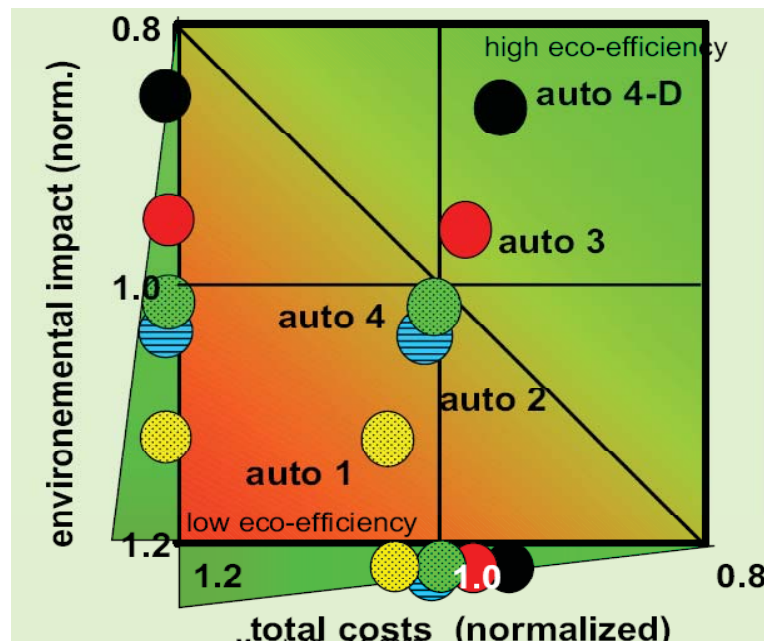
Figure 3. Eco-efficiency portfolio of BASF in an automobile study [7]


2.6 Sensitivity Analysis

After the description of the current state of a system, this last step of the methodology employs different scenarios to illustrate the changes on its status in the case that different weighting factors, input data or emission values are used. The sensitivity analysis verifies the stability of the results and evaluates the robustness of the study. It may also serve answering questions that deal with further developments and options as well as suggesting research and marketing strategies. It consists therefore an important tool towards decision making and integrated management.

3. The Aegean Eco-efficiency Group Objectives

The Aegean Eco-efficiency group is composed by one professor, two post-graduate students and fif-





teen under-graduate students in the Laboratory of Physical and Computational Sciences of Financial and Management Engineering Department of the Aegean University in Chios and one guest-professor from the Institute for Sustainable Development SUNY in the Stony Brook University of New York. The objective of the group is to develop further research on the subject of eco-efficiency and to transmit the concept to the local community.

This objective will be broken down in two main steps. First the development of a methodology that allows the overall assessment of a system and gives equal importance to the environmental and ecological aspects while being fully incorporated to the regional reality and conditions. The second, is to practically apply the developed methodology to realistic and practical cases relevant to the local environment, businesses and society.

In order to meet the first step, the initial reference base will be the Eco-efficiency Analysis of BASF. The methodology needs to be adopted and adjusted as to reflect the regional reality. Therefore, all weighting, relevance, economic, environmental and societal parameters need to be replaced and updated. Moreover, the methodology will extend to include new indicators (mostly related to the toxicity and risk potential categories) that are of particular importance or interest for the regional community. These indicators will be identified through regional public and expert interviews, statistical resources regional and/or national and all other available databases and literature. In this way, all impact categories will be modified appropriately for the Aegean area.

The scientific review will highlight other areas of particular interest for the region and the aim will be to extend the methodology towards new directions. Specific interest will be paid to the societal aspects in order to evolve into a three-dimensional model that

produces holistic assessments based on all economic, environmental and societal interests. This version of the model will have the potential to serve as a decision support system that produces integrated assessments and allows decision making and management planning through a process of assigning relative weights to each category according to the interest per se.

Such analysis comprehends a scientific study of the entire lifecycle of a product or process with an evaluation of all facets of costs, energy use, use of raw materials, environmental and safety issues related to manufacturing, storage and transportation, health impacts, and emissions. This is why the role of industry is essential during all the stages of the study. At this point, the second step of the study is reached. Eco-efficiency portfolios for several operational procedures will be developed based on in-situ data of local industries and businesses.

The second part of the objective is to apply the methodology in four practical case studies related to products or processes of regional interest. The case studies will focus on one end product, two business line productions and one form of renewable energy. The chosen product to be studied is bottled-water, due to its particular importance for the customer community of the North-Aegean region. The product lines where the methodology will be applied are the local mastic gum production and the aquaculture lines, since these are both businesses of local interest, which makes it easier to gain access to the necessary data to work with. Finally, an eco-efficiency portfolio will be created for a renewable energy generation source as alternative to the local electricity plant.

The main difficulties arising when plotting this study are related to the collection of case specific data, in order to address the problem realistically and produce accurate results. It is very possible that the

businesses under study will not be able to provide specific quantitative data during all the stages of their production processes since in most of the cases there is not adequate monitoring of the processes. In these cases, the study will employ data from studies on relevant businesses, statistical resources but also expert opinions.

The study takes also into account that, due to the size and the range of the businesses, the whole life cycle of a product or process is not realized inside the same company. This means that a number of material or sub-products are imported and thus, the business can not account for their system cycle. In these cases, the study will focus on the specifically defined steps inside the system of each alternative, trying to compare those steps that differ.

The whole project is a discovery tool for the regional reality and therefore it is possible that other difficulties we can not consider at the moment will emerge. The sure is that the project will serve as a pilot study that will explore the regional reality and will incentive community and business to deal with the emerging pitfalls (ex. lack of data) by giving a direction that improves the quality of research in the future.

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Training Seminar - lecture handouts: March 13-14, 2007



Post-socialist community action in Lithuania¹

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1. Introduction

Post-socialist rural areas have joined the European Union at a time when local actors, in the form of voluntary rural community organisations, have increased decision-making power in the rural development process. EU enlargement provides new ground for researching alternative heritages of rural collective action in Central and Eastern Europe (CEE) and how these impress upon the operation of newly established non-statutory community organisations today. In a context where there is scarce tradition of non-statutory third-sector interest groups, nuances in approaches to new forms of community action - influenced by socialist histories as well as contemporary rural conditions in recently acceded EU member states - provide an opportunity to profile case-specific variances within the context of the enlarged EU.

This paper focuses on the rural district of Ukmerge in Lithuania, where 19 community organisations were formed under the impetus of a Rural Partnership Programme (RPP) (2000-2003). The paper explores some of the main determinants on community action in this post-socialist environment, and then turns to a single case-study community organisation, examining why community action spurred by an RPP-funded local development project had a unique outcome.

The paper has four main sections. The first summarises key features of the EU governance and rural development approach (of which a defining feature is the participation of local communities in the development process) and the circumstances of the initialisation of a Rural Partnership Programme (RPP) in post-socialist Lithuania in 2000. The second section presents an empirical analysis of community action in the Ukmerge District, identifying and explaining

¹ This research was conducted for an EC 5th Framework project - Integrated Development of Agricultural and Rural Institutions (IDARI). IDARI is financed under the EC's FPS Quality of Life and Management of Living Resources, Key Action 5



influences arising from an historical socialist regime on the operation of 19 newly formed community organisations today. The third section pays attention to a single case-study, examining past experiences and influences that have caused this community organisation to operate differently than others in the district. The fourth section presents emergent conclusions on the operation of community organisations in the post-socialist case-study district at hand.

2. The EU Governance and Rural Development model and the RPP

The EU LEADER² programme's frequent reference to rural 'community' echoes one of its primary goals, which is to re-orientate the rural development approach on the basis of two principles: decision-making taking place as close as possible to the site of implementation (principle of subsidiarity); and hierarchical decision-making structures being replaced by mechanisms involving representatives from a wide range of statutory and non-statutory organisations (principle of partnership) (Osti, 2000, p. 172). The very purpose of the governance and rural development model, which LEADER is intended to represent, is that it responds to the dynamics and accommodates the aptitudes of a well-developed civil society, which in rural areas of the EU15 has manifested itself in the presence of a variety of non-statutory interest groups, commonly in the form of rural community organisations; farmers' organisations; rural tourism groups; rural enterprise groups; and rural environ-

mental groups. In the EU15 the types of issues that local rural community groups tend to undertake within their mandates are far reaching: including lobbying government for services and infrastructure; the creation of employment; and the undertaking of services such as care for the elderly and children. Essentially, non-statutory community-based interest groups tend take on issues of local concern that are not otherwise satisfied, by either the state or private sectors.

With EU enlargement and the extension of governance and rural development policy to CEE, however, comes an inevitable challenging of the underlying assumptions that preconceive initial conditions for the application of the policy model on the ground. The interplay of the peculiarity of the governance model, as one which has a direct relationship with liberal democratic free market civil society institutions; with the peculiarity of the post-socialist rural environment, conditioned by its recent legacy of centralised state socialism gives rise to intricate determinants and interplays for the transposition of rural development policy to CEE.

In the advent of the Baltic States' accession to the EU, the UK Department for International Development (DfID) implemented a three year Rural Partnerships Programme (RPP)³. The purpose of the programme in all states was "to support the creation of a new rural development policy framework in which local rural people can work in partnership with national, regional and local authorities, to identify local needs, prioritise actions and manage strategies" (RPP, 2003, p. 1). The RPP recognised that in order to meet the policy challenges of EU integration such

² The LEADER (*Liaisons Entre Actions de Developement de l'Economie Rurale*) programme, in 1991 marked the unprecedented incorporation of principles of governance into EU-led rural development. The programme is described as "a sustained and sustainable process of economic, social, cultural and environmental change designed to enhance the long-term well-being of the whole community" (Moseley, 2003).

³ Three rural partnerships were established in each of the Baltics, and Ukmerge was the site of one of the Lithuanian partnerships.



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as the implementation of the LEADER programme, there was a need for developing ways in which to include local communities in the development process and to develop relationships between different sectoral groups, by means of partnership. In a context where primary rural development concerns related to unemployment, inadequate infrastructure, and considerable levels of rural poverty, the stated RPP vision for Ukmerge was a “socially and economically developed district with active, influential, democratic and focused communities working towards better economic and educational opportunities for its members” (RPP, 2003, p. 31). The partnership’s mission statement was the following: “the partnership board is an active learning organisation striving to encourage community groups and to develop the capacities of their members to take active part in economic activities” (RPP, 2003, p. 31).

At the time of the RPP’s inception, there was no area-based community organisation in operation, and the only form of non-statutory interest groups took the form of sporting clubs (mostly hunting clubs). The RPP’s aim was to strengthen the non-statutory sector by putting into place an intensive local training programme in community facilitation that emphasised local collective strategy for rural development and principles of popular participation. The result was the formation of 45 area-based community organisations, 19 of which received funding from the RPP⁴.

In how the new organisations operated in practice, the experience of socialism was found to be influential on the dynamics of local involvement in the organisations and the types of issues that the or-

ganisations incorporated into their mandates. Village inhabitants’ expectations from community organisations, and how organisations were locally judged and evaluated, was also coloured by experiences of socialist institutions which had dissolved only a decade prior to the implementation of the RPP.

3. Community Action in the Ukmerge District under the RPP

The officially established organisations and their members independently designed local development projects and applied for RPP funding⁵. There were three priority measures under which community organisations could receive funding: strengthening of social ties and of the local ‘sense of community’; development of a diverse rural economy; and helping to create a safe rural environment in which to live⁶. Figure 1 presents a categorisation of all projects designed by community organisations and submitted to the RPP, according to project type (45 projects in total)

The categorisation of projects above shows a dominance of projects that seek as a primary objective to strengthen social interaction. Furthermore, it is notable that of the 19 community organisations that were funded by the RPP, all sought to strengthen social interaction, with the exception of one. In a context where there is a wide range of basic development problems, arising from considerable poverty and employment, it is questionable why community organisations prioritised the strengthening of social interac-

⁴ The analysis presented in this paper relates only to the 19 community organisations to which funding was allocated.

⁵ An in-depth analysis of these processes is presented in Macken Walsh (2007).

⁶ These three priority measures were identified by a local audit, where focus groups interviews were conducted by the RPP. The third priority measure, ‘helping to create a safe rural environment’, was in response to the high rate of crime (particularly theft) in the district. Funding available for community organisations’ local development projects was not proportionately pre-allocated to the three measures.

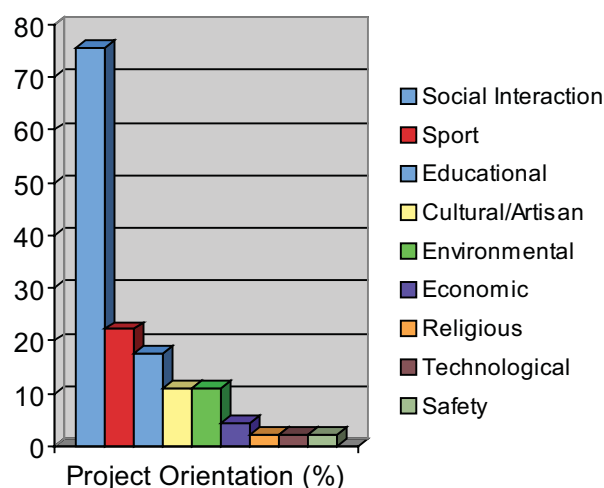


Figure 1: Orientation of proposed local development projects submitted to the RPP⁷

tion to such an extent. In the EU15, community-level development projects are known to address and to have considerable success in impacting on a broad spectrum of local development problems. The liberal democratic free-market environment of the EU15, however, fosters capacities of non-statutory community organisations and in the post-socialist context, where the private and voluntary sectors have been developing in little over a decade, it is likely that newly established community organisations draw from a different skills- and experience-base in how they assimilate their mandates and make attempts to consolidate local collective action.

From an analysis of activities undertaken and in-depth interviews with members of community or-

ganisations, it is evident that the socialist regime was of significant influence on the mandates and activities of the new organisations, and of particular influence was the cultural house.

3.1 The Cultural House

An institution that originated in the collective farms, and continues to exist today through funding from the Ukmerge municipal government, is the village cultural house. The cultural house was an institution conventionally present on all collective farms that undertook the organisation of all social events for farm workers. A close connection between the new community organisations and the village cultural houses was apparent through the community organisations' usage of cultural houses as their primary meeting place, and the types of activities that the organisations engaged in. Examples of local development projects that mirrored the social activities of the cultural houses were: "We will visit grandmother; we will meet our friends", "The development of a water-side helps to develop a community with initiative"; and "Work, cooperate, engage in sport". Aside from the RPP-funded projects, it was clear that the majority of community organisations' additional activities sought to rejuvenate events that under socialism the cultural houses would have organised, for example: New Year's events, local birthday and anniversary celebrations⁸.

From interviews conducted with village inhabitants, however, it was evident that they held expectations from the community organisations that went beyond the area of social interaction. It was clear that many rural inhabitants perceived the community organisa-

⁷ This classification of projects represents all project applications submitted to the RPP i.e. 45 applications in total (of which 19 were funded).

⁸ Today, events with religious connotations such as St. George's Day and Christmas celebrations are celebrated by the cultural houses and incorporated into the activities of new community organisations.



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tions as not having had a serious impact on local development problems, especially in relation to unemployment. As expressed by one respondent, “social events and planting flowers around here won’t do us much good” (Female, 70 years, Dainava). While it was evident that rural inhabitants’ expectations from community organisations often were unfulfilled, it was also true that the range of expectations exceeded the responsibilities conventionally undertaken by non-statutory organisations in free market liberal democratic regimes. From an analysis of interviewees’ opinions and attitudes regarding the mandates of the new community organisations, interesting issues arose in relation to concepts of statutory versus non-statutory responsibility, which are explored in the following section.


2.1 Perceptions of statutory and non-statutory types of activity

A main determinant on how rural inhabitants of the Ukmerge district perceived differentiations between statutory and non-statutory activity is the experience of ‘uni-sectoral’ socialism, specifically the socialist collective farms. The collective farms were multi-functional entities that undertook functions that in liberal democratic regimes would be seen as spanning public/state; private; and third-sector responsibility, such as the provision of employment, the allocation of housing, and the provision of all services. Frequently, interviewees associated the new community organisations with the old socialist collective farms, comparing the mandates and functional capacities of the two. This association of community organisations with collective farms was problematic, because the idea behind establishing community organisations in Lithuania’s current political environment of free market liberal democracy was that they would be distinctively non-statutory entities, working indepen-

dently towards rural development goals. The association of new community organisations with collective farms also gave rise to obscurities in how new non-statutory responsibilities and mandates were developed and positioned against the historical backdrop of the centralised state-controlled farms of the past. It was clear that expectations of a significant number of rural inhabitants mirrored more what would have been historically expected from collective farms than from typical third-sector community organisations, as explained by one interviewee - “people expect the community to provide everything the collective farm provided, like jobs and maintenance work” (Community Board Chairperson, 58 yrs, Petronys).

From interviews conducted, there was evidence of diverse opinion among village inhabitants on what the mandates of the new community organisations should encompass. There was evidence that rural inhabitants’ expectations from the community organisations’ project objectives often were conflated with facilities and infrastructure that in liberal free market democracies the state usually provides, for example running water and sewerage infrastructure. On the other hand, it was also evident that rural inhabitants perceived that community organisations should have a role also in private and household affairs, for example neighbourly disputes. A consistent finding overall was that rural villagers held a wide variety of expectations, which constituted a very direct reflection of their historical experience of the mandates of the collective farms; and a certain indecision about what should be expected from the new community organisations. This indecision, too, often translated into scepticism concerning what role rural inhabitants themselves should play in the activities of the new community organisations.

The implementation of community organisations’ local development projects often required voluntary action from rural inhabitants. This was often met



with scepticism from rural villagers. As one villager put it, “it is a fairytale that people will carry out work voluntarily for others under the new community organisations. Under socialism, the work had nothing to do with us and was carried out by paid workers”. From another related perspective, the idea of voluntary work, as something that is engaged in for one’s own benefit and for the benefit of the larger community, is also a new one – “people still think that they are doing the work for someone else, not themselves!” Overall, it was clear that rural inhabitants gave evidence of a certain indecision regarding the distinction between private and state responsibility.

2.2 The role of the RPP

While it is clear that the socialist collective farms held a consequence for what rural villagers expect contemporarily from community organisations, it is also true that the RPP as a programme had a part to play in how the new organisations came into operation. The particular approach of the RPP, which concentrated more on handing over the development process to local people, and less on imparting strategy relating to economic and social development, resulted in the community organisations operating according to their own traditions, experiences, and knowledge.

While efforts to ‘hand over’ the development process is considered to be an essential characteristic of the governance and rural development model, the capacity of the model to thereby deliver effective and representative development is presumptuous that there is a wide range of interest groups that are experienced in the area of rural development. Different rural circumstances in the Ukmerge district explain the community organisations’ failure to pursue a range of economic, social and cultural goals, instead using their own traditions of collective and participatory

action to guide the activity of the new organisations. It is questionable, therefore, that in this post-socialist environment where there is scarce tradition of entrepreneurship and a virtual absence of non-statutory activity in the private and NGO spheres, whether the RPP could have related more specifically honed and strategic local development goals in its capacity building phase (even in reflection of the three priority needs in rural areas, established by the local audit).

However, there was one case in the Ukmerge District that succeeded in implementing an economic-oriented project and generating eight positions of employment. The following section focuses on this case, examining the local conditions and circumstances that go some way towards explaining how this project came about.

3. The case of the Petronys Community Organisations

While the generation of employment opportunities was identified as a primary rural development need in the local audit, only one of the proposed projects was economic in nature. This project was proposed (and funded by the RPP) in the village of Petronys. There were two unique factors present in the village of Petronys that were not present in the other 18 villages: the historical experience of a economically successful and well developed collective farm where farm workers had significant decision-making power; and the experience of an educational programme put in place by a UK NGO five years prior to RPP implementation.

In Petronys, the economic and institutional strength of the collective farm under socialism has made an essential contribution to the skills and experience available to the village’s community organisation to-



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day. The operation of each collective farm under socialism was largely influenced by the farm leader, and historically, farm workers in Petronys had a trustful relationship with the leader (who was in place for 30 years prior to the dissolution of the collective farm and continues to live in the village today⁹). The leader bestowed significant power on the collective farm board, which had a mandate that extended beyond farm management issues to matters relating to workers' welfare and the utilisation of their private plots. The farm leader prioritised the development of housing and the purchasing of machinery, which had the direct result that workers, as well as professionals, were encouraged to remain on the farm as employees rather than moving elsewhere, and to continue living in Petronys as beneficiaries after the dissolution of the collective farm.


With the collapse of socialism and the onset of the new regime, villagers in Petronys were generally better off and had a better standard of living than counterpart villagers in the Ukmerge district. Today, villagers claimed, every household inherited a piece of machinery from the collective farm and people feel fortunate, in comparison to other villages. Due to the plentiful housing, people who were raised in Petronys tended to stay, and those who were transferred under socialism tended to come back on holidays and returned permanently upon Lithuania's independence. Skilled workers and professionals were encouraged to stay and earn their livelihood from farming, as they inherited machinery from the farm and also because of family and social ties – it was claimed that “many families have four generations living here in Petronys” (Female, 42 yrs, Petronys). The stable

population of the village also resulted in the continuation of the village school, library, and cultural house (professionals employed in these institutions also contributed in a significant way to the establishment of the community organisation and its progress). In the aftermath of the dissolution of the collective farm in Petronys, a number of skilled women set up a dairy producer group and went on to receive the support of a UK NGO called “Powerful Information”¹⁰. The NGO aided the establishment of the village's first rural enterprise project that focussed on processing raw dairy products and conforming (as well as challenging) the relevant regulations. Five years subsequently, upon the inception of the RPP, the village of Petronys had an existing skills and knowledge-base capable of developing this existing enterprise through the RPP funding opportunity and submitted a project to establish a craft business and learning centre. The craft business and learning centre employs eight local people, and additional grants have been secured from the UNOPS, the World Bank, the Municipal Government, and the Lithuanian Youth Affairs Council.

Overall, the Petronys community organisation operated entirely differently to the other organisations established in the district. The conferring of an unusual degree of autonomy to farm workers resulted in the development of the village population's skills, experience and knowledge and allowed the pursuance of development avenues that were inaccessible to other villages in the district (see Macken-Walsh, 2007). The experience of the educational programme offered by the UK NGO also proved invaluable, as a strategic and specifically targeted initiative that

⁹ The farm leaders of other villages in the Ukmerge district had left the locality. Rural inhabitants explained that it was common for collective farm leaders to leave the village upon the dissolution of the collective farm, as they were generally disliked by the farm population.

¹⁰ www.powerfulinformation.org



responded directly to the dairy producer group's needs. The RPP initiative, rather than giving rise to innovation in the Petronys village per se, moreover allowed the already skilled core of actors in the village to consolidate their niche.

4. Conclusion

Enhanced by the RPP's minimal intervention in the community organisations' operation, the operation of newly established organisations provided a lens for empirical analysis and the revelation of determinants that are lingering from the socialist period. While in the post-socialist rural district of Ukmerge a tradition of enterprising non-statutory activity may not be prevalent, there is nonetheless a strong heritage of collective action stemming from cultural houses that originated under socialism.

It is clear that the newly established community organisations emerged in line with local traditions of collective action, which bore the imprints of a number of socialist experiences – namely the cultural house, and the 'uni-sectoral' approach of the socialist regime. While the impressive number of community organisations established as a result of the RPP training phase (45 in total) is indicative of the potential cultivation of non-statutory organisations in the Ukmerge district towards the future, the powerful impression of the cultural house on the organisations' activities, and the lack of otherwise oriented influences, resulted in somewhat restricted mandates. Furthermore, the experience of the centralised approach on the collective farm under socialism, which spanned all aspects of what would be considered as private, public life in liberal democratic regimes, gave rise to difficulties in how rural inhabitants of Ukmerge came to recognise the mandates of the community organisations as distinctively non-statutory.

The role of path dependency is crucially influential to how community organisations are positioned to engage in the development process. While the RPP provided training in community facilitation, it did not pursue targeted sectoral development strategies. The nature of the RPP's approach in 'handing over' the development process was a significant contributing factor to how the vast majority of projects sought to strengthen social interaction, which reflected existing local capacity alone. It is clear that small-scale educational programmes, such as the Information is Powerful initiative implemented in Petronys are crucial in developing capacity and preparing post-socialist villages for the increasing autonomy afforded to community organisations through programmes such as LEADER.

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E-Government services for the development of small & medium enterprises in rural areas: the rural-EGOV approach

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1. Introduction


The objective of the paper is to present the results of the Greek National Workshop on Rural e-Government Challenges that took place in Chios Island. One of the main goals of the workshop was to study the needs of SMEs in Chios and subsequently other Greek rural areas about governmental and public services, as well as to examine which of these could be offered online. Moreover, to study the degree of awareness of rural SMEs regarding existing e-government services. Our paper presents the outcome of the Greek National Workshop, a report on knowledge and qualifications of rural SMEs on the use of e-government services. Section 2 describes Rural-eGov project and defines the project's aims and expected results. Section 3 presents the outcome of the Greek National Workshop and identifies the ICT and e-government services experience and training needs of rural SMEs in

Aegean islands. The conclusions of the Workshop are presented in section 4.

2. The Rural-eGov Initiative

The Rural-eGov project aims to bridge an existing gap in national and European training systems and practices. The main aims of the Rural-eGov project are, first, to study the needs of SMEs in rural areas about governmental and public services, as well as to examine which of these could be offered online. Moreover, to study the degree of awareness of rural SMEs regarding existing e-government services. Second, to review the status of existing e-government services in the participating countries, as well as the degree in which they could cover the needs of rural SMEs.

Third, to design and develop a web-based observatory, which will include a collection and categoriza-



tion of e-government services that can support SMEs from rural areas (termed as the Rural-eGov Observatory). Fourth, to develop a set of proposed training scenarios (based on blended learning strategies for vocational training). These will promote the combination of ICT-based learning (such as digital learning repositories that support virtual communities) with traditional forms of learning (such as seminars and learning groups). Their aim will be to train SMEs from rural areas in understanding and reaping the benefits from e-government services.

Fifth, to develop innovative and relevant e-learning content that will support the proposed training scenarios, which will be described and stored (in the form of learning objects) in the Observatory's repository of digital training objects. Sixth, to carry out a set of pilot sessions with a number of representative user groups (SMEs from the participating rural areas) and to evaluate the proposed approach.

Finally, to produce a set of policy recommendations to EU agencies, National Governments and Rural Administration in order to stimulate the discussion about the development of e-government services for rural development and the education and training of citizens (with a particular emphasis on businesses) on how they can take advantage from such services. The proposed approach advances the following program objectives:

- “to improve the skills and competences of people, especially young people, in initial vocational training at all levels, with a view to facilitating their integration and reintegration to the labour market”
- “to improve the quality of, and access to, continuing vocational training and the lifelong acquisition of skills and competencies with a view to increasing and developing adaptability,

particularly in order to consolidate technological and organisational change”

- “to promote and reinforce the contribution of vocational training to the process of innovation, with a view to improving competitiveness and entrepreneurship, also in view of new employment possibilities”,
- Rural-eGov addresses the call priority “Developing Relevant and Innovative E Learning Content”.

3. Identifying the training needs of rural SMEs in Aegean islands

3.1. e-Rural Government Workshop

As we stated previously, one of the main goals of the project is to study the needs of SMEs in rural areas about governmental and public services, as well as to study the degree of awareness of rural SMEs regarding existing e-government services. To achieve this, a series of National Workshops on Rural e-Government Challenges is organized in all the participating countries.

The “e-Rural Government Workshop” took place in Chios Chamber of Commerce premises (Chios, Greece) in February 28th, 2007. The participants were SMEs representatives (owners & staff) as well as special SMEs organisations (representatives, associations, organisations) and individuals who support SMEs in their business activities & governmental agencies (KETA etc). The project partners responsible for the workshop were Chios Chamber of Commerce and University of Aegean. The workshop's structure / objectives were the following:

- Outline of objectives of the Rural-eGov project



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and how it aims to help rural SMEs;

- Feedback on questionnaire and discussion
- Introduction to basic topics and terms (e-Government service, etc.);
- Demonstration of characteristic e-Government services at a European level, the possibilities/benefits for rural SMEs;
- The envisaged benefits of using e-Government services for rural SMEs.
- Preparation for the group work and answering the questionnaire:
- Demonstration of characteristic e-Government services at a national, regional and sectoral level (with a focus on the services that will be used as training case studies for each country);
- Posing the questions that the workshop aims to answer: do SMEs know about the presented services, have they ever used them, what are the reasons for not using them, what kind of training would they consider useful for this purpose, etc.
- Executing the survey

3.2. Results


From the six representatives that participated to the workshop, three were Lobbying, two belong to a Governmental Organization and one belongs to a Non-Governmental Organization. They were questioned in what they believe about rural SMEs and how rural SMEs are doing with e-government services. They stated almost unanimously SMEs use relevant

e-services though a third party/intermediary organisation. Only two of them know the existence of an e-government service at the EU level which is relevant for rural SMEs. They identified www.e-procsee.net. Almost everyone knew some e-government services at the national level which are relevant to rural SMEs. They identified www.ika.gr (4), www.taxisnet.gr (4), www.info3kps.gr (1) and www.kep.gr (4). They all think that SMEs do not use e-government services weekly.

Regarding the usefulness of e-government services they think that the user instructions on e-government services have been something between fairly easy to understand and difficult to understand. Two of them estimated that the time having saved using e-government services compared with the traditional way of working was over seven hours, two of them say that it was between two and five hours and two estimated that they didn't save any time at all. Half of them estimated that rural SMEs can save up to 100 per year through using e-government services. The other half estimated that rural SMEs can save over 500 per year.

Regarding the relevance and the significance of the e-Government services they were given a set of topics and related services and asked to identify their importance for SMEs. The majority replied that e-government services related to business life events, like starting or closing a business, are quite important, while e-government services related to business management (like agricultural policy, banking, taxation etc) and business development (like funding opportunities, research and development etc) are very important. Three of the representatives said that an important e-government service that they think it's important to become available to SMEs is e-issuing of certificates by Municipalities.

The total number of participating SME respondents was 22. Only 1/3 of them were women, while their



age varied mainly between 26 and 40, with some being 46 to 55 years old. 19 of them were the SME's owners. 9 SMEs are agriculture and fishery related, 5 tourism related and 4 commerce related. 15 of them stated that their company's form is trade name. 10 of the participants don't have any employees and 10 of them have 1-4 employees.

First they were questioned current usage of ICT and e-services. They rated themselves on PC skills (literacy and competency) varying equally between very good and very poor (4 very good, 6 good, 2 fair, 5 poor, 5 very poor). 12 of them stated that they have a lot or great experience in using the internet, while 4 of them had none. Only 9 have broadband connections. They mainly use the internet to search for information, buy products and as a communication tool. Some of them use it for advertising/presentation of the company and offering product information, while very few of them use it to recruit employees. 4 of them don't use Internet at all.

Only 9 of them have previously used an e-government service. Most of them access e-government services by internet or by a third party/intermediary organisation. Only two of them knew an e-government service at the EU level. Two thirds of them knew some e-government services at the national level. The most recognisable e-government service was www.taxisnet.gr. 12 of them think that while using e-government services, the pages have been uploaded on an optimal or acceptable speed. They don't use e-government services weekly and when they do, most of them spent 15-30 minutes. Most of them have been using e-government services for less than 2 years, while only 1 has been using them for over 5 years.

Most of them are using the PC / Internet, search engines and information services for their routine duties and tasks. Half of them are using communication and transaction services and some are using

e-government services. Most of them feel that they need additional training in the use of e-government, communication and transaction services. The kind of training that they think would help them become more effective in their business is hands on training (8 votes) while only 1 voted for e-learning. 12 of them did not answer at all. When they were asked about their preferred method(s) of learning new skills and knowledge, 12 of them answered one to one training, 8 answered small group discussions and 2 answered tutor-directed study. Regarding their preferred training times for formal training sessions, most of them prefer evenings (10), some of them prefer weekends (8), while others prefer training during working hours (6). The majority (18) prefers the duration of the training to be half days. According to them, the main barrier to receiving training is the demands on time outside working hours, while some of them say that there is a lack of financial support at work.

4. Conclusions

The objective of "e-Rural Government Workshop" that took place in Chios is to study the needs of SMEs in rural areas about governmental and public services, as well as to study the degree of awareness of rural SMEs regarding existing e-government services. A number of interesting conclusions derived from this workshop. First of all it's clear that most of the SMEs representatives and organizations that participated to the workshop believe that e-government services are very important and that SMEs can benefit from them in terms of both money and time. They think that e-government services related to business management and development are very important. Most of the SMEs are using ICT for their routine duties and tasks, but only some of them are using e-



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government services. Most of them feel that they need additional training in the use of e-government, communication and transaction services. The kind of training that they think would help them become more effective in their business is hands on training while only 1 voted for e-learning. This shows that at the time there is a lack in familiarity with advanced ICT use and e-learning practices and spots a need

for a blended learning model. There is a need for innovative training models that can combine traditional forms of learning with e-learning forms. The outcomes of the project demonstrate that there is much to earn from introducing and training of the SMEs to the new world of information and transactional technologies.



The One Laptop per Child Project: Providing Children around the World with New Opportunities to Explore, Experiment and Express Themselves

Michail Bleasas
MIT Media Lab & One Laptop Per Child (OLPC), USA

"It's an education project, not a laptop project."
Nicholas Negroponte

1. The OLPC mission

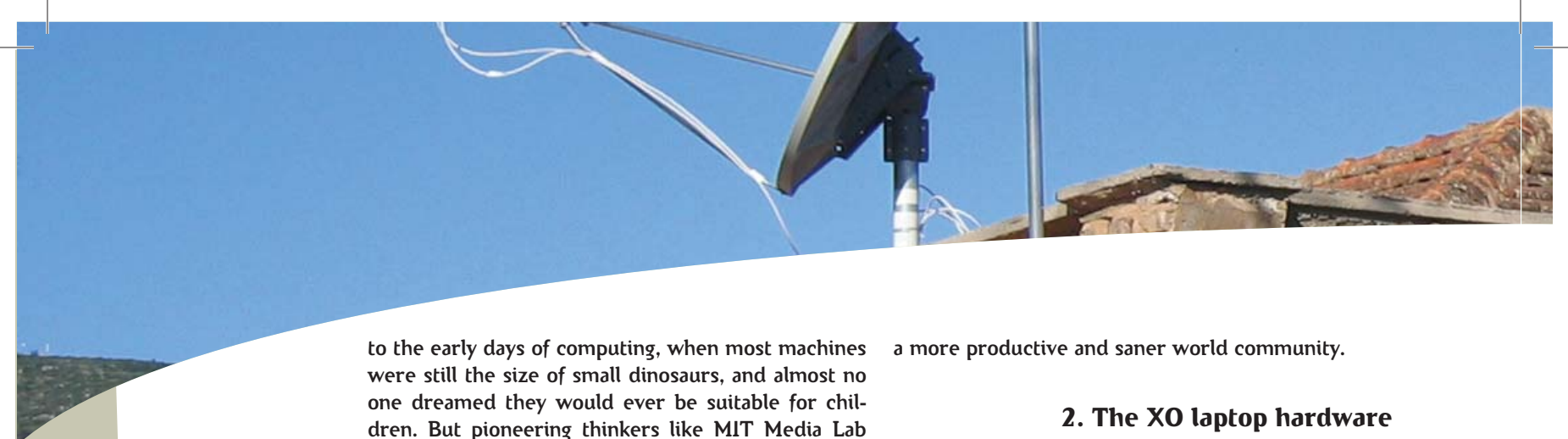
Most of the nearly two-billion children in the developing world are inadequately educated, or receive no education at all. One in three does not complete the fifth grade. The individual and societal consequences of this chronic global crisis are profound. Children are consigned to poverty and isolation—just like their parents—never knowing what the light of learning could mean in their lives. At the same time, their governments struggle to compete in a rapidly evolving, global information economy, hobbled by a vast and increasingly urban underclass that cannot support itself, much less contribute to the commonweal, because it lacks the tools to do so.

It is time to rethink this equation. Given the resources that poor countries can reasonably allocate to education—sometimes less than \$20 per year per pupil, compared to the approximately \$7500 per

pupil spent annually in the U.S.—even a doubled or redoubled national commitment to traditional education, augmented by external and private funding, would not get the job done. Moreover, experience strongly suggests that an incremental increase of “more of the same”—building schools, hiring teachers, buying books and equipment—is a laudable but insufficient response to the problem of bringing true learning possibilities to the vast numbers of children in the developing world.

Standing still is a reliable recipe for going backward. Any nation's most precious natural resource is its children. We believe the emerging world must leverage this resource by tapping into the children's innate capacities to learn, share, and create on their own. The answer of the One Laptop Per Child (OLPC) Project to that challenge is the XO laptop, a children's machine designed for “learning learning.”

The project's origins go back more than four decades



to the early days of computing, when most machines were still the size of small dinosaurs, and almost no one dreamed they would ever be suitable for children. But pioneering thinkers like MIT Media Lab Professor Seymour Papert disagreed sharply, and over time led the long march from radical theory to reality proving the immense power of the personal computer as a learning tool for children. XO embodies the theories of constructionism first developed by Seymour Papert in the 1960s, and later elaborated upon by Alan Kay, complemented by the principles articulated by Nicholas Negroponte in his book, *Being Digital*.

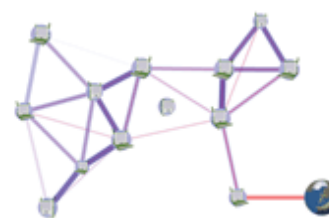
Extensively field-tested and validated among some of the poorest and most remote populations on earth, constructionism emphasizes what Papert calls “learning learning” as the fundamental educational experience. A computer uniquely fosters learning by allowing children to “think about thinking”, in ways that are otherwise impossible. Using the XO as both their window on the world, as well as a highly programmable tool for exploring it, children in emerging nations will be opened to both illimitable knowledge and to their own creative and problem-solving potential.

OLPC was founded by Nicholas Negroponte with a core of Media Lab veterans, but quickly expanded to include a wide range of exceptionally talented and dedicated people from academia, industry, the arts, business, and the open-source community. Each individual involved brings a unique skill set, and a deep personal passion, to the project.

OLPC is not, at heart, a technology program, nor is the XO a product in any conventional sense of the word. OLPC is a non-profit organization providing a means to an end—an end that sees children in even the most remote regions of the globe being given the opportunity to tap into their own potential, to be exposed to a whole world of ideas, and to contribute to

a more productive and saner world community.

2. The XO laptop hardware



The XO is a potent learning tool created expressly for the world's poorest children, living in its most remote environments. The laptop was designed collaboratively

by experts from both academia and industry, bringing to bear both extraordinary talent and many decades of collective field experience for every aspect of this nonprofit humanitarian project. The result is a unique harmony of form and function; a flexible, ultra-low-cost, power-efficient, responsive, and durable machine with which nations of the emerging world can leapfrog decades of development—immediately transforming the content and quality of their children's learning.

Design factor was a priority from the start: the laptop could not be big, heavy, fragile, ugly, dangerous, or dull. Another imperative was visual distinction. In part, the goal is to strongly appeal to XO's intended users; but the machine's distinctive appearance is also meant to discourage gray-market traffic. There is no mistaking what it is and for whom it is intended.

XO is about the size of a textbook and lighter than a lunchbox. Thanks to its flexible design and “transformer” hinge, the laptop easily assumes any of several configurations: standard laptop use, e-book reading, and gaming.

The laptop has rounded edges. The integrated handle is kid-sized, as is the sealed, rubber-membrane keyboard. The novel, dual-mode, extra-wide touchpad supports pointing, as well as drawing and writing.

XO is fully compliant with the European Union's RoHS Directive. It contains no hazardous materials. Its NiMH batteries contain no toxic heavy metals, plus it features enhanced battery management for an extended recharge-cycle lifetime. It will also tolerate alternate power-charging sources, such as car batteries.

In addition,—for use at home and where power is not available—the XO can be hand powered. It will come with at least two of three options: a crank, a pedal, or a pull-cord. It is also possible that children could have a second battery for group charging at school while they are using their laptop in class.

Experience shows that laptop components most likely to fail are the hard drive and internal connectors. Therefore, XO has no hard drive to crash and only two internal cables. For added robustness, the machine's plastic walls are 2mm thick, as opposed to the standard 1.3mm. Its mesh network antennas, which far outperform the typical laptop, double as external covers for the USB ports, which are protected internally as well. The display is also cushioned by internal "bumpers."

The estimated product lifetime is at least five years. To help ensure such durability, the machines are being subjected to factory testing to destruction, as well as in situ field testing by children.

3. The XO laptop software

XO is built from free and open-source software. Our commitment to software freedom gives children the opportunity to use their laptops on their own terms. While we do not expect every child to become a programmer, we do not want any ceiling imposed on those children who choose to modify their machines. We are using open-document formats for much the same reason: transparency is empowering. The chil-

dren—and their teachers—will have the freedom to reshape, reinvent, and reapply their software, hardware, and content.

The XO Laptop will bring children technology as a means to freedom and empowerment. The success of the project in the face of overwhelming global diversity will only be possible by embracing openness and by providing the laptop's users and developers a profound level of freedom.

As the children grow and pursue new ideas, the software and the tools need to be able to grow with them and provide a gateway to other technology.

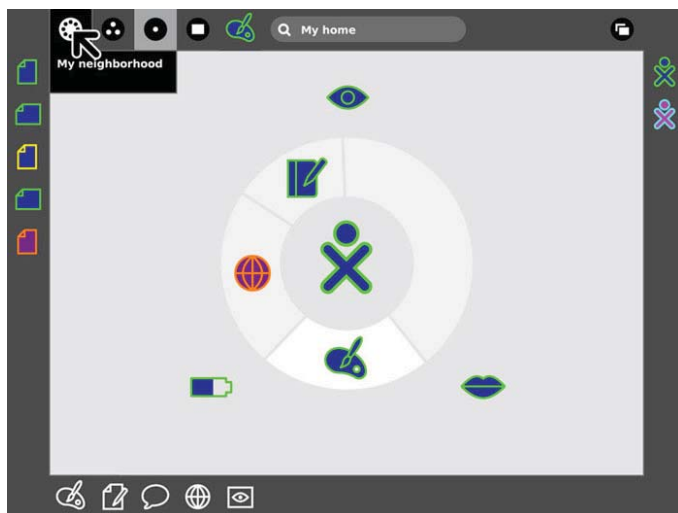
Learning is our main goal; we do not focus on computer literacy, as that is a by-product of the fluency children will gain through use of the laptop for learning. Children—especially young children—do not need to learn about IT and certainly do not need to be fluent users of WORD, EXCEL and POWERPOINT. They are not office workers. However, picking up these skills, having grown up with a laptop, will be readily accomplished.

Epistemologists from John Dewey to Paulo Freire to Seymour Papert agree that you learn through doing. This suggests that if you want more learning, you want more doing. Thus OLPC puts an emphasis on software tools for exploring and expressing, rather than instruction. Love is a better master than duty. Using the laptop as the agency for engaging children in constructing knowledge based upon their personal interests and providing them tools for sharing and critiquing these constructions will lead them to become learners and teachers.

As a matter of practicality and given the necessity to enhance performance and reliability while containing costs, XO is not burdened by the bloat of excess code, the "featureitis" that is responsible for much of the clumsiness, unreliability, and expense of many modern laptops. XO will start up in an instant and move briskly through its operations. We accomplish

this by focusing on only those features that children need for learning.

4. The XO laptop interface



The desktop metaphor is so entrenched in personal computer users' collective consciousness that it is easy to forget what a bold and radical innovation the Graphical User Interface (GUI) was and how it helped free the computer from the "professionals" who were appalled at the idea of computing for everyone.

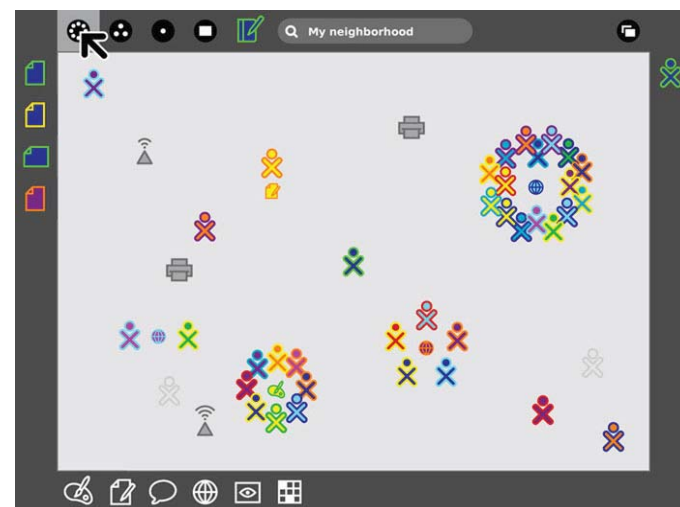
OLPC is about to revolutionize the existing concept of a computer interface.

Beginning with Seymour Papert's simple observation that children are knowledge workers like any adult, only more so, we decided they needed a user-interface tailored to their specific type of knowledge work: learning. So, working together with teams from Pentagram and Red Hat, we created SUGAR, a "zoom" interface that graphically captures their world of fel-

low learners and teachers as collaborators, emphasizing the connections within the community, among people, and their activities.

4.1 Activities

There are no software applications in the traditional sense on the laptop. The laptop focuses children around "activities." This is more than a new naming convention; it represents an intrinsic quality of the learning experience we hope the children will have when using the laptop. Activities are distinct from applications in their foci—collaboration and expression—and their implementation—journaling and iteration.



4.2 Presence

Everyone has the potential for being both a learner and a teacher. We have chosen to put collaboration at the core of the user experience in order to realize this potential. The presence of other members of the learning community will encourage children to take

responsibility for others' learning as well as their own. The exchange of ideas amongst peers can both make the learning process more engaging and stimulate critical thinking skills. We hope to encourage these types of social interaction with the laptops. In order to facilitate a collaborative learning environment, the laptops employ a mesh network that interconnects all laptops within range. By exploiting this connectivity, every activity has the potential to be a networked activity. We aspire that all activities take advantage of the mesh; any activity that is not mesh-aware should perhaps be rethought in light of connectivity. As an example, consider the web-browsing activity bundled with the laptop distribution. Normally one browses in isolation, perhaps on occasion sending a friend a favorite link. On the laptop, however, a link-sharing feature integrated into the browser activity transforms the solitary act of web-surfing into a group collaboration. Where possible, all activities should embrace the mesh and place strong focus on facilitating such collaborative processes.

4.3 Expression

Starting from the premise that we want to make use of what people already know in order to make connections to new knowledge, our approach focuses on thinking, expressing, and communicating with technology. The laptop is a “thing to think with”; we hope to make the primary activity of the children one of creative expression, in whatever form that might take. Thus, most activities will focus on the creation of some type of object, be it a drawing, a song, a story, a game, or a program. In another shift in the language used to describe the user experience, we refer to objects rather than files as the primary stuff of creative expression.

As most software developers would agree, the best way to learn how to write a program is to write one,

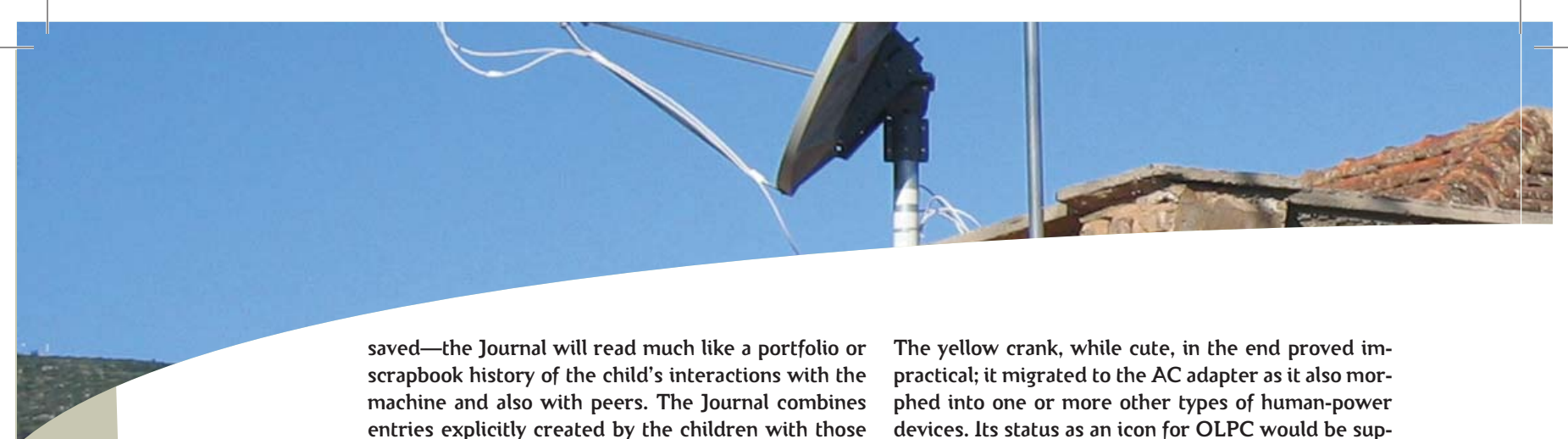
or perhaps teach someone else how to do so; studying the syntax of the language might be useful, but it doesn't teach one how to code. We hope to apply this principle of “learn through doing” to all types of creation, e.g., we emphasize composing music over downloading music. We also encourage the children to engage in the process of collaborative critique of their expressions and to iterate upon this expression as well.

The objectification of the traditional file system speaks more directly to real-world metaphors: instead of a sound file, we have an actual sound; instead of a text file, a story. In order to support this concept, activity developers may define object types and associated icons to represent them.

4.5 Journaling

The concept of the Journal, a written documentation of everyday events, is generally understood, albeit in various forms across cultures. A journal typically chronicles the activities one has done throughout the day. We have chosen to adopt a journal metaphor for the file system as our basic approach to file organization. While the underlying implementation of such a file system does not differ significantly from some of those in contemporary operating systems, it also holds less importance than the journal abstraction itself.

At its core, our journal concept embodies the idea that the file system records a history of the things a child has done, or, more specifically, the activities in which a child has participated. Its function as the store of the objects created while performing those activities is secondary, although also important. The Journal naturally lends itself to a chronological organization (although it can be tagged, searched, and sorted by a variety of means). As a record of things a child has done—not just the things a child has



saved—the Journal will read much like a portfolio or scrapbook history of the child's interactions with the machine and also with peers. The Journal combines entries explicitly created by the children with those that are implicitly created through participation in activities; developers must think carefully about how an activity integrates with the Journal more so than with a traditional file system that functions independently of an application. The activities, the objects, and the means of recording all tightly integrate to create a different kind of computer experience.

5. Laptop design evolution

As first conceived, the XO laptop display used LCOS (liquid crystal on silicon) in the form of a projector. Nicholas Negroponte demonstrated the concept in early 2005, using a set of black sticks sliding across a frame to convey some sense of how the folding optics would work.

The laptop began to evolve in June of that year, when Mary Lou Jepsen, newly named as acting CTO, began considering a dual-mode display: one a conventional color LED laptop screen, the other a sunlight-readable, black-and-white e-book. The concept made abundant sense for the developing world, where outdoor classes are common and the cost of shipping textbooks is a major expense.

At a July board meeting, Design Continuum presented an array of innovative prototype designs that would lead, by November 2005, to the famous “green machine”, with its distinctive pencil-yellow crank, which was unveiled to the world by UN Secretary General Kofi Annan at the World Summit on the Information Society at Tunis.

The yellow crank, while cute, in the end proved impractical; it migrated to the AC adapter as it also morphed into one or more other types of human-power devices. Its status as an icon for OLPC would be supplanted by the mesh-network antennas, or “ears.” At the same time, Quanta Computer, our ODM, made a strong case for fitting the laptop with a so-called transformer hinge to simplify the machine's transformations from classic laptop, to game device, to e-book reader. In the spring of 2006, Yves Behar, the noted San Francisco industrial designer, came aboard to complete the final design of the Generation-One XO.

In November of 2006, the first XO test machines, the B1 (Beta1), rolled off the Quanta assembly line in Shanghai.

In early 2007, the B2 iteration of XO, stronger, sturdier, with a slight increase in tilt, was ready for its debut. In February 2007 these B2-test machines were shipped to developers and the launch countries. In the meanwhile, the first mesh network was deployed in March 2007, and the first school server in April. B3 followed in May 2007 and we expect that pallets of B4 machines are to arrive in OLPC offices in early July 2007. Regarding the most recent additions to our user community, Peru announces in May 2007 that it will participate in OLPC, while back in January if this year Rwanda also announced that it, too, will participate in OLPC.

6. References

One Laptop per Child (OLPC), a \$100 laptop for the world's children's education. Available at www.laptop.org.

The RURAL WINGS project: Bridging rural Europe's digital divide and introducing a new learning culture to remote and isolated areas

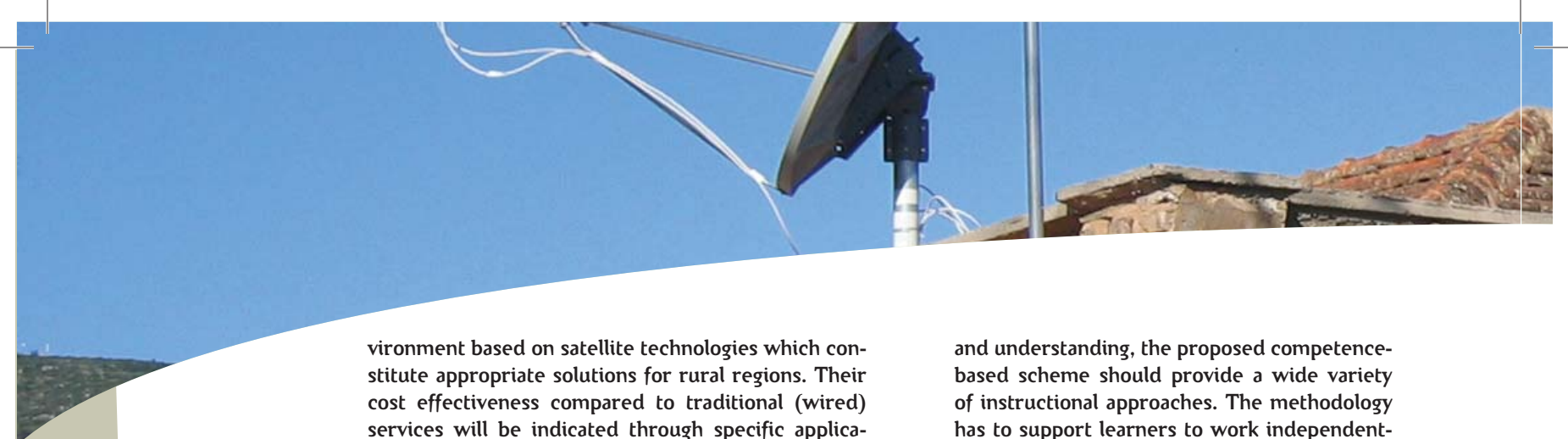
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Rural Wings is an ambitious project funded within the FP6 framework that proposes to develop an advanced learning platform through satellite DVB-RCS access technologies, promoting a user-centered methodological approach which constitutes its major innovation. The main aim of the project is to support the creation of a new culture in rural communities promoting digital literacy and reducing resistance to the use of new technologies. Rural Wings aims to offer stimulating and creative learning environments to support vibrant user communities and will attempt an extended implementation in 125 of pilot sites in 12 countries. The Rural Wings project will be implemented in Europe (Greece, Cyprus, Spain, United Kingdom, France, Switzerland, Sweden, Estonia, Romania, and Poland) in Middle East (Israel) and in Asia, (Georgia, and Armenia). The consortium consists of 25 partners that are divided in two categories, the core group of technological and pedagogical partners

(10 partners, 2 involved in the scientific coordination and management, 4 in the technological applications and 4 in the design and development of educational scenarios) and the group of additional partners (15 partners that are involved in the design and development of the technological and pedagogical applications that will be tested in the different pilot sites). Both groups include in total 12 National Coordinators that are institutions that will coordinate the project's implementation activities at national level in each of the participating countries.

Rural Wings project comes to maximize the role of ICT in lifelong and distance learning of professionals and individuals in rural or isolated areas, guaranteeing access to a wealth of information at all times so that they can carry out professional and skilled work, being no longer at disadvantage due to their geographical location. The Rural Wings project proposes to develop and implement an advanced learning en-



environment based on satellite technologies which constitute appropriate solutions for rural regions. Their cost effectiveness compared to traditional (wired) services will be indicated through specific applications that will address several and varied users communities. The project's approach will be developed along three main axes: learning at school (teachers and students), at work (professionals' communities) and at home (individual citizens)

The basic objectives of the RURAL WINGS project can be summarized to the following key points:

1. To perform an extended validation process and a usability evaluation during the development and integration to the final system of the technology, scenario settings and services that will be offered to the users
2. To create of a world-wide network of Learning Hubs in rural areas. These centers (in the initial phase schools, public offices and health centers will serve as Learning Hubs) will be equipped with the necessary infrastructure in order to support the project's implementation. These Learning Hubs pilot sites will serve as working models and demonstration sites within which the project's activities will take place
3. To introduce a new learning culture. The aim of this project is not to impose solutions but rather to empower people in all the stages of their life to invent their own solutions. The project is going to demonstrate the use of a new generation of technologies and applications that enable people to design, create, and learn in new ways, helping them to become more active participants in their communities.
4. To provide a range of learning methods that will enable users to become independent learners. The project targets several types of users. As each person has different ways of learning

and understanding, the proposed competence-based scheme should provide a wide variety of instructional approaches. The methodology has to support learners to work independently, co-operatively and in an increasingly self-organizing way.

5. Provision of eLearning tools that can be used by all members of the local community who are in need of continuous training, education and support.
6. Utilization of the ICT capabilities for promoting the local community's interests. Special attention will be given to the use of ICTs to serve the local community's goals. The use of ICTs is expected to contribute strongly to the connection of the young people's education with real life in their community.
7. Enhancement of the communication between rural communities. The aim of Rural Wings is to create a virtual learning community where people will be encouraged to communicate and will get familiarized with the idea of co-operation and networking. The Rural Wings learning environment will be, among others, an integrated communication tool. People will be able to participate to video-conferences through the Rural Wings integrated system itself, to have electronic discussions with their partners on the problems, to learn about other countries and cultures.

The Rural wings project is evolving in time following the pattern described briefly below:

- a) Initially study, in a design and integration phase, the user requirements for integrated broadband satellite services; This phase will lead to the definition of services, tools and functionalities that the educational platform will provide to its users;

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- b) Provide guidelines for quality modifications and improvements of the final broadband services, based on the user needs analysis and initial usability studies;
- c) Perform a long series of user trials organized in separate implementation phases in order to investigate how the innovative DVB/RCS satellite technology affects the users throughout the specifically developed applications and to

monitor their satisfaction from the offered integrated services

- d) Collect the results of the final usability study and the system's overall evaluation and formulate an integrated report on the possible future steps and improvements and on how the potential future users will accept the product.

The general project evolution scheme is shown in the diagram of Figure 1:

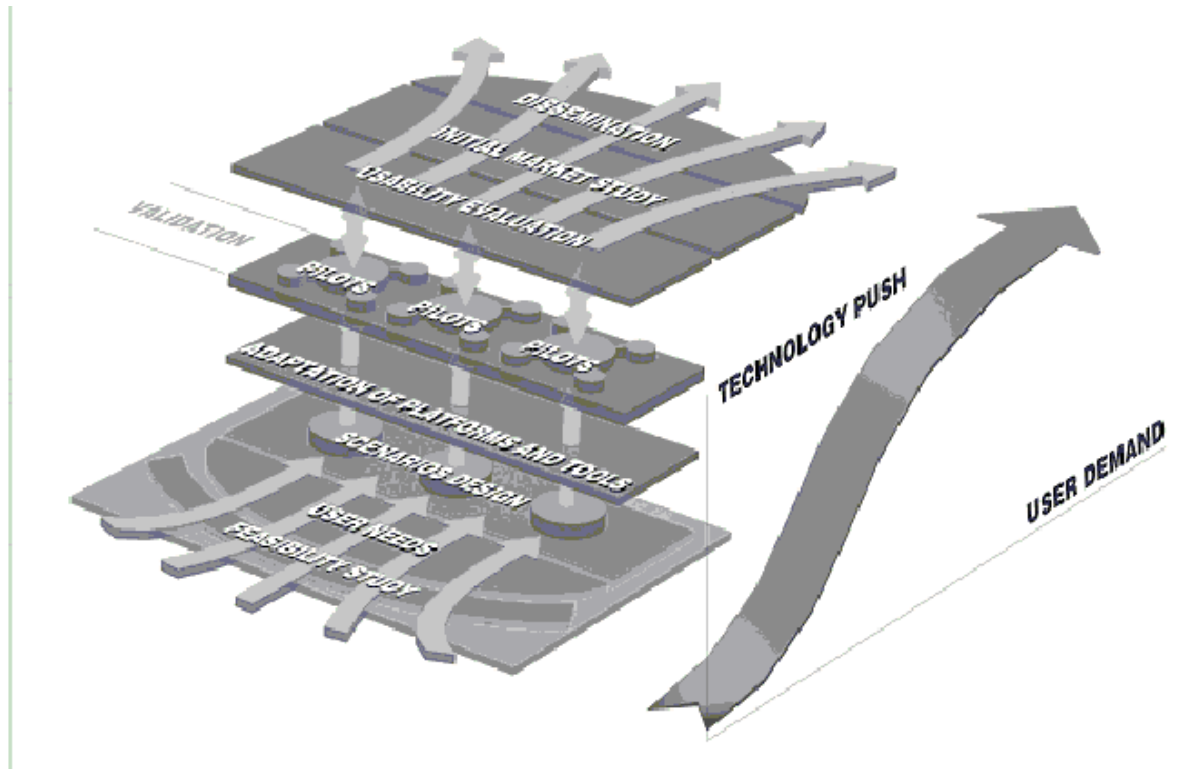


Figure 1: The project's pathway advances through a process of continuous interaction between the User Need (horizontal axis) and the Technology Push (vertical axis). The development of three families of advanced learning scenarios for different contexts (Learning at School, at Work and at Home) are the driving forces for the project's advancement and the provision of value-added services to people that live and work in rural areas.

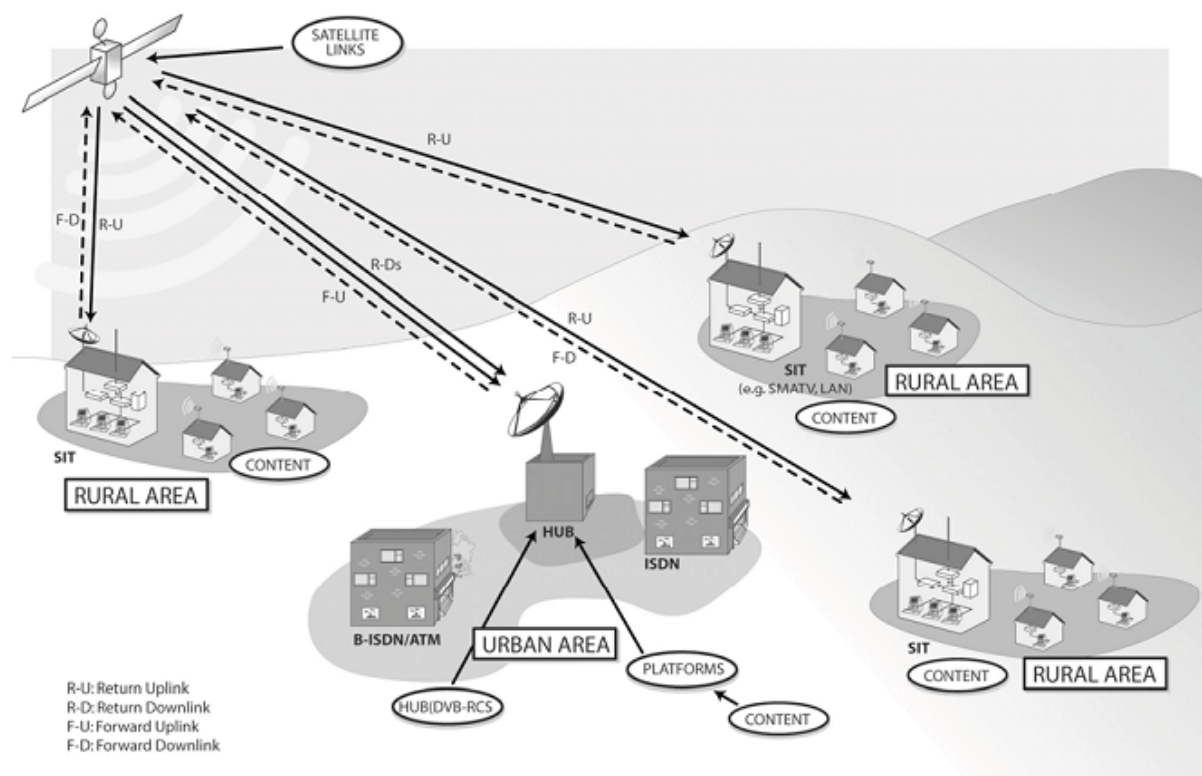


Figure 2: The Rural Wings project will launch a hybrid end-to-end satellite/terrestrial WiFi system for the provision of educational and training content to the rural communities.

The general architecture of the whole system which is proposed by the RURAL WINGS project is described by the figure 2.

In figure 2 the main nodes of the whole system are clearly defined. First there is the satellite, which receives and re-transmits the signal coming from the earth stations (end users with DVB/RCS terminals and HUBs). The satellite for the Rural Wings case will not be only one, because three satellite providers will be used (HELLASSAT, EUTELSAT and Avanti). An important node of the whole systems is the HUB.

The HUB can be regarded as the system “router” that controls and directs the satellite signals to the proper users. It is the heart of the system, situated in urban areas with direct connection to high quality Internet backbone (DSL, ADSL lines etc).

All the offered e-platforms and e-learning applications of the system and their related content is uploaded to the HUB through servers that are in the premises of the platform providers and are connected to the HUB through the Internet backbone. If the platform provider cannot be supported with a fast

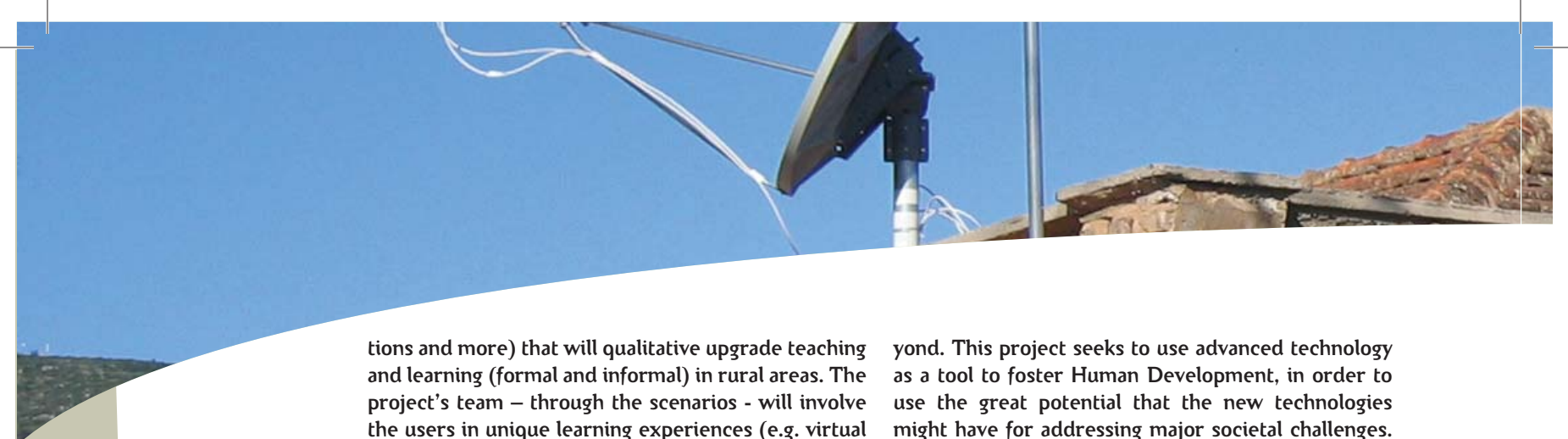


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Internet line connection to HUB for the uploading of the e-platforms and e-tools, this can be achieved through the satellite system itself with the use of a DVB/RCS terminal. In RURAL WINGS project there are two platform providers (DBC with its Web TV applications and FOURIER with its remote experiments applications that use this option)

The third nodes of the system are the end users. These are the rural areas which are remote /isolated and scarce areas with poor or complete lack of Internet connectivity. These rural areas (villages, houses etc) are the pilot sites of the Rural Wings project. In the pilot sites the key node of the system is the so-called “learning hub”. The learning hub is the centre for the Rural Wings project tele-education activities. It consists of the DVB/RCS terminal and its antenna which is the “door” for the flow of information from the outer world. In the same physical area LAN networks of PCs can be connected to the DVB/RCS terminal, which will enable all the interested users to connect to the rest of the world. The “learning hub” is the centre of learning activity and the technical node of the pilot site. Around the learning hub and in a radius of up to 3-4 Km, independent users (not directly located to the “learning hub” premises) can be directly connected to the “learning hub” with the use of a simple PC, a WiFi receiver equipment and a small WiFi antenna. If there are physical obstacles between the “learning hub” and the independent users then the use of WiFi repeaters are also included in the system’s local architecture. Based on the project’s scheduling and available resources WiFis will be used selectively in a limited number of sites according to their needs and their geographical morphology (in 25 out of 125 sites). In the rest of the cases there could be architectures involving only the “learning hub”, or architectures in which the independent users will be connected to the “learning hub” through the LAN network alternatively.

The main outcome of the Rural Wings project will be the development of a cognitive-based open learning system and environment (adapted to individual learners’ needs) that can generate creativity and a capacity of learning to learn among the users, through the development of a new learning culture. It will offer to the users (students, teachers, doctors and health personnel, farmers, local administrators and public authorities) ubiquitous access to the learning content. The Rural Wings learning environment will be developed through the effective utilization of a wide range of ICT applications for educational purposes (e.g. Training sessions, WebTV channel for students, virtual visits to museums, science centers, research laboratories, telescopes, seminars for sustainable development or agro-tourism) based on a participatory methodology in which users will play a very active role in creating additional components, through the creative use of constructionist principles and related ICT technologies. The Rural Wings learning environment will also support the exchange of material between users and experts, it will allow for easy uploads and downloads of relevant material, it will facilitate the direct communication between the users and the networking activities of all the actors involved. Such a service offers high-speed two-way connection (e.g. 1Mbps/512kbps) that gives the opportunity to deliver content utilizing completely the capabilities of multimedia tools. Video streaming (high quality in specific cases) broadcasted by the selected training centers can be delivered to users at school, at work or at home. Real-time on-line seminars can be realized in this way, while the users will have the opportunity to download simultaneously educational and training material and supporting documents or software according to their needs. Concluding the Rural Wings learning environment is expected to provide access to the scientific and cultural heritage resources (museums, science centers, research laboratories, collec-



tions and more) that will qualitative upgrade teaching and learning (formal and informal) in rural areas. The project's team – through the scenarios - will involve the users in unique learning experiences (e.g. virtual tours, interactive exhibitions) in order to introduce them in the new learning culture.

It is evident that all the above described activities cannot be performed without a well designed and properly supported implementation plan. In this implementation plan that will be realized in three phases (test runs and phase A and B final runs) lasting approximately 24 months in total, the National Coordinators have a very strategic role to play. The role of the National Coordinators is considered as one of the key factors for the successful implementation of the project, as they will be invited to play the role of a Change Agent operating in a realistic interactive context. That is, they will be in charge of driving change in the group/community by first diagnosing and understanding the context and players and then trying to 'convince' them. In this respect the project's learning hubs will serve as working models and demonstrators, where all the project related implementation activities will be realized.

Concluding the Rural Wings project aims to perform a wide-scale validation of the use of satellite technology for educational purposes. The objective will be to select the most appropriate wireless access applications, placing also emphasis on ESA developed applications, and to propose a roadmap up to the operational status including technical developments and demonstrations within the project's framework. In this way it is hoped to promote and facilitate the use of satellite communications over Europe and be-

yond. This project seeks to use advanced technology as a tool to foster Human Development, in order to use the great potential that the new technologies might have for addressing major societal challenges. The success of the new technological applications depends heavily on the acceptance of the end-user. The Rural Wings project will add its contribution towards this direction and will act as a change agent in charge of driving change in the community of users, i.e. first diagnosing and understanding the 'players' and their context and then trying to 'convince' them. The RURAL WINGS consortium will deploy a series of scenarios that will be addressed to a range of users (students, teachers, doctors and health personnel, farmers, local administrators and public authorities), in different learning contexts (school, work and home) and that will touch upon a range of subjects from different perspectives. This is vital for building user awareness and clarifying user requirements. Initial "hand-holding" with the users' groups encourages them and helps to build trust and confidence vis-a-vis to the use of technologies.

The approach of the Rural Wings aims to put together the private sector (ICT and SatCom companies) and the civil society (rural communities), in order to develop pilot initiatives that are grounded to the needs of different local users' communities and can be integrated into the local economy to ensure sustainability. Leveraging the experience gained from such pilot applications it is expected that in turn will affect changes in government policies and laws that will encourage and support the effective implementation of a universal satellite broadband service encompassing and benefiting all the population.

Creation of Telecenters to Support Learning, Entrepreneurship and Access to Information Society, in Isolated Areas: The TELEACCESS Project

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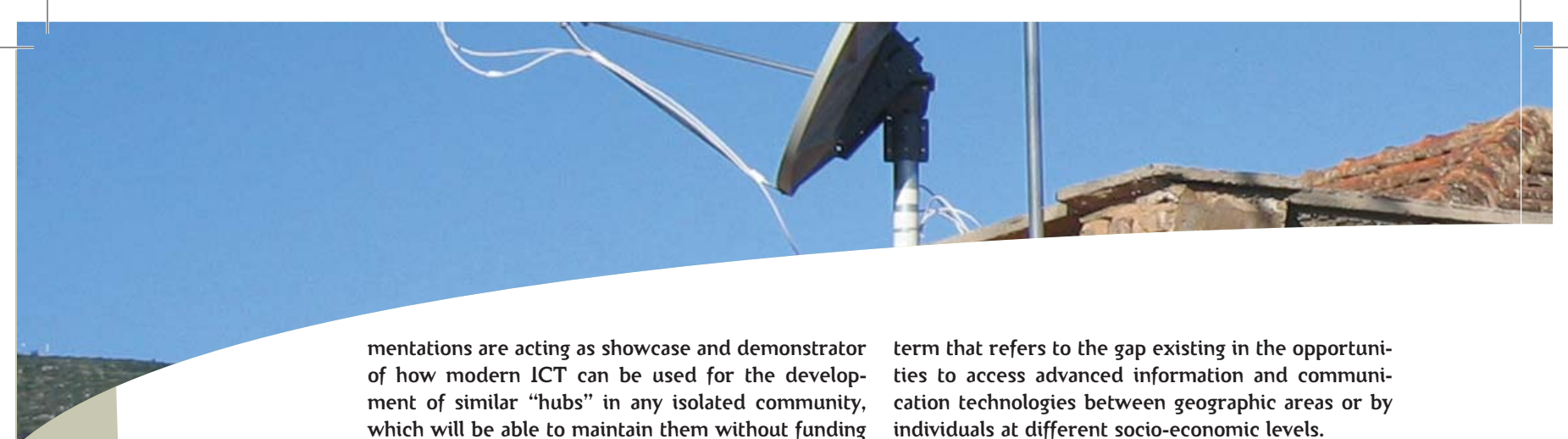
1. Introduction

The presented work examines the ways in order to foster digital culture among citizens within disadvantaged areas by demonstrating initiatives to bridge the digital divide through advanced broadband telecommunications providing access to the Info- Society. Existing local establishments can be turned into local learning hubs, which provide the local labour force and citizens of all ages with fast Internet access and opportunities for lifelong learning creativity and development. We present the showcase of Teleaccess project (funded under Interreg IIIB CADSES European Union Initiative) which addresses the use of Telecenters in order to deal with the digital divide problem in disadvantaged territories.

Users are involved in the creation or adaptation of applications specifically addressing their own needs, so that their perception of their problems leads the activity and not imposed solutions. Actual implementation is based on analyses of user needs, cost/benefit of technological options, compatibility with national strategies, and identified best practices.

The final result will be that local beneficiaries are discovering new opportunities for covering diverse needs and aspirations e.g. by selling their products and services over the web; by promoting their area as a tourist destination or as a site of cultural interest; or by exploiting rich lifelong learning resources available through the internet as students, employees or entrepreneurs. The Teleaccess project pilot imple-

**We define as "telecenter" a place that enables and promotes the Information Society; uses and develops ICTs, and provides support services or advice to SMEs and the community; focuses on work-related activities and professional activities including services for social groups.*



mentations are acting as showcase and demonstrator of how modern ICT can be used for the development of similar “hubs” in any isolated community, which will be able to maintain them without funding by sharing responsibility and imitative amongst local users. Thus a practical and easy to apply solution is offered to all remote communities in their struggle for equal opportunities for learning, economic and social development, and a more democratic access to the Info-Society.

2. Digital Divide and disadvantaged communities

Within the last 10 years despite the spread of World Wide Web, the Internet has become one of the most valuable and effective communications media and the most inclusive source of information. ICT has been realised as a major factor for regional and sustainable development. ICT presents opportunities to resolve traditional trade-offs among economic growth, the environment and social cohesion. Equally, there is the opportunity to integrate sustainability criteria into the Information Society at an early stage in its development, maximizing the social and environmental opportunities of ICT and mitigating its adverse impacts (Forum for the future, 2002). The effective use of ICT is proven to be mandatory for effective and balanced development, horizontally in all economic and social sectors and activities (e.g. commerce, tourism, health, agriculture, government, education, job creation, culture, environmental preservation, crisis management etc). However, in many cases the difficulties of establishing universal effective access could serve to reinforce current patterns of social exclusion and produce barriers to balanced development instead of supporting it. World widely there is a rising concern over the so-called “digital divide” – a

term that refers to the gap existing in the opportunities to access advanced information and communication technologies between geographic areas or by individuals at different socio-economic levels.

The key factors leading to the digital divide are:

- Missing infrastructure or access
- Missing incentives to use ICTs
- Lack of the computer literacy or skills necessary to take part in the information society
- Poverty and social exclusion

Most countries that have been concerned about this problem have instituted policies aimed at reducing aspects of it. For example, the EU launched the e-Europe initiative to accelerate the uptake of ICT across Europe and to ensure that all Europeans have the necessary skills to use them. E-Europe focuses on the social and regional aspects but also on technological aspects such as the provision of ICT services on multiple devices or platforms other than the PC -digital TV, satellite, third generation mobile phones, etc.- (Xavier, 2001).

The world widely experience shows the several specialized initiatives needed for disadvantaged areas in order to anticipate expansion of current digital divide and at the same time provides solutions to deal with the actual problem.

In USA (Closing the Digital Divide in Rural Communities, 2001), (Courtright & Robbin, 2001) several initiatives have been funded within the last years in order to deal with the digital divide problem in general and its’ wide spread in rural communities in particular. Some selected successful ones are presented below.

- The department of agriculture initiated a fund available for advanced telecommunications infrastructure in rural communities and the department of housing created an initiative to help establish computer-learning centres.
- The state of Illinois (Xavier, 2001) utilized a



Bridging the digital gap

legislation which makes it easier for technology providers to access grants from a specific Digital Divide Elimination Infrastructure Fund.

The Canadian government is also placing primary reliance on market forces while committing, “where market forces fail to provide a minimum level of access, to step in to ensure affordable access to essential services for all Canadians, regardless of their income or geographic location” (Bridging the “Digital Divide”, 2001).

In Europe (Bridging the “Digital Divide”, 2001), (The Digital Divide in Austria, 2000) several efforts have been given within the last years in the direction of dealing with the rural digital divide problem. The UK government’s policy stance is typical in pronouncing a long-term strategy for developing Internet access, while placing primary reliance on market competition. Rapid rollout of high bandwidth communication networks, providing fast ‘always-on’ connections directly to business premises, homes and public access points in libraries and similar community institutions is a key objective of the Government. In Austria several initiatives aim to deal with the digital divide in any of its occurrences and types. An example of an effective initiative especially for rural communities is the Lower Austria case which utilized the so-called “Infopoints” in each community and a “Service point” in each district head office to offer an easier access to information for citizens and tourists via Internet.

Most of the effective solutions presented above, focused directly on ensuring access to technology; the majority of access-based successful initiative also involved training. However, especially for the case of businesses and citizens in rural communities there is an additional need for the provision of cost-effective, reliable access to the information superhighway. The most important lesson is that there is an absolute necessity to work on, access, training, and contents at the same time to promote access to In-


ternet. The experience is showing that in order to achieve these goals for disadvantaged (isolated, rural etc) communities we cannot based on households infrastructures. Of course there is a need to work for achieving “broadband at home” but for the case of citizens, lacking on literacy and motivation, the first steps must be supported from the local public administration using its infrastructures and capabilities (see infopoints example in Austria). The presented work is giving a showcase on how to plan and organize such specialized support activities.

3. The “Teleaccess” project showcase

3.1 In General

The Teleaccess project is funded under the Interreg III B CADSES program. INTERREG is an EU Community initiative aiming to stimulate interregional cooperation. It is financed under the European Regional Development Fund (ERDF). It is designed to strengthen economic and social cohesion in the European Union (EU) by promoting cross-border (strand A), trans-national (strand B) and interregional (strand C) co-operation. With INTERREG, interregional co-operation between regional and other public authorities across the entire EU territory and neighbouring countries is promoted. The overall aim is to improve the effectiveness of regional development policies and instruments through large-scale information exchange and sharing of experience in a structured way.

Taking into account the cohesion policy, Lisbon Strategy, Kok reports (Lisbon Agenda), (“Facing the challenge”, 2004) the participating partners willing to attempt to share their expertise to formulate a detailed plan on how disadvantaged regions can overcome their problems in the field of Information So-



ciety, aiming at the development of competitiveness for the regions and better integration of the New Member States.

For more than 14M European households in remote areas (with high proportions in Eastern Europe) the digital divide is growing, despite many Programmes focusing on this issue. A more concentrated and coherent approach is needed, such as the one offered by the proposed project, so that a common plan is achieved for coordinated development efforts relating to providing access for all to Information Society.

3.1.1 The Partnership

The consortium has been organised in a way to assure project's effective implementation. The Lead Partner (RACTI) has significant expertise in the area of E-services and managing erdf projects (important for its role as project coordinator). All partners have significant expertise in Eu projects and in the same time either: acting as final beneficiaries for telecenters application or/and having technical and organisational expertise on how telecenters can be established and used to help local communities.

The consortium include (apart from the lead partner):

- Municipality of Alonnisos (Greece)
- Municipality of Dymi (Greece)
- EllinoGermanikiAgogi (Greece)
- Umbria Region (Italy)
- Sviluppo Marche (Italy)
- Department for Information and Publishing of Italian Prsedincy Council
- Media Design Center of TU Dresden (Germany)
- Progress and Business Foundation (Poland)
- Recreation and Development Union (Bulgaria)
- Central administrative office of e-Croatia

3.1.2 Objectives

The overall long term objectives of the project can summarised as follows:

- To utilize advanced broadband telecommunications to provide participated areas with access to InfoSociety,
- Improving the availability to citizens of enhanced IT-enabled services;
- To encourage the creation of a digital culture among citizens of the participated regions and bridge the widening digital divide, by supporting its isolated communities to produce their own local information and content based services, offering them lifelong learning opportunities harmonised with spatial policies and promoting their local identity;
- To provide the initial local telecomm infrastructure, which will catalyse economic activity, mobilizing local resources and attracting external investment, towards a sustainable and comprehensive rural development;
- To encourage further projects and cooperation in different fields;
- To reinforce competitiveness in the participated regions;
- To support isolated areas in emergency situations;

3.1.3 Activities

TELEACCESS is piloting the telecenter concept in selected sites in the participating regions. The pilots adapt best practices according to local analyses (user needs, cost/benefit of options, compatibility with national strategies). This background work will take the form of an evaluation of the specific needs of the participating remote areas, as well as an evaluation of the use of telecenters for each site. Pilot work includes

a plan for the creation of the telecenters, design and development of applications offered, pilot operation, as well as a concrete plan for sustainable operation after the end of the project. Future action will also be decided and formulated through networking and exchanges in the participating regions.

The services to be offered by the telecenters are:

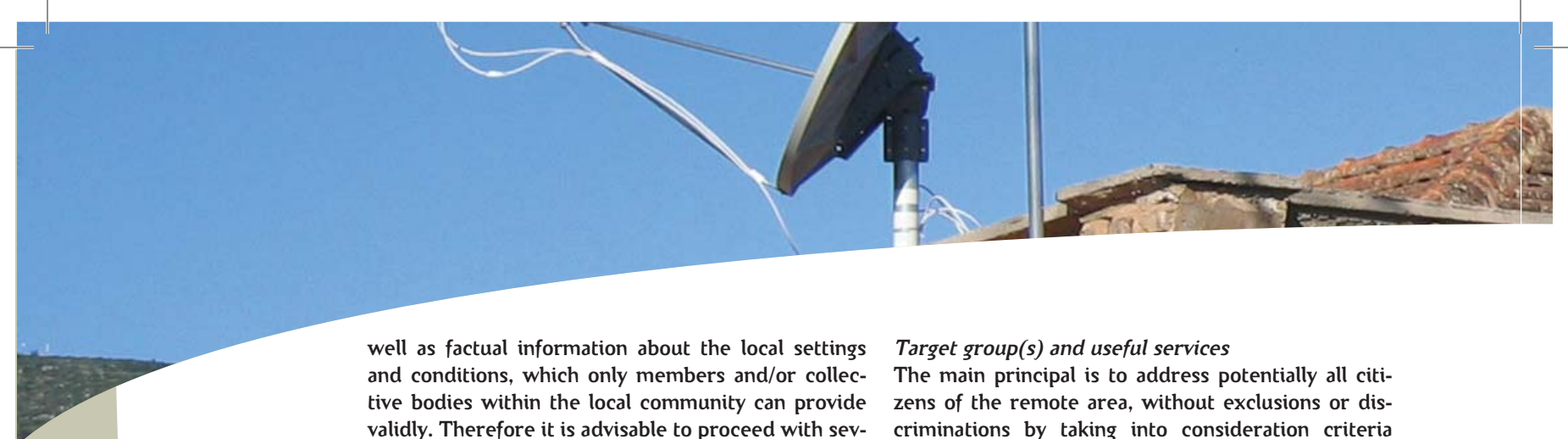
- Training
- E-services
- Info-points
- Consultancy
- Business support services
- Specialised Broadband service

It has to be pointed out that TELEACCESS does not intend to create new institutional structures, which would antagonize institutions already existing in remote rural communities of the participated regions. On the contrary, the aim is to utilize existing structures and enhance their contribution to spatial development, while local influential authorities (teachers, doctors, administrators) are advanced to change agents tackling rural skepticism towards technological innovation. In premises such as public offices, a Telecenter will be set up which will serve as the gateway of the community to knowledge and the Info-Society. Each Telecenter will serve each area's needs. The Telecenter will not resemble any of the existing institutional structures, in that it will function as a "hub" offering opportunities for learning, creativity and development to all members of the local community, through activities as diverse as an agricultural e-shop, a web-based local TV channel, a virtual school laboratory, cultural heritage e-promotion, etc. It will offer considerable added value, by revitalizing the community as a place fostering civic development, entrepreneurship, lifelong learning, digital creation, human spirit, and collective efficiency. The Telecen-

ters will be equipped with the necessary infrastructure to serve as working models and demonstration sites, showing that the proposed hubs will not emulate traditional training and information centers. The tools available will be wide ranging, from broadband access, computers, digital cameras and a variety of supportive software tools. The project seeks to safeguard coordination of this initiative with the existing institutional framework, by including spatial development agents in the consortium, and through active networking and dissemination of the project idea in all participating regions. No work will be duplicated, as the project will encourage local institutions to undertake new developmental activities and initiatives, which fall well beyond their current provisions to the rural communities. In addition, the proposed Telecenters are considered as viable and sustainable entities in a long-term perspective. Project activities include focused analyses at the local level, as well as encouraging the development of local motivation and know-how for innovation, which will help regional and local to develop feasibility studies and business plans for sustainable localized implementations of Telecenters, and initiate further future projects.

3.2 Activities until now

Until now, within its first year of implementation, the Teleaccess project presented a methodology for the creation of telecenters in digitally disadvantaged areas. This methodology is meant as a flexible, locally customizable tool that provides help in identifying all those parameters and issues that need to be taken into account when an initiative sets out to establish a local mechanism, aiming to address real local needs. All efforts to provide local Information Society solutions need to take primarily into consideration the local perceptions of the needs of the community, as



well as factual information about the local settings and conditions, which only members and/or collective bodies within the local community can provide validly. Therefore it is advisable to proceed with several steps which will all include the local community. The first step had to be the collection of needs and problems in relation with the use of new ICTs. The scope of this initial field work was to help identify the characteristics of the local rural territories, on the following sectors:

1. Strategic background and community needs (administration model, relation with national and regional strategies, current useful services, potential useful services for the local groups)
2. Economic situation (main economical activities and problems)
3. Geographical description
4. Internet penetration (for business and at home)
5. Additional problems (situation on computer literacy, and motivation on using new ICTs)
6. Existing mechanisms to support the use of new ICTS in the territory (What kind, What they are offering, Problems, Positive impact)

Based on this initial work, the next step had to include the identification of:

- o Where to create a telecenter in order to cover the needs and provide solutions
- o By Whom and How (local force to operate it and how will organize it)

In this next step it was important to run a small-scale survey, to ask the local community, possibly through the completion of a questionnaire by an informed local agent (or more than one, if appropriate), about issues such as the following:

Target group(s) and useful services

The main principal is to address potentially all citizens of the remote area, without exclusions or discriminations by taking into consideration criteria such as geographical disadvantage, remoteness, and digital exclusion. For each of the chosen groups of users, the local informant should give a description concerning their current problems which can be solved, and needs which can be covered. It is also necessary to take into account any local sensitivity to certain issues, which could have an impact on the successful deployment of e-services and applications in the telecenter.

Existing premises and equipment that could be used for the telecenter

One of the major issues for the establishment of a telecenter is the identification of the appropriate place for it. RACTI's methodology lies on the principal that the telecenters in rural areas do not need new buildings, as already existing local entities can host such new developments. Therefore, an issue of priority is to locate and describe existing premises within the area in which the telecenter is to be established, which could be used for this purpose. It is also advisable to think of all possible existing equipment which they think could be used. A list of equipment should be compiled, with as a detailed description of specifications as possible. Possible needs for upgrades to the existing equipment should also be recorded.

Local structures which can operate and / or support the telecenter

The success or not will greatly depend on local organisations and institutions in the area of the planned telecenter that may be interested in using and/or supporting the telecenter.

Existing broadband connectivity

For the different internet connection technologies, such as DSL, wireless, satellite, etc., a clear understanding should be established of issues such as availability of the technology in the area of the telecenter, the extent of its use, its costs, average waiting time and cost for its installation.

Establishment plan and actual establishment

The information on all the above issues that will be gathered needs to be considered and analysed coherently, leading to an informed decision of the kind of telecenter that should be established in this specific area, the services to be offered, the needed infrastructure, the appropriate time and synergies for its creation, as well as to an overall initial estimation of actions to be taken and their timing.

In the following paragraphs we briefly present the case of three territories in which we tested the methodology and come up with a concrete plan for the creation of telecenters to cover their specific needs.. These territories include isolated rural areas with strong digital divide problem occurrence and low level of computer literacy and new technologies use motivation, therefore the utilization of “telecenters” was decided as useful for the initial “push”. Each case was different and led to different results after the application of the methodology.

3.3 The case of Dymi

The first case involves a rural Municipal area in Western Greece, called Dymi. Municipality of DYMI is a Local Government which belongs to the Region of Western Greece. In order to deal with the current Digital Divide problem the municipality is based on the national strategy for the Information Society. However, the effective application of new ICT in Dymi has been slow because of the lack of cooperation be-

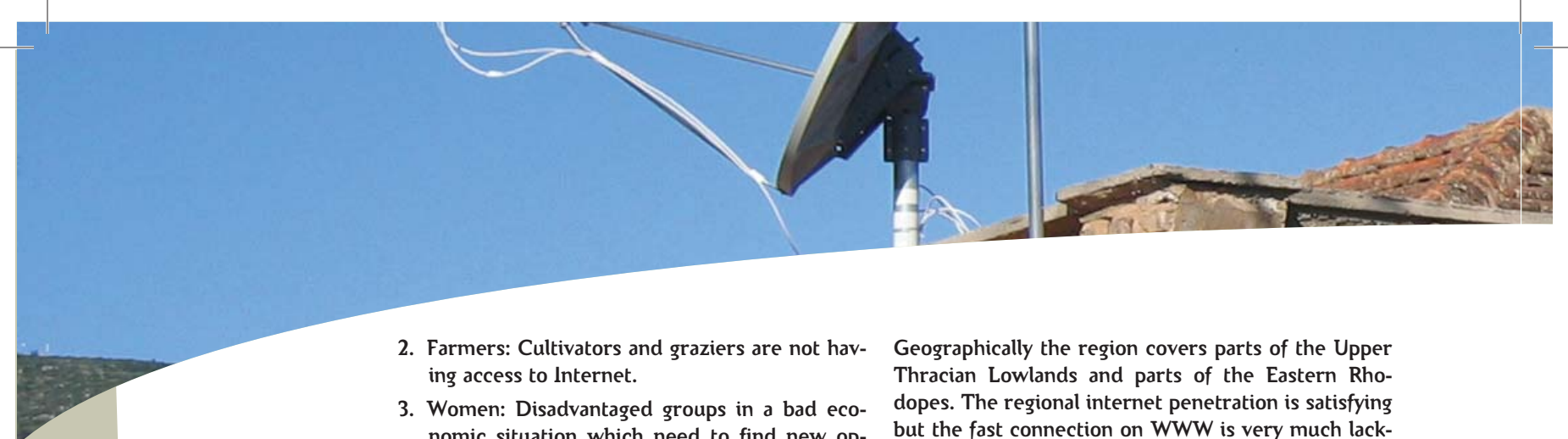
tween the state, the private sector and the citizens and the lack of strong motivation for the local people. Although internet access and basic e-services are accepted as very useful for the local development, the outcomes until now are not satisfying. The internet penetration is very low, especially in the distant rural areas, the computer skills are less than basic and the majority of internet users have low connection.

The municipality administration has identified that the establishment of a telecenter will contribute positively to the bluntness of the digital «divide problem». Until now there are no telecenters existing in the territory, focused in distant rural businesses (which are the ones lacking much more behind). The only related info-centers are private owned training centers and public e-services offices. All these are very much specialized and not focused on the problems of local rural businesses. Based on the above outcomes of the initial research work, the municipality took the decision to establish a telecenter within the local Public Support office (KEP) of the municipality. In that way it will be possible to cover the needs of users and enhance their computer literacy providing them with an opportunity to get in touch with new technologies applications and services. From that point, a second detailed study carried out in order to:

- produce conclusions on which services will have to be delivered and for which target groups
- fully specify the current infrastructure situation and the additional needs in order to effectively operate the telecenter

The user groups that identified as the ones lacking more behind, and their specific needs in relation with new ICTs effective use were:

1. Tourists: There are no info points to help them access information. A telecenter can give them such opportunity.

- 
2. Farmers: Cultivators and graziers are not having access to Internet.
 3. Women: Disadvantaged groups in a bad economic situation which need to find new opportunities.

3.4 The case of Umbria

The second case involved the regional area of Umbria in Italy. It is administered by a regional government, including several municipal rural areas. Its economy is based on four strong lines: manufacturing, handicrafts, agricultural, and tourism. Weakness points are the deficiency of infrastructures, the disequilibria related to geographical characters, social economy and environment. Positive elements can have an effect on the region, such as an uncontaminated environment, a cultural heritage as basis for tourism, social cohesion: an almost good quality of life, which can become unsustainable, without the development of new ICT. The decision of the regional government was to establish 3 telecenters in respective region's municipalities. These telecenters will act as innovation learning hubs to help the people from the nearby territories having an easy way to effectively use new technologies (which now are not used). Each one will focus on different target group and will provide different services based on the specific needs within each group. All of them will be established using of existing infrastructure of the respective municipalities, having the administrative support of the regional government.

3.5 The case of Haskovo

The later case involves the Haskovo region in Bulgaria. Haskovo region is situated in central part of South Bulgaria. The population is 270 096 people. 70.6% of the population live in cities and 29.4% in the villages.

Geographically the region covers parts of the Upper Thracian Lowlands and parts of the Eastern Rhodopes. The regional internet penetration is satisfying but the fast connection on WWW is very much lacking behind and therefore there is no effective use of specialised new ICT applications. The digital divide is much stronger in the small settlements. The basic national initiative in order to deal with the problem ("e-Bulgaria") unites all national programmes and projects in the area of ICT. Coordination for the implementation until now is not efficient therefore the region has decided to utilize 2 telecenters in order to help specific small municipalities with increased Digital Divide situation.

Mineralni bani is a rural municipality with population is 7000 people who are employed in agriculture, light industry and tourism. On the territory of the municipality there are no big industrial enterprises, which is one of the reasons for the high rate of unemployment. Stambolovo Municipality is a rural municipality with most of its settlements having population under 300 people. For the last few years there has been an intensive migration. The economy of the municipality is concentrated mainly in the municipal center. The communication services are limited. Existing telecenters within Haskovo are until now very few, public owned, situated in the capital and other big cities of the region, and they provide a very limited set of services. The additional ones which will be established within Mineralni and Stambolovo will focus on local businessmen and they will provide specialized e-services and consultancy/training on ICT. The further contribution of the two additional telecenters to the development of the region will be sought in several directions:

- economic impact (percentage of (youth) employment; percentage of successful job searches, household engaged in small enterprises, increased number of markets for buying and

selling)

- social impact (percentage of specialists residing in the community, opportunities for distance and life-long learning)
- Impact on local organizations (networking, sharing information with similar organizations, participation in discussion groups).

3.6 Next steps within the Project

The next step within the next 12 months will be the assessment of telecenters operation results and how these are connected with the local situation and needs with a final aim to create a concrete project handbook including:

- viability plan for the pilot telecenters
- guidelines for the creation of telecenters as support mechanisms to overcome the digital divide problem of disadvantaged territories.

4 Conclusions

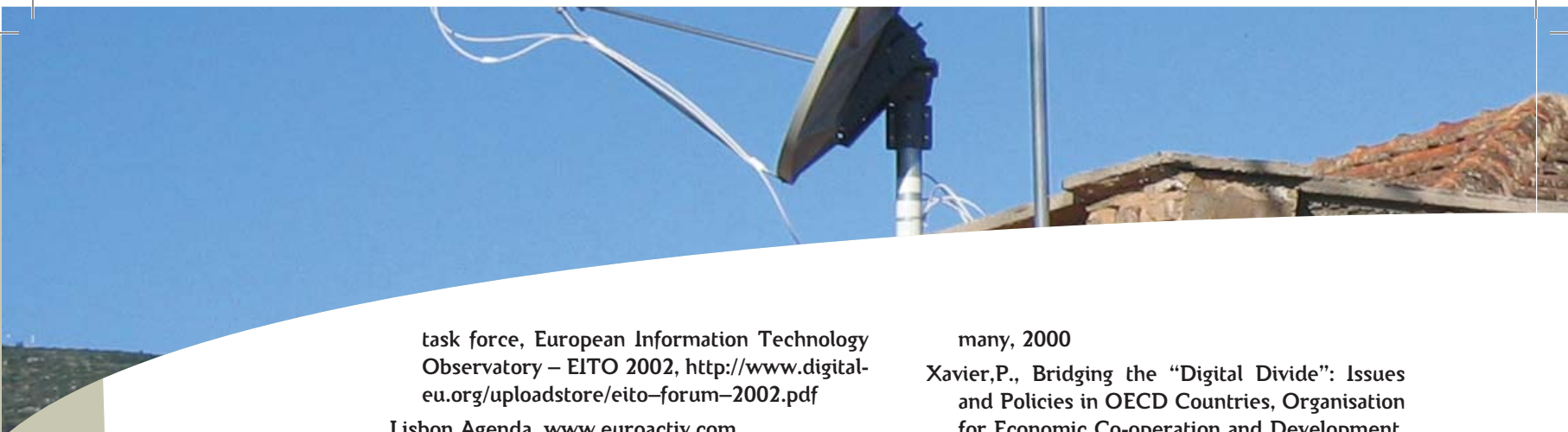
As mentioned earlier within this paper, the key factors leading to the digital divide are: Missing infrastructure or access, Missing incentives to use ICTs, Lack of the computer literacy or skills, Poverty and social exclusion. These barriers are very difficult to overcome within rural territories (especially distant isolated ones) and therefore the solution for these cases must include apart from traditional efforts (establish the needed infrastructure and provide financial help in order to have access) some additional support ones from the local actors (administrations, business chambers etc). The experience until now showed that a helpful initiative towards this direction can be the creation of local “learning hub” (telecenters) which will act as a lever to promote and support the use of information society from all local

people within a territory lacking motivation and opportunities to acquire it.

However, this establishment of telecenters is not effective by its own. It has to be supported and sustained actively by local stakeholders and it has also to be based on the actual local needs and situation. With the Teleaccess project we propose a methodology in order to create telecenters fully customised based on the specific economic situation, existing barriers and problems, and local users needs. We presented the steps of the application of this methodology in several local communities in Greece, Italy and Bulgaria in order to establish local telecenters and how this led to different solutions (different kind of telecenters, by different kind of local stakeholders, providing different services to several local groups).

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Interactive Services and Scenario Specifications for Satellite-enabled Education

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1. Introduction

This paper describes satellite-based education scenarios designed to provide innovative and efficient tele-education solutions to geographically dispersed communities that would otherwise be excluded from the ongoing progress in the area of tele-education and e-learning. By doing so, we do not only provide faster broadband access possibilities offered by the satellite technologies to previously isolated communities, but also enable the use of innovative content and efficient tele-education platforms by these communities, so that they can actively participate in an exchange of knowledge that is crucial for building a knowledge economy.

The structure of this paper is as follows: Section 2 presents an overview of distance learning systems; Section 3 describes three satellite network architectures that can be used for electronic learning purposes; Section 4 describes in detail the core satellite-enabled tele-education scenarios and their ob-

jectives. Section 5 details the services required for the implementation of satellite-based education scenarios described previously. Finally, Section 6 draws the conclusions from this study.

2. Distance learning technologies

According to Kaplan-Leiserson [1] e-Learning is defined as a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM, and more. In this view, e-Learning subsumes all available delivery and distribution methods, including wired and wireless technologies such as mobile phones and mobile terminals, to disseminate learning content and materials.

e-Learning can be decomposed into three core com-

ponents (Contents, Services and Technologies) as depicted in Figure 1 [2].

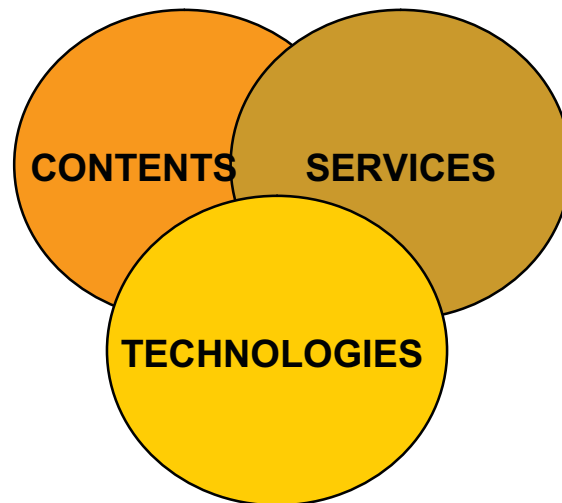


Figure 1: e-Learning components [2]

The Contents are the learning materials that can be re-used; the Technologies are the underlying tools that enable access to these learning materials; and the Services refer to the support given to the users (learners), such as assignments, tutorials, course management etc.

Thus, an e-Learning system integrates all three components by utilizing the following:

A Learning Management Systems (LMS) makes up the infrastructure of an e-learning system. LMS are dynamic platforms that support the tracking of users (learners), assessing performance, deployment of content, providing administrative functions such as access to user records, as well as providing an environment for chat rooms, forum-type discussions, and synchronous learning environments [3][4].

A Learning Content Management System (LCMS) is a collaborative authoring environment for creating

and maintaining learning content. Within the LCMS, workflow processes can be activated to coordinate collaborative authoring of learning content. Subject experts and tutors use the LCMS to develop content while media developers could add interactive materials and multimedia elements. Finally, course directors would use the LCMS to review and approve the submitted objects.

An e-Learning portal functions as an entry platform for the course content itself, and for other features such as learning management systems and authoring environments. It is important for the portal to be well organized, easy to navigate, and personalized to the learner, if possible. Personalized learning portals interface can provide many resources to users such as user (learners) progress information, development plans, courses taken in the past and those in present, appropriate news releases, announcing upcoming seminars and events, and access to learning communities [4].

A Learning Object Metadata (LOM) is any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning (computer-based training systems, interactive learning environments, intelligent computer-aided instruction systems, distance learning systems, and collaborative learning environments) [5].

The Knowledge Pools are distributed repositories of metadata compatible with the LOM standard which assure an efficient publication, search and restore of educative contents. An interesting characteristic of these servers is that they can be federated.

3. Satellite-based network architectures for distance learning

Our considerations concentrated mainly on three distinct satellite network architectures for education applications, all of them being different implemen-

tations of the same generic network architecture (Figure 2). The rationale in supporting multiple satellite communication environments stems from: (1) the variability of expected user requirements (some users have inflexible legacy communication systems, while others can be open for very innovative deployments), and (2) the existence of a number of satellite platforms with a wide range of capabilities and cost.

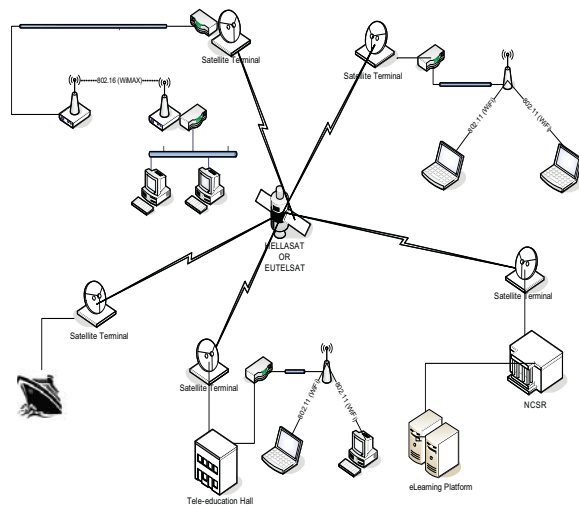


Figure 2. *Generic satellite-based network architecture*

The main architectures for satellite education can be identified as follows:

3.1 VSAT Architecture

Land-to-Land VSAT Architecture

This architecture includes a number of VSAT enabled sites and further interconnection using WiFi and/or WiMax wireless infrastructure for delivering the service to more users. Different usage scenarios can

involve point-to-point, point-to-multipoint interactive communication, live lectures and video on demand capabilities, as well as interconnection between the network sites in order to ensure the necessary collaboration between the learning groups, which is an essential eLearning element.

Land-to-Vessel VSAT Architecture

This network architecture includes one or more ship(s) connected with a VSAT station at the central node with a fully equipped studio. It facilitates live lectures and video on demand capabilities using IPv4 protocol.

3.2 DVB-S/S2 Architecture

This architecture involves DVB-S or DVB-S2 enabled sites for tele-training. It can support tele-training scenarios, such as point to point and point to multipoint interactive communication and collaboration, as well as live lectures and video on demand capabilities using IPv4 and IPv6 protocols.

3.3 DVB-RCS Architecture

This architecture involves DVB-RCS enabled sites connected with the central DVB-RCS platform. Similarly to the previous architecture, this architecture can support live lectures and video on demand capabilities using IPv4 protocol.

4. Distance Learning Scenarios Over Satellite Networks

Ten scenarios have been identified to fulfill the needs of geographically dispersed target communities. This section briefly details the objectives of these scenarios and describes the interactions between the users and the satellite-enabled learning system.



4.1 Common Room-oriented Scenarios

Broadcast/multicast e-learning service to a common room. The primary objective of this scenario is to offer easily accessed pre-recorded educational courses targeted to audiences at remote locations, with no previous access to such services due to network connectivity restrictions. Its secondary objective is to design and present courses content based on remote audience characteristics and preferences so as to ensure immediate adoption of such services and full learner participation.

The distance learning service provider pre-records the educational content in high quality with the instructions of the course coordinator. The content is either pre-recorded for the sole purpose of later being transmitted on demand or broadcasted, or it is pre-recorded during an actual training course towards respective learning community in urban areas (e.g. during seminars organized in urban areas for similar user groups). Pre-recording involves digitization of existing conventional (paper-based, videotapes, etc.) content where needed (to be provided by the course coordinator, who is an expert/consultant with knowledge on issues of interest for the targeted user community. Configured and adapted content is stored within a dedicated repository along with course description information. Such a repository is part of a learning content management system (LCMS). Educational content is organized in Learning Objects (LOs) within the LCMS to allow for reusability by other types of tele-education services. The content is linked with a respective service that may be either broadcasted/multicast over purely satellite networks or interlinked core satellite and broadband wireless access networks or invoked as a video-on-demand service by the user, over the same types of networks. Transmission in all cases is IP-based using IPv4 or IPv6 protocols.

The remote learning communities gather in tele-education rooms/halls to attend the educational course. Based on the core and access networks used receiving terminals may differentiate. Pre-recorded educational content is either broadcasted over satellite core and access networks (DVB-S2, VSAT) or multicasted over broadband satellite and wireless IP-based access networks (DVB-RCS, WiFi, WiMax) respectively. Each room is equipped with TV sets, VCRs, video projectors and set-top boxes/PCs (equipped with the necessary receiver cards), receiving satellite antennas and hubs or wireless access points, microphones and speakers. Trainees may be able to view the course material on their PC screen, in case that a number of PCs are setup in the tele-education hall. Transmission of the course content to PCs is performed over a broadband wireless network interlinked with a core satellite-based transmission network. In this case, remultiplexing due to the use of IP-based protocols for transmission or content format transcoding due to lower wireless network bandwidth may be required in some cases.

Course initiation may either occur when learners through the intervention of the local administrator access the broadcasted/multicast web service at pre-scheduled times or request the service on demand at any time (the difference lies in the fact that in the latter case the content starts being transmitted after the user request, while in the first case it is broadcasted at the scheduled time irrespectively of when the user initiates reception).

Access to this service is feasible either through a purely satellite network and client terminals (VSAT, DVB-RCS), or through a core satellite network interlinked with broadband wireless access networks (DVB-S2/VSAT + WiFi/WiMax). Broadcasting or multicasting is implemented based on IP protocols for streaming over Internet such as IPv4 and IPv6.

The audience, during the course presentation, is

passively viewing the educational content. Interaction and backchannel communication with tutors happens after the course ends. If transmission and reception is based on the DVB-S (or S2) standard (uni-directional case), backchannel communication is implemented through alternate channels such as Single Channel Per Carrier (SCPC). In the case of use of VSAT, DVB-RCS and wireless connection, bi-directional communication is possible. In such cases questions may be posed to the tutors and answers may be received by using a variety of communication means. This scenario constitutes another scenario, described in more detail in the sequel.

Offline feedback and Q&A session following broadcast/multicast e-learning service to a common room. The objective of this scenario is to allow smooth communication and interaction with the tutor after an e-learning session in order to resolve questions.

This is an extension of the electronic learning service to common room scenario and requires the occurrence of the main learning scenario in order to be performed. The remote learning community having viewed the pre-recorded educational course poses questions to tutors using PCs directly connected to satellite access networks or wirelessly connected to a core satellite-based e-learning network infrastructure in the tele-education room that the course has taken place, taking advantage of the backchannel communication capabilities of VSAT, DVB-RCS, WiFi and WiMax technologies, while in the case of DVB-S/S2 forward channels, alternate return communication channels are used such as SCPC. Questions may be posed and answers may be received in textual format using synchronous (chat) or asynchronous (e-mails via HTML forms, postings to dedicated tutor-learner forums setup at a learning portal of an LMS/LCMS) means of communication, or collaboration among learners and tutors may be achieved through non-textual interaction mechanisms that do not im-

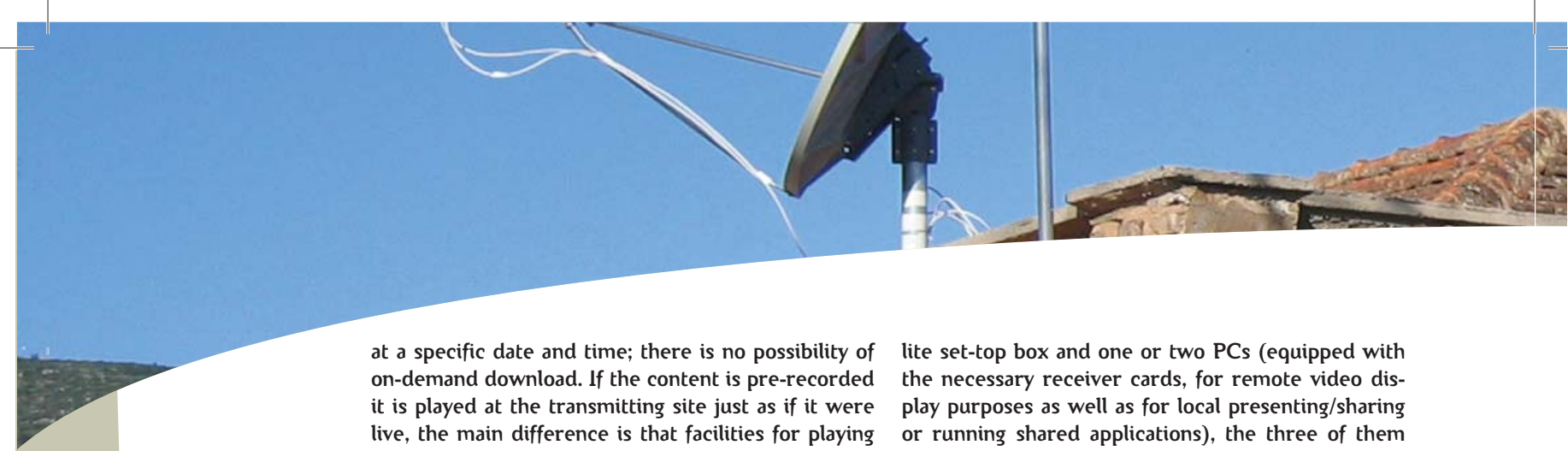
pose significant bandwidth requirements, such as audio conferencing by using microphones, speakers and dedicated audio conference software.

Virtual Classrooms with Remote Tutor; fully interactive; pre-scheduled for all participating sites or on-demand for specific sites (tutor is based on a central site). The main objective of this scenario is to allow the creation, support and maintenance of a virtual classroom that provides similar tools and capabilities as in a real classroom without the physical presence of the interacting learners and teachers/tutors in the same space domain but only in the same time domain.

In the context of this scenario, an implementation of an environment similar to that of a classroom is envisioned. In this sense, a tutor based in a studio or in a lecture room will provide the material and lecture the remote and local students. For this, a number of technological infrastructures have to be used. The service can be provided by all network means that provide interactivity with a minimum of 384Kbps/128Kbps downstream/upstream for an audio feedback from the remote sites and 384Kbps/384Kbps downstream/upstream for video feedback. This figure is sensitive to the specific platform used for implementing the virtual classroom. Several software packages may be required in order to support different types of user requirements in terms of services offered and their quality.

Webcast that is accessed from common room. The primary objective of this scenario is to promote and enable teacher-to-learner and learner-to-learner knowledge sharing.

In this scenario, either one of the remote sites or the main site, can transmit live or pre-recorded content to one or more of the rest of remote sites. It involves a unicast, multicast or broadcast distribution with no interaction at all. Receiving sites have to tune into the transmission channel in order to receive the content



at a specific date and time; there is no possibility of on-demand download. If the content is pre-recorded it is played at the transmitting site just as if it were live, the main difference is that facilities for playing pre-recorded content are needed.

In order to use the service, the person in charge of the room's audiovisuals at the receiving site connects using a PC to the webcast service of the e-learning infrastructure. If the transmission medium is bidirectional, s/he could be asked to log-in into the system before receiving contents, otherwise the user has to listen for session announcements and, if required, enter his decryption key to access the encrypted content. Either by logging into the system or by looking at the session announcement list he must select a session from this list. As soon as this selection is done, content starts to be played at the receiving site. All the contents are seen at the remote site with the chosen media player; if slides are being used, the video quality should be good enough to display every detail of them.

Videoconferencing between geographically dispersed classroom sites. The core objective of this scenario is to enable learners from remote classrooms to participate live in joint lectures, seminars or workshops, interacting in more or less the same way as when physically sharing the same site.

As part of this scenario, the remote learning communities (classes) get together in specially set up classrooms (usually at remote sites) to participate in the educational activities. Classes (learners as well as tutors/facilitators) from each site are able to hold lectures or meetings/conversations, and collaborate with classrooms (colleagues/ fellow learners) at other sites.

Each classroom is equipped with conventional presentation boards (flipcharts, white/black-boards etc.), video cameras, microphones, and speaker systems, DVD/VCR player, a TV set/projector, a satel-

lite set-top box and one or two PCs (equipped with the necessary receiver cards, for remote video display purposes as well as for local presenting/sharing or running shared applications), the three of them connected to the satellite network and all devices interconnected with each other for easy operation.

The sessions have to be prescheduled so that all sites receive the time slot information well in advance. A facilitator takes care of the setup, configuration and live operation of the system at each site. The required full two-way interaction is possible via VSAT or DVB-RCS, and possible also via DVB-S (or S2) with a SCPC back-channel. Transmission of live video from other sites to the set-top box or PC is performed bi-directionally over a satellite network. The teleconference is launched at each site by logging in to a multipoint web service at a pre-determined fixed time. The facilitator supervises and facilitates the discussion by switching control between sites (in continuous collaboration with the facilitators at other sites), moderating the discussion and granting right-to-speak to participants in the local room, controlling the use of microphones and directing cameras accordingly.

LMS-based e-learning service that is accessed from a common tele-education room. The main objective of this scenario is to offer easily accessed educational courses targeted to audiences at remote locations, with no access to such services due to network connectivity restrictions. Its secondary objective is to design, configure, manage and present courses content and descriptions based on remote audience characteristics so as to ensure immediate adoption of such services and full audience participation.

This scenario involves interactive learning in an asynchronous mode based on a learning management system. Using such a system, an e-learning service provider may design and offer a number of courses based on the training needs of targeted remote communities and enhanced learning tools for enabling



Bridging the digital gap

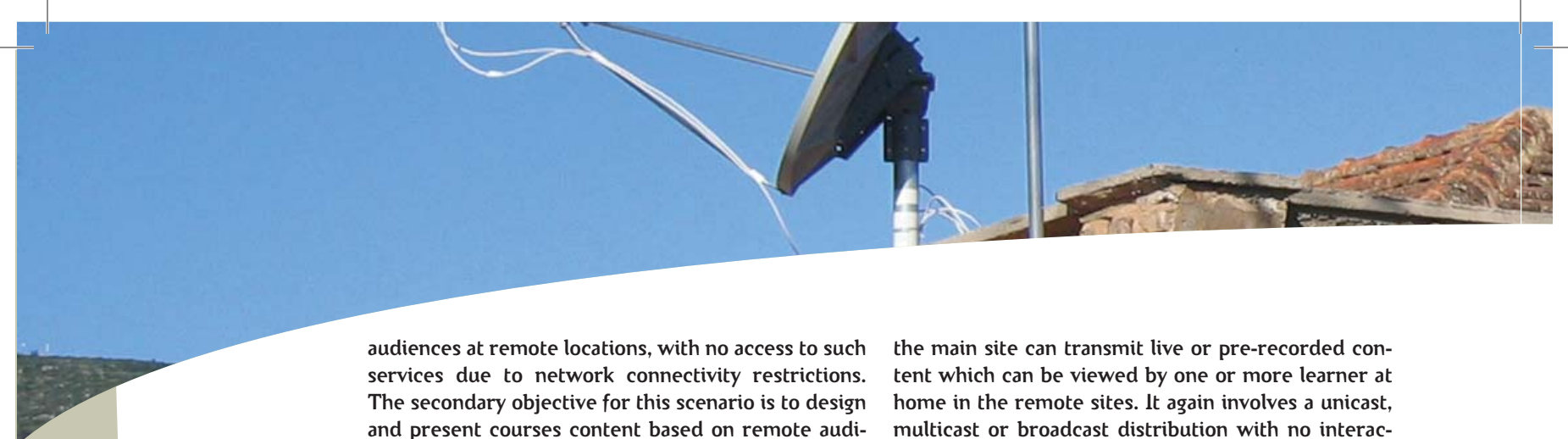
efficient interaction among learners and tutors or between learners themselves aiming at enhanced learning experiences. The scenario involves access of a group of remote learners situated in a common tele-education room to an e-learning portal with offered educational courses, part of an LMS/LCMS system. In any case learner profile management, identification and adaptive feedback during the learning process are supported. Thus, while a learner selects and views a course, using his PC connected in wireless or satellite mode to the core network, he is automatically identified since he is initially requested to login to the portal. His profile information, stored in a user management database of the LMS/LCMS, includes personal details (name, age, basic education, occupation, etc.) as well as his competencies with new technology, his progress up to now on the selected courses, etc. The system is able to guide his learning experience with little or more help based on his profile and learning status, and his interaction with the system, as well as assess his learning performance. The portal, apart from offering and managing courses and user profile registration functionalities (users register the initial interaction with the system), further includes collaboration tools among the learner community or between learners and tutors such as chat, based on two-way text-based messages exchange (including, images, file exchange, smilies, etc.), dedicated purpose forums to pose questions to tutors, make announcements, collaborate with other learners in solving problems or clarifying concepts, audio conferencing, email exchange. Access among learners in the same or other groups (i.e among users logged in from different tele-education rooms) is based on IP-based broadband wireless connectivity and in cases on satellite enabled connectivity. Access to e-learning courses is performed in an asynchronous, offline mode, that is, course content and descriptions already pre-exist in the LMS/LCMS sys-

tem, and the user connects at any time to retrieve the material of his interest or use portal tools for collaboration and learning.

From the service provider side, the LMS/LCMS offers administration functionalities as well as course authoring and management tools to allow experienced users and tutors to manage the system, input content and generate descriptions and learning metadata, configure content and create adapted versions, perform server-side adaptation. Administration features include user management, security issues, controlled access, content management and description, portal management and updating with dynamic content, forum setup and administration. Learning content in different formats and qualities (to allow for optimal transmission and reception, based on accessing network and network characteristics) is inserted in the system using a course management module that involves a content and metadata adaptation engine and a number of content transcoders. The experienced tutors may author, organise and efficiently annotate the course material potentially in a semi-automated fashion, divide content in re-usable learning objects with associated descriptions using simple tools that do not require major technical competencies, adapt the learning process, setup projects/quizzes, and configure assessment algorithms. Tutors may receive learners' questions via chat utilities, e-mails, or by monitoring dedicated forums. Audio conferencing and synchronous communication with tutors is feasible at scheduled time slots. Transmission relies on IP-based multimedia streaming, using protocols such as IPv4 or IPv6.

4.2 Home-oriented Scenarios

LMS-based e-learning service that is accessed from home. The primary objective of this scenario is to offer easily accessed educational courses targeted to



audiences at remote locations, with no access to such services due to network connectivity restrictions. The secondary objective for this scenario is to design and present courses content based on remote audience characteristics so as to ensure immediate adoption of such services and full audience participation. This is an extension of the LMS-based e-learning service scenario addressing the common room setting, where the same functionalities are offered to interested learners accessing the e-learning courses from home on an individual basis and asynchronously to other users. The limiting factor now is the access network and its bandwidth reserves. The access network is in most of the cases a broadband wireless network, due to the low cost of user terminals.

Access to Virtual classroom from home. The first objective of this scenario is to allow the creation, support and maintenance of a virtual classroom that provides similar tools and capabilities as in a real classroom without the physical presence of the interacting learners and teachers/tutors in the same space domain but only in the same time domain. The second objective is to provide the flexibility to the users to join the virtual classroom from home, and the final objective is build a Virtual Classroom environment that can facilitate standalone users to communicate whenever they want with others co-workers or users from their homes in order to be informed for their work sector or to be trained / educated.

An implementation of an environment similar to that of a classroom from users based at their home is envisioned. In that sense a tutor based in a studio or in a lecture room will provide the material and lecture the remote home users.

Webcast that is accessed from home. The main objective of this scenario is to enable and promote teacher-to-learner and learner-to-learner knowledge sharing from home.

In this scenario, either one of the remote sites or

the main site can transmit live or pre-recorded content which can be viewed by one or more learner at home in the remote sites. It again involves a unicast, multicast or broadcast distribution with no interaction at all. Receivers have to tune the transmission channel in order to receive the content at a specific date and time; there is no possibility of on-demand download. If the content is pre-recorded it is played at the transmitting site just as if it were live, the main difference is that facilities for playing pre-recorded content are needed. The receiver has to use commercial off-the-shelf player and software to view the contents.

Pre-recording involves digitisation of any audiovisual content being in analogue form, before In order to use the service, the user at home connects using a PC to the webcast service of the e-learning infrastructure. According to the selection made by the learner, relevant content starts to be played at the receiving site. All the contents are seen at the remote site with the widely available commercially off-the-shelf media player.

Videoconferencing from home. The objective of this scenario is to enable learners from their homes to participate live in joint lectures, seminars or workshops.

(1) Live participation from home in a lecture/seminar/workshop held in a classroom

At the main site, the class (learners as well as tutors/facilitators) gets together (physically) in a specially set up classroom/auditorium to participate in the educational activities. Learners from their homes (geographically dispersed) are able to attend lectures or meetings/conversations, and collaborate with colleagues/ fellow learners at other sites.

The classroom is equipped with conventional presentation boards (flipcharts, white/black-boards etc.), video cameras, microphones, and speaker systems,

DVD/VCR player, a TV set/projector, a satellite set-top box and one or two PCs (equipped with the necessary receiver cards, for remote video display purposes as well as for local presenting/sharing or running shared applications), the three of them connected to a satellite dish and all devices interconnected with each other for easy operation.

The sessions have to be prescheduled so that all parties receive the time slot information well in advance. A facilitator takes care of the setup, configuration and live operation of the system at the main site. The required full two-way interaction is maintained via wireless broadband networks or satellite options like VSAT, DVB-RCS, and possibly via DVB-S/S2 with a SCPC back-channel. The users of the teleconference join to the session by logging in to a multipoint web portal at a pre-determined fixed time. The facilitator supervises and coordinates the discussion by switching control between sites, and granting right-to-speak to remote participants.

(2) Collaboration of learners from home (multi-peer)

Learners from their homes (geographically dispersed) are able to set up (in either ad-hoc or prescheduled manner) and hold meetings/collaboration sessions/workshops, and collaborate with colleagues/ fellow learners at their respective homes.

All participants of the teleconference service require a video camera, a microphone and speakers, and either a combination of TV and satellite set-top box or a PC.

The sessions are either “ad-hoc” or prescheduled. System configuration and network management capabilities have to be granted locally for each system. The required full multipoint-to-multipoint interaction is possible via hybrid satellite (VSAT or DVB-RCS, and possible also via DVB-S/S2 with a SCPC back-channel) and wireless broadband networks.

The systems allow teleconferencing to be launched from any site, with other user logging in from local (via wireless) or remote (via satellite and possibly wireless) sites.

5. Satellite-enabled education services

Based on the requirements of the scenarios presented in the previous section, a number of services can be identified. The process of identification of these services is informed by the previously derived scenario specifications.

5.1 Virtual Classroom Service

A virtual classroom is defined as a computer accessible, on-line learning environment intended to fulfil many of the learning facilitation roles of a physical classroom. It provides a distributed learning environment at any time, any place and at any pace.

By using Virtual Classrooms, one can hold face-to-face conversations and collaborate with co-workers around the world.

5.2 Learning Content Management System (LCMS) Service

Among the services that have been identified as relevant to the scope and objectives of the satellite-enabled education is the deployment of a Learning Content Management Service. An LCMS supports the authoring, publication and management of learning content, including multimedia content adaptation aspects, from the viewpoint of the system administrator and author but at the same time it will provide for personalised access to combined Learning Objects (LOs) in a Learning Path that suits best the learners of the participating communities.



5.3 Tele-Conferencing Service

This is a core service enables live sessions connecting many geographically dispersed sites, either ad-hoc or prearranged manner. The functionality offered by a tele-conferencing service is similar to that of the Virtual Classroom, however it is more focused on live interaction and more flexible with regard to time scheduling and site participation, but with limitations in terms of delivering materials. Tele-conferencing can be defined as bi-directional communication between two or more groups, or between three or more individuals, who are in dispersed sites.

5.4 Webinar/Webcast Service

This service consists of a unidirectional, live or pre-recorded, transmission of content from one site to the rest of remote sites. The date and details of each session should be announced previously in order for the receiving site to tune in properly.

The main actors that interact in the educational process could be teachers and learners, or just learners among them. There are no restrictions on the communities that could be able to use this service; In principle any community (including agrarian and maritime) can benefit from it.

While the content can be pre-recorded at the transmitting site, this service does not involve on-demand download. In that way the receiving site can not distinguish if the content being played is live or pre recorded. The only difference in this case is at the transmitting site.

The content could be received at a common room or at the learner's home. Both scenarios are pretty similar. The main difference is the need for a more sophisticated common room setup. It is expected to use common-of-the-shelves player software at the receiving site.

5.5 Other Services

Another potential service that accommodates the needs of already defined e-learning scenarios is the "Broadcast/multicast e-learning service". In such a service, pre-recorded educational content is either broadcasted over satellite core and access networks (DVB-S2, VSAT) or multicasted over broadband satellite and wireless IP-based access networks (DVB-RCS, Wi-Fi, WiMAX) respectively to remote groups of learners gathered in a tele-education hall, equipped with receiving satellite antennas and hubs or wireless access points, set-top boxes or PCs, video projectors, VCRs, TV sets, microphones and speakers. The session is initiated either at pre-scheduled times or by the course coordinator, and it involves, initially passive viewing of the educational course and later on communication and interaction possibilities for Q&A sessions.

6. Conclusion

The thrust of this paper was the need of certain professional communities for satellite-based tele-education. In particular, we considered these needs in the context of providing tele-training services to professional communities that are distributed in remote areas. Generic satellite-based service requirements of rural communities have been identified, and on this basis, three network architectures have been considered and described. Furthermore, ten usage scenarios have been proposed and comprehensively described in terms of their objectives and functionality to justify the benefits for the geographically distributed communities. Finally, in the light of the identified user needs and the proposed scenarios, a number of services have been identified to implement the envisaged scenarios. The paper makes a strong case for the development and wider

adoption of satellite-enabled services, as this will extend the benefits of ICT-based education to an even larger proportion of the workforce worldwide. It is also expected that that emergence of such learner-oriented systems for distance education via satellite communication will lead to sustainable solutions to the problem of delivering education to geographically dispersed learner communities in developing countries, most of which suffer from a complete or partial lack of network infrastructure.

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8. Acknowledgement

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The C@R Project: Rural Living Labs for the Collaborative Creation of Services - Enhancing Rural Development by People Working and Living in Rural Areas*

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1. Introduction

The C@R project [1] aims to boost the introduction of Collaborative Working Environments (CWE) as key enablers catalyzing rural development. According to this strategic goal, the C@R integrated project proposes a complete set of research activities and tasks which will identify, develop and validate technological responses of actual barriers while jeopardizing the sustainable development in rural areas.

The main vision of the Collaborative Working Environments Unit of the EC, DG INFSO [2] (defined through multiple and diversified works, such as the Rural@Work family of AMI communities [3]) on the ICT application to rural settings is to develop Information Society in rural areas, to foster European devel-

opment and integration, to increase competitiveness of European companies, to stem rural depopulation and to diversify income and employment opportunities in rural areas. "Rural" in Europe counts for 80% of European area and 22% of European inhabitants. Rural development is not only about a competitive European agriculture, but each day it is focusing more on meeting the expectations of citizens in rural areas, aiming to a deeper integration into today's society and promoting economic development. The large opportunities that technological progress is offering to address key societal challenges still require significant progress of state of the art technologies for its application to rural areas and its transformation into products and services that address their specific situation.

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To achieve this priority objectives, C@R will advance on the specification, development, test and validation of a powerful and flexible worker-centric collaborative platform that will significantly increase the capabilities of rural inhabitants, both at work and life, thus leading to a better quality of life and a revalorization of rural settings. From the technical point of view, the C@R project is organizing the work in three layers (Figure 1): 1) the Collaborative Core Services (CCS) at layer 1, b) the Software Collaborative Tools (SCT) at layer 2, and 3) the Rural Living Labs (RLLs) at layer 3.

In this architecture the Layer 1 is encapsulating all the core services and resources (networks, sensors, devices, software modules, localization sources, etc.) in reusable software components. A key piece of the C@R framework is the upper-layer service architecture which combines in a synergic manner the layer 1 components according to orchestration high level capabilities resulting in a set of high level software tools, as part of layer 2. The C@R architecture is designed to be highly customizable in the sense of providing mechanisms to incorporate any proprietary or open solutions, and any standard. This current approach is permitting C@R to substantially contribute to the definition of a user-centric Open Collaborative Architecture (OCA) [4]. The layer 3 aims in articulating the Rural Living Labs as innovative research instruments involving rural users. The RLL user-oriented methodology is guaranteeing to meet the highly specific rural users' expectations and is providing mechanisms to gather technical requirements for the C@R architecture. Within this framework several innovative scenarios with an expected high impact

on rural development have been selected to enable a later validation of this architecture. These scenarios will be validated within 7 living labs that are included in C@R.

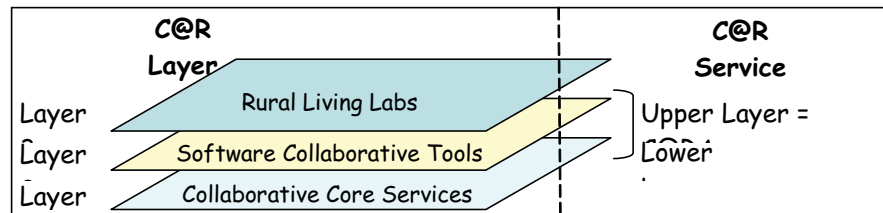


Figure 1: The three layers of the C@R project

Through this architecture and the technologies that are currently under development in the C@R framework, five main goals will be addressed. This goals are: 1) provide a collaborative platform for rural communities, defined in cooperation with other Collaborative Working Environment communities, 2) demonstrate the use of the same platform integrating a range of tools for various rural user communities, 3) promote the user centric Open Collaborative Architecture (OCA) in the industrial, new business opportunities and emerging rural sectors, demonstrating its affordability and usability, 4) develop a common methodology for Rural Living Lab developments and assessing benefits of results, and 5) support Policy Makers in deciding which EU Policies are needed for Innovation and Rural Development in 2010.

The CWE platforms are expected to be built over a large and complex set of interrelated and complementary technologies, methodologies and concepts and a more detailed representation of the three layered C@R architecture that is under development is presented in Figure 2 and will be presented in the following sections of this paper.

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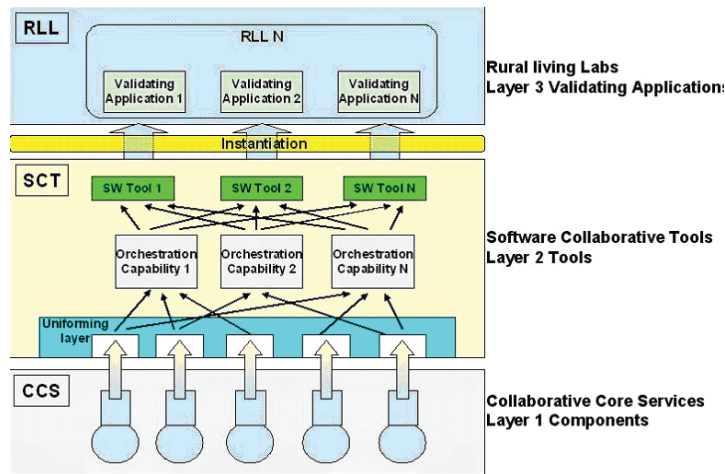


Figure 2: C@R Layered Reference Model

The C@R vision is consistent with the approach that in an all-inclusive information society and knowledge economy every citizen, irrespective of location as the starting point, has full participation rights to the information society. Based on this view, we see how the needs of people living and visiting rural and remote areas are leading to functionalities, which a modern society ubiquitous infrastructure and the ambient intelligent environment have to provide.

This person centric and user driven view should cover all aspects of private living and professional working in the rural and remote areas of Europe, in the multiple and simultaneous user roles, either as individual and independent entity or as member of a well established group or dynamically created community.

This paper is organized as follows. In Section 2 the Collaborative Core Services will be presented while the Software Collaboration Tools will be presented in Section 3. In Section 4 the aim of the Rural Living Labs will be addressed and finally in Section 5 concluding remarks will be presented.

2. The Collaborative Core Services (CCS) in C@R

The main goal of the Collaborative Core Service layer is to deliver software components encapsulating the basic resources with the required advanced features needed to build rural CWE frameworks. At this level (layer one, lowest level, in the Layered Reference Model), the project is researching on the appropriate CCS architecture, data objects, protocols and APIs to enable easy orchestration of basic resources and to allow C@R CWE to easily export/import basic resources to/from other initiatives. Therefore, the basic

resources will be available into the architecture due to this encapsulation research effort.

The following diagram in Figure 3 and the level descriptions describe the generic internal architecture proposed by C@R for CCS SW components modeling:

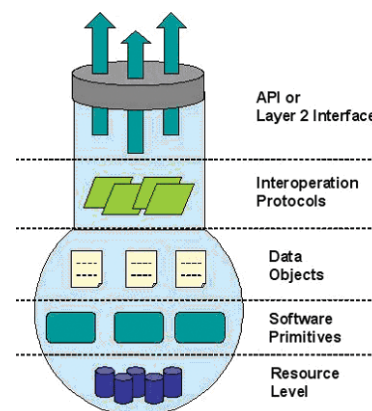
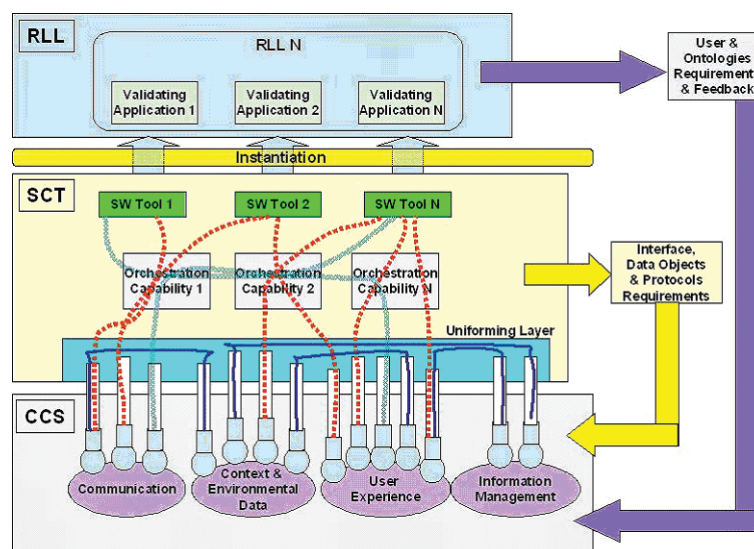


Figure 3: C@R CCS (Layer 1) Components Architecture

In the resource level (only for hardware based components), C²R is investigating the resource device/hardware capabilities and enhancements, which are critical to enable rural CWE. A good example of this investigation is the selection of low powered sensors. For the software primitives, the resource software primitives will be improved in order to enhance existing capabilities and create additional new ones as demanded by the requirements provided by application layer 2 and validation layer 3. In the Data Objects the resource identification, availability, status and other relevant properties will be characterized and specified in detail, while in the Interoperation Protocols the resource communication methods and details with other CCS SW components, layer 2 software tools and layer 2 orchestration capabilities will be characterized and specified in detail. Finally in the Layer 2 Interface the detailed API of the SW CCS component will be completely specified.

How CCS SW components are integrated into the C²R reference model is shown in the following diagram in Figure 4, which depicts as well possible communication flows among them and other C²R architecture blocks.

Figure 4: C²R CCS SW Components system integration



According to the communication flows model depicted in the figure above, CCS SW components are able to directly exchange information among themselves (through the uniforming layer in layer 2) enabling self-organizing systems (for instance, self organizing sensor networks) or central managed systems (for instance, network access systems selection and aggregation depending on a QoS CCS SW component).

2.1 Communication CCS Components

One of the key categories of resources to be orchestrated towards the creation of rural CWE are those related to communication, including access networks, advanced communication features or network services, advanced protocols and new routing or networking techniques. The C²R communication networks will be based on the all-IP converge networks scenarios paradigm that aims to provide seamless transparent services and which is still under definition and development by related standardization bodies. C²R is currently trying to work close to the models and standards proposed by the IETF (SIP, sipping, QoS, Multicast, IPv6, IPv6 Mobility and v6ops groups), ETSI (TISPAN group dealing with convergence complex scenarios), 3GPP/3GPP2 (IPv6 recommendations provided by IETF, IMS, presence, etc) and OMA. Whenever possible, the project will contribute providing feedback, vali-

models and standards proposed by the IETF (SIP, sipping, QoS, Multicast, IPv6, IPv6 Mobility and v6ops groups), ETSI (TISPAN group dealing with convergence complex scenarios), 3GPP/3GPP2 (IPv6 recommendations provided by IETF, IMS, presence, etc) and OMA. Whenever possible, the project will contribute providing feedback, vali-

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dation results and proposed standards and/or models to the OCA Working Group (OCA WG). In order to cope with in-field rural activities in wide areas, where shadow coverage areas due to lack of infrastructures and abrupt areas are normal situations, the project is researching and developing the “Ad-hoc Rural Network concept” (ARN), see Figure 5.

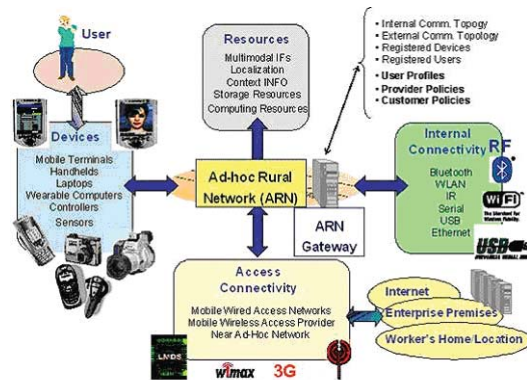


Figure 5: Ad-hoc Rural Network (ARN) C&R model & ARN Gateway component

The main activities will be focused on the validation of an ARN model based on different internal and external access systems and the ARN gateway, being a specific element to provide autonomy and coordination features such as ARN users registry, wireless access system providers registry, and peer-to-peer networking. Regarding ARNs and access systems, during the first phase of the project discovery and selection of requirements will be selected and analyzed while the aggregation and combination will be carried out during the second project phase. Besides, the ARN model, the project will analyze horizontal communication technologies which might be used in other CCS components and higher levels, such as IPv6. During the initial research efforts, C&R will anticipate basic

communication features related to QoS based on the SIP model while advanced features related to QoS, Multicast, mobility and advanced routing will be considered in the second phase.

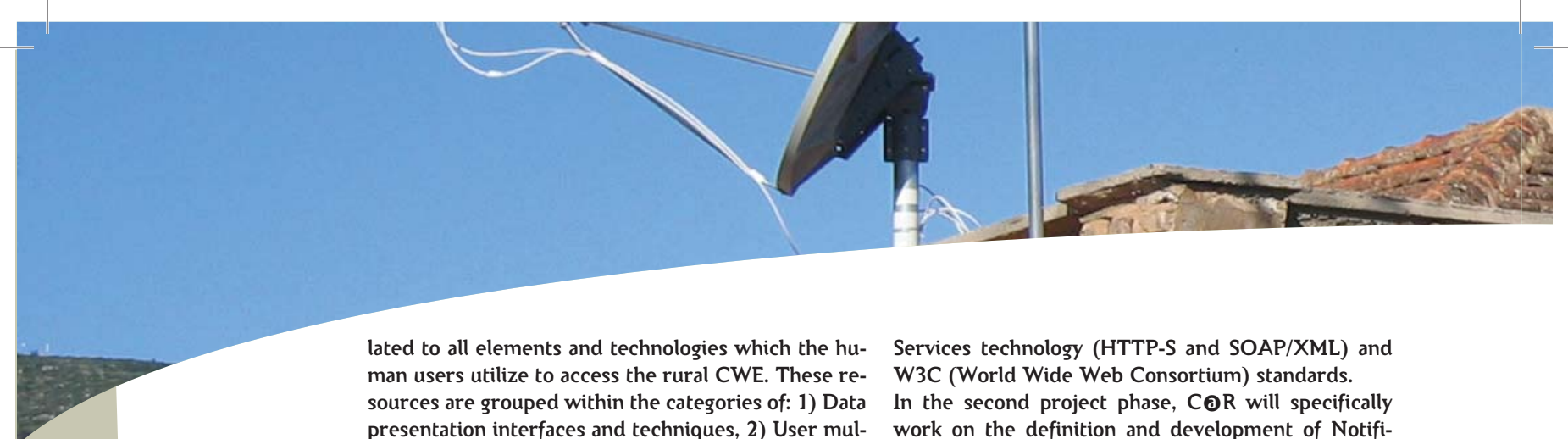
2.2 Context & Environment Data Capture CCS Components

Environmental and context data capture resources group all environment data input sources in two categories: a) Localization which provide the location of users and resources as needed by the rural CWE, and b) Sensors that include mainly RFID technology, specific sensor types required by the project Living Labs and biometric sensors. C&R is analysing different localization techniques and protocols based on the access networks and also with localization helpers (GPS/Galileo). The target is to provide localization data using standard and semantic compatible data objects. The situations and data accuracy when and how localization will be implemented will be aligned with RLLs requirements. In the second phase of the project a geo-mobility server will be provided. The Geomobility server is an element offering basic functions on which location-based applications are built (the OpenLS Core Services).

Regarding sensors, the first phase of C&R will analyze RFID tags for objects identification and data storage and biometric sensors for personal identification and system security. In the first project phase, these sensors will be encapsulated with the general CCS components architecture and, in the second phase, some advanced features (self-organization, self-maintain, over-the-air upgrades) implemented in the component API and new types of sensors might be as demanded by specific RLL needs.

2.3 User Experience CCS Components

User Experience resources and techniques are re-



lated to all elements and technologies which the human users utilize to access the rural CWE. These resources are grouped within the categories of: 1) Data presentation interfaces and techniques, 2) User multimodal interfaces, and 3) User advanced terminals. The main goal of deploying these components is to dramatically increase the efficiency and speed of relevant decisions and work by providing advanced images combining reality and VR elements, voice interface as needed by in-field or mobile users adapted to the context and terminal capabilities and display. Some of the key innovations in this area include the mapping and merging to ontologies, improved creation and exploitation of metadata to simplify information retrieval, and the integration of Geographic Information System (GIS) technology with sensor web technology and with other related context-aware technologies. This integration is made possible by the adoption of international (consensus-driven) standards. Until now the State of the Art has been a disconnection among the various technology fields of interest (e.g. telecoms, GIS, Earth Observation, and semantic web), and these can be better brought together through standards and through ontology mapping.

2.4 Information Management CCS Components

Information Management components allow the rural CWE access to a vast range of stored and real-time information. This information may be provided by classic databases (normally through a Web Service), GRID/P2P networks and notification or Web Services. C²R is implementing several rural CWE services as Web Services, including the ESA Grid on-Demand Service infrastructure where access to Grid computing resources is handled transparently by the EO Grid interfaces that are based on Web

Services technology (HTTP-S and SOAP/XML) and W3C (World Wide Web Consortium) standards.

In the second project phase, C²R will specifically work on the definition and development of Notification Services CCS SW components related to: a) Notification, publish and subscription of IMS services through enablers (e.g. Presence and Group management), and b) Tools for virtual organizations, which could constitute another core service based on IMS and other technology enablers.

3. The Software Collaboration Tools (SCT) in C²R

The idea of Collaboration technologies is not new as Collaborative Supported Computer Work (CSCW) has been a well-known field of study since the 80's. However, the term "collaboration" is so loosely used and covers such a broad spectrum of technologies that it is difficult to describe it in an exact manner. From a broad range of collaborative business tools like CRM and ERP systems to Web services, C²R is facing major sets of collaboration tools at present. Existing Collaboration tools mostly aren't based on open methodologies, standards and/or frameworks, but on proprietary solutions, languages and experience of developers. Some of the key issues of CSCW include group awareness, multi-user interfaces, concurrency control, communication and coordination within the group, shared information space and the support of a heterogeneous, open environment which integrates existing single-user applications. CSCW systems are often categorized according to the time/location matrix using the distinction between same time (synchronous) and different times (asynchronous), and between same place (face-to-face) and different places (distributed).

However, the social aspects of collaboration must

be taken into account to be successful. Software architectures for distributed and mobile cooperative communities must support the fundamental requirements for distributed cooperation: efficient information sharing across a widely distributed enterprise environment; constant and timely update and placement of the distributed knowledge base with many different sites acting both as potential users and potential providers of information; shared access to a set of services. The approaches and technologies for supporting these new ways of work are still the subject of research. Nevertheless, they are likely to “borrow” concepts and technologies from a variety of fields, such as workflow systems, groupware and CSCW, event-based systems, software architecture, distributed database systems, mobile computing, and so on.

3.1 The C@R Upper Layer Middleware Architecture (C@RA)

C@R aims to create and validate a collaborative-and-information friendly environment for working and living in rural areas, the C@R Upper Layer Middleware Architecture (C@RA). The development of such collaboration environment is required to capture, define and validate a set of requirements for implementing the C@RA in concrete rural and remote Living Labs in the domain areas of rural living labs. C@R is defining and implementing collaborative working environment for supporting Rural Living Labs activities which will be called the C@RA-based CWE. This will also involve the definition of an Open Service Oriented Architecture (OSOA) which supports all the needs and features identified in the requirements definition of C@RA.

OSOA will integrate collaborative services components defined by Layer 1, and software tools defined and developed by Layer 2. The C@RA, OSOA and

Software Collaboration Tools is being prototyped and will be validated into the RLL to ensure compliance with end user requirements. The design of C@RA will comply with: 1) defining an open architecture (OSOA), 2) to develop a uniforming layer for integration and interoperability, and 3) to adapt the services provided by Core Collaborative Services (CCS) to interoperable standards. This design with all the involved components is presented in Figure 6 for the second layer of the C@R architecture.

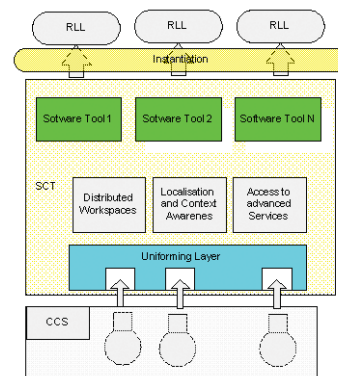
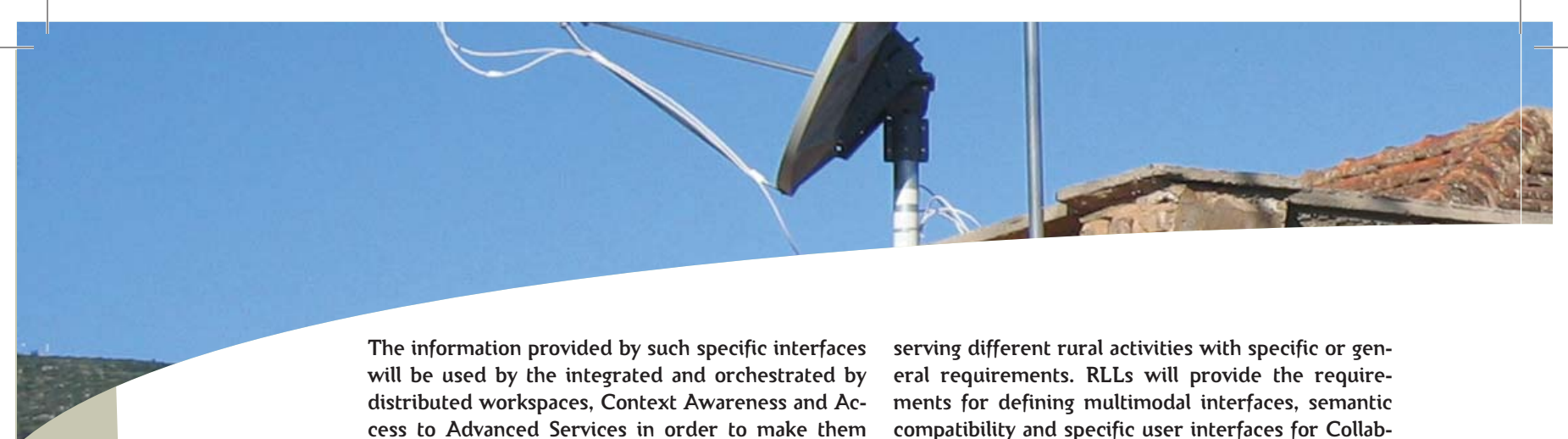


Figure 6: OSOA Global design

3.2 Uniforming Layer

A key component of OSOA is the Uniforming Layer. The Uniforming Layer will offer a general Manager component with a Manager interface to be used by the integration and orchestrating components. Each CCS created as part of Layer 1 will be integrated by the definition of the suitable connector which will negotiate with the Manager and link with the interface with integration and orchestration capabilities. Each CCS will offer two interfaces; a common interface which common functionalities, and a specific interface including such elements specific for each CCS.



The information provided by such specific interfaces will be used by the integrated and orchestrated by distributed workspaces, Context Awareness and Access to Advanced Services in order to make them visible to the end-user.

3.3 Orchestration Capabilities

The orchestration capabilities will define components for providing common services for all the Software Collaboration Tools. Each orchestration capability will harmonize and integrate into a single model all the information related to the same issue, providing to the Software tools a uniform and transparent way for using this information.

The definition of ontologies, creation of workflows, and definition of semantic compatibility models, combined with the requirements provided by RLL will be the theoretical base for the definition of the three identified Orchestration Capabilities components, distributed workspaces, context awareness and access to advanced services. Other orchestration capabilities may be identified during the project and incorporated to OSOA.

3.4 Software Tools

The design, creation and deployment of Collaborative Software Tools for supporting rural activities is the final objective of the C²R Upper Layer Middleware Architecture (C²RA). Many types of Collaborative software tools have been designed and created over time (real-time conferencing, video conferencing, application sharing, etc.). Nevertheless those software tools are based on proprietary and closed solutions, focused to activities performed at the office. The C²R project aims in creating software tools suitable for rural environment activities based on facilities provided by the Orchestration Capabilities, and able to be instantiated in different rural environments,

serving different rural activities with specific or general requirements. RLLs will provide the requirements for defining multimodal interfaces, semantic compatibility and specific user interfaces for Collaborative Software Tools.

3.5 Common Reference Architecture

The definition of OSOA and C²RA will be based on architectures and facilities of existing Collaboration environments widely used as BSCW. Nevertheless, it is required to define a common Reference Architecture which enables the development of reusable and interoperable service and application components for collaboration at work. The definition of this common Reference Architecture will mainly be the result of coordinated action among the OCA WG, combining the expertise of several CWE IPs. OSOA and C²RA will represent the instantiation of the reference architecture for C²R specific purposes also comprising built in requirements derived from rural working and living. It is extremely important that the principles of the common reference architecture are inherited and built into the C²RA.

4. The Rural Living Labs (RLLs) in C²R

Living Labs is a research methodology for innovation that challenges the whole research and innovation process in real-life conditions by human, social, cultural, organizational and institutional aspects, and has an impact on sustainable service, business and technology development. Thus, we are not talking about just user-centric research or usability research, but about a real human-centric approach. Moreover rural living is characterized by widely-distributed activities of work and life. Successfully integrating these activities and multiple roles requires that solutions design is driven by human-centric innovation prin-

ciples, adapted to the rural requirements. When this happens, RLLs should boost in an all-inclusive way the new service, business and technology development in rural and remote areas, in co-creative co-operation of local people, public agencies and SMEs. RLLs should also foster the creation of new economic activities, including the creation of new enterprises and new jobs.

Inside the C@R platform there is the need to find the ways and means to start from the very beginning with service and technology development in RLLs that teaches us to construct a user-centric (based on consequent LL-methodology) open collaborative reference architecture. Technology innovation has to be triggered by business drivers and not vice versa. The user centric requirements derived from a meaningful business case will be transferred into technical requirements and specifications for SCTs, C@RA, OSOA and CCSs respectively. The RLL methodology provides unique conditions to revolutionize technology development making use of a team that speaks one language. It is important to enable all stakeholders (e.g. end-users, process owners, IT experts) to speak this common language that avoids the separation of business and technology thinking. This offers opportunities to develop “end-to-end” simplified and easy to use applications that are most appropriate for the respective business case.

The Layer 2 and Layer 3 started from the beginning of the project the mutual work on rural and remote knowledge society service and open reference architecture development in order to provide a feedback on the nature of the LL-methodology that we are about to develop. Layer 2 should find the factors how to pull together the technologies (components) for rural services and businesses. The LL-methodology will provide information in the format that reflects in a human-centric way user needs and behavior. First experimentations been initiated with individual fea-

tures of technologies that suit to this service, open reference architecture and technology development (such as voice recognition and others). Moreover C@R RLLs are also working in the direction of implementing a Policy Support Tool (PST) for the RLL stakeholders. The PST will take into account all the potential situations for the exploitation of the project results and will be a tool support policy development based on these results. Finally, all the necessary information from all the Living Labs running in the project and a first assessment of it will be gathered and used as input for the policy-related activities within C@R.

5. Conclusions

This paper showcases the architecture and the underlying ideas of the EU Integrated Project C@R: Collaboration at Rural. The architecture has been presented in the form of integrated software and hardware components encapsulating the basic resources with the required advanced features needed to build rural Collaborative Working Environments (CWE). Finally the three layers of the system architecture has been presented and analyzed.

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Workshops



Bringing and managing change – the community empowerment Rural Wings workshops

The Rural Wings Scenarios of Use: Tools Empowering Change Agents in the Rural Communities



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1. The Rural Wings project

The Rural Wings project (2006-2009), an ambitious, large-scale international research project supported by the Directorate-General for Research of the European Commission (Thematic Priority 'Aeronautics and Space' of the 6th Framework Programme), is our latest and most ambitious addition in a series of projects (MUSE, ZEUS, NEMED) seeking to enable the development of advanced professional competences and a lifelong learning culture in teachers working in small rural schools (cf. Sotiriou & Koulouris, in this volume). Recognizing the crucial role of satellite telecommunications for securing broadband for geographically disadvantaged populations, this project takes several decisive steps ahead, not only in the field of technology, but importantly also by carefully addressing the real needs for learning of all citizens living in remote rural areas, and by fostering the development of lively learning communities in remote schools and the villages hosting them.

DVB-RCS technology is used, which allows for two-way communication between the end-user and the satellite, lifting the need for any terrestrial telecom infrastructure, and thus rendering broadband available really everywhere, even in the most isolated and deprived area. At the same time, the project integrates satellite telecommunications with local wireless networks, thus demonstrating the appropriateness of satellite technologies for the provision of fully integrated services and applications to the whole of the remote rural population. What is more, the Rural Wings project develops an advanced technological environment supporting lifelong learning activities in the school, at work, as well as at home. In this way, familiarization of all citizens with the new technologies is promoted, resulting in a reduced resistance to the use of state-of-the-art opportunities for local development.

Teachers working in remote rural schools –the main target group in the pilot applications in Greece– un-



dertake a crucial role in this process. Through further support, professional development and networking, teachers of rural areas are encouraged to evolve into catalysts of change and development, not only within their schools, but more widely within their local communities.

2. The Rural Wings scenarios of use

The Rural Wings project sets itself the ambitious aim to contribute towards the introduction of a new learning culture among citizens of rural communities, by providing them with opportunities for all to learn through a range of learning methods which will eventually enable them to become independent learners. More specifically, the envisioned learning culture of the rural communities ought to encourage and empower all individuals, in all stages of life, to exploit new technologies in order to invent their own solutions, by designing, creating, and learning independently in new, self-organised ways. These envisioned independent learners, however, should also learn to co-operate better with other local actors, and thus become more active participants in the shared processes of their communities.

To this end, the Rural Wings project demonstrates the use that various new technologies and applications can have as tools in the hands and intellect of inspired citizens of all ages aiming to cover their own needs according to their background and current activities or aspirations. In order to cater for the intrinsic multiplicity of user groups and user needs that such an approach implies, the project seeks to provide a range of learning methods and instructional approaches, corresponding to diverse learning circumstances in the various rural settings.

In the light of these propositions, 'scenarios of use' have been developed as the necessary intermediate

step in the path leading from theoretical conceptions of learning in rural communities, to their practical realisation into a 'virtual learning community' through the implementation of learning activities in the pilot sites. In other words, the scenarios are meant to provide concrete answers as to how the Rural Wings project may achieve its objectives relating to the promotion of lifelong learning in rural communities.

The 'scenarios of use' developed in the Rural Wing project constitute a central tool in the Rural Wings approach. They form the practical guides which operationalize the theoretical propositions of the project. These scenarios are the main operational tools for the national coordinators in the various countries, as well as the local change agents in the pilot rural communities – such as the teachers in the Greek rural schools. Using these scenarios as their reference and starting point, the local visionaries will decide on, develop, prepare, and execute the envisaged activities in the rural communities. The scenarios are hence the national and local coordinators' main design tool, and are mainly addressed to them. It should therefore be noted that the development of the scenarios of use is an effort of primarily practical value. Although their conception is grounded on a deep understanding of user needs and available possibilities on the basis of relevant academic concepts, the scenarios themselves aim to demonstrate, in practical terms, what exactly should and can be offered to users in rural areas involved in the implementation of the Rural Wings user-centred activities, and the extent and nature of users' involvement in these processes.

Indeed, the scenarios developed are meant as initial demonstrators of various possibilities offered for the exploitation of broadband services by rural communities. In the course of the project, feedback from the implementation of these initial scenarios, and user input through local focus workshops that will be organised in rural communities, will lead to refine-

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ments and adjustments, so that the final broadband services proposed by the Rural Wings project will respond accurately to the local needs and expectations. What is more, becoming gradually more and more experienced, local users will be encouraged to move away from ready-made solutions to adapt the broadband services according to their own priorities, thus dynamically forming the learning scenarios and realising the expressed preference of the Rural Wings project for a user-centred, design-based research approach requiring that feedback from the field be constantly taken into consideration in a continuous design process.

3. Background to the development of the scenarios

Before one can start ‘translating’ theoretical propositions into practical guidelines, it is necessary to investigate and take into account the characteristics of the real world in which the theory will be implemented. Responding to this self-evident need, the developers of the scenarios of use, in the outset of their effort, recorded various implementation parameters, i.e. characteristics of the actual settings which may turn out to be significant during the implementation of the learning scenarios in real life. The outcome of this attempt has been a generic but enlightening account of the anticipated context of implementation, taking the form of an inventory of implementation parameters, which provided input into the subsequent process of scenario design and development. The implementation parameters identified were divided in two major groups:

- those directly referring to the local circumstances; and
- those relating more generally to the project, its priorities and potential.

3.1 The local circumstances: Target groups and ‘learning spaces’

Since the Rural Wings project is targeting all rural citizens without exclusion, more than one distinguishable user group may be defined in each rural community. Therefore, the design of the learning scenarios takes into account the variety of target groups (school students and teachers, administration employees, professionals, entrepreneurs, farmers, etc.), both men and women without discrimination, and the ‘learning spaces’ in which these groups are expected to become active as learners: school, workplace, home. What is more, the design-based research approach adopted by the project also requires that the local settings be taken into consideration, and users be involved, and monitored, in the design process. This will be achieved through the participation of end users in local focus workshops, in which they will provide the pedagogical and technological teams of the project with insights into their particular needs, and gradually more and more feedback, which will form users’ own input into the process of designing and redesigning the broadband services offered, so that eventually they best match the local needs.

Users’ interest and motivation: Obviously, the interest that local users may have in specific areas of knowledge or application, and their motivation to be involved in learning activities in these areas, is the driving parameter in the selection of the subject of the learning activities. In the same area parameters also fall such as the local economic situation and tendencies in the labour market (e.g. unemployment and interest in, or need for, career shifts). For the development of the scenarios, work conducted previously in the project for the identification and analysis of user needs has served as the main indicator of the interests and motivation of the various, diverse rural





communities across Europe (Hansson et al., 2007). The interconnection of the developed scenarios with the users and their identified and analysed needs is presented further below.

Where need may arise for the selection of a limited number of subjects among several areas of stated interest, the project gives favourable consideration to learning subjects which, on one hand, have a potential for the promotion of innovation, creativity, entrepreneurship, solidarity, community development, as well as the penetration of the Information Society in the rural communities, and, on the other hand, are suitable for distance learning. In this way, the full potential of satellite enabled broadband for innovative lifelong learning activities in rural areas may be better demonstrated to local users, and the relevant benefit may be more clearly recorded and investigated.

Current learning culture and the role of the local

change agent: In order to introduce ‘a new learning culture’ through the design and implementation of the learning scenarios – a central objective for the whole project – it is necessary to find out what the current learning culture of citizens in a rural community is. The learning culture parameters looked into are presented in Table 1.

The second point in Table 1 refers to the role of a local person who will promote and facilitate the change involved in the uptake by the community of the broadband services. Indeed, a crucial ‘component’ of the current learning culture is the local change agent. The role of such a person in each local community is crucial to the success of the Rural Wings approach. The change agent will be in charge of driving change in the community by first diagnosing and understanding the context and players involved, and then trying to ‘convince’ them, in a continuous route towards

Table 1: Implementation parameters

Parameter	Comment
Average educational level of the target group	Including previous formal and informal learning experiences
Exceptional cases of target group members above the average educational level, or with exceptional creativity	These could serve as facilitators/moderators/change agents emerging from within the local group, taking up specific roles assigned to them in the learning scenario
Previous innovative, learner-centred learning experiences	As opposed to traditional education and training; the path to independent, self-directed, inquiry-based, and distance learning may need to be carefully paved
Eagerness to adopt applications in each of the three learning spaces (school, work, home)	Not all three learning spaces may be ‘mature’ enough to adopt innovative approaches to lifelong learning in a pilot site or country
Readiness for the development of synergies between local stakeholders	The desire of the project to foster synergies across the three learning places through the appropriate scenarios may not be possible in all sites. Where possible, scenarios should make full use of the potential of local leadership and other local entities to act as centres and/or individuals promoting lifelong learning in the whole community

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capacity building through ICT, as an integral part of the route to sustainable development (cf. UN World Summit on the Information Society, 2005).

Users' familiarity with ICT: The project aspires to demonstrate to the rural communities, and familiarise them with, the use of a new generation of technologies and applications that can enable people to design, create, and learn in new ways, helping them to become more active participants in their communities. Apparently the current level of familiarity of target users with information and communication technologies is an important parameter influencing the content and level of complexity of the learning scenarios. In particular, design of the scenarios also incorporates the availability or not of local technical support (cf. applications that may require increased technical support locally, for setup or maintenance of the infrastructure and tools).

Language and other local aspects: The provision of e-content and e-services is typically a highly localised matter, and the field of e-learning is not an exception. Users' linguistic and cultural background are taken into account in the process of decisions regarding which learning scenarios can and should be implemented in each cultural context, given, among other things, the costs of localisation (translation, adaptation, etc.) of content existing in another language, as well as any local sensitivity to certain issues (e.g. due to religion or ethnicity in minority areas).

Building international collaboration: Given the multinational and strongly multicultural nature of the sample of rural sites in which the designed scenarios will be implemented, special attention is paid to a) providing opportunities and motivation for the development of activities and collaboration involving users from as many pilot sites and countries as possible; and b) avoiding the concentration of activities around national nodes, with little or no interaction across the borders.

3.2 Potential and limitations of the available technologies and services

The process of scenario development is the main point where the two driving forces of the Rural Wings project, User Demand and Available Technology, meet. As successful scenarios are perceived those which effectively and efficiently match the needs and potential of the local communities, with the potential offered by the various technologies available, addressing successfully the limitations existing at both sides.

In particular, priority is given to the development of scenarios that, on one hand, take advantage of the advanced possibilities offered by broadband connectivity, and, on the other hand, have the flexibility to support smooth realisation of the learning activities even in cases of technical problems (e.g. no internet connection through satellite due to poor weather conditions). In addition, given the limitations imposed by the definite amount of project resources, the availability of existing methodologies and content within the consortium, which could be adapted to meet the needs in some of the Rural Wings learning contexts, should also be taken into consideration when deciding on the selection of learning scenarios.

4. Learning design principles

Building on, but also expanding beyond, relevant work conducted for the analysis of needs earlier in the project, a list of pedagogical and organisational principles has been compiled which the scenarios follow and materialise, each one with a special focus and emphasis on certain aspects of learning design that are more relevant to the specific context. The pedagogical and organizational principles followed are presented in Tables 2 and 3 respectively.





5. Scenarios: the meeting point of user needs and available technologies

The development of the scenarios of use stands at a crucial point in the course of the Rural Wings project. This is where the conducted analysis of user needs informs the selection of the broadband services that seem to respond better to the local circumstances of the users, and where the decisions are made about how end users will be involved in extended episodes

of use of these services in order to get acquainted with the new possibilities, and, gradually, come to a point of user maturity whereby they will invent their own solutions to cover their own particular needs. In the following sections, the selection of the first demonstration applications is presented, as well as the way in which the corresponding scenarios of use match with the identified user needs. What should be highlighted, however, is that the scenarios presented at this initial stage are only a starting

Table 2: Pedagogical principles

Principle	Comment
Learner motivation	The learning experience should be relevant to the learner’s existing motivation, and encourage the deepening of this motivation
Personalized learning experiences	The individual learner should be presented with content and interaction personally relevant to them. The overall learning design should be adapted to the local context
Challenging learning experiences	Learning should be sought through authentic and meaningful learning activities promoting learner’s enjoyment and creative involvement in the learning process
Learner’s informed consent	The learner should be informed in advance about the learning activity: its purpose, procedures, activities, equipment, options, conditions, potential benefits and drawbacks
Learner in charge of their learning	Learner’s conscious personal investment in the learning effort should be encouraged and facilitated, as well as their stable belief in their personal responsibility and initiative for whatever relates to their own learning
Learner-inventor	Learners should be encouraged and facilitated to use the opportunities and resources on offer to invent their own solutions for their own personal learning needs
Learner-producer	Learners should be encouraged and facilitated to develop gradually into more and more critical and creative users of the opportunities and resources on offer, becoming generators of knowledge and new content rather than remaining consumers of ready-made solutions.
Promotion of lifelong and informal learning	Informal learning should be facilitated even in formal learning contexts, and a culture of ‘learning everywhere throughout life’ should be promoted
Social learning	Learning through social interaction and collaboration should be encouraged. In online distance education settings, learner’s ‘social presence’ should be supported
Inclusion	Gender-, age- and ethnicity-inclusive approaches should be followed

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Table 3: Organisational principles

Principle	Comment
User's ICT skills	The learner should be adequately ICT-literate to be able to access and exploit the e-learning resources
User's self-organisation	The learner should be adequately prepared to manage their time and organise their own learning
Addressing resistance to change	Resistance to change is inherent when introducing innovations: new technologies, new ways of working, new ways of learning... Strategies should be incorporated in the design to overcome this resistance
Multidisciplinary learner support	The learning experience should be organised and supported comprehensively and creatively, though multidisciplinary expertise: pedagogical, organisational, technical, administrative. Good organization of the support team is crucial. Team members' roles should be made explicit to the learners.
Efficient learner support	Efficient support on demand, at local and central level, is necessary, providing solutions to arising problems and managing emerging crises
Learner guidance materials	Provision of materials such as a learner guide, outlining for example aim and learning objectives, teaching and learning methods, content and material, type of assessment, technology required, technology skills required, expected study time and study period, support and contact persons for learning instructions, technical issues and administrative issues



point for the pilot implementation of concrete demonstration cases in the pilot sites. Through the evaluation of the implementation experiences and the user feedback generated in the local focus workshops, the end users will gradually become more and more involved in a process of transforming and probably further localising the scenarios, so that they describe activities that best respond to the various local needs, priorities, and circumstances.

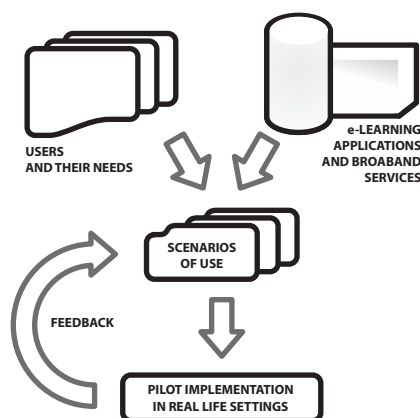


Figure 1: Scenarios of use are the point where broadband services and applications, user needs, and continuous user feedback meet and interact



5.1. The proposed applications

The Rural Wings consortium brings together expertise and past experience in various forms of e-learning, which have been tried in the framework of past projects and proven successful and useful for users in rural and disadvantaged contexts. The corresponding tools and applications constitute an important asset in the overall design of user-centred activities in Rural Wings: by making such tools and applications of proven value and user acceptance available to people in the rural communities, the consortium intends to achieve a first familiarisation of the various user groups with some characteristic possibilities and opportunities available, at various levels of difficulty, user effort demand and prerequisite experience. Based on the first experiences of using such applications and tools, users will gradually discover the various solutions technology can offer to their own problems, becoming more and more independent and creative in the use of ICT. Thus, the applications and tools already available within the Rural Wings consortium per se do not constitute an end; the scenarios are not based on them. The scenarios developed exploit these readily available good-quality resources to address what users really perceive as relevant learning – or indeed what the consortium knows, based on past experiences, users may perceive as worthy learning experiences when they get to know the technology better. Thus, the existing offer of ICT applications and tools merely provide a means, a first stable step, a starting point demonstrating available options to the users. Of course, in this introductory phase of user-centred activities, the ICT instances that may be of use are not limited to an exclusive list of applications. The tools and applications provided by the consortium members can be combined in complementary ways with other resources freely available, most remarkably

over the internet, while recommendations of other known “best of breed” applications that may be used in the context of Rural Wings can easily be integrated into the developed scenarios.

Another aspect of the selection of the proposed applications is that which aims at the demonstration of the use of broadband services for covering the learning needs of rural areas at various levels of bandwidth, from the lower through to the upper limits of broadband. Thus, the applications involved in the scenarios of use range from rather low-demand web portals and web-based services, to bandwidth-consuming video streaming and videoconferencing applications, so that the trials with real users will reflect the various instances on the spectrum of bandwidth needs.

The scenarios clearly use the available tools and applications as demonstration cases, and encourage the discovery and integration of other content into the usage schemes by national coordinators and the end-users themselves – in particular in the framework of localisation processes, in which national, regional or local resources are taken on board to address the local needs more closely, transforming the generic scenarios into context-specific learning modules.

To mention a most obvious example from the field of formal education, the conception and development of the learning-at-school scenarios foresees that the national coordinator, together with the local coordinators / change agents will adapt the chosen scenarios to reflect the provisions of the national curriculum and exploit any already available relevant content, such as existing national e-learning resources tailored for primary, secondary and higher education. In adult education, a corresponding example of scenario localisation may well relate to cultural differences between learners, or the local peculiarities of the work force and the labour market. Further, it should also be noted that the scenarios of use do not imply any application-bound cost for the end user, at

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least for the duration of the project. After the end of the project, it is expected that users will be technologically literate and mature enough to select which digital applications and services respond to any given local needs, and thus may deserve the investment of paying for using them, or may indeed be replaced by other, freely available user-accepted options.

5.2 The connection with the users and their needs

A central driving force in the Rural Wings project is its aspiration to provide users in rural areas with advanced ICT-enabled learning opportunities delivered through satellite DVB-RCS internet access technologies, by engaging genuinely user-centred methodological approaches which will secure the relevance of the various implemented applications with the real needs of the users. As a direct consequence of this priority, the developed scenarios of use directly refer to the user groups, and are closely linked with the users needs, identified earlier in the course of the project (Hansson et al., 2007; Pedersen, 2007). Elaborating further, we are proposing a taxonomy which systematically organises the target rural settings and groups, the needs addressed and the proposed principles followed.

Based on this taxonomy, the developed scenarios can be precisely anchored on the wider project perspective. At the same time, this taxonomy may also prove useful for the systematic, meaningful-to-the-user structuring and organisation of the content that will become available to the end users in a Common Access Point developed within the Rural Wings project.

The target groups and their settings: In line with the overall conception of the Rural Wings project, as well as in the light of the conducted analysis of user needs, the scenarios bear relevance with vari-

ous target groups, in various learning contexts. They address the needs for learning and personal and professional development of a range of users:

- Students
- Teachers
- Farmers
- SME entrepreneurs
- Doctors and health personnel
- Local administrators and public authorities personnel
- Rural citizens active in their private space.

In this way, all the types of rural settings identified by Hansson et al. (2007) are covered, namely:

- Communities with an interest expressed by rural schools / educational establishments
- Communities focused on agriculture
- Communities focused on non-agricultural rural entrepreneurship and/or holiday use of the rural area
- Communities with interest in local governance initiatives and innovation
- Remotely located research stations.

The user needs addressed: Special attention has been paid to grounding the selection and orientation of the scenarios on the four basic categories of needs and the actual needs identified by Hansson et al. (2007). These have been further elaborated in the present context to produce a comprehensive, structured list of the detailed needs that the scenarios ought to address, codified into an inventory of rural citizen's needs for broadband-enabled lifelong learning and development, as presented in Table 4.

Rural Wings users: Actors in three interconnected learning spaces: Organising the various possible learning circumstances of the user groups addressed into three major learning contexts, the scenarios dis-





tinguish three different, yet strongly interrelated, 'learning spaces':

- learning@school

- learning@work
- learning@home

By definition overlaps are expected between the

Table 4: Rural citizen's needs for broadband-enabled lifelong learning and development

<p>Learning More and better learning opportunities: Need to support and enhance formal and informal learning in the school, in the workplace, at home – eventually 'learning everywhere'.</p>	Enhanced access to education
	Enhancement of formal learning – access to rich educational resources
	Teacher training provision
	Farmer training provision
	Professionals training provision (health personnel, local administrators)
	Enhanced opportunities for informal learning in a person's private space and time
	Promotion of new knowledge in remote areas - Enhanced activity of remotely located research centres
<p>Governance More and better governance opportunities: Need to support and enhance rural citizens' possibilities for communication with the various levels of government, and for their information about local, regional and national initiatives</p>	Locals' enhanced access to public services and information
	Better local government - Knowledgeable and creative local government personnel
	Citizens' enhanced involvement in local, regional, national initiatives and issues
<p>Economic Growth More and better economic growth opportunities: A need to enhance rural citizens' opportunities for entrepreneurship and economic growth</p>	Promotion of state-of-the-art agricultural practices - Knowledgeable and creative farmers
	Promotion of rural tourism - Knowledgeable and creative local entrepreneurs
	Promotion of innovative rural businesses - Knowledgeable and creative local entrepreneurs
<p>Communication More and better outward communication opportunities: A need to enhance rural citizens' feeling of access to, and communication with, the world beyond their local settings</p>	Communication with others via e-mail, ip phone, video – regionally, nationally, internationally
	Access and use of up-to-date information on the internet
	Opportunities to follow the fast pace of world developments and global change

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three spaces, and most notably between the home, on the one hand, and the school and workplace settings, on the other hand: apparently, all those active at school or work may well act as learners in the informal learning context of their homes, too. More than this, the interconnection of the three contexts is actively sought in the project and promoted by the scenarios, as to some extent such an integrated approach can guarantee the establishment and proliferation of a lifelong learning culture in the community. It may help individuals realise that learning is not to take place only in that place which each individual has predominately associated with learning activities and experiences. Learning can and ought to be a continuous, lifelong learning process, which cuts across the boundaries of the various contexts in which a person operates in the course of a day – or indeed in the course of their lives.

Content areas: As a result of the cross-section of the identified user needs and the various applications readily available, the scenarios could cover a range of areas of knowledge and skill, approaching them from different perspectives. The content areas that could be covered are the following:

- Improving school through new educational resources

- Rural entrepreneurship through education
- Rural teachers' training in innovation
- Informing and training farmers and agriculturalists
- Training in health emergency situations
- Training in change management
- Broadcasting of local affairs to the world.

Table 5 presents the anticipated spaces in which each group may develop learning activities.

5.3 The scenarios developed for the first phase of implementation

Based on the above background analysis, the following scenarios have been developed for the first phase of pilot implementation:

- Entrepreneurship education: A rural e-shop run by students
- Access to education: A virtual music school for rural students
- Students broadcasting local affairs through their own WebTV programme
- Better education: Enriching science learning and scientific activity in remote rural areas



Table 5: User groups in the learning spaces

	learning@school	learning@work	learning@home
Students	●		●
Teachers	●	●	●
Farmers		●	●
SME Entrepreneurs		●	●
Doctors and Health personel		●	●
Local administrators and public authorities personnel		●	●
Citizens active in their private space			●



- Rural school teacher training
- On-the-field personalized communication and training services for farmers
- Health emergency training
- Addressing change and innovation competences in rural communities
- Alexander, the local educational leader
- Lisa, the university student
- Martin, the farmer
- Ann, the pensioner
- Elsa, the doctor

The scenarios developed cover all three learning spaces (school, workplace, home). Although several of these scenarios can lead to the realisation of learning activities in more than one learning space, their main relevance to the three learning spaces is represented in Table 6.

6. Structure of the scenarios

The learning scenarios provide concrete instruction design models for the different ‘learning spaces’, making the rationale, learning goals, learning activi-

Table 6: Main relevance of the scenarios to the learning spaces

	learning@school	learning@work	learning@home
Entrepreneurship education: A rural e-shop run by students	●		
Access to education: A virtual music school for rural students	●		
Students broadcasting local affairs through their own WebTV programme	●		
Better education: Enriching science learning and scientific activity in remote rural areas	●		
Rural school teacher training	●	●	
Addressing change and innovation competences in rural communities		●	
Health emergency training		●	
On-the-field personalized communication and training services for farmers		●	
Alexander, the local educational leader			●
Lisa, the university student			●
Martin, the farmer			●
Ann, the pensioner			●
Elsa, the doctor			●

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ties, participants' roles, and processes to be followed in each case, explicit (Figure 2).

SCENARIO OF USE

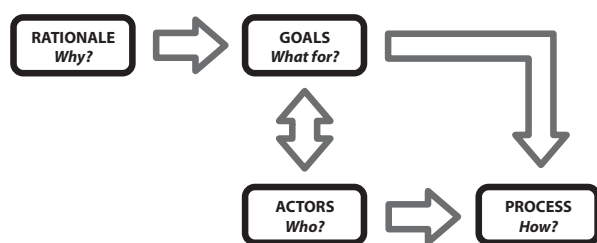


Figure 2: The elements of the learning scenarios

To make the multiple functions of a scenario best visible and the scenario easily usable by the various types of its potential users, the following structure of the information included has been devised and used consistently for the presentation of the scenarios developed for the three learning spaces (school, workplace, home):

- Scenario title: each scenario is given a clear title, demonstrative of its purpose and content focus.
- Rationale: this is a short text briefly describing the context, content, and purpose of the scenario.
- Space of implementation: in this field a table presents the learning space (school, work, home) in which the activities described in the scenario are mainly expected to take place, as well as the spaces in which the activities could also, or might possibly take place.
- Rural settings and user groups addressed: a table presents the identified rural settings (Rural school, Agriculture-oriented community, Entrepreneurship-oriented community, Interest in local governance, Remote research sta-

tion) in which certain user groups (Students, Teachers, Farmers, Entrepreneurs, Health personnel, Administrators, Private citizens) are expected to, or may possibly be, interested in the scenario.

- Involved actors: In this section the characteristics (e.g. demographic information, educational background, motivation) of the actors involved in the scenario are presented.
- Specific goals: The purpose and intentions of the scenario are presented here in the form of specific goals/objectives.
- Connection with the identified user needs: The identified user needs that are addressed by the scenario are selected out of a list.
- Connections with the curriculum: The links of the proposed scenario with certain areas of the school curriculum or other formal education curriculum are mentioned here.
- Types of learning supported: Out of a list of main pedagogical approaches the most relevant to the approach adopted in the scenario are marked.
- Temporal mode: It is marked if the scenario foresees time-independent activities, e.g. asynchronous interaction with others, or time-dependent activities, e.g. synchronous interaction with others, or both.
- Prerequisite competence: This field describes the knowledge and skills that the involved actors may need to possess in order to participate in the activities effectively.
- Applications involved: This field describes technological solutions identified that can be used for the implementation of the scenarios
- Narrative description: This is main part of the scenario, in which the activities proposed are



described in detail.

- **Evaluation parameters:** This field provides information about the parameters of the proposed implementation that should be particularly focused upon in the evaluation.
- **Relevant resources:** Additional information or resources.

This systematic structuring of the scenarios serves as a common framework for the anchoring and practical presentation of all scenarios to all stakeholders, allowing at the same time for internal differences which may exist between the various scenarios due to the very different contexts they may refer to. At

the same time, this organisation of the information may also prove useful for the systematic, meaningful-to-the-user structuring and organisation of the content that will become available to the end users in the Common Access Point on the web developed within the Rural Wings project, as a realisation of these scenarios.

7. Localising the scenarios

The scenarios outlined above are generic in nature. They are based on the overall analysis of user needs and the conceptual foundations of the Rural Wings



Figure 3: An example of presentation of the scenarios of use

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project. By necessity, therefore, they are the result of a degree of abstraction, and do not claim to provide answers to country- or pilot-site specific questions about how to be implemented. What they do provide, however, is a general set of ideas, aims and guidelines, which form adequate initial input in a process of localisation and adaptation conducted by the national and local coordinators, so that the activities eventually implemented in the pilot sites really address the local needs.

In the conception of the Rural Wings scenarios of use, national coordinators in particular are considered as the main interface between the more general objectives and aspirations of the project and the more concrete national, regional and/or local educational policies, strategies, priorities and needs. In line with this role of theirs, the National Coordinators have transformed the generic scenarios into context-specific learning modules, consisting of materials in the local language (where English is not appropriate for use with the local users) and of local relevance (where the local circumstances deviate considerably from those generic ones anticipated in the scenarios). In this process, the proposed ICT applications and learning resources may be complemented, or even replaced, by national, regional or local resources

which may be of particular local relevance.

It should, finally, also be stressed that through the implementation of the proposed scenarios in real-life settings and the involvement of end-users in the proposed activities, the generated experiences will form input for further elaboration of these first generic, demonstrative scenarios, whereby the discovery and integration of further content and usage schemes by the national coordinators and the end-users themselves will be particularly encouraged.



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Technology Enhanced Music Education in Remote Areas: Supporting the Teaching of Wind Instrument in Rural Areas through the Virtual European Music School (VEMUS)



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1. Introduction

Music technology has become a recognised subject area in its own right. In discussing music education it is important to acknowledge the relevance of music in children and young people's lives, and the musical cultures and communities that emerge in and around clubs, rehearsal spaces, homes, arts centres, conservatories and schools. In this context the need for self-guided learning, peer interaction, coaching and guidance, collaboration, and sharing of resources can be met with the aid of music technology and existing information and communication infrastructure. The particular needs of remote areas make the necessity for such technology and infrastructure even more acute.

Computers have been used in music education for over 20 years. Applications are covering fundamentals of music, instrument performance skills, analy-

sis of music as well as composition skills. The basic facilities for every practising environment for training of musical performance skills are: a database of lessons (content), display of the score on the screen (note reading), and the possibility to listen to a (synthesized) performance of the score. In the simplest implementation, the computer could be used to present the material to the student. That does not fundamentally differ from a songbook with an audio cassette, apart from interactive features, such as showing the fingering by clicking on a note. More advanced practising environments offer a performance analysis as well, enabling the computer to "listen" to the student's performance. This opens the way for assessing the performance and providing feedback to the student, which adds another dimension to the interactivity.



2. VEMUS: A virtual music school for rural students

VEMUS is primarily focused on performance skills but since it addresses beginners, it also includes fundamental teaching of wind instruments combined so that practicing sessions become a complete learning setting. It also provides support for distance learning by allowing students to have access to updated content and to communicate with a specially mandated distance learning teacher group to obtain electronic guidance, feedback and assistance whenever they require it, through asynchronous Internet communication.

Although designed to be autonomous, the system is expected to be most successful when used as a supplement to traditional music lessons with a teacher. In the VEMUS approach the computer provides feedback that adds to human teacher practice, by incorporating visual and aural feedback. The computer-student interaction is seen as a mirror reflecting certain aspects of a student performance. The combination of performance-specific feedback, visually presented one score-viewer are believed to enhance the efficiency of practicing.

The VEMUS system may be viewed as the interaction of a user and a virtual teacher by the means of a score viewer. During a student performance, the virtual teacher (in the role of a listener) keeps track of the student's position in the score and turns the page if needed. After the performance the virtual teacher (in the role of an analyst) provides an evaluation of the performance on request of the student. The feedback is presented in the score, where mistakes and errors (one at a time) are highlighted and clarified with a text message. Additional system components helping the student are a tuner, a metronome and a virtual-reality fingering viewer. When the user performance ends, the virtual teacher may evaluate the performance on request and shows the

results on the score. The score is at the heart of the user and virtual teacher communication and interaction: visual helpers or feedback from the virtual teacher are provided as annotated music scores; aural feedback may be requested by the user using the score as user interface.

Through the Distance learning platform the students are able to view the content that exists in the remote database, download content and upload their performance units, while teachers can author content, view the files that students have uploaded, view reports on student progress and communicate with the students that are assigned to them.

The aim of VEMUS is to smoothly blend e-learning functionalities with traditional face-to-face teaching. This is accomplished by complementing - rather than substituting - the stand-alone self-practicing environment. This is accomplished with:

- a remote music content repository,
- adequate student profiling,
- meaningful monitoring of student progress through time,
- virtual student groups coached by a remote tutor.

The Distance Learning Platform (DLP) is shown as an option on the VEMUS local system, running on the teacher or student computer. Through connection to the VEMUS server, students download new content to study, using the self-practicing environment, while teachers create new content locally using the provided authoring tools, and then upload it to the repository using tools provided by the distance learning platform.

Virtual classes (groups of remote students) are created, managed and monitored thanks to the distance learning platform. Their progress is monitored through the content assigned by teacher and the improvement of the performance after practicing on that content. Personalized coaching is possible

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through feedback from teacher to remote student in the form personalized comments or advice.

3. The VEMUS scenario of use in the Rural Wings context

VEMUS has provided the inspiration for the development of one of the scenarios of use within the RuralWings project (see Koulouris & Sotiriou, this volume), demonstrating how broadband services can help tackle that disadvantage of problematic access to music education and rich music learning resources, from which many rural students may well suffer. The content of this scenario is presented below.

3.1 'Access to education: A virtual music school for rural students': A rural Wings scenario of use

Rationale

Students in remote rural areas with no or little chance so far to receive good quality music education, get access to a series of new options for technology-enhanced music learning:

- Independent music learning and self-practicing
- Asynchronous distance music education
- Learning music synchronously in a classroom.

Involved actors

- Teachers in primary or secondary schools who wish to introduce innovative, student motivating ways of teaching a series of cross-curricular skills and knowledge, bringing school learning in contact with entertainment, the contemporary media culture, and the local community surrounding the school.
- Students in the upper grades (age 11-12) of

primary school, or in secondary school, who need to acquire the relevant knowledge and skills, and who are interested in developing innovative activities in the school and in collaboration with the surrounding community.

- Local actors, e.g. farmers, entrepreneurs, local community authorities, who wish to get acquainted with the possibilities



offered by new technologies for the promotion the area and of local people's views and needs over the internet.

Specific goals

- To provide people living in remote rural communities with opportunities to learn music effectively, using new technologies, in the first place, to get access to music teaching resources, and, further, to gain better quality music learning experiences through their contact with contemporary, stimulating music learning approaches.
- To help music teachers and music education providers get access, and offer good quality music learning experiences, to remote rural people who have had little, if any, possibilities so far to participate in music classes.

Connections with the curriculum

Teaching of music, and in particular of the instruments recorder, clarinet, flute, and saxophone, in various institutional circumstances; possible connections with other curriculum areas such as IT through the application of cross-curricular teaching approaches.





Prerequisite competence

- Basic ICT skills
- Basic score reading and other corresponding content-related skills

Applications involved

- the VEMUS (Virtual European Music School) system, available at www.vemus.org



Narrative description

Music is a universal language, something everybody understands and enjoys. It is thus one of the things that bind together people from different places, backgrounds and cultures. Nowadays, everyone, including music students and teachers, is getting increasingly familiar with new technologies, and the opportunity to use the internet for the provision of music education is gaining supporters, in particular among remotely situated potential learners. This scenario describes how the satellite broadband networks of Rural Wings foster equal opportunities for access to good quality music education.

A music teacher, teaching recorder, clarinet, flute, or saxophone in a remote rural area, is presented with the possibilities offered by the VEMUS music learning

environment. This integrates e-learning components to augment music teaching in different learning settings: it supports activities in music classrooms, as well as self-study in the lab or at home, while teachers and students are encouraged to participate in the building of a learning community. It should be noted that the music teacher could also be based in an urban centre, regularly travelling to villages to teach, or receiving students in his classes who travel for their music education. In this case the teacher would use the technology to minimise the need for his physical presence in the musical education of his remote rural students.

There are three different options available to the remote rural teachers and students of music, which can be used in any combinations. These options are presented below.

Independent music learning and self-practicing

Beginner students of music are provided with a complement to conventional music teaching, in the form of an ICT application assisting them when practicing at home or in the lab, thus making practising sessions much more informative, constructive and enjoyable.

The teaching and learning activities supported include:

- Evaluating student's performance
- Detecting errors
- Prioritizing and selecting information to display to the student
- Showing information to the student in the appropriate form
- Grading the student's performance.

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Asynchronous distance music education

Groups of remote music students and teachers are supported and involved in common activities asynchronously. Users, who may be at music school or in remote settings, are provided with access to content, content authoring tools, and collaboration opportunities.

Even students and classes from different countries can be brought together and collaborate. They may select and exchange popular songs from their countries, learn how to play the songs helped by their teachers and the software, and periodically go online to follow each other's progress.

Users may make use of the following features on the web:

- an open content repository
- authoring tools augmenting the content repository
- asynchronous communication tools

tion tools

- tools allowing remote coaching of students and monitoring of their progress through time.

For example, remotely located students can be supported by:

- Studying the same song separately
- Practicing at their own time and pace, communicating with each other regularly
- Uploading a new performance to a shared workplace, every time a student makes progress
- Downloading and importing the performance of someone else into their own environment, playing on top of it, using it as accompanying music
- Providing feedback to their peers.



Learning music synchronously in a classroom

Music teaching in group settings may be enhanced through ICT providing aids supporting the teacher





and tools supporting collaborative learning. In this synchronous technology-enhanced music learning experience:

- Students share a common workspace and a common view of the music score.
- The teacher adds annotations on the score, which automatically appear on all students' screens.
- While a student performs, the teacher and the other students can see his/her performance and related information (e.g. visualizations, page turning) on their screens.
- The system evaluates the performance and the teacher uses graphical elements to explain "hard-to-learn" points.

- The performance and all materials produced are automatically stored and made accessible to students for further reference.

Implications for evaluation

Evaluation should focus on how these innovative music teaching approaches are perceived by the teacher and the students, as well as by other people in the local community (e.g. parents) at the outset, and after they are fully implemented. User input for possible improvements both in the application, the use of the satellite broadband link, and the educational approach should be particularly sought.

Relevant resources

The VEMUS manuals



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WebRadio and WebTV: Giving a Media Voice to the Local Community



Madeleine Caroline Schleiss
DBC WebRadio and WebTV, Switzerland

1. Rural Wings WEB-TV

Rural Wings WebTV is the modern internet information media. Through its interactive multimedia platform, it represents a free community media, comparable to the traditional radio, traditional TV related to a website, but with a dedicated multimedia content edited and managed by the concerned communities itself. Rural WebTV can offer multiple channels, common and/or dedicated spaces, with free access areas for public, and with open and/or private access for tutors and teachers.

Rural Wings WebTV is to be a vector for informal learning at different education levels. Its aim is to be the ideal multimedia communication platform, with an advanced and interactive learning environment, offering easy and user-friendly applications for intercultural dialogue in the three main domains:

- Learning@ school
- Learning@ home
- Learning@work

The content production can be totally free improvisation, or be a part of a learning process, depending on the chosen strategy or the concept of the communities' communication. A group leader will have to define the program to be realized by each group, for example by the students for learning@school, by the members of a postgraduate course (graded or not), by the teachers or group leaders for the learning@home and learning@work contents.

This represents a pleasant method to learn communication, to learn cooperation within a production team, accept spectators' criticism, enlarge knowledge, using contemporary redaction and editing tools from "the blank paper to the wave and the screen". Rural Wings WebTV offers the possibility of multiple production managements, like interactive lessons plans (with free access), internal communication spaces between teachers, live and/or on-demand audio exchanges (free or restricted area access), and of course a dedicated Radio-TV channel.

Rural Wings WebTV brings to all these domains the



tools to create and publish content by themselves, to upload them online by accurate interfaces, not only to communicate to each other, but also to exchange ideas, opinions and information with the public and expert.

2. Example of learning @school

Rural Wings WebTV is an example of an up-to-date learning environment that encourages students to become active learners and to realize the value of informal learning as an integral part of education, involving students in extended authentic episodes of playful learning. Students will decide the subject, for example an aspect of their country's culture to promote. They have to collect the content, write the scenario, shoot the film, do the editing, finalize the

emission, write the English text for voice-over, record the national and international versions and upload the final versions to the dedicated platform. The learning environment is acting as stimuli for intercultural dialogue between the schools participating in the project, as the starting point for discussion and exchange of ideas about culture, Europe, national and European identity. The activities of the Learning@school program bring students in contacts with the society through real daily life situations, making them simultaneously learn in an informal but effective way within the framework of the schools' curricula.

There will be provided an easy to use description for the teachers that would like to implement this technological pathway and/or adapt it to their specific educational environment, including also online support.

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A Model to Strengthen the Community Voice in Ireland's Local Development Process: The ADOPT Model



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1. The Model

The five letters that combine to form the acronym ADOPT represent five different components of the model. These components include: an Audit of the area; agree Districts in the area; establish representative Organisations to promote accountability and transparency; formulated Plans at appropriate levels starting at the community level; and Train community development leaders and local development functionaries. The model is a composite model that originated from two main sources:

- The strengths of successful area based community development initiatives; and
- Modifications to a number of contemporary community development models of the Irish local development context.

Practitioners may opt to apply the model in whole or in part. However, it is advised that the model possesses systems like qualities, whereby the envisaged impact of its entire application is greater than the

sum of its parts. It is not necessary that the components be implemented sequentially. The ADOPT model is illustrated in Figure 1 of the accompanying slide presentation

The centre of this figure depicts the five key components of the ADOPT model. The outputs of each of these key components radiate out from the centre. These outputs are in turn linked to their respective objectives. Finally the objectives are linked to demonstrate their mutual dependence in the ADOPT model.

2. Audit the Area

This component of the model aims to ascertain the community constituency and to assess its development status. The local area in the ADOPT model typically refers to the 34 local authority areas that include the 29 County Councils and the five City Boroughs, consistent with the CDB areas. Each of these local areas has its unique community constituency.



However, describing this constituency is complicated by the fact that there are a number of ways to define/ describe the concept that is 'community', namely:

- All the individuals, groups and organisations within a particular geographic area;
- Communities of interests that connect people and groups within a specific geographic area; and
- A sense of identity or membership of particular social groups.

Defining community in purely spatial terms is still very much the norm with rural community activists on the ground. Progressing this definition one might conclude that 'communities' differ greatly in many respects including population size and level of development. The number of communities per local area also varies considerably, which is not surprising given population disparities between local areas (i.e. between 25,000 and 300,000 people).

There has been a growing move towards explaining the 'community' concept in line with communities of interest. A number of reasons have been offered for this including: improvements in communications technology and personal mobility that allow for regular interaction across larger areas; increasing diversity of interests within communities as they grow in heterogeneity; and enhanced public support to diverse interests in the last decade. It is not unusual for a community with a population of just a few hundred people to have up to 20 interest groups. If this calculation is extended to the local area level, each local area has thousands of community based interest groups. The huge numbers and diversity of interests suggests the need to establish organisational mechanisms to facilitate enhanced networking and the participation of the community constituency in the local

development process.

The third description of the community concept is associated with a sense of identity of members of a social group and less with either geographic area or interest. Examples of such groups include the gay community, academic community, traveller community, ethnic communities etc. These members may be diffused around the country not just the local area and may represent people that do not necessarily interact but that are joined by a common feature e.g. culture age, gender, sexual orientation, race, social or political attitude.

The audit of the local area begins by identifying all the communities in the local area described along the lines of spatial/ geographic area. This ensures geographic representation in line with settlement patterns. The audit proceeds to assess the level/ status of development in respective communities. Given the value-laden nature of the development concept, local stakeholders are required to establish indicators to assess the levels of development of their community. In the study that established the ADOPT model, communities were assessed on the basis of: the number and variety of active interest groups in the community; the level of communication and co-operation within and between these groups; the strength of the leaders and the level of broad based community participation; and the strength of the linkages with the external development environment. In the auditing context all communities can be categorised in one of three categories:

- Formative i.e. a community that is either in the early stages of coming together to participate in community development or a community that has low levels of social capital¹ whether

¹ Social Capital is defined as networks together with shared norms, values and understandings that facilitate co-operation within or among groups.

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this is due to poor leadership, latent conflict, development burnout or any such reason;

- Progressive i.e. a community that has a lot of development activity albeit in a relatively unmanaged and/ or poorly co-ordinated fashion; and
- Advanced i.e. a community that is working to an agreed vision, has inclusive development plans and good links with the external environment.

Local development research in Ireland suggests that all local areas have some communities in each of the three categories. Those that have relatively more communities in the advanced stage are considered strong in community development terms.

Though the auditing process begins by recognising communities as spatial entities it immediately proceeds to assess the extent to which ongoing development represents different interests. Community activists can be excused for questioning the approach being used to access communities through existing structures especially in those communities that traditionally excluded those interests on the margins. ADOPT, in recognising the limitations of past community efforts, advocates building intra-community social capital. Those cases that have limited social capital and that fail to acknowledge inherent social differences and conflict will require greater attention in the preparatory planning phase in the planning component of ADOPT.

3. District Selection

The term district, though not entirely new to Irish local development discourse, has traditionally been of limited significance. The ADOPT model aims to change this by advocating that all local areas should recognise inherent inter-community interaction be-

tween communities that are mutually dependent because they share common services. Consequently the district is defined as a sub-local area division comprising a service centre and the area it serves. Research has shown a commitment from community activists to participate in development that directly affects them.

In reality the situation is rather more ambiguous as: districts cross local area boundaries; a district has more than one centre that provides services; smaller communities access services from a number of centres and thus may not fit comfortably into any one district; and sub-area divisions exist that were established for political/ electoral purposes; and the introduction of new divisions may complicate the situation for the community constituency.

The study that gave rise to ADOPT concluded that many of the above ambiguities could be addressed by establishing appropriate organisational mechanisms for community groups and communities of interest to actively participate in development activities that affect them. This study found that: smaller communities are willing to work with their neighbouring communities towards an agreed vision for their district; service centres realise that they need the support of their mutually dependent communities to sustain the quality of services in rural areas; and this district concept provides the critical mass for communities to embark on projects that are too big for any one community to address in isolation.

4. Organisation

This component of the model aims to formalise the organisational mechanisms to enhance communication and financial, political (outside of the political system), and social accountability and transparency on development related issues within a community.





The proposed mechanism at community level is called a pan community organisation (PCO). It provides a forum for community-based groups, interest groups (associated with the community) and individuals to discuss and monitor community developments. PCOs can be recognised by their objectives, membership, and rules and regulations as documented in Table 1.

The objectives of the PCO as presented in Table 1 demonstrate its role in supporting interest groups in the community and providing the environment for enhanced social interaction. The effectiveness of the PCO largely depends on a level of agreement in formulating these objectives and a clear understanding of what is meant by each of the above objectives. This will invariably require establishing development

indicators, targets and means to measure progress for each of the above objectives.

PCO members can be classified in one of two categories: a) executive members; or b) associate members. Executive members recognise the PCO as their parent group. They are subject to the conditionality of the legal entity chosen but they also receive all the associated benefits e.g. limited liability, improved access to funding opportunities, insurance cover, accountability etc. Examples of executive member organisations are tidy towns groups, youth groups, womens groups, hall committees, etc. Associate members on the other hand are responsible to the PCO as members of the PCO, however they are legally responsible to their respective parent organisations. Groups that might fit the latter category would

Table 1: Characteristics of a Pan Community Organisation.

Objectives	Membership	Rules and Regulations
<p>To provide a forum for groups to discuss and plan development activities;</p> <p>To monitor the implementation of agreed plans;</p> <p>To facilitate networking between groups;</p> <p>To encourage the participation of groups and individuals in the community development process;</p> <p>To foster a sense of local pride;</p> <p>To provide an entry for both external and internal actors to participate in community development activities; and</p> <p>To establish gateways at an appropriate level that provide 'Joe Citizen' with access to the policy process by bringing together participatory and representative democracy at the community level.</p>	<p>Membership of the organisation comprises all groups operating in the community (listed in an attached schedule)</p> <p>Additional clauses should also include:</p> <ul style="list-style-type: none">• that new groups in the community have automatic membership; and• a community may co-opt individuals to the PCO with the aim of improving its effectiveness and efficiency. The number of these individuals must be agreed.	<p>The rules and regulations stipulate agreed procedure for:</p> <ul style="list-style-type: none">• the organisation;• holding meetings;• finance;• insurance; and• other issues of legal significance e.g. interpreting the constitution, amendments to the constitution, income and property, and the issue of winding up or dissolving the organisation.

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include GAA, Vincent de Paul, IFA, etc.

The process employed in adopting a PCO exploits the tradition of adapting standard sample objectives, membership and rules and regulations from a recognised template. However, the objectives are context specific and communities are advised to develop each objective to suit their situation. Therefore, in accepting these objectives the community must personalise the objectives by quantifying/ qualifying what it means by improving participation, improving social inclusion, creating networks, etc. in terms that recognise the context of that community. In this way a group can be audited to assess if it is respecting its agreed objectives. This improved transparency and accountability can promote the continued strengthening of the community sector in the local development process.

Encouraging community wide membership will promote respect for existing efforts on the ground. Improved communication between groups can reduce suspicion and provide the forum to establish broad-based community co-operation based on trust.

The rules and regulations are extensive but simple. The activities of the PCO in realising the process include the following:

- agree objectives, membership, rules and regulations;
- agree a plan of action for the community forum that includes indicators of progress, targets and means of verifying/ measuring same;
- employ legal advice on incorporation;
- acquire charitable status; and
- incorporate the forum.

Following incorporation, the activities of the forum are consistent with its plan of action and associated objectives. Frequently communities decide against formalising their organisation for a number of reasons including the associated costs. Given the value

of incorporation, this model proposes that the costs of incorporation and the cost of mandatory auditing of accounts should be grant aided.



5. Planning

ADOPT assumes that all communities have ongoing development at various levels of organisation/ co-ordination. It advocates that new development interventions need to recognise existing efforts to ensure against: alienating existing community activists; duplicating current effort, which invariably leads to splits in communities; confusion for residents and support organisations; and wastage of valuable resources. To this end, ADOPT seeks to enhance the community's social capital as a requisite for its active participation at district level. This involves establishing networks and bridges between individuals, groups and organisations in the community that promote a community voice. ADOPT achieves this through the community planning process.

This planning process consists of six phases, each of which should be addressed as part of the overall development process, with varying degrees of emphasis depending on the development status and previous experiences of respective communities. Particular attention is given to issues of social inclusion, enhancing social capital and establishing an agreed vision at community level. Based on the premise that conflict is an inherent social process, communities are encouraged to address existing and/ or potential conflicts of interest throughout the process. It should be noted that this includes active and latent conflicts, neither of which can/ should be overlooked. The ADOPT model regards poor social interaction and/ or lack of inter group communication as a source of mistrust and a potential reservoir for conflict.

The six phases comprise: preparatory phase; situa-



tion analysis; needs/ wants/ problem analysis; project identification; project appraisal and implementation. The aims, envisaged outputs and major challenges for each phase are documented in Table 2.

Table 2: Overview of the ADOPT Community Planning Process

Phase	Aim	Output	Challenges
The Preparatory Phase	To encourage the community to take ownership of the planning strategy and to agree to drive the process	Research the development situation; Win support of community leaders (among all interests including marginal interests) and external stakeholders; and Establish the demand for the planning process	Manage existing conflicts; Afford the preparatory phase sufficient resources; and Work through recognised channels
Situational Analysis	To bring together all the groups and interested individuals in the community to review their development situation (special attention to be given to 'quiet' interests)	Agree the community constituency for the planning process; Conduct a resource audit of the community; and Reflect on representation by geographic area/sector of the economy/ age/ class/ gender etc	Bigger communities tend to 'plan for' the communities they serve; Smaller communities are restricted in breadth of issues; Not all like to attend meetings.
Identification of problem/ wants/ needs	To document issues that need to be addressed in the community through the planning process	Provide the forum for all groups and relevant persons to input in this phase; Identify and discuss the needs of relevant stakeholders; and Improve/ commence working relations between interest groups serving a common population.	Maximise participation; To provide a level playing field to discuss the needs of the community; To tap skills that exist within the community; To accommodate difference; and To prioritise exclusion; Project Identification

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Project Identification	To establish a wish list of projects/ programmes that the community perceives would address its needs and problems.	SWOT analysis of community; Agree actions/ projects to address/ satisfy the problems/wants/needs; and Establish a wishlist.	Encourage community to dream; Good representation should ensure realistic expectations; Need a mix of easily achieved short-term projects and bigger programmes.
Phase	Aim	Output	Challenges
Project Appraisal	To involve all relevant stakeholders in the project appraisal process this includes many of the local development agency representatives on the CDB.	Community reps selected and prepared to introduce wishlist to support agencies; Support agencies identify projects they will support, project that they are not interested in and advise on additional projects of interest; and feedback outcomes of meetings with respective support organisations to the community for discussion in plenary.	Get the right person from support agencies; prepare the community reps to present the wishlist; sell the community process and plans to the support agencies; Identify other opportunities through the support agencies.
Documenting the Plan	To document all of the information collected to date in an appropriate format to manage the implementation of agreed projects	Agree a team to consult in drafting the community plan; Identify and propose groups that might take responsibility for implementing agreed projects; and Establish a community structure to monitor the implementation of the plan.	Build on existing structures; keep the process simple and encourage participation in agreeing date, responsibilities, targets and indicators; small team of people may require training.

All communities should undergo the planning process to varying degrees depending on their current development status. The study that gave rise to ADOPT identified that many communities that were identified as progressive and/ or advanced proved more demanding and time consuming than communities at the formative stage. The main reason forwarded for this was that community leaders appreciated the opportunity to improve the inclusivity of all interests and relevant stakeholders.

6. Training

Community representatives require training to accelerate the learning process in carrying out their new roles in the local development process. The aim of this component in the model is to enhance the capacity of community activists to actively participate in developments at grass roots, community, district and local levels. Community representatives are stereotyped as the poor relation in local development



activities. This is not surprising given their voluntary status and the relatively limited attention provided to this sector in preparing it for its mandate. Despite difficulties experienced to date the sector is being offered a window of opportunity and the challenge remains with community activists to exploit this opportunity. ADOPT advocates achieving this through education. An accredited training course was designed as part of the ADOPT model. The course content included:

Theory of Community Development

Irish Local Development Context

- History

- Global Influences

- The European Union

- National Development Policy

- Local Development Policy

Community Development Models

Community Development Strategies

Community Development Issues

- Partnership

- Participation

- Social Inclusion

- Social Capital

Management Skills

- People management

- Communications

- Holding meetings

- Planning

- Monitoring

munities, however, community activists frequently have limited access to knowledge of the external development environment or 'the bigger picture'. It could be argued that organisations and agencies charged with supporting communities have had limited success in establishing appropriate mechanisms to enable community representatives to realise their capacity. This model aims to inform those selected to represent their respective communities and provide them with a foundation course that will enable them to make sense of the local development process.

The model advocates targeting community leaders to undertake this training. The bringing together of all leaders within a district to participate in training provides a suitable environment to share information and begin the process of networking on projects of mutual interest. It also encourages a strengthening of the bridges/ links between groups of similar interest. This promotes the organic growth of a structure that adequately accommodates both communities of interest and community groups.

The activities to be undertaken in fulfilling this component of the model include:

- mobilising community leaders (ensuring the community has convened all its groups, reflected on representatives and agreed persons to participate);
- tutors and development workers agree a tentative course content to reflect balance between theory and practice (to be finalised with the agreement of participants on the first night); and
- delivering the programme, encouraging sharing of information, and promote projects that encourage sharing of information.

The implementation and informed evolution of the ADOPT model will require a body of local development professionals with the capacity, confidence and

The majority of community representatives have the will and the ability to represent their respective com-

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Table 3: The Benefits that could Accrue from Implementing ADOPT at Local Level

Partners	Potential Benefits
Elected Representatives	Provides forum to liaise with community constituency at community and district levels; Provides gateways for local demands to enter the policy formulation process; Facilitates the coming together of representative and participatory democratic systems; and Encourages elected representatives and community representative to liaise at grassroots level before bringing issues to the local level.
Local Development agencies	Provides an agreed entry point to community development process; Improved system for selection of community representatives on the boards of support agencies; Improved co-ordination between support agencies; and Training will provide more informed programme staff.
State Agencies	Provides a vital link between state agencies and the community sector; Encourages the involvement of state agencies in community development; Opportunity to introduce communities to top-down initiatives; and Allow for improved targeting of resources to address existing inequalities.
Social Partners	Provides co-ordination and vision for community and voluntary initiatives; Encourage communities to support neighbouring communities; Establishes the organisational mechanisms, at community and local levels for enhanced legitimacy of community representatives; Provide community representatives with a mandate to act on behalf of their respective communities, districts and local areas; Enhance the capacity and confidence of community delegates to represent their respective constituencies on various local structures





will to support an increasingly sophisticated community sector. There is a deficit in the availability and accessibility of educational programmes to re-skill local development professionals. A great deal of attention is being given to the concept of life-long learning, and equally, academic institutions are applauded for the growing number of 'mature students'. While one would have to acknowledge developments in education as positive, it would be naïve to neglect the hypothesis that the increased numbers of mature students in full-time education is a reflection of the lack of relevant educational mechanisms that allow personnel keep up to date in their respective disciplines.

This is certainly true for local development functionaries in agencies and local government who require further training in current local development thinking and recent local development policy. ADOPT advocates the development of a 'Community Development Summer School' to re-skill community development professionals. This school should attract workers from a variety of disciplines and with a range of experiences. Presenters on the programme will bring with them experiences from different cultures, social systems, political systems, etc. The school will also be an opportunity to discuss and challenge contemporary Irish social policy from the implementers' perspective.

7. Conclusion and Associated Future Research

The utility of this model can be analysed from a number of different perspectives.

Table 3 summarises the potential benefits for partners to the Irish local development process.

The potential benefits that could accrue from using the ADOPT model are many, however, these benefits are not automatic. It is envisaged that the benefits to the local area will be proportional to the number of local actors that actively commit to the model.

The benefits of a widespread take-up of the ADOPT model will also have national benefits. The confusion of models and strategies currently in use has rendered comparative evaluations, organised training and the transferability of best practice highly arduous. The absence of 'a national model' is resulting in all kinds of collaborations, linkages and partnerships within and between communities, districts and areas. The composite nature of the ADOPT model, the appropriateness of the organisation mechanisms to the Irish context and the very timing² of the ADOPT model warrants further examination given its relative success in piloting. It is envisaged that ADOPT has sufficient inbuilt flexibility and the required universality for acceptance as a national model.

² Many CDBs are seeking new model to strengthen the social partner/ community and voluntary wing of their board.

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The interplay of local tradition and rural development initiatives in Ireland: A case-study



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1. Introduction

In the area of rural development, governance has entered debates and gained prowess in the EU over the past two decades and became operational in 1991 by means of the LEADER¹ Programme. The governance model is considered to be conducive to an EU rural economy that contemporarily seeks to focus less on the productivist agricultural sector and more on innovation and diversification. The model claims to encourage more representative and effective rural development, on the basis that different local stakeholders are involved as decision-makers in the development process, and that the emergent development outcome is more integrated as a result. The model, though representing an effort to 'hand over' the development process to local people, is nonetheless advocating a particular type of rural development outcome and it is conceivable that different rural

communities are differently positioned to achieve this outcome, according to different local traditions, capacities, and resources.

This paper attempts to explore what constitutes the new 'post-productivist' rural development agenda that have come into place through initiatives such as the EU LEADER programme. The main question put forward in this paper is the extent to which traditional income-generating practices at the local community level - inspired by local experiences, traditions, and capacities - concur with contemporary EU and national agenda for rural development.

This paper has five sections. The first overviews the origins and the key tenets of the governance and rural debate. The second section and explores the rationalisation of the governance approach in rural areas of the EU, considering the pretext of the EU Common Agricultural Policy (CAP), focusing on its emphasis on the locality. The third section overviews

¹ LEADER (*Liaisons Entre Actions de Développement de l'Economie Rurale*)



the globalisation literature, and the linkages between globalisation and characteristics of the contemporary EU rural development 'product'. Taking a case-study approach in the West of Ireland, the fourth section examines the implementation of rural development initiatives in the area of Carna, Connemara, and the interplay of these initiatives with traditional income-generating practices at the local level. Section five presents emergent conclusions and research questions.

2. Governance and Rural Development

Governance is a movement that has taken place within the politics of liberal democratic regimes, which characteristically involves both statutory and non-statutory representation in decision-making at a range of governmental levels. Non-statutory representation in decision-making dates back to the socialist utopian experiments of the 18th and 19th centuries in the UK and North America; the Romantic movement at the turn of the 19th century (Matthew Arnold, for example); the doctrine of self-determination that led to the decolonisation movement (Gandhi); the post-1968 social movements spurred by the negative effects of modernity; and the movement to revitalise cultural and political heritage in regions throughout Europe, evidenced in national and international policy (Ray, 1999, p. 524). The rationale behind the use of governance models are various from case to case, and can range from child-care, education, employment and health to infrastructure and housing.

Contemporaneously, new governance institutions in the UK for example (Higher and Further Education Corporations, Housing Associations, District Health Authorities and Health Trusts, City Technology Colleges and Urban Development Corporations) are now responsible for over £40 billion of public funds, a figure similar to the allocation of elected local authorities (Goodwin, 1998, p. 7).

Essentially, 'governance' signifies a shift from top-down bureaucratic 'government' towards a multi-agent and multi-tier form of governing. Stoker (1996) notes that it "refers to the development of governing styles in which boundaries between and within public and private sectors have become blurred" (p. 2). It involves the participation of a wide range of actors including representatives of interest groups and civil society as well as elected representatives². Governance is multi-institutional and is implicated in all levels of decision-making. Rhodes (1996), for example, says that it is used to refer to "a new process of governing; or a changed condition of ordered rule; or the new method by which society is governed" (Rhodes: 1996, pp. 652-653). Similarly, Jessop (1995) says that governance represents a shift to "a broad concern with a wide range of governance mechanisms with no presumption that these are anchored primarily in the sovereign state" (Jessop, 1995, pp. 310-311). Such institutional forms of governance have been called "government at a distance" (Murdoch and Abram, 1998, p. 41) or, at an international level, "managing a nobody in charge world" (Stoker, 1996, p. 4).

In relation to power structures in this nobody in

² Stoker (1996) identifies five characterising features of governance: "Governance refers to a complex set of institutions and actors that are drawn from but also beyond government; Governance identifies the blurring of boundaries and responsibilities for tackling social and economic issues; Governance identifies the power dependence in the relationship between institutions involved in collective action; Governance is about autonomous self-governing networks of actors; Governance recognises the capacity to get things done which does not rest on the power of government to command or use its authority. It sees government as able to use new tools to steer and guide" (Stoker, 1996, pp. 4-15).

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charge world, there is a shift in power to what Talcott Parsons would call 'consensual power' or to Steven Lukes' 'one-dimensional power' (Parsons, 1969; Lukes, 1974). This form of power depends on the (various levels of) consensus that is generated by outcomes of governance. Governance reconceptualises power as a matter of social reproduction rather than social control – "what is at issue is not so much domination and subordination, as a capacity to act and accomplish goals" (Stone, 1989, p. 229 quoted by Goodwin, 1998, p. 10) or "a power to, not a power over" (Goodwin, 1998, p. 10).

3. The Emergence of Governance and Rural Development in the EU

There has been significant rural change in member states since the inception of the EU in 1958, which is in part attributable to and reflective of the changing development objectives of the EU Common Agricultural Policy (CAP) over time. The primary focus of the CAP has shifted from an initial focus on the problem of food security in post-war 1958, to the problem of agricultural over-production, to the problem of rural depopulation in the 1980s. Overall, the iterative impact of EU agricultural and rural policy measures since 1958 has given rise to complex affects, and identifiable strengths and weaknesses in rural areas as regards economic and social issues. The emergence of EU governance and rural development with the LEADER programme in 1991 was

inspired very much by the policy effects of what preceded it and the main feature of EU rural policy prior to the LEADER programme was that it concentrated primarily on agriculture, to the expense of the development of the broader rural economy. As noted by John Gray (2000) "since its inception, the European Community has conflated these two modes of conceiving rurality (rural and agricultural), alternately adopting them" (Gray, 2000, pp. 32).

Upon the CAP's inception in 1958, reflecting the initial policy concern with food security, concrete policy action was formulated for the agricultural sectors of the then EU member states³. The policy was legally established by the Treaty of Rome (1958), which set down the following two objectives: article 39.1(a) to increase agricultural productivity "by promoting technical progress and by ensuring the national development of agricultural production and the optimum utilisation of all factors of production, particularly labour" and article 39.1(b) to "ensure a fair standard of living for the agricultural population". The three principles that guided the CAP's first policy intervention focused directly on agriculture⁴, however, and the vast majority of all subsequent policy action implemented by the CAP was dominated by the same agricultural edge.

The CAP stimulated various responses in terms of changing conditions in EU rural areas over time, depending on the particular intervention. As a result of the implementation of the three initial guidance principles, the CAP succeeded in guaranteeing food



³ Belgium, Germany, France, Italy, Luxembourg and the Netherlands founded the European Coal and Steel Community in 1951, followed by the European Economic Community and the European Atomic Energy Community in 1957. In 1973, Denmark, Ireland and the United Kingdom joined the European Union. In 1981, Greece became a Member State. In 1986, Spain and Portugal became members. In 1995, Austria, Finland and Sweden joined the EU.

⁴ The principles were: to allow the free transport of goods and labour among the member states; to place protective tariffs on external goods; and to set up the European Agricultural Guarantee and Guidance Fund (EAGGF), which allowed member states to share the corresponding financial benefits and burdens.



security but in the seventies and eighties, population growth slowed and the demand for food began to wane. At the same time, agriculture was gaining prowess in the area of technological production and the supply of food soon far exceeded consumer demand. The CAP had achieved food security and accordingly, agricultural producers were in a comparably secure situation vis-à-vis the threat of rural poverty than they were at the outset. Although standards of living in rural areas increased, in terms of how the CAP perceived rural areas in terms of their full economic potential, the rural economy continued to be treated solely as a function of agriculture up until 1988. It was recognised that the development of the agricultural sector in isolation from other potential areas of development in rural areas was unsustainable from both an economic and social point of view (CEC, 1988) and in the absence of serious food security and rural poverty concerns, alternative foci for future EU rural development were sought.

A document published in 1988 "The Future of Rural Society" was a significant turning point in the focus of EU rural policy in that it recognised the need to go beyond agricultural structural interventions and address broader rural development opportunities and social issues. Indicative of changed conditions and potential opportunities in EU rural areas, the Future of Rural Society document broke the CAP's longstanding conflation of rural areas and their economies with sites of agricultural production. Recognising that EU rural areas had reached an increased level of development generally, where consumption as well as production was taking place, the document put forward a view of EU countryside's broadened role, stating that rurality "refers to a complex economic and social fabric made up of a wide range of activities: farming, small trades and businesses, small and medium-sized industries, commerce and services" (CEC, 1988). Implicit in this shift, then, was

the unprecedented involvement of rural economic activity outside of the agricultural sector. In the formulation of programmes that would encompass this broadened concept of rural areas and respond to correspondingly wider development needs and opportunities, there was a shift from a sectoral approach towards an inter-sectoral approach.

The concept of partnership as a method to join together different rural development interests came from an acknowledged need to provide for the representation of different sectoral stakeholders in decision-making processes on rural development issues so as to encircle the local spectrum of potential economic activity. The participative approach was expected to provide a modus for achieving effective (integrated) rural development, representative of different sectoral stakeholders by allowing their participation in the development process.

The LEADER programme emerged in EU policy in 1991 as the policy response to the need for integrated multi-sector rural development. The programme was to operate on the basis of two principles: decision-making taking place as close as possible to the site of implementation (principle of subsidiarity); and hierarchical decision-making structures being replaced by mechanisms involving representatives from a wide range of governmental and non-governmental groups (principle of partnership) (Osti, 2000, p. 172). LEADER was oriented towards "enabling a better understanding of the area and its living strength" (CEC, 1988) and is described as "an innovation and a lever of innovation" (LEADER European Observatory, 1997).

The principle of subsidiarity, along with the principle of partnership, underpins the EU model for governance and rural development and emphasises the importance of allowing the development process to be influenced by local actors and locally-specific development concerns. The participation of area-based

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organisations in the development process is a central pinnacle of the governance and rural development approach, and local organisations, with a variety of different mandates (concerning, for example, rural enterprise, the environment, and community representation) are expected to contribute to achieving more democratic as well as more customised local development.

Local organisations that are representative of an area's population, known as community organisations, are common participants in governance and rural development programmes in the EU15. While the operation of community organisations are problematised by the inconsistent processes that at the local level give rise to the emergence of such organisations and of their community representatives, they are intended nonetheless to represent the interests of all social groups in the locality, including socially and economically disadvantaged groups (see Moseley, 2003). The participation of community organisations in the development process is expected to provide representation for marginalised groups, and thus a more effective means of addressing local development concerns more deeply. While this is the case, it is also true that as more participants and interests enter the rural development sphere, traditional economic actors are often required to adopt to new rural development rules.

4. Globalisation and the contemporary EU rural development 'product'

One of the main incentives behind the participation of local organisations in EU governance and rural development, relates to the benefits of locally-customised development agenda in an era when diversifying beyond agricultural production is emphasised. It is claimed that partnership and other governance

models are not simply multi-tier versions of centralised policies but represent a chance for localities to focus on their individual attributes, resources, and forms of capital and exploit them (Walsh, 1995 p. 1). The type of development that arises from such a local focus veers away from the productivist agricultural development model and towards a more holistic rural development ideology, within the realm of the locality. The development context of governance indicates the movement away from staple development concerns (such as food security and poverty alleviation), towards the valorisation of local resources through 'niche' high value-added production. Considering the strengthened economies of the free-market liberal democratic EU member states within the global economy, and the new market opportunities that this situation brought, new rural development perspectives sought to tap into broader rural economic opportunities by focusing on the "indigenisation of the local economy" (Ray, 2000) and the "championing of local distinctiveness" (Moseley, 2003) so as to encourage high value-added production.

This rural development ideology (which has been referred to as 'post-modern', see Bryden and Shucksmith, 2000) is closely related to the influence of globalisation on the economies; societies; and political systems in the EU15:

"Globalisation, (thus) is a complex set of processes – not a single one - and these operate in contradictory or oppositional fashion. Most people think of globalisation as simply pulling power and influence away from local communities and nations into the global arena and, indeed, this is one of its consequences; nations do lose some of the economic power they once had. Yet, it also has an opposite effect: globalisation not only pulls upwards, it pushes downwards, creating new pressures for local autonomy." Giddens (1999)





Contextualising this to local development, Ray (2000) says that these new pressures for local autonomy “manifest themselves at the level of individuals and of territories. They are an outcome of the escalating awareness of, contact with and borrowing from, other cultures and polities as goods, people and ideas circulate on a global scale” (Ray, 2000, pp. 5). Echoing Giddens (1999, above), Lash and Urry (1994) see this as the paradox of globalisation: “it produces on the one hand, cultural and political cosmopolitanism and, on the other, an increasing awareness of, and wish to preserve, diversity, that is, ‘indigenisation’”. This ‘indigenisation’ is adopted by enterprises that “are able to attach lifestyle significance or political ideology to their products and services, replacing material and labour value with design value” (Ray, 2000, pp. 6). The term ‘indigenisation’ broadly reflects the principle behind new development manifestations of the localised approach. New development outcomes of the LEADER programme are concerned with marketing local distinctiveness:

“Increasingly, local producers have to produce and market something a little different – something ‘differentiated’ from the competition – and this requires ingenuity both in appraising the local resource base with a view to exploiting any distinctiveness and adding value to those resources in a way that will please an increasingly discriminating clientele. The development strategy of ‘adding value to local resources’ requires a positive attitude both to the potential of local resources and to the implications of globalisation. In the latter case it means seeing the opening up of world markets as an opportunity as well as a threat, and seeking not a rejection of globalisation but a judicious positioning within it” (Moseley, 2003, p. 48)

This ‘post-modern’ rural development challenge is incorporated by the LEADER programme ethos, and it clear that discourses of EU rural development make problematic assumptions about rural areas’ ca-

pabilities to confront this challenge, which is essentially dependent on the capacity of local people to be “competent actors in the development process” (LEADER European Observatory, 1997). Achieving the ‘championing of local distinctiveness’ represents a very particular rural development challenge, and as stated above, requires a certain ‘ingenuity’ from local people on the ground. As a model that hones in on the attributes of each rural locality, and depends on the participation of local non-statutory groups, the governance and rural development model is open to the influence of local determinants, such as traditions, resources, and capacities. It is inevitable that varying local determinants are to differing extents conducive to the achievement of new rural development goals.

Sociological issues relating to the operationalisation of governance and rural development programmes that seek to encourage innovation and the diversification of the rural economy have been noted to some extent in the literature. Kucerova and Kovach (2007), for example, detect the rise of a “project class” that is particularly well suited to new rural development opportunities in Central and Eastern Europe. Likewise, Osti (2000) claims in his article on LEADER in Italy that farmers’ organisations are often “bewildered from losing their established channels of influence”.

In the Irish case, it is clear that there are a number of implications for the shift from ‘top-down’ to ‘bottom-up’ policies. It remains pertinent to investigate how different social groups subscribe to the new post-productivist development ethos and how they engage with new rural diversification initiatives. It must be questioned whether the achievement of the new rural development product is more conducive to certain social groups more so than others. Rural sociological change in Ireland is an expansive issue and one that is implicated in the study of the implementation of all

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rural development initiatives. Different social groups are emerging within a fast-changing Irish rural society and new and more pronounced divergences in rural identities are evidential, caused for example, by a growing proportion of commuters; the growing attractiveness of rural areas as places in which to live or holiday; and the strengthening organic and rural health movement which attracts newcomers and entrepreneurs to rural areas. In the Irish case, as well as elsewhere in the EU, there is an increased challenging role of traditional agriculture as a viable, and legitimate, rural enterprise. There is a corresponding growth in the incidence of land- and area-based conflicts in rural areas, for example in relation to planning and environmental issues. These are issues that are case-specific, reflecting of different localised experiences of rural change. Taking one case-study area in the West of Ireland⁵, the following section presents some initial research findings of an analysis of the interchange between rural development initiatives arising from agencies and partnerships such as LEADER, and local traditions of economic and income-generating practices.

5. Local Development: the case of Carna, Connemara, Co. Galway

Carna is located in the west coast of Ireland in the Connemara region (see figure 1 below). Carna is a Gaeltacht area of Ireland, which denotes that Irish is the most commonly spoken daily language. Economic, social and cultural change is slow in Carna, which is in part attributable to its remote location. Because agricultural land is poor, resulting in virtu-

ally no intensive farming, Carna and the surrounding area makes up one of the few regions in Ireland that has not experienced the type of rural economic, demographic and environmental change brought about by the EU CAP.

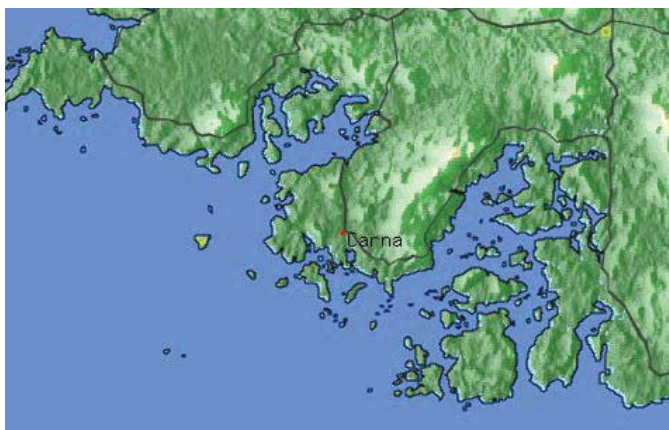


Figure 1: Carna, Connemara, Co. Galway

The area is affected by poor employment opportunities, with most of the working population commuting to Galway City, and unlike other areas of Connemara (predominantly English-speaking areas), there is little tourism. The population in the area is falling (differently to parts of urban Ireland where the population is increasing rapidly) in the most part due to a lack of employment opportunities but also due to quality of life issues, such as a lack of social outlets and facilities. Contemporarily, among those who stay and live in the area, there is a high dependency on social welfare allowances and state medical benefits.

The following table presents information on population change; employment levels; educational attainment; and the prevalence of the Irish language in each of the town-lands that make up the Carna area:

⁵ In-depth interviews were conducted with inhabitants of the Carna area from May - July 2007





	Population			Change in Pop. as %		Unemployment Rate %	% 3 rd Level Education	% Daily Irish Speakers
	1996	2002	2006	1996-2002	2002-2006			
Camas	395	388	367	-1.8	-5.4	26.4	16.4	90.9
Cill Cuimín	129	118	122	-8.5	+3.4	18.7	16.5	84.4
Turlach	545	477	552	-12.5	+15.7	29.8	9.2	85.7
*Maíros	152	134	143	-11.8	+6.7	15.1	19.8	
Abhainn Ghabhla	334	341	314	+2.1	-7.9	34.6	9.6	75.2
Scainimh	667	648	619	-2.8	-4.5	35.3	12.5	92.2
An Cnoc Buí	906	831	801	-8.3	-3.6	29.1	18.9	81.4
*Cloch na Rón	102	87	94	-14.7	+8.0	24.3	19.2	

Table 1: Population Change, Employment, Education, and Language

Source: Gaeltacht Area Development Plan: 2006-2012, Galway County Council.

Local rural development institutions are: Cumas Teo and Meitheal Forbartha na Gaeltachta (MFG). Udaras na Gaeltachta is an additional nation-wide agency for the economic development of Gaeltacht areas. All three institutions are oriented for the development of Gaeltacht areas and offer services through the Irish language. Cumas Teo is a partnership company and “aims to enable and strengthen communities through local development programmes”⁶. It undertakes three main functions: a community information service, which provides information about rights, e.g. social welfare, tax and grants and aids local people with the relevant administration and form-filling; the Treoir programme, which gives the unemployed help with training, preparation for interviews, and media-

tion with employers; and community development, which offers support for disadvantaged groups. MFG is a LEADER partnership company, representing all Gaeltacht areas nationwide. The main stated aim of MFG is “to empower communities through guidance; by encouraging self-confidence and self-development throughout the community in every aspect of community life, including economic development and development in social, cultural and environmental arenas”⁷.

The development context for these agencies’ operation is one that is characterised predominantly by the problem of unemployment, and related problems of reliance on social welfare benefits. The official and non-official mandates and activities of the agencies attempt to address (to greater and lesser extents) these prominent local development problems, while also offering seed grants for the establishment of new enterprises in keeping with the diversified ru-

⁶ See www.cumas.ie

⁷ www.mfg.ie

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ral development agenda that is promoted at both the Irish national and EU levels. It is evident, however, that some of the initiatives instigated by local development agencies are more utilised by the local population than others, and that different dynamics influence their utilisation.

Cumas Teo, for example, acknowledges the high numbers of social welfare recipients and their particular needs by providing its related information service, which is highly utilised by the local population. Similarly, the 'back to work' schemes offered by Cumas Teo in conjunction with state training and education schemes (for example FAS⁸) are in high demand, but not necessarily due to the schemes' popularity among local people. There are two back to work schemes offered by Cumas Teo. One is for those who are in receipt of unemployment benefit and offers short-term employment in improvement, maintenance, and restoration of local public buildings, roads and walls⁹. The second scheme offers educational re-skilling in computing (specifically, the European Computer Driving Licence (ECDL)) and is offered to those who are in receipt of unemployment benefit (the 'dole' as it is colloquially called) in order to encourage recipients back into the workforce. The course is obligatory as without attending the course, eligibility for unemployment benefits is forfeited.

A predominantly negative attitude towards the 'back-to-work' computer course was evident from interviews conducted with those who were attending or who had completed the course. As most young people originating from Carna are employed and are living elsewhere, or are commuting to nearby towns and cities, the majority of those who are unemployed and

attending the course in the area are aged between 40 and 60 years. Interviewees from among those who had attended the course claimed that computer training was "senseless" due to their unwillingness to work in the area of computing (in part caused by issues relating to a lack of technological culture); the lack of related employment opportunities in the Connemara area; and the fact that they did not wish to leave the Connemara area in search of employment due to family and land attachments¹⁰. Most of those interviewed made reference to having experienced feelings of extreme frustration and medically-treated depression, caused by an environment where there is a general lack of opportunity and restriction of choice, and also because of the nature of the 'back-to-work' computer course, which they conceived of as entirely fruitless. Feelings of humiliation and frustration are exacerbated in this case by the fact that attendees of 'back-to-work' schemes (particularly older attendees) are in the most part highly skilled in traditional income-generating practices that have contemporarily become unfeasible (discussed further on).

Cumas Teo also offers courses in arts and crafts. These are mostly attended by women and are conceived moreover as hobby activities rather than as activities that can be used for income-generation. Nonetheless, a positive attitude locally is evident towards these arts and crafts courses.

Seed grants for new rural enterprises are also offered by MFG LEADER partnership and Udaras na Gaeltachta. According to records held by these agencies, there is a very low number of applications that come from the local indigenous population in Carna (most applications are received from extra-local ac-



⁸ www.fas.ie

⁹ Social welfare benefits of those who are employed by these schemes are not affected.

¹⁰ The population in the area is aging significantly, and most of the elderly are cared for in their own homes by younger relatives. Social obligations are an added disincentive for people to leave the area.



tors). Explanations put forward locally for the lack of applications attracted from the indigenous population refer to 1) the problem of dependence on social-welfare benefits (particularly state medical benefits) and fears of losing these benefits as a result of an increase in household income; 2) emerging obstacles that prevent local inhabitants from pursuing traditional income-generating activities that they have been engaged in for generations; and 3) the view that non-traditional entrepreneurial practices are best suited to younger generations, and those who have attained educationally (most of these groups having left the Carna area).

The table 2 summarises information on the local development initiatives offered by local agencies, and factors influencing local engagement with these initiatives.

There are a number of local resources that are unique to the Carna and broader area, though the development of these resources is not directly targeted by local rural development initiatives. It is evident that

there are factors that have contributed to the diminishment of traditional income-generating activities. The most significant resources are the following: the Irish Language; Connemara marble; Connemara pony breeding; Connemara lamb; in-shore fishing (shell-fish); and seaweed (an organic, prolific resource). Table 3 presents information on local resources, and factors influencing the utilisation of these resources. The Irish language is a significant resource in Carna and is becoming stronger as an industry in reflection of Ireland's growing social movement relating to the preservation and consolidation of Irish culture and heritage. As the Irish language is becoming more cosmopolitan, consumers from many sectors are coming to the Carna area to learn the language. Earnings from the provision of domestic accommodation and food for Irish language students are tax-exempt and this is claimed to be a major incentive locally. Other local resources that are associated with the Connemara area, but are of minor economic importance in Carna are high value added products that

Table 2: Local Development Initiatives

Local Development Initiative	Local Utilisation/Uptake	Influential Factors
MFG/ Udaras: Small enterprise grants	Minimal	Lack of tradition, information, and knowledge of rural enterprise. Bureaucratic obstacles.
Cumas Teo: Back to Work Scheme – Computer Training	Demand exceeds supply	Obligatory. Associated with retention of social welfare rather than with future employment.
Cumas Teo: Back to work scheme: local maintenance works	Demand exceeds supply	Obligatory. Associated with retention of social welfare rather than with future employment.
Cumas Teo: Arts and Crafts courses	Demand meets supply	Predominantly female engagement. Perceived predominantly as recreational activity.

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Table 3: Local resources & traditional income-generating practices

Local Resource/ Practice	Initiative(s)	Local Utilisation/ Uptake	Influential Factors
Irish Language	Summer Language Schools	Strong uptake from indigenous population	Tax exempt, managed and monitored by external agency
Connemara Marble	None	None	–
Pony Breeding	None (private farmers)	Minimal	Local sale
Connemara Lamb	State Marketing Food Initiative	Minimal	Tax issues
Inshore Fishing	None	Traditionally major, recently diminished	Policing, Regulation, unfavourable taxation
Seaweed	None	Traditionally major, now diminished	Poor pay; unfavourable taxation.
Small-scale farming (inc. food processing)	None	Traditionally major, now decreased.	Regulation



are widely marketed, such as ‘Connemara Lamb’; ‘Connemara Ponies’; and ‘Connemara Marble’.

There are a number of local resources however, which have been the mainstay of income generation and household subsistence for generations. According to local accounts, small-hold family farming, inshore fishing, and the cutting of seaweed (sold as fertiliser) have been the mainstay means of household subsistence. Particularly, the sale of shellfish and seaweed in the past were prominent forms of income generation. Fishermen and seaweed cutters traditionally sold their harvests to traders who visited the area. Contemporarily, the number of those engaged in inshore fishing and seaweed cutting has greatly diminished, which local inhabitants attribute

to a number of factors, mostly relating to income taxation, unfavourable pay, and excessive regulation. The practice of inshore fishing has gone into virtual discontinuation in Carna (demonstrated by an unprecedented occurrence where no scallops were harvested in 2007), which is locally attributed to the implementation of water safety regulations that are incompatible with and prevent the usage of a traditional type of boat (Currach), used locally for harvesting both shellfish and seaweed¹¹. Additionally, local fishermen claim that there is no financial incentive to fish due to excessive taxation and excessive monitoring of fish catches.

In relation to seaweed, while historically it was sold as fertiliser to traders who would transport it

¹¹ The boats vary in size but for the purposes of fishing, they accommodate 2 persons on average and due to this size constriction, it is reported that the boats are not large enough to carry the safety equipment required by regulation.



to more fertile lands in East Galway, there is now a seaweed processing plant in nearby to Carna (in Cill Chiarain) that utilises local harvests. While seaweed is an organic prolific resource in Carna, there are not enough seaweed cutters in the area to meet the factory's demand. Though the factory also buys seaweed from seaweed cutters based in other parts of Ireland, such as in Counties Mayo and Donegal, the shortage of seaweed has caused the factory to regularly close for up to several weeks, putting employees on mandatory leave of absence. It was claimed by local seaweed cutters, and those who have discontinued the practice, that seaweed cutting is both life endangering and non-lucrative (cutters explaining that they receive E40 per tonne¹²). A further disincentive explained by local cutters is that the E40 per tonne is taxed, and that tax officials visit the factory regularly to inspect details of seaweed suppliers.

Another traditional practice that has undergone change is the practice of subsistence farming. Although Carna, due to its poor soil and weather conditions, has never been conducive to large-scale intensive farming, the small household farm has been a dominant characteristic of the landscape. The household farm has traditionally functioned less as an income-generating practice and more as a diverse food-source, primarily of pork (domestically preserved by salting); mutton; chicken; eggs; and other dairy produce. The consumption of raw dairy products is discouraged by health regulations contemporarily, as well as the domestic production of butter; salted pork (bacon); and associated pork products (such as 'black pudding'¹³). Today, the domestic processing of dairy and pork products has become rare in Carna, as well as throughout Ireland, and it remains illegal to

sell such domestic produce.

Considering the forms of traditional income-generation identified above, and the rural development initiatives employed by local agencies in the Carna area, it is apparent that there is a certain disparity between the two. Rural development agencies in the area do not directly seek to develop any locally-occurring resources and practices. For a coastal area in the West of Ireland that is particularly disadvantaged and suffering from high unemployment rates, it is questionable why rich local marine resources are not valorised through the consolidation and support of practices that have been prevalent for generations. It is also questionable why local agencies, rather than profiting from vast localised knowledge in traditional forms of (potentially lucrative) income-generation, are opting to pursue the development of local educational capacity by offering courses in subject areas such as computing that do not respond to the cultural, economic, or environmental landscape.

While research findings from this case-study analysis shed doubt on the strategy employed by local development initiatives, it is also true that initial conditions for rural development in Carna remain characterised by a prevalent dependence on social welfare, and a lack of tradition of enterprise. These are the determinants that in practice are preventing the 'championing of local distinctiveness'¹⁴, prescribed by programmes such as LEADER. While the local 'ingenuity' required for capitalising from rural development initiatives such as LEADER is in abundance, evident from the local knowledge and traditional skills that have succeeded in sustaining a far larger population in the past than is present in Carna today, the vehicle for transforming this ingenuity into viable rural enter-

¹² *The factory does not process the seaweed to high added value but dries and packages it.*

¹³ *A product made from pork blood and cereal.*

¹⁴ *Moseley (2003); see above.*

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prises is lacking. Cumas Teo addresses a crucial obstacle to this vehicle by dedicating a large proportion of its resources to addressing local inhabitants' social welfare concerns. Lacking in the activities of MFG LEADER and Udaras na Gaeltachta, agencies that are reliant on the organic emergence of rural enterprise ideas and business plans from a population who are unaware of funding opportunities and are lacking in the relevant experience, are capacity building programmes in business and enterprise skills.

Also, in relation to the Irish language industry, which is an area of growth that has shown considerable success, it is notable that a major determinant has been tax exemptions from earnings. In Carna where social welfare benefits are rife, it is conceivable that social welfare protection in the short to medium-term may be a worthwhile measure to encourage inhabitants' first engagement with new rural enterprise ideas and to allay inhabitants' (rational) fears of poverty in an area that has seen little economic prosperity.

5. Conclusion

Following the productivist CAP, the EU LEADER programme is seeking to 'indigenise' the rural economy by including local representatives in the development process. The LEADER programme envisaged that local development actors' "design and implementation of development interventions" (LEADER European Observatory, 1997) would result in more representative and effective development. Local actors were seen as "competent actors in the development process" (CEC, 1988) and it was conceived that through 'bottom-up' forces and dynamics that new, diverse, and innovative rural development solutions would come forth in an economy where productivist agri-

culture was no longer prioritised.

This research finds that the partnership and rural development agencies in place in the case-study location of Carna, Connemara, including the MFG LEADER company have not succeeded in bringing about the 'championing of local distinctiveness'¹⁵, that characterises contemporary rural development goals. The promotion of certain types of avenues to employment (e.g. computing) and the effective marginalisation of traditional knowledge and traditional economic activities problematises the 'handing' over the development process to local development stakeholders in this case. While there are rich local resources and unique forms of local knowledge present in the Carna area, vehicles for profiting from these resources and knowledge are absent. The lack of a tradition of entrepreneurship, together with a widespread dependence on social welfare benefits, gives rise to a development context where the articulation of innovative rural development ideas is not forthcoming from the indigenous population. The absence of capacity building initiatives to encourage local people to engage with development agencies' funding opportunities is a major obstacle to the utilisation of local resources and the cultivation of a vibrant rural economy.

Furthermore, it is also the case that external forces are negatively impacting on and in cases effectively extinguishing local income-generating practices that have been in place for generations. The case of Carna is suggestive that opportunities for rural development, such as see enterprise grants, are not accessible to the indigenous population but tend to marginalise them. Though governance and rural development models are purported to promote a 'power to' rather than a 'power over' approach, and are considered capable of bringing about a 'bottom



¹⁵ See Moseley (2003) and above.



up' and locally-specific development process, external forces that are outside of the remit of the local governance model can be hindering and need to be tackled by rural development programmes. One of the claims of the governance model, differing to top-down approaches that do not take into consideration locally-specific variations, is that it has the capacity to hone in on the peculiarity of local conditions and circumstances. In the case of Carna, major obstacles to income-generation that utilises unique local resources and local knowledge, are forces that do not take into consideration local specificities. Regulations that prevent the usage of traditional boats such as currachav for harvesting seaweed and shellfish are a prime example of this. A worthy task for LEADER partnerships, therefore, may be to appraise the local resource base with a view to challenging extra-local forces that pose obstacles to local development, as well as to incorporate locally-specific incentives to encourage the local population.

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Simulation Learning Experiences in Rural SMEs. The EIS case



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1. Major change challenges for rural SMEs

Nowadays, SMEs face major change challenges in various sectors. Survival strategies for traditional craft industries, regional agricultural reform, health and safety regulation in food industries, international accounting standards, the competitiveness of small companies in tourism and surviving fast growth in high-tech industries, are some of the most major issues.

The main challenge in providing HR development services to SMEs rises from the fact that the latter do not have the human or financial resources to devote sufficient attention to professional education. At the same time, major growth initiatives (such as initiating exports) require significant investment in expertise and in developing internal capabilities.

SMEs and their owner-managers are not prepared to make any discounts in the quality of education they demand. Thus we face a market failure: on one hand

there is demand for high quality education, on the other hand there aren't sufficient resources to acquire such services directly from providers such as a major business school.

The Swedish Trade Council (STC) tries to remedy this failure by developing HR development programs that can achieve economies of scale in the provision of the necessary knowledge and capabilities. At the same time they deal with the shortage of human resources and the limited managerial attention by developing coaches. Coaches receive top level training which they then deploy in an advisory capacity for the benefit of SMEs.

2. Value Generated for the SMEs

SMEs may face limited human and financial resources but their needs and expectations are nonetheless undiminished because the external challenges they



face are monumental. Given these conditions, SMEs require greater actionability for the knowledge they acquire through development programs; they do not have the luxury of devoting time and energy to theoretical knowledge which needs time to ferment and bear fruits. Hence the mode of deployment is of paramount importance. To be more exact, this mode of deployment entails answering a number of questions, namely:

1. What is the total cost of attendance and how might this be reduced for individual SMEs without compromising the quality of training?
2. How far can the workshop be tailor-made to serve the specific needs and pressing challenges of participating SMEs?
3. What mode of delivery is chosen (synchronous/asynchronous, collocated or distributed)?

Having offered a training package which serves the needs of SMEs, the next question is whether this investment in knowledge and competencies has had a positive effect on the business. The notion of coaches that STC has applied is very relevant to this requirement and maximizes the long term value of the whole EIS deployment. By placing expert advisors alongside the trained SME managers, the EIS workshop can yield far greater returns in practice as opposed to leaving individual participants to their own devices. Although it is generally difficult to follow up individual SMEs over the longer term to assess the impact of EIS training on the field, the deployment of coaches maximizes the long term value of EIS a priori and maintains a network of contacts from which information about specific SMEs can be elicited.

3. The EIS simulation at a glance

Before we give a better description, we have to mention that the EIS simulation is the result of the research work on the Change management and innovation emerging from CALT, INSEAD's centre for advanced learning technologies. Moreover, the EIS simulation is constantly being improved and a number of new simulation games addressing the challenges of collaboration and innovation are currently under development in the context of multi-million R&D projects supported by the EU and by academic and corporate consortia. The EIS community regroups all those passionate about the EIS simulation creating an exchange of experiences constantly enhancing the tool and bringing to light any new ideas for its use. Analyzing the EIS simulation, we have to say that it is multi-media learning software which allows participants to simulate important changes within an organization while confronting various forms of resistance. In addition, we have to clarify that the users are the employees of organizations, who focus on enhance their change and innovation readiness and the change and innovation management competencies. Users participate in teams in an intensive simulation experience and during this experience they are challenged to act as a team of 'change agents' in charge of introducing a major innovation in a context that reflects the dynamics of their own organizations. Thus, they come in contact with a number of virtual characters (behaving and reacting dynamically in a believable way and reflecting different forms of resistance to the proposed change as well as cultural specificities of the simulated organisation). Furthermore, at the debriefing phase a collaborative learning process will support the acquisition of relevant change management competencies, and the design of an "Action Agenda" aimed at making the knowledge acquired

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through the simulation experience ‘actionable’ in their own contexts. Co-located groups of users go through this experience in 1-day workshops, while distributed users are able to participate in the simulation game over the Internet and over longer time frames, fitting the needs of the learners involved and their organisations. Finally A “Change Simulation Master” certificate distributed on completion of the experience and enable users to organise similar sessions with other users supported by a “Train-the-Trainer Module” accessible online.

4. Learning Objectives

If we try to explore the EIS simulation’s learning objectives we will have to mention the generic competences development, which are change management, innovation, collaboration, team dynamics, leadership, decision making, organizational behaviour and exports inside knowledge, and some more specific competences development which are knowledge exchange dynamics, leadership (team activation), working under time pressure, group decision making dynamics and team building. In addition we also have to include some other target domains such as high level of participation, highly realistic and work-related, illustration of simulation- based learning and of course fun.

5. Spatio-temporal Logistics

A better understand of EIS simulation followed by the description of its different phases. EIS simulation begins with the pre-session phase with a ½ day duration, in which the participants are geographically dispersed and they communicate via a virtual platform. This first phase also includes some relevant activities, such as material distribution, pre-session ex-

changes with participants, pre-session assignments, and installation of CM simulations on participants/ teams computers. The next phase is the session introduction phase with a 1.5 hours duration, in which the participants are located in a classroom and they communicate physically. The relevant activities are the introduction of focus and objectives of the session /workshop as well as the simulation scenario and software. The third 2hours is run phase, consists of the strategy formulation phase and the playtime (in Teams) phase where the participants are located in a classroom where they communicate physically. The relevant activities are elaboration and consensus-reaching by a team of participants of a strategy to address the simulation mission simulation run by the team (simulated change management intervention). It follows the debriefing phase with duration of 2.5 hours, it includes the team and the group debriefing phase where the participants are located in a classroom and they communicate physically. In the beginning the different groups come up with the first reflections (insights gained and issues to be raised) and overall the professor intervenes in facilitating reasons in order to compare results and experiences and to address together the question: “What can we learn from this simulation experience, and how to make these insights actionable?” Thus we reach the follow-up phase for half day over the following two weeks where the participants are geographically dispersed and they communicate via the virtual platform ICDT. During this phase the participants read in depth material which has been distributed during the session to reinforce or extend the insights gained, they run of the simulation a second time (individually) during the next two weeks after the actual workshop to validate the actionability of the insights gained and of course they are provided with further on line material (web links) for further study and practice.





6. Technical logistics

In all the work described above, our efforts have led us to mention some technical logistics, seeing that deployment scenarios can vary significantly depending on the hardware devices (PCs, Laptops, Mac, etc), operating systems (Windows XP, Linux, MacOS, etc), Browsers (IE, Firefox, etc) and of course the different types of Network (local, Internet, wireless, etc). Last but not least we have to point out that Technical logistics depend on the opportunities and the constraints of the Facilitator to distribute access to the simulation software, by installing it on local computers via CDs, USB keys or via the network. Moreover the Facilitator can provide direct access to the simulation software via the Internet but firewall issues have been identified as a potential barrier.

7. Value Generated for the rural SMEs

It has been a firm belief of the team that, although EIS simulation does play a crucial role, its implementation arises many issues and values for the rural SMEs. Concerning the total cost of attendance we have to

indicate how important the role of intermediate/facilitator is. The STC example in Sweden shows us how a charter organization, which represents thousands of SMEs, can be a facilitator in order to reduce the total cost for individual SMEs without compromise the quality of training. Further more in all cases the EIS has been proven fully adjustable to the SMEs needs due to its generic character and can serve all the SMEs specific learning needs and pressing challenges. Finally the mode of delivery can overcome and serve rural SMEs technical barriers as it can adjust to the existing infrastructure each time. At this point we have to mention that the STC has major learning impact, as it is interactive, highly involving, collaborative, experience-based, actionable and widely accessible. By placing expert advisors alongside the trained SME managers, the EIS workshop can yield far greater returns in practice as opposed to leaving individual participants to their own devices. The deployment of coaches maximizes the long term value of EIS "a priori" and maintains a network of contacts from which information about specific SMEs can be elicited.

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Enhancing Social Capital as well as Human Capital in Remote Rural Communities



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1. The importance of human and social capital development in rural communities

Human capital refers to the knowledge, information, ideas, skills, and health of individuals. This is the “age of human capital” in the sense that human capital is by far the most important form of capital in modern economies. The economic success of individuals, and also of entire economies, depends on how extensively and effectively people invest in themselves (Becker 1992).

The modern economic environment places more a premium on education, training, and other sources of knowledge. This can be inferred from changes in the relation between education and earnings/employment, with greater demand for more skilled workers

and large gaps in wage differentials by education in European nations for both men and women. The total investment in schooling, on-the-job training, health, information, and research and development (R&D) is estimated to be over 20 percent of gross domestic products, making modern societies to gravitate toward information-society and knowledge-capital economy. Technology may be the driver of a modern economy, especially of its high-tech sector, but human capital is certainly the fuel (Becker 1992).

We live in a world where new drivers of change are appearing continually. Most recently, habitation fragmentation and global climate change, are now occurring so rapidly, that mutualistic networks are likely to be severely affected in many places (Renner 2007). Some of the most important impacts of the climate change will be felt by agriculture because agricultural production is fine-tuned to temperature and mois-



ture conditions in terms of cultivation practices and inputs (Tsigas 1997).

These new drivers of change accentuate the volatile external environment faced by the rural communities, which must also cope with the impacts of the ever-present drivers of global change, such as the globalization process; the revolution in Information Technologies (IT); deregulation; and the global disintermediation, which have been driving the economic and societal transformations so far.

Globalization brings “global networks”, “global supply chains” and other “value chains” and a global nexus of producers, suppliers, and subcontractors. The IT revolution intensifies the urge and accelerates the process of globalization. Global “reach” and “speed” in business and mass communication become catalysts pushing toward the completion of the globalization process, with supportive information technologies, such as wireless internet, streaming technologies, multicasting web conferencing, etc., adding aesthetic, marketing, and perceptual-learning dimensions to the process, thus rendering the global expansion both desirable and inevitable.

Deregulation at the national level signals the strengthening the entrepreneurial forces (and of markets). Disintermediation signals the effect of “connectedness” and the new “immediacy of communication”. The explosion in the creation of dot.coms devoted to “networks”, “auctions”, “exchanges”, and “communities” is indicative of the process of disintermediation.

Advanced levels of human capital as well as social capital are needed to facilitate the transition from insularity to a globally networked world and to mitigate the possible adverse effects of these changes in the years to come. Greater investment in education is considered to be an effective way for rural communities to respond, in the longer run, to such volatile environments. Educated persons take a much longer

time perspective in their personal decisions (Becker and Mulligan 1997) and, as such, they are more likely to anticipate the incidence of changes when they decide about their activities and they better protect themselves. Avoiding being trapped in competing for a limited resource with limited global information, they will fend-off evolutionary freezing and the possible demise of their community (Johnson et al. 2000).

Although human capital resources are essential to participate in the new globalising economy, local development should focus on more than human capital development (Bollman 1999), on aspects such as regional identity and entrepreneurial climate, public and private networks (von Mayer 1997), in short, aspects relating mainly to the concept of social capital, which is presented in the following section.

1.1 The significance of social capital

Economic performance across countries and regions appear to depend on social capital, a concept, which aggregates empirical variables such as density of social networks, trust in others, honesty etc, and is generally assumed to enhance cooperation and reduce the cost of transacting.

Research on the role of social capital and social interactions in financial development, economic growth, workplace behavior, employment and wages, and even criminal behavior, has been growing steadily in the last years. The relation of trust to economic growth has been investigated in recent research works such as Rafael La Porta's et al. (1997), who document a strong correlation between the trust prevailing in a country and the presence of large organizations, or the work by Stephen Knack and Philip Keefer (1996), who find a correlation between a country's level of trust and its rate of growth. However, the theoretical

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link between social capital and growth is very indirect (Solow 1995). Putnam (1993) admits that the mechanisms through which “the norms and network of the civic community contribute to economic prosperity” should be investigated further (Guiso et al. 2004).

In trying to explain differences across countries in economic performance, Kumar and Matsusaka (2006) have stipulated the existence of two types of social capital. “Village” capital takes the form of personal networks, kinship, patron-client relations, and in-depth knowledge about trading partners. “Market” capital takes the form of knowledge about how to use third parties and of trusting “strangers”.

Either type of social capital can be optimal in the right environment. “Village” capital is efficient when economic activity is primarily local, involving transactions between members of the same social network. “Market” capital is effective for transactions between “strangers” (that is, parties outside the local personal networks). The stock and type of social capital also influences the accumulation of social capital by subsequent generations because of learning externalities (children raised in the midst of a dense social network are likely to develop the skills to function in that network).

In another study, Guiso et al. (2004) have investigated the link between the level of social capital and an important factor underlying economic prosperity, namely, financial development. To identify the effect of social capital on financial development, Guiso et al. exploited differences in social capital within Italy. In what the authors name “high social capital areas” (equivalent to “market social capital” of Kumar and Matsusita paper), households are more likely to use checks, invest less in cash and more in stock, have higher access to institutional credit, and make less use of informal credit. The effect of “village social capital” is stronger where legal enforcement is weak-

er and among less-educated people. These results have also revealed that the behavior of citizens who have changed residence is still affected by the level of social capital of the province where they were born.



2. Important considerations in deploying “outside media” to remote communities

As technological advances in communications offer enhanced capabilities and have dramatically lowered the cost of transmitting information over large distances, broadband-based e-services and media (“outside media”) are entering remote communities. Nowadays, the growth of the broadband services offer the potential to integrate remote communities into the global nexus of activities and revolutionize teaching and learning by allowing “ubiquitous e-learning,” where citizens, teachers and students may interact closely even though they are separated physically and in time.

Broadband services help create technologically advanced and socially innovative environments, in which fast, permanent, easy and affordable internet connections can cover the needs of the modern people, no matter where people are located or what they do. Access (or not) to broadband services is therefore emerging as a main criterion for the people’s participation in the Information Society. Those with no access to “fast internet” are considered to be “digitally excluded”, excluded from the challenges and opportunities of our times, not fully participating in the modern society and economy. Guaranteeing access to broadband services for all citizens constitutes a priority for governments and organisations worldwide.

Integrating remote communities into the global nexus, is not as a linear, straightforward, process as it seems to be. Three significant questions should be



asked before, namely:

- 1) What is the right type of social capital to promote?
- 2) Since novel practices are not self-executing but individuals must learn how to use them, how to best engage the population at large in order to accumulate the human capital, complementary attitudes and actions necessary to engage constructively with the new media?
- 3) How do outside media affect engagement in local affairs?

Answers to these questions are presented in the following sections.

2.1 Promoting the right type of social capital

In a pre-industrial environment where transportation and communications costs are high, economic activity and trading is overwhelmingly local (Crone 1989) and those societies and economies that are most able to accumulate village capital become the wealthiest. When new technologies are developed that significantly reduce transportation and communication costs, it becomes optimal to interact and trade with people who are not kinship-related and belong to a different social network in order to take advantage of the “global” environment, extensive markets and division of labor. However, doing so requires development of social capital of the “market” type, which supports exchanges between ‘strangers’. The process of replacing village capital with market capital is typically called “modernization”.

Societies and economies with a large initial stock of village capital find it more difficult to transition to a market economy than countries with a small stock of village capital. Some societies and economies can be trapped in a bad equilibrium with the wrong type of

social capital.

2.2 New media are not self-executing—individuals must learn how to use them.

New media are not self-executing—individuals must learn how to use them. Pro-growth practices cannot be established simply by obtaining a PC with wireless internet access, or getting the right written documents or appointing competent teachers; new media become effective only when the population at large accumulates the human capital, complementary attitudes and actions necessary to use them.

2.3 Avoiding adverse social network effects

Broadband-based services provision may be considered as an undisputed improvement of the lives of the rural citizens, however certain cases have demonstrated that this may not always lead to positive social results; consumers attracted to outside media may consume less local information and, as a result, disengage from local affairs.

In a recent study, George and Waldfogel (2002) have investigated how, in the late 1990’s, the New York Times (a daily newspaper with nationwide circulation) implemented a national distribution strategy, establishing or expanding home delivery in more than 100 cities across the US. Using longitudinal data on local newspaper circulation, Times penetration, and voting, the researchers found that as the New York Times became more widely circulated in a market, sales of local newspapers to individuals targeted by the Times declined. Moreover, as Times penetration increased, college educated individuals targeted by the Times became less likely to vote in local elections. Although some consumers benefit from availability of outside media in local markets, “distraction” from local affairs is a possible negative consequence of modern information technology.

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3. Linking remote communities: the Greek case

The main aspiration of the broadband-services 'movement' is to cover the entire population, independently from the characteristics of a person's place of residence and work. In certain cases this requirement cannot be covered by terrestrial network infrastructures, mainly in remote and under-populated regions, where investment in terrestrial equipment is economically disadvantageous.

In Greece, the extensive mountains, the open seas, the great number of islands, and all these combined with the demographic decline of rural areas, compose a picture in which it is difficult for terrestrial infrastructures to correspond to the contemporary demand for broadband everywhere. The digital disadvantage of the country is being recorded in comparative studies among European countries, while the digital gap between urban and rural regions seems to be widening, as broadband services are primarily deployed in the urban environments, in the cities.

3.1 Remote schools

The negative consequences of the digital gap become particularly evident in the small remote schools in the Greek provinces, which are generally recognised to carry out work of national importance as they offer to the children living in mountainous and insular regions the access to education, which all Greek children are entitled to. Education generally is a space of innovative applications supported by broadband technologies, as the educational system constantly seeks to exploit all possibilities offered by new technologies for more effective and efficient education. Unfortunately, the exclusion of remote communities from the contemporary opportunities first of all affects these "borders" of the educational system, the

small schools functioning in remote areas. At the same time, even though -for each remote community- the school constitutes a point of reference, a tool for growth, and a source of vision and hope for the future, the digital gap constraints the school to a backward role in educational developments. Advanced technology solutions, such as provision of fast internet via satellite communications may help mitigate the problem.

3.2 Linking the remote schools: fast internet via satellite communications

Recognizing the need to fight digital exclusion and support the remote Greek school, Ellinogermaniki Agogi, in collaboration with prominent scientific and technological institutions (University of the Aegean, National Technical University of Athens, Hellenic Aerospace Industry, HellasSat, OTE), has undertaken in recent years a series of initiatives for the exploitation of satellite broadband telecommunications for the benefit of students, teachers, and all residents of Greece's remote areas, in the framework of pioneering European and national research projects.

Up to date, 30 small rural schools are equipped with satellite internet and a multitude of opportunities to use rich educational and teachers' training applications. In this way, education in the mountains and on the islands of our country is coming to the first line of developments, for the first time in many decades: broadband is becoming an everyday reality for Greek students and teachers located at remote places such as the village of Argyri in the Municipality of Acheloos (known as the "most remote municipality of Europe") to some distant beaches of Crete, from the village of Monodendri in the mountainous Zagorochoria down to the islands of Amorgos, Lipsi, Kalymnos, Karpathos and Rhodes, from the villages of Orestiada in the northeast to mountainous





Messinia, from the mountains of Cephalonia across to the village of Mesta in Chios. The emerging results of this work are in agreement with what is observed in similar international initiatives, that the satellite telecommunications can constitute in the next years a feasible, effective and efficient solution guaranteeing broadband for all – and for the remote educational communities in particular. Based on these outcomes, the Greek government is planning to supply remote public services with bi-directional satellite broadband access, with 2/3 of these installations being carried out in one thousand remote schools.

3.3 The school as the community's Learning Centre: becoming a central node in social network

The research efforts mentioned in the previous paragraph, focus particularly on developing the human potential and capitalizing on the symbolism of remote schools. With the school as a point of reference and departure, the possibilities of (and the benefits from) satellite broadband are demonstrated not only to teachers and students, but more widely, to each member of the remote community. Integrated broadband services are designed and applied, and 'upgrade' the school to become a local Learning Centre, making it a place of pedagogic innovation and quality educational services accessed equally by children, students, their teachers, and every active citizen. The school multiplies its functions, offering opportunities to use new technologies for lifelong learning and creativity. Each resident of the area can visit the Centre to exploit the rich possibilities offered according to their own particular needs. The conditions are thus created for the development of digital applications that will cover real needs of the Greek countryside for better education and training services, but also for better ser-

vices of administration, health, communication, and generally more favourable conditions for the growth of entrepreneurship and local development (Sotiriou & Koulouris, this volume). Such an approach –which will be presented in the next section- has been taken in "resurrecting" and transforming the school at the village of Mesta, in the island of Chios, in Greece, making it operational as a community Learning Centre, with the aim to support the societal and economic growth of the village.

4. Case study: The school as a Learning Centre in the village of Mesta, Chios

4.1 The economic and social setting

The village of Mesta is located in the south-western region of the island of Chios, the fifth largest of the Greek islands, situated in the Aegean Sea seven kilometres off the Turkish coast, with a current resident population of 51,936 (2001 census). Chios' terrain is principally mountainous and arid, with a ridge of mountains running through the spine of the island. A large number of Chians have moved to the major urban centres on the Greek mainland and the island has a considerable diaspora abroad, notably in London and New York. The island is famous for its medieval villages, its scenery and good climate. Its chief export is mastic but it also produces olives, figs, and wine. Its international fame is based on the size and quality of its merchant shipping community.

Mesta, with a population of 501 (2001 census), is the most remote of the so-called "Mastichochoria" villages (literally: Mastic Towns), namely the cluster of villages of Mesta, Pyrgi, Olympi, Kalamoti, Vessa, and Elata, which dominate the labor-intensive production of the mastic gum in the area since the Roman peri-

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od (source: <http://en.wikipedia.org/wiki/Chios>). The villages, built between the 14th and 16th centuries, have a carefully designed layout with fortified gates and cobbled narrow streets to protect against the frequent raids by marauding pirates. Mesta's village-castle structure keeps the houses tied tightly together in what seems like a closed and compact form; the houses had doors and windows that faced only the interior of the wall, that is, inside the village.

The area's chief export is mastic (*pistacia lentiscus*), an evergreen shrub or small tree growing to 3–4 m tall, mainly cultivated for its aromatic resin. The mastic resin is a relatively expensive kind of spice, used in liquors (mastica alcoholic drink), chewing gum pastilles, pastries-making, baked goods, and cosmetics such as toothpaste, and lotions for the hair and skin and perfumes. The resin is harvested from incisions in the main branches of the tree dropping onto specially prepared ground under the branches. The harvesting is done during the summer months between June and September. After the mastic is collected it is washed manually and spread in the sun to dry. Mastic is produced in the traditional way without incorporation of modern means of cultivation and production. Chios' mastic production has been granted EU-protected designation of origin (PDO) and a protected geographical indication (PGI) name. Recently, the financial support of Greek venture capital and private equity funds has provided state-of-the-art marketing and sales of mastic-based products in selected locations in the capital cities of many countries.

4.2 Brief historical background

Chios, claimed to be the native land of the epic poet Homer, was for many centuries under the rule of the Byzantine Empire. In the 13th century, Chios became initially a possession of the Republic of Venice, but during the turmoil of the 13th century the island

ownership was constantly affected by the regional power struggles, reverting to Byzantine rule (1225) and ceded to the Genoese (1261). and remained continually in their control until 1566, when it passed into the Ottoman Empire until 1923 when, by the Treaty of Lausanne, it finally became integrated to the Greek State.

4.3 The importance of human capital throughout the Mesta history

Throughout the turbulent historical times, mastic cultivation affected the fate of the village of Mesta in a significant way. Better conditions of living, in comparison to residents of other occupied areas, were due the conquerors' need of the Mesta villagers knowledge of the production of mastic. Mastic was considered so important that since the Roman times the penalties for stealing it were extremely severe. The Genoans enforced the most strict penalties: stealing a least piece of mastic was enough for the loss of the thief's one ear, hand, his nose or even his life (source: <http://www.chiosnet.gr/mesta/history.htm>).

Throughout history, privileges were granted to the residents of the island and especially to the villages where mastic was produced. For example, during the Ottoman occupation (which started in 1566) the village of Mesta, along with some other villages of the area, was dedicated to the sultan's mother and formed a separate administrative region, having had the privileges of exercising local government. The residents of Mesta used to elect the governors of their village (the Elders of the village) and their churchwardens through a general meeting. Their office lasted for a year. The churchwardens were responsible for the village problems; they collected the taxes, they solved certain misunderstandings, or problems in general between the Greeks and the





Turks, they appointed teachers and field guards, they also guarded the village wells and the village boundaries.

One of their most important achievements was the providing of the right to sell mastic in the free market. That happened in 1840 when, under the pressure of the Elders, an executive order (firman) was decreed by sultan Abdul Metzit. Since that year every village was free to sell the precious product to whoever made him the best offer.

Thus an improvement took place in the financial state of the villagers. Even in 1866 when privileges in the entire Ottoman empire were abolished by sultan Abdul Aziz, the village of Mesta (as well as the rest of Masticochoria) retained the right of electing their own Elders and the right of free sale of mastic.

The value assigned on Mesta's human capital (that is, the knowledge of cultivating the valuable mastic) played also a significant role in the aftermath of the 1822 Chios' uprising during the Greek War of Independence, which was put down and, in revenge, the Sultan ordered a massacre of the islanders (the massacre, depicted by Eugène Delacroix in his famous artwork at The Louvre, expelled or annihilated 5/6 of the 120,000 Greek inhabitants of the island). The residents of Mesta were saved from slavery because of their knowledge about the cultivation of mastic. When the Turks realized that they would lose the highest income that they had from Chios, they granted amnesty to the cultivators of mastic. Thus all villagers who had been arrested as hostages were set free and many of those who had left their village returned back. The destruction of the village was great anyway. According to a census conducted in 1802 it consisted of 275 families, 1112 people whereas in accordance with a census conducted in 1831 it had only 152 families, that is, some 600 people (source: <http://www.chiosnet.gr/mesta/history.htm>).

4.4 The role of social ties of the Mesta community

Nowadays Mesta has 501 residents (2001 census). Many more are those who dwell in Athens, Thessaloniki and in the USA. Associations have been established by the communities of Athens and of the USA, whose primary concern is to be in direct contact with the heritage and customs of their native land.

Many works have been taking place initiated and funded by Mesta people living abroad. In the past the communities of Egypt and Russia made great offerings to the village whereas these days the communities of the USA and Athens contribute mainly to the promotion of the village's heritage.

The villagers themselves are vividly interested in the maintenance of their cultural heritage as well as in the environmental conservation. As far as cultural issues are concerned there is the "Cultural Association of Mesta", members of which (informed by Chians living in Athens but aware of the Rural Wings project) approached the coordinators of the Rural Wings project and persuaded them to implement the technology and education solutions developed in that EU-funded project to the school of the Mesta village.

4.5 Linking Mesta via the Rural Wings project

The EU-cofunded Rural Wings project (www.rural-wings-project.net) implements, in selected remote rural communities, satellite-based broadband infrastructure in order to offer learning resources to diverse learners in these communities, fostering meaningful, working networks toward lifelong learning and competence development. Being the latest and most ambitious addition in a series of projects seeking to enable the development of advanced professional competences and a lifelong learning culture in

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remote rural educators, the Rural Wings project uses two-way satellite telecommunications and local wireless networks to render broadband available really everywhere, even in the most isolated and deprived rural area. The ultimate aim of this provision is to address the learning needs of all citizens living in remote rural areas, fostering the development of lively learning communities in remote schools and other local educational institutions and initiatives, and the villages hosting them.

When representatives from the “Cultural Association of Mesta” invited the Rural Wings project coordinators to consider the school of Mesta as one of the project’s pilot sites, the coordinators assessed the village’s cultural identity, entrepreneurial spirit and social networks in terms of its potential to establish and maintain a community of practice (Wenger, 1998), that is, groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.

The representatives of the “Cultural Association of Mesta” and the Rural Wings project coordinators started collaborating in 2006. The “Cultural Association of Mesta” comprises members from both residents of the village and Mesta-related people living in the capital city of the Chios island or in Athens. Being aware of the offering of the Rural Wings project, the “Cultural Association of Mesta” contacted the project’s coordinators and proposed the school at Mesta to become a pilot site.

Their objective was (and always is) for the school to serve as a learning center for the societal and economic growth of the village and a key factor in strengthening the community’s ties with the village’s people who are living in Athens or abroad (especially, educating their children in the Greek language and the Mesta/Chios cultural heritage). The Cultural Association members offered whatever effort and as-

sistance would be needed, engaging the entire village population in constructive ways, and utilizing the implemented broadband-services infrastructure toward the long-term development of the community, placing it in the hands of the community’s youth and of young couples of professionals, who were just settling in the village as permanent residents.

At that time the school had ceased to operate because the number of children had been reduced to levels below those mandated by the Greek Ministry of Education as minimum for having the school operational. The village’s students were driven back and forth, each day, to attend the school of the nearest town. The village’s school was abandoned.

By Spring 2007 the school building had been restored and the technology infrastructure had been implemented. Initial public offerings to the village residents included dancing lessons and broadcasting the community’s public celebrations via the Internet (live, from the village’s main square so that everyone, anywhere in the world to be able to watch the celebration at real time). In June 2007, the RuraLearn 2007 Conference took place in the village of Mesta, with the school building and newly established infrastructure serving as the Conference’s venue. More than 150 participants from 13 countries arrived at the village. The entire village population was engaged in assisting the Conference participants, events, and in participating as much as possible. Children became “official” guides to help the participants to find their places of accommodation. Mastic producers offered free mastic gum products. The conference’s gala dinner took place in the central square of the village and the entire village was invited to participate.

In the aftermath, the conference participants interacted constructively with the local people and the attractiveness of the cultural and natural environment (highlighting the level of their hospitality and potentially disseminating the village of Mesta as a tourist





destination). The village residents interacted constructively with the “strangers”, learning the potential of the infrastructure already established in their village, which can be used for communication purposes and for supporting life-long learning activities not only for themselves but for their relatives living abroad (a summer school, offering language, dancing and other cultural and heritage conservation life-long learning activities, is planned for the coming year), thus strengthening the societal ties and supporting economic growth.

This kind of engagement, collaboration and learning takes time and requires sustained interaction – which are some more of the things that the technologies the Rural Wings project has been envisaged to support.

4.6 Conclusion

Improving the human capacity of the local workforce is essential to provide opportunities for the individuals, regardless of where they will work. However, although human capital resources are essential to participate in the new globalising economy, local development should focus on more than human capital development (Bollman 1999), as noted by von Meyer (1997):

The positive performance in creating rural employment results from specific territorial dynamics that are not yet properly understood, but probably include aspects such as regional identity and entrepreneurial climate, public and private networks, or the attractiveness of the cultural and natural environment. (von Meyer, 1997, p. 20)

The aspects of regional identity and entrepreneurial climate, public and private networks, and cultural and natural environment, relate to the concept of social capital, toward which, research on investigating its role in financial development and economic growth has been growing steadily in the last years.

Technological advances in communications and, particularly, the growth of the broadband services offer the potential to integrate remote rural communities into the global nexus of activities, necessitating the development of social capital of the “market” type, takes the form of knowledge about how to use third parties and of trusting “strangers” (that is, parties outside the local personal networks).

When representatives from the “Cultural Association of Mesta” invited the Rural Wings project coordinators to consider the school of Mesta, Chios, in Greece, as one of the project’s pilot sites, the coordinators assessed the village’s cultural and historical identity, entrepreneurial spirit and social networks, in terms of its potential to establish and maintain a community of practice.

Local citizens’ commitment to the community’s development by engaging in joint activities (between themselves, their communities abroad, and “strangers”), help support the new generation, share information and learn from each other, while pursuing their interests, was the main consideration in finally selecting the school at Mesta as one of the Rural Wings project’s pilot sites.

The project supported the renovation of the village’s school and the implementation of the broadband technology infrastructure. Initial public offerings to the village residents included dancing lessons and broadcasting the community’s public celebrations via the Internet (live, from the village’s main square so that everyone, anywhere in the world to be able to watch the celebration at real time). In June 2007, the RuraLearn 2007 Conference took place in the village of Mesta, with the school building and newly established infrastructure serving as the Conference’s venue. The entire village population was engaged in assisting the Conference participants, events, and in participating as much as possible. Thus, the village

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residents interacted constructively with the “strangers”, learning the potential of the infrastructure already established in their village, which can be used for communication purposes and for supporting life-long learning activities not only for themselves but for their relatives living abroad (a summer school, offering language, dancing and other cultural and heritage conservation life-long learning activities, is planned for the coming year), strengthening the societal ties and supporting economic growth. This case exemplifies the challenges and the opportunities of linking remote rural communities to the global nexus via broadband-based services.

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The Educational Role of the Culture Association of a Remote Small Rural Community



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Learning and Culture Association of Mesta, Greece

1. A unique rural community, like many others

Our village, Mesta, is a small traditional fortified medieval settlement at the southwest end of the Chios island in the eastern Aegean Sea. Chios is one of the Greek islands lying opposite to the Turkish coast, constituting thus part of EU's borderline to the East. Beside the uniqueness of our local history and heritage, our community definitely has had the same fate as, and today resembles, numerous other rural communities in Greece and in Europe, with reference to the challenges that remote rural areas are facing, as well as to the considerable potential for new initiatives for rural development and quality rural life.

2. Background

Geographical disadvantage and socioeconomic factors in the second half of the twentieth century have kept the village of Mesta far from many of the in-

fluences of modern urban life. This can be clearly seen, for example, in its architecture: Mesta is nowadays the only still inhabited well-preserved medieval castle-village in Greece. The village was built in the fourteenth century as a fortification aimed to protect the villagers and their stored produce from pirate raids; today's Mesta, with the same stone-wall houses, vaulted passages and narrow labyrinth streets, has preserved this character almost unaffected. Despite its unique historical architectural character, Mesta was only 'discovered' by a famous Greek architect in the 1970s and thereafter protected by the law as a historical monument. The village remained however almost unknown to most Greeks for many more years, until some more recent attempts to promote its heritage and unique character to tourists.

The heritage of Mesta comprises one more valuable asset, beside its architectural uniqueness. The village is one of the 'Mastichochoria', i.e. the villages in southern Chios which have been for centuries associated with the cultivation of mastic (*Pistacia lentiscus*). The dried raisin of mastic, which flourishes



only in this part of the world, has been for centuries a renowned aromatic product with medicinal properties and culinary uses. The production of mastic has been tightly interweaved with the destinies and fates of villagers in southern Chios: having been a Genoese monopoly and then a source of privilege for the local population during Ottoman rule, the production of mastic went through a crisis in the middle of the twentieth century, to reach nowadays a renewed recognition as a basic ingredient in good quality cosmetics and health products. The production and disposal of mastic is today controlled by the Association of Mastic Producers. According to statistics from 2004, in Mesta there are about seventy producers of mastic – a rather small number compared to the past.

3. Mesta today

Mesta nowadays has a small, but economically active population. There are around 350 permanent inhabitants in winter, while the population of the village surpasses 1000 during a short peak period in August, when mainly expatriates and a few tourists come to spend their summer holidays there. The massive migration and brain drain to the big urban centres of Greece in the last forty years of the twentieth century, as well as an even older and longer wave of emigration to America, have left the formerly flourishing agricultural community with only few permanent residents, mainly middle-aged and elderly, but importantly also some children. Nevertheless, stabilization tendencies have become evident in recent years, as the shrinking of the local population seems to follow a slower pace due to the return of some (still very few) expatriates from the cities and from abroad after retirement – as well as of very few, but promising, younger second-generation offspring of the village who decide to give up life in the city and

re-discover the beauty of daily life and the new opportunities emerging in the land of their ancestors. Most of the permanent inhabitants are traditional farmers, who supplement their income through mild tourist industry activities in summer. There are also a few who are employed in services, predominantly in the public sector.

The rich cultural and agricultural heritage of our area, its unspoilt nature, and its strategic position in the Aegean Archipelago, leave ample space for innovative initiatives in the agricultural and tourism sectors, and more generally for programmes and schemes aiming at sustainable rural development. However all these are still almost non-existent, or in the best cases individual visions with questionable hopes of realization, due to the lack of local social capital – indeed a lack of educated, informed citizens equipped with the necessary modern tools and skills. It is expected, however, that more vivid attempts for the revitalization of the economy in the village will originate in the few repatriates, most of whom bring with them experiences, economic practices and mentalities from metropolitan centres of Greece and the US.

4. Education and lifelong learning in the village

The children of the village, numbering nowadays about twenty, used to attend the small multigrade school of Mesta. The function of this school was discontinued in 2002, as a result of a major attempt of the Greek educational authorities to merge small rural schools wherever possible, so as to form larger school units in selected rural locations. Since then the children of Mesta have been commuting daily to Pyrgi, a bigger village lying 11 km away, to attend school there. This major change in the life of the village – a traumatic experience symbolizing abandon-

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ment in the eyes of many villagers— almost coincided with another reform which changed the local administration landscape in the whole of rural Greece. As a result of the centrally decided mergers of village communities into large rural municipalities comprising several villages, Mesta also lost its own local administration and became one of the administrative sections of a new municipal authority established in Pyrgi, the Municipality of Mastichochoria.

This left the Learning and Culture Association of Mesta, a decades-old local association with rich cultural activity, as the only active local agent that practically promotes lifelong learning for local people of all ages in the village, as well as a number of other initiatives for the revival of the village community and sustainable rural development. In recent years, some of us have made constant attempts to convince and mobilize the right people, so as to revive the building of the closed school, turning it into an all-day and all-age centre of learning and creativity – a vision of tremendous symbolic value for the village. With this in mind, the Association has also invested much effort and resources for the free provision of evening classes and workshops for children and adults. For example, using computers that the Association acquired through donations and purchases, and in collaboration with capable locals, we are offering classes of computer skills to children and adults. Young volunteers have developed a website for the Association (www.mesta-chios.gr), while other local citizens—including a substantial proportion of women— attend workshops of traditional dances and traditional loom weaving, as well as classes in tradition music, and English language classes. At the same time, the Association is currently seeking ways to help the local population realize the potential for development through the promotion to the world of the historical, agricultural, cultural and natural heritage of the village. A recent idea worth mentioning is their inter-


est in training the villagers to promote the numerous wild plants and herbs that thrive in the unspoilt natural environment of the village, bringing thus the ancient knowledge of the locals about the qualities of these herbs to the foreground and putting it in the service of sustainable local development. Among our planned projects is also the teaching of the Greek language to the Greek-American children with an origin in the village, who typically spend a few weeks of summer vacation there, as well as edutainment projects for the promotion of science awareness and a scientific culture among younger and older visitors of Mesta in the summer.

5. Against the digital gap

We are aware of our digital disadvantage in comparison to urban and suburban areas across the country, in terms of access to the digital services and relevant opportunities of our times. The only connection to the internet available in Mesta nowadays is still PSTN dial-up or ISDN through the terrestrial wired telephone network. The possibility of terrestrial broadband infrastructure reaching the village appears to be rather remote, because of our small population and our rather remote location in relation to the capital of the island of Chios, where most of the modern activities are concentrated. The absence of broadband in Mesta definitely means an unfair exclusion of the local population from a considerable potential for new initiatives for rural development and quality rural life, which could be substantially supported by the provision of high-speed connectivity and the development and/or exploitation of state-of-the-art digital services.

The response to this problem currently appears to come to us from the sky. Our Association prides itself upon the inclusion of Mesta in the list of the





few selected pilot remote rural sites across Europe of the large-scale EU-funded project Rural Wings, which aims to exploit satellite data telecommunications for the purpose of promoting learning in remote rural communities such as ours. Thanks to this recent development (2006), the old school building has been equipped with satellite broadband, which greatly supports our own efforts for transforming the abandoned school of the village into a Rural Learning Hub, a place promoting an innovation culture in the community, offering opportunities for lifelong learning, creativity and expression to all villagers, and particularly to the young generations. It is this restored building and its new infrastructure that is now capable even of hosting international events such as the RuraLEARN conference itself.

Among the many learning and culture activities of our Association that satellite broadband can now enhance, it is particularly worth mentioning the new possibilities offered by the technology for music education. There is currently an interest of several children in learning wind musical instruments, and predominately the clarinet, the roots of which can be traced in the long tradition of folklore clarinetists in the village. These children, who are at the same time characterised by high levels of self-motivation

for mastering ICT skills and the internet –a reaction, apparently, of the youth to the isolation and disadvantage of the village–, are excited by the idea of learning music through new technologies. We are just in the brink of realising that applications of learning music at a distance will provide the Association, as the organizer of the courses, and the learners themselves, with access to resources that are impossible to attain and secure in the small scale and isolated position of the village.

6. Mesta and RuraLEARN

By choosing our village for the organization of its public events, the RuraLEARN project seeks to directly exemplify the challenges faced by Europe's rural communities in terms of development and inclusion, as well as the relevant opportunities that lifelong learning presents for Europeans of all ages in rural and geographically disadvantaged areas. We have proudly and warmly welcomed our international guests in this unprecedented organisation, and hope that our small but unique spot on Europe's map will inspire those who have the vision and the capacity for building a brighter, learning-enabled future for Europe's countryside.

Lifelong learning in rural Greece – the local voices workshop

The contribution of Laboratorial Centre of Natural Sciences (EKFE) in the promotion of laboratorial teaching of Natural Sciences in Chios

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Themistoklis Salasidis, Dimosthenis Kefalas, Panagiotis Katsalas
Laboratory Centre for Science of Chios, Greece

EKFE constitute centres of Research, Technical and organisational support of laboratorial teaching of natural courses, providing advices on organising laboratories in the school units of Secondary and First degree Education.

Director is Karakonstantis Andreas, Physicist, and Executives are Pouleres Nikolaos, Chemist, Gaisidis Yanis, Physicist, Salasidis Themistoklis, Physicist, Kefalas Dimosthenis, Computer science, Katsalas Panagiotis, First degree Education teacher.

Here are some activities of EKFE

1. Supporting teachings – Seminars. Are realised 30 on average during school year. They include presentations of experiments and instructive proposals for teachers in Physics, Chemistry and Biology

2. Collaborations in EKFE. Teachers practise themselves in experiments, are lent appliances and



chemical preparations, repairs instruments.

3. Visiting schools. The executives of EKFE visit schools and collaborate with the teachers for organising school laboratories , planning and preparation of experiments. Also the executives present experiments in the students.

4. Visiting EKFE . Students are familiarized and they participate in the realisation and implementation of experiments, with the new technologies (virtual experiments, use of internet e.t.c.)

5. EKFE produces and issues printed and electronic material to the teachers to support the experimental teaching.

6. EKFE Web Page (<http://ekfe.chi.sch.gr/>) contrib-

utes on communication of regional schools with EKFE, on the issuing supporting material, directives on the implementation of experimental teaching, informing on legislation-circular, that they concern in the teaching of Natural Sciences





Lifelong learning in rural Greece – the local voices workshop

The Science Museum of Chios as a challenge to enrich the scientific and cultural life of the inhabitants of the island of Chios and the wider area of Voreio Aigaio

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1st High School of Chios and Science Museum of Chios, Greece

1. Presentation of the Science Museum of Chios

The Science Museum of Chios <http://1gym-chiou.chi.sch.gr/fysiki.htm> is a small museum that has been in existence since 2001. Its collection of scientific instruments consists of the scientific collection of the old science laboratory of the historic “Gymnasium of Chios” that dates from 1792 and was an important centre of science teaching during all the 19th century and the early 20th century. The scientific instrument exhibition hosted at the museum is a valuable one consisting of 800 scientific instruments for educational use, dated from the beginning of the 19th century and created by major European scientific instrument manufacturers of the 19th and 20th centuries.

The scientific instruments of the museum collection cover almost all the sections of physics education (i.e. mechanics, fluid mechanics, meteorology, optics, waves, thermodynamics, electricity and magnetism, atomic physics, astronomy). In addition the collection includes scientific instruments for the teaching of chemistry, biology and geography. Besides, the museum hosts a geological collection of rocks and shells. The majority of the scientific instruments is now repaired and operational, thanks to the initiative and work of two physics teachers, Antonis Bournias and Paraschos Kallitsis, who spent four academic years, from 1997 to 2001, working on this, since many instruments were in bad condition and some of them were almost destroyed.



2. Presentation of the educational activities of the Science Museum of Chios

Since 2003, the Science Museum of Chios acts as a science centre for pupils, teachers of primary and secondary education and for the general public as well, through the application of a science education programme <http://1gym-chiou.chi.sch.gr/programma%20fysikis.htm> organized with the financial support of the local government. The educational programme is addressed to pupils from the whole country and has been already attended by more than 3000 pupils living mainly at the department of Voreio Aigaio (North Aegean Sea). In the last two academic years the Science Museum of Chios has been involved in adult education, organizing lectures linked to scientific issues and presented with the help of the science museum exhibits. In parallel, the educational activity of the Science Museum contributes to the primary and secondary teachers' education through the organization of seminars and workshops at a local level and through the communication of the applied educational activities' results via the participation in Pan-Hellenic or International Congresses concerning the teaching of science.

3. Content, design axes and philosophy of the museum educational programme

A major activity of the Science Museum is the preparation of educational material that promotes the integrated approach of science teaching and spotlights the cultural aspect of science using the history of science, the reproduction of historical experiments, the use of historical scientific documents and the links between science and life. The museum exhibits provide us with a constant source of inspiration for the

creation of the museum educational programme. We wondered "how we can make them tell their stories to the visitors?" We choose to see the museum instruments as representatives of the original ones and to reproduce via the educational programme the historic incidents that are linked to them. In this way the visitor could receive answers for two important questions regarding the exhibits. "What is this - what can we do with it?" and "Which is its place in the history of scientific culture?" As mentioned above, the content of the educational programme is enriched every year, in order to include in its thematic units the majority of the instruments of the scientific collection. For the moment, about one third (1/3) of the instruments collection is included in the educational programme. Its units, designed and prepared by Flora Paparou, have the form of lesson-shows and are titled:

"Matter and Light: From the lightening to the X-rays – Removing the air"

"Matter and Light: Flames, stars, city lights and atoms' electronic structure"

"How would the earth be without air?"

"The first days of electricity"

"Electricity and magnetism: Paths and crossings"

"The history of magnets and compasses"

"Whispering to the August stars..."

As mentioned above, one of the main design axes of the educational programme is the weaving of the different units' content in a contextual way, using the history and philosophy of science, as well as links between science, culture and life. We use the museum exhibits to reproduce historical experiments. We also use several and various historical sources, such as scientific documents, press documents, literature texts related to science issues, photos, designs etc, in

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order to vivify the historical context in an integrated way, spotlighting both the scientific thinking and cultural aspects linked to the discussed scientific issues. With the help of all that, we create educational software in which we embody the videos of the historical experiments reproduced in our museum. We use this educational software for the presentations of our museum lesson-shows, in parallel with narration and experiment performance in front of the audience. We also plan to use this educational software as a tool for distance learning.

4. The involvement of the Science Museum of Chios in European collaborations

During the last academic year we tried to involve the Science Museum of Chios in international projects. As it is not an independent institution but linked to the 1st High School of Chios we choose to apply for two projects: a) for a Lifelong Learning Comenius Learning Partnership programme titled: “School and Science Museum”, addressed to pupils of secondary education and b) for a Lifelong Learning Grundtvig Learning Partnership programme titled “Exploring Science as Culture through the European Science Museums”, addressed to adult learners. Among the main purposes of both project propositions are:

- to make the museum alive, easily accessible to different kind of visitors and present in the local, national and international cultural life,
- to create links between our museum and other European science museums,
- to upgrade the museum educational activity to an international level,
- to give to some of our educational activities a

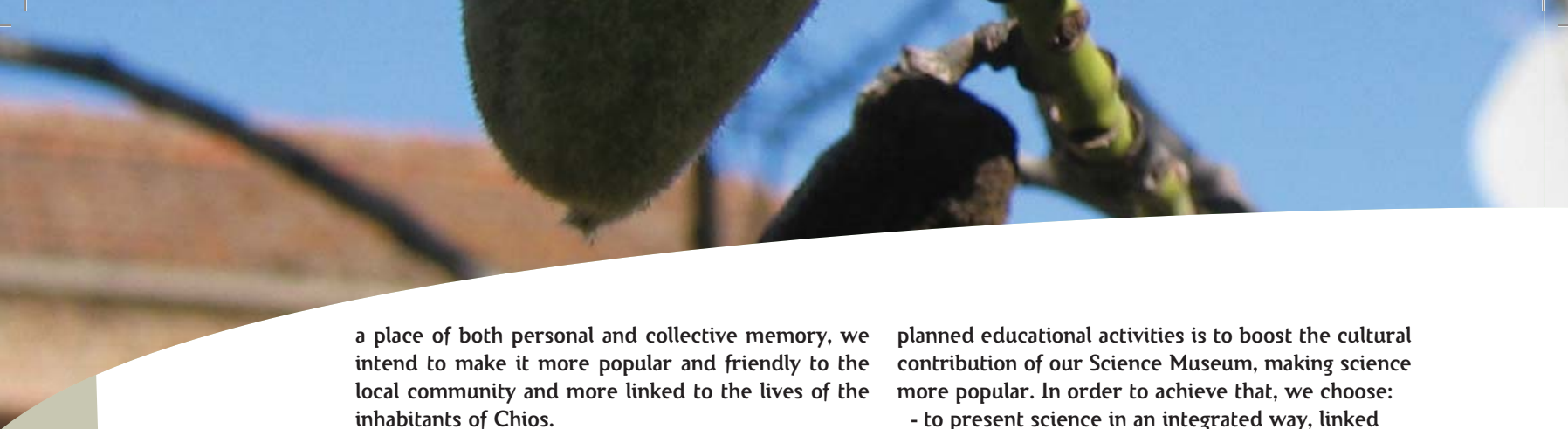
convenient form for distance learning.

5. Propositions for strengthen the connections between the Science Museum of Chios and members of local communities

The Science Museum of Chios is strongly connected to the educational and cultural life of Chios. Firstly, many of the scientific instruments of the museum collection were used to teach science to the pupils of the “Gymnasium of Chios” in years past, so many of the Chios inhabitants have school memories linked to the science museum. On the other hand, the instruments of the older collection dated from the 19th century remind to the Chios’ public the importance that science education in Chios had during the 19th century and more generally the cultural contribution of the island during the Greek Enlightenment.

In order to spotlight the history of the museum and its links to the life of the local community, we conceived the idea to add two more components to our educational activities. The first is to form a group of teachers and pupils that will have to collect and write down “stories” related with old laboratory of the Gymnasium of Chios and the educational use of the scientific instruments. The second one is to begin an extend research in the old part of the Korai’s library and study, which includes scientific books of the end of 18th century and 19th century that belonged to the Gymnasium of Chios and are strongly related to our exhibits. Using in appropriate way the results of this research in the creation of educational material we hope to provoke the collective memory related to cultural contribution of Chios during the Greek Enlightenment and recall the high scientific educational standard existed during this period.

Using, in this way, the Science Museum of Chios as



a place of both personal and collective memory, we intend to make it more popular and friendly to the local community and more linked to the lives of the inhabitants of Chios.

6. Creating an ambitious role for the Science Museum of Chios, that of reminding us of ancient Greek scientific culture

In addition to all described above, we want to mention a more ambitious perspective we confronted, while creating the different units of the educational programme. This was to strike a more deeply hidden string, this of the collective memory related to the ancient scientific culture. The spark for this idea was given to us by the research on the scientific issues we transformed to museum lessons. We noticed that very often the European scientists of the first scientific revolution, that occurred the 17th century, “discuss” their scientific hypotheses with ancient Greek scientists. We also verify the strong cultural link between the European scientists of all centuries after the first scientific revolution and the ancient Greek science. As we live in the same places that inspired Aristotle, Aristarchos or the Pre-Socratics, and we speak the same language we could maybe find a path to the beauty and the spirit of the contemporary science hearing their voices in parallel with those of modern scientists.

7. Cultural presence of the Science Museum of Chios at local, regional and national level - Actual situation and future planning

What we want to do more via our present and future

planned educational activities is to boost the cultural contribution of our Science Museum, making science more popular. In order to achieve that, we choose:

- to present science in an integrated way, linked to culture and art both by our given open lessons and performances and by the development of different ways to present the exhibits as well,
- to use the museum as place that can provoke personal and collective memory.

Specific levels of action, present and future:

- We already act at a local and national level through our educational activities.
- We intend to act at an international level and establish European collaborations through the realisation of Lifelong Learning programmes for students and adults.
- We plan to expand the use of new technologies and make our museum more digital and our educational activities accessible to distant visitors, though our proposed European collaborations.

8. Presence of our Museum in Congresses at national and international level

Presentations at international level:

Bournias, A., Kallitsis, P., Tzimas, N., 2002: The experimental teaching of physics at the historic Gymnasium of Chios, named “School of Chios” during the 19th century, XXI Scientific Instruments Symposium, National Hellenic Research Foundation, Athens 2002 (poster presentation)

Paparou F., Kallitsis P., Karaliota, A., Boulouxi, A., 2005: The educational utilization of the Science Museum of Chios via the application of the museum educational programme. 1st In-

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ternational Congress “Science and Art”, Hellenic Physics Society, Athens, June 2005

Presentations at national level:

Bournias, A., Kallitsis, P., Tzimas, N., 2001: Organization, Function and Presence of Science Museum in Chios, 9th Pan-Hellenic Congress of the Hellenic Science Society, Chios 2001

Paparou F., Karaliota A., Kallitsis P., 2004: Presentation of educational software for the teaching of sections of the subject: “Matter and Light”: A proposal for the utilization of the History and Philosophy of Science in the teaching of physical sciences in secondary education. 10th Congress of the Hellenic Physics Society, Lout-raki 2004

Paparou, F., Kallitsis, P., Boulouxi, A., 2004: “How would the earth be without air?” Development of a proposal for the teaching of physical sciences at the Science Museum of Chios. 4th Pan-Hellenic Congress on the Teaching of Physical Sciences and New Technologies in Education, Department of Primary Education of the National & Kapodistrian University of

Athens, Athens 2004

Paparou F., Kallitsis, P., 2005: “How would the earth be without air?” Presentation of an applied proposal for the teaching of physical sciences at the Science Museum of Chios, Department of Primary Education of the National & Kapodistrian University of Athens, Athens 2005

Paparou F., Kallitsis, P., 2005: “The first days of electricity?” Teaching proposal for the teaching of physical sciences at the Science Museum of Chios, 3rd Hellenic History, Philosophy and Science Teaching Conference, Department of Primary Education of the National & Kapodistrian University of Athens, Hellenic Physics Society, National Hellenic Research Foundation, Athens 2005

Paparou F., Kallitsis P., Karaliota A., Psillos, S., 2006: “The first days of electricity” Presentation of a teaching proposal applied at the Science Museum of Chios, 11th Pan-Hellenic Congress of the Hellenic Physics Society, Larisa, April 2006





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Pupils' Learning Experiences in the Primary Schools of the Greek Countryside

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1. Introduction / Rationale

Multigrade schools (MG) have been providing education to pupils for an extended period of time and they are currently met in rural areas of the countryside. Multigrade refer to schools where students from different grades are grouped in one room, mainly for administrative purposes rather than philosophical. Teachers are delivering the curriculum to more than one grade at the same time, while pupils keep their grade identity through their assigned tasks. The most common types of such schools in Greece are those of One Teacher's Schools (ITS; one teacher for both posts of head teacher and staff to cover all grades) and Two Teacher's Schools (2TS; staff consisted of two teachers including the head teacher, where each one teaches 3 grades).

Despite their gradual closing, MG schools still exist in large proportions in the Primary Education sector (Ministry of National Education and Religious Affairs, 1995; Primary Education Teachers' Union web

site <http://www.doe.gr/>; Figure, 1). First of all, there are geographical conditions (high mountains with small villages, many islands) that pose constraints to people's transportation therefore, further consolidation of rural MG and pupils' every day busing is prevented. Moreover, social as well as cultural conditions prevent the establishment of boarding schools. Many parents migrate in order to be close to their children's school, which contributes to further depopulation of the countryside. Finally, certain local communities are opposed to the consolidation of such schools (Papastamatis, 1995; Tressou-Milona, 1996a).

Despite all that, in Greece MG schools have been treated as temporary solutions and have not been provided with the appropriate means to overcome their difficulties. The buildings and facilities provided are usually in bad condition (Papastamatis, 1995; Tressou-Milona, 1996a; OECD, 1997). Teachers have not been trained to teach in multigrade situations,

although a proportion of them are required to teach in MG -in the early years of their career (Tressou-Milona, 1996a; Hargreaves, 1997). The curriculum provided does not address the particularities of rural MG and their local communities. The amount and content of subjects being taught are the same with single grade schools (SG; schools where one teacher is appointed to one grade-age group to cover all subjects) although the time provided for each subject is not the same as that of SG. Moreover, pupils are not necessarily taught the subjects relevant to their grade, since every other year they attend topics that

tional comparative studies have shown that pupils who attend MG schools do not seem to learn either more or less compared to their counterparts who are placed in horizontally grouped classrooms. (HMI, 1978; Galton et al., 1980; Bennett et al., 1983; Veenman et al., 1985; Yeoman & Seta, 1986; Veenman et al., 1987; Miller, 1990; Little, 1995; Veenman, 1995, 1996, 1997). The differences however found were not consistent in the content areas of language and mathematics. The outcomes of a study for example concerning both English MG and SG (HMI, 1978) stressed that 9 and 11 years old pupils achieved higher

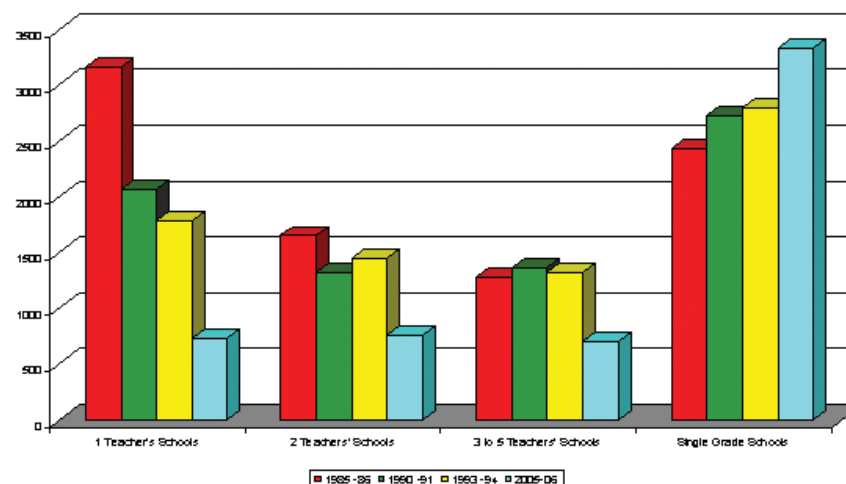
in the areas of reading and 11 years old in mathematics when they were placed in SG classrooms

On the other hand, there is a consensus in regard to pupils' non cognitive outcomes. Pupils enrolled in MG do not appear to be different in their social and emotional adjustment compared to those of SG. International literature also suggests that multi-grade classroom organisation does not affect pupils' non cognitive growth (Ford, 1977; UNESCO/APEID, 1989; Miller, 1990,

1991; Psacharopoulos et al., 1993; Veenman, 1995; Gray & Feldman, 1997; Butler, 1998). Based on such findings, the examiners' report of the OECD (1997) review conclude that MG schools are not by default considered inferior, while they acknowledge certain advantages concerning students' outcomes.

So far though, pupils' achievement from MG and SG has been compared through written or oral exami-

Figure 1: Multi-grade and single grade schools in Greece.



do not comply with their age-abilities (Papastamatis, 1995; Tressou-Milona, 1996b). Bearing in mind though the decrease in the birth rate, it is inevitable- that some SG will eventually become MG.

In Greece there is a widespread notion that MG schools are inferior to SG and educational policy constantly focuses on their gradual closure and consolidation to bigger ones (Papastamatis, 1995; Fykaris, 2000). The outcomes however of interna-

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nation. Apart from children's background, the development of these out-comes depends on the learning processes taking place inside schools. Yet, little is known if such processes vary between different types of schools and the impact such processes could have on student outcomes. By clarifying and analyzing these processes (e.g., pupils' activity and interaction, discussion between teacher and pupils) we can illuminate further how such processes can affect pupils' outcomes (Gage & Needels, 1989).

Thus, the present study aims to describe and analyze pupils' learning experiences in MG and SG that have been allocated in rural areas in relation to three different aspects of classroom life: i) Pupil's activity. ii) Pupils' interaction. iii) Pupils' cognitive engagement. Adopting a sociocultural framework, we hypothesize that if pupils are actively participating, interacting with classmate(s) and the teacher during subject elaboration and taking part to discussions emphasizing higher thinking skills, their learning experiences would be of a higher quality.

2. Methodology

2.1. Non-participant systematic classroom observation

In this study, non-participant systematic classroom observation was adopted. The re-searcher took into consideration the coding systems developed in other studies (Galton & Patrick, 1990; Pollard et al., 1994; Alexander, 1995a, b) as well as the particularities the specific method has (Delamont & Hamilton, 1984; Croll, 1986; Simpson & Tuson, 1995). Thus, for a period of 9 months 144 pupils from 20 different classrooms (9 from SG and 11 from MG) were observed. These classrooms were allocated in 11 schools (8 MG and 3 SG) from three regions (Arcadia, Korin-

thia, Chios). Finally, each class was observed 3 times and we remained in the classroom for a whole day. The coding system for pupils' activity and interaction has as follows. 1. Activity: i) Task engaged (speak, read, write, spell, problem solving, listen-observe). ii) Distracted. iii) Task management. iv) Waiting to receive instruction from teacher. 2. Interaction: i) Alone. ii) With teacher individually. iii) Classmate(s).

2.2. Language transcripts

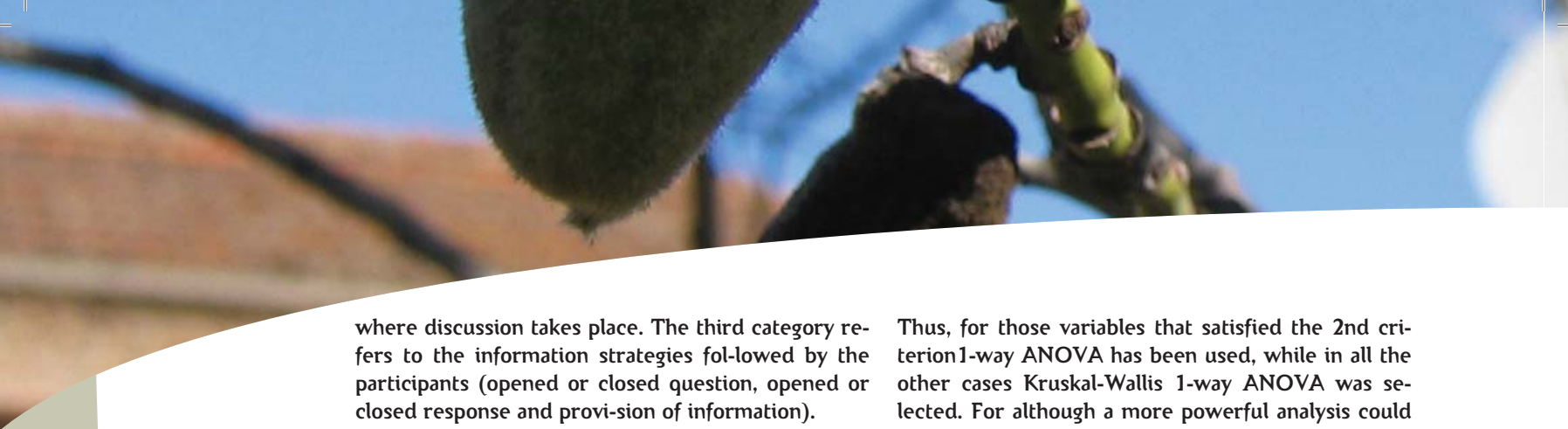
During observation, classroom interaction was also audiotaped and then transcribed. The focus of the transcription was on classroom interaction during the elaboration of the new text-topic. The reason for choosing this phase of the teaching-learning process is that at this point, both teachers and pupils were given opportunities to freely express themselves, share experiences and ideas.

2.2.1. Unit of analysis

The unit of analysis for the transcripts has been the utterance. It has been defined as '... one independent unit of verbal communication, together with any other units which are dependent on it' (Wells, 1975: 30) and both its meaning and voice intonation have been taken into consideration. During the coding of students' participation, all their spontaneous comments and responses that were acknowledged by teachers were taken into consideration.

2.2.2. Coding of the language transcripts

The coding system of the language transcripts which comprises of four categories of features was based on research carried out previously by Wells (1975) and Dickinson & Smith (1994). The first category refers to the person who speaks (teacher or student), while the second codes the context-subject (language, mathematics, science and social sciences)



where discussion takes place. The third category refers to the information strategies followed by the participants (opened or closed question, opened or closed response and provision of information).

The fourth category refers to the cognitive engagement of the participants and is divided into three sections: 1. High thinking skills discussion (this level includes: i) Personal experiences that assist the connection of newly acquired material with previous experiences. ii) Vocabulary analysis. iii) Analysis: explanation of incidents not stated in a text, comparisons, assuming the role of another person. iv) Predictions: identification of any sign within a given paragraph that could make students aware of the content of future paragraphs. v) Reasoning: interpreting actions, justifying personal preferences). 2. Low thinking skills discussion (this level includes: i) Description of text pictures. ii) Evaluation: personal preferences, feelings. iii) Checking: verifying text information or students' ideas. iv) Recall of facts or text information. v) Feedback). 3. Task management (this level includes: i) Management of interaction: defining appropriate behavior. ii) Task organization: turn taking, managing the task. iii) Reading. v) Others). High thinking skills discussion requires greater thinking effort, since such information is not provided by the text, compared to low thinking skills discussion.

2.3 Data analysis

All variables have been calculated in relation to the total number of utterances (13,119 in total) or observations (166 sessions were observed; 94 from MG and 72 from SG). Moreover, the researcher took into consideration that: i) Each statistical test has certain underlined assumptions that have to be satisfied and ii) Variables should belong to a specific level of measurement, with equal variance and normal distribution (Siegel & Castellan, 1988; Hatch & Lazaraton, 1991; Cramer, 1994).

Thus, for those variables that satisfied the 2nd criterion 1-way ANOVA has been used, while in all the other cases Kruskal-Wallis 1-way ANOVA was selected. For although a more powerful analysis could have been used (e.g., 2-way ANOVA, Cluster Analysis), using simpler analysis, precision and clarity has been preserved.

3. Results

3.1. Differences in pupils' activity among subjects

Students from all types of schools are more task engaged compared to the other three variables, during Language sessions. There are no significant differences on how often children are task engaged, distracted and occupied in task management activities across all types of schools. However, pupils from 1TS spend significantly more time waiting to receive instruction from their teacher compared to 2TS and SG schools ($p < .02$).

During Mathematics, pupils from 1TS are significantly less task engaged ($p < .05$) compared to the other types of schools. On the other hand, students in 1TS and SG are significantly more distracted compared to those who attend 2TS ($p < .02$), while pupils who attend MG spend more time in task management activities compared to SG ($p < .05$). There were no differences on how often they wait to receive instruction across all types of schools.

In Social Sciences and Science sessions pupils from 2TS seem to be more occupied to their assigned task ($p < .01$), while those from SG are the most distracted ($p < .0001$). Similarly to Mathematics, activities related to task management take place significantly more often compared to SG ($p < .0001$) (Table 1).

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Table 1: Pupils' activity according to subject.

Variables	1TS		2TS		SG		1-Way ANOVA
	M ¹	SD	M	SD	M	SD	
			Language				
Task engaged	68.03	22.28	70.88	16.79	67.29	20.35	F= .4422
Distracted	11.65	13.71	10.58	10.62	15.79	12.86	F= 2.6051
Task management	11.00	8.60	14.95	11.57	15.13	17.89	F= 1.0180
Waiting for teacher	6.59	17.80	1.87	6.44	.65	3.50	F= 4.2199**
			Mathematics				
Task engaged	56.71	25.75	67.72	22.49	68.21	14.86	F= 3.7856*
Distracted	18.34	20.13	11.60	13.36	20.66	14.18	F= 4.3437**
Task management	16.38	21.17	13.02	13.67	9.00	6.12	F= 3.2250*
Waiting for teacher	3.93	15.63	5.86	18.92	.52	3.94	F= 2.0392
			Social Sciences & Sciences				
Task engaged	57.98	22.00	71.77	17.06	62.69	19.34	F= 5.0045***
Distracted	14.62	13.81	13.48	12.09	28.99	12.12	F= 14.4388†
Task management	15.08	17.91	12.84	12.43	6.29	5.55	F= 6.8918****
Waiting for teacher	10.90	21.27	.00	.00	.09	.66	F= 12.9579†
p<.05 **p<.02 *p<.01 ****p<.001 † p<.0001							

* $p<.05$

** $p<.02$

*** $p<.01$

**** $p<.001$

† $p<.0001$

3.2. Differences in pupils' interaction among subjects

Table 2 shows how pupils interact during various subjects. Thus, those from 1TS are significantly less often left without interaction compared to pupils from 2TS and SG across all subjects [Language ($p<.003$), Mathematics ($p<.0005$) and Social Sciences & Sciences ($p<.01$)]. Moreover, teachers pay more individualized attention to their pupils in 1TS compared to 2TS and SG ($p<.004$) during Language and

Mathematics with the exception of Social Sciences and Sciences. During Language sessions, no significant differences were found on how often children interact with a classmate across the three types of schools. In Mathematics however, pupils from 1TS and 2TS are given significantly more opportunities to interact with a classmate ($p<.02$), while during Social Sciences and Sciences only children who attend 1TS were significantly more often interacting with a classmate ($p<.05$).

¹ M: Mean, SD: Standard Deviation.

Table 2: Pupils' interaction according to subject.

Variables	1TS		2TS		SG		1-Way ANOVA
	M	SD	M	SD	M	SD	
Language							
Alone	84.04	12.42	90.84	8.31	90.60	8.57	F= 6.1585*
Classmate(s)	5.41	7.51	5.49	6.33	4.28	5.12	F= .6376
Teacher individually	7.81	11.67	2.06	3.35	3.98	6.44	F= 5.8396**
Mathematics							
Alone	79.59	14.75	87.10	10.31	89.09	9.15	F= 7.9332***
Classmate(s)	8.98	9.70	8.90	9.43	4.82	6.51	F= 3.9940†
Teacher individually	6.78	9.97	2.23	3.46	4.48	5.52	F= 4.7909††
Social Sciences & Sciences							
Alone	86.72	11.11	92.47	7.08	91.84	7.72	F= 5.0062††
Classmate(s)	8.55	10.96	3.81	6.00	3.59	5.21	F= 5.5528§
Teacher individually	3.30	5.59	1.83	4.76	2.62	4.87	F= .7993
*p<.003 **p<.004 ***p<.0005 †p<.02 ††p<.01 §p<.05							

3.3. Classroom discourse

During classroom discourse at the recipient of interaction level, speakers (teacher or child) in MG speak significantly more to the class as a whole ($p<.02$). On the other hand, talking either to an individual student or to the teacher, or even talking to a group of pupils do not significantly differ among different types of schools.

In the sharing of information level, pupils enrolled in MG seem to share more information than those from

SG ($p<.04$). In contrast, posing opened or closed questions or responding to questions do not significantly differ among schools.

Notably, there are no significant differences on how much high thinking skills and task management discussion take place among 1TS, 2TS and SG. However, there is significantly more low thinking skills discussion in 1TS compared to 2TS and SG ($p<.02$). Moreover, the majority of discussion in such schools is devoted to low thinking skills (Table 3).

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Table 3: Classroom discourse in MG and SG.

Variables	1TS MR ²	2TS MR	SG MR	K-W 1-Way ³ ANOVA
Recipient of interaction				
Individual	11.67	7.13	8.06	H= 1.7418
Group	8.67	9.13	8.17	H= .1420
Whole class	9.33	14.00	5.78	H= 8.3725*
Teacher	11.00	9.50	7.22	H= 1.6544
Sharing of information				
Give information	9.67	13.25	6.00	H= 6.6434**
Close question	11.30	9.25	7.22	H= 1.8100
Response to close question	10.67	8.75	7.67	H= .9081
Open question	14.00	6.75	7.44	H= 4.9865
Response to open question	13.33	6.75	7.67	H= 3.9081
Others	11.00	12.00	6.11	H= 5.2549
Cognitive engagement				
High thinking skills	6.33	12.25	7.56	H= 3.4571
Low thinking skills	15.00	8.75	6.22	H= 7.6630*
Task management	9.33	12.75	6.33	H= 5.1434

* $p < .02$

** $p < .04$

4. Discussion

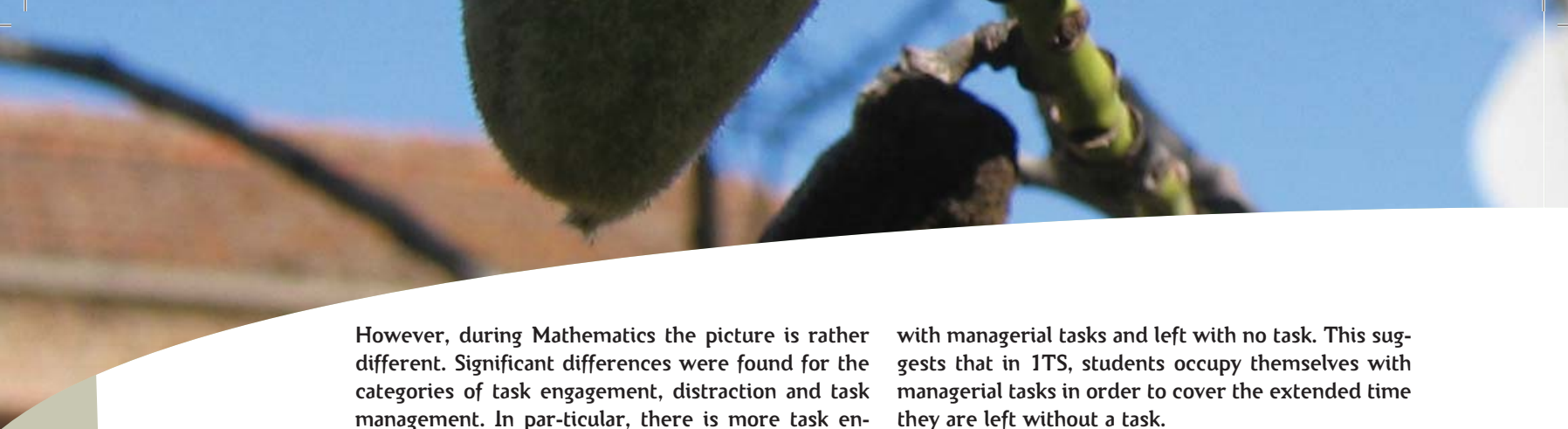
The aim of this study was to examine the impact of different schooling institutions, on the quality of pupils' learning experiences. We hypothesized if children are actively participating and interacting during classroom processes through open questions and exchange of information and are engaged in discussion that emphasizes the development of high thinking skills, the quality of their learning experiences is likely to be enhanced.

When differences in activity were examined during Language sessions, no differences were found for the

categories of task engagement, distraction, task management and others. The present study agrees with Veenman et al's (1987) argument who claims that there are no differences between MG and SG in the content areas of reading-language and the amount of time spent to them. However, there is a conflict with HMI's (1978) results that 9 and 11 years old students achieved higher in the area of reading when placed in SG. The present study has also found that children in 1TS were significantly more left with no task compared to 2TS and SG, which points out the difficulties teachers face to manage many grades simultaneously.

² MR: Mean Rank

³ K-W: Kruskal Wallis



However, during Mathematics the picture is rather different. Significant differences were found for the categories of task engagement, distraction and task management. In particular, there is more task engagement in SG which complies with HMI's (1978) findings. On the other hand though, the present results do not follow Veenman et al's (1987) arguments that no differences occur between SG and MG in the area of Mathematics. It should be noted here that despite differences, students from 2TS performed as well as those from SG. However, the highest rate of distraction takes place in SG. Conversely, children in 1TS are more frequently engaged in managerial tasks and waiting for the teacher. The analysis reveals that during Mathematics in SG a rather awkward situation exists. Students are more task engaged, but they are also more distracted. Such an outcome may be due to the particular teaching style adopted during the delivery of the day's topics. Alternatively, the degree of individualized attention might play a significant role, since while the teacher is occupied with one of them, the rest may be distracted. Moreover, the comparison between 2TS and 1TS illustrates that in 2TS students are more engaged, less distracted and less occupied to managerial activities. This again raises the issue of how much time a teacher can devote to a grade in each type of school.

In Social Sciences & Science, children in 2TS are much more task engaged. However, there is almost twice as much distraction in SG compared to MG. These outcomes point out that the type of school can make a difference. Despite time limitations and the number of grades teachers in MG have to deal with, both drawbacks may end up as advantages. In MG, teachers present immediately the core ideas of the topic, while in SG the extra time could be used for extended discussion which, in the end, may distract pupils' attention. Similarly to Language and Mathematics, children in 1TS are more frequently occupied

with managerial tasks and left with no task. This suggests that in 1TS, students occupy themselves with managerial tasks in order to cover the extended time they are left without a task.

In addition, differences in interactive patterns among subjects were also explored. During Language, children were more alone and they interacted less individually with the teacher in 2TS and SG compared to 1TS. Each child does reading, spelling, listens to the teacher who reads the new topic, explains unknown words and there is also some discussion. Thus, for a large proportion of time the children from 2TS and SG either work alone on the tasks assigned by the teacher or participate to the discussion.

During Mathematics children are also more alone and interact less individually with the teacher in 2TS and SG compared to 1TS. However, in MG schools children interact more with a classmate than in SG schools. Given the fact, that in such schools teachers have to deliver from 3 (in 2TS) up to 6 topics (in 1TS) per session, children spent more time working or discussing with classmates when waiting for the teacher to finish with the remaining grades. Similarly, in Social Sciences & Science pupils in 2TS and SG are more left alone and interact significantly less with a classmate compared to 1TS. Therefore, the outcomes from all subjects in 1TS, suggest that the number of grades in a classroom (up to 6) does not allow students to be left alone for an extended period of time, since teachers are regularly moving from grade to grade.

We additionally investigated the classroom discourse. In all schools, there were almost no differences to whom the speaker (teacher or child) was speaking, the type of questions-responses posed during discussion and there was also equal use of high thinking skills and discussion related to task management. Only in 2TS, there was more exchange of information and the speaker was speaking considerably more

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to the whole class compared to ITS and SG, while in ITS the discussion was more based on low thinking skills. It's apparent that SG are not making the better use of their advantages (one teacher per grade, one subject per session) regarding the sharing of information as well as the posing of closed and opened questions. Discourse in MG appears to be more complete given the greater sharing of information. It's also remarkable that the various types of schools do not differ in higher order thinking and in the management of activity. On the other hand, the high proportion of discourse related to low thinking skills make ITS a less challenging environment for the pupils compared to the rest type of schools.

In conclusion, ITS have problems to have all children task engaged during Mathematics and SG schools to make children concentrate during Social Sciences & Sciences. Thus, MG schools are more effective during Social Sciences & Sciences which probably is due to fact that the proportion of whole class teaching is less than in SG. Moreover, ITS and SG have almost no differences in the proportion of pupils' interaction and the quality of discussion. However, SG children were more distracted, while MG children more occupied in managerial tasks. Very small differences were found in ITS (children wait teacher, low thinking skills) that are due to the difficulties teachers face in managing the task. It is striking though that in all schools more the 80% of their time children work alone or passively listen to the teacher in all subjects. Though in MG working with a classmate is more often in Mathematics and in Social Sciences & Sciences, in ITS teachers interact more individually with children during Language and Mathematics. More significantly though, the quality of classroom discussion is almost similar across all types of schools.


Thus, the picture emerged from classroom observation suggests a pattern of teaching-learning where despite differences among schools, pupils for the

most of the time do not interact with someone else. Rather, they simply listen-observe without active participation, while interaction with a classmate and the classroom teacher is limited. A similar picture emerges from discourse analysis, since it's obvious that speakers (teacher or pupils) mainly address the class as a whole. It is not proven though that pupils'-teachers' interaction suffer, since they often speak to each other and attract individualized attention. These outcomes though should be seen under the light of teacher's-pupils ratio, since the less numbers of pupils per teacher the more the teachers can meet their pupils' needs which can overcome some MG's disadvantages. Moreover, group work is limited despite its proven benefits (Galton & Williamson, 1992).

The outcomes from this study and others suggest that there are not significant differences among different types of schools that could justify the claims of those who wish to form one type of school. Therefore, the quality of pupils learning experiences is not either positively or negatively affected by the type of schools such pupils attend. It's not the type of school that makes the difference. Rather, teachers' ability to lead pupils as well as the quality of classroom interaction has the greater impact on their learning experiences. Thus, we should focus on how teaching-learning processes can improve using their advantages in such ways so as to overcome their drawbacks.

4.1. Suggestions for future research, policy and practice

The outcomes of the study could have considerable implications. Future research should investigate how classroom processes are related to students' cognitive and non-cognitive outcomes across different types of schools, since this study has only focused on classroom processes.



There are also considerable implications for teachers. In-service training of teachers re-garding classroom management, use of various teaching strategies, in particular group work and training of teachers on how pupils' should become independent learners are im-perative.

Furthermore, the current educational policy should also be reconsidered. Despite MG presence for many years their contribution for the development of rural areas has been ig-nored. Teachers have not been trained for such schools neither the National Curriculum and textbooks have been adapted to their needs. Therefore, educational planning should first of all acknowledge MG's needs which have been largely neglected and a change of attitude is needed if their educational demands are to be met. Finally, having in mind the rapid decrease in birth rate what is necessary is a policy that will address the needs of the schools that are currently operating in a multi-grade mode and which will set the founda-tions for those to follow.

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