Supporting Rural Citizens' Access to Knowledge: One More Aspect of e-Democracy

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Abstract. The paper considers the potential offered by lifelong learning as a tool for capacity building and development in rural areas, especially through the exploitation of contemporary technologies. The challenges and opportunities connected with small rural schools are particularly focused upon, and teachers working in them are proposed as ideal change agents potentially powerful to catalyse bottom-up developmental initiatives in the local context. The experiences from a series of relevant teacher professional development initiatives in this direction are presented, and some of the main findings and questions arising are summarised.

Keywords: Lifelong learning, rural areas, teacher development, local initiative, change, capacity building.

1 'Rural Learning': A Vehicle to Development

Rural areas should lie in the heart of efforts for a coherent Europe, since they constitute a vital part of European Union (EU)'s physical make-up and identity. According to the EU Rural Development policy for 2007-2013, more than 91 % of the territory of the Union can be defined as 'rural', and this area is home to more than 56 % of the EU's population. Therefore, rural development cannot but form an important pillar of EU's policies. In this context, Europe's contemporary rural development policies place agriculture in a broader context, including issues such as increasing competitiveness, enhanced quality of life in rural areas, and, eventually, attractiveness of rural areas to young farmers and new residents.

Lifelong learning equipping rural citizens with access to development opportunities is expected to play an important role in this direction. Informed and empowered inhabitants of rural Europe may not easily abandon their space and heritage to move to urban centres. They may evaluate the challenges differently, and respond to them flexibly and creatively. It is a task for the whole of the education and training system to promote such a form of 'rural learning', in formal, non-formal and informal contexts [20].

Education and rural development are indeed closely interlinked in many ways. Better educated rural populations have been shown to achieve greater economic development [3]. Higher educational levels in rural areas are positively related to better

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income growth, and improvement of rural schools can improve local economic conditions by slowing down or reversing 'brain drain' [4].

2 The Role of New Technologies for Capacity Building in the Rural Space

Worldwide, there is an increasing recognition at the political level of the role Information and Communication Technologies (ICT) can play for development and capacity building in disadvantaged populations and less-favoured areas. UN's World Summit on the Information Society in Geneva (2003) and Tunis (2005) produced an action plan which sets objectives very relevant to the rural space, such as building an inclusive Information Society by reducing the digital divide, and putting the potential of knowledge and ICTs at the service of development. At the European level, the strategic guidelines for rural development for 2007-2013 call for the mainstreaming of the Information Society into rural development policies. Considerable investments are currently made for bridging the digital divide so that rural areas in Europe attain their full potential, quality of rural life is improved and rural economy strengthened [34].

As rural citizens' knowledge and skills constitute basic elements of this new environment, technology-enabled and technology-enhanced lifelong learning ought to be one of the vehicles leading rural communities to local capacity building. Rural citizens should be given opportunities to interact with contemporary knowledge and artefacts in a continuous line of personal involvement from childhood to third age, as well as opportunities to collaborate with each other and across age group borders. In this way the rural community as a whole will produce its own sustainable solutions to create conditions for rural well-being and development.

3 Rural Schools: Challenges and Opportunities

Rural Europe is facing important challenges in terms of access to state-of-the-art learning and Information Society opportunities. Next to the shrinking of rural schools in many parts of Europe, features such as low ICT adoption, low entrepreneurship and vulnerability to unemployment underline the need for more and better lifelong learning opportunities. It would be short-sighted to try to trace the source of these inefficiencies only in the skills of the rural workforce and the provision or not of proper adult education and professional training. People's stances and potential in their rural homelands are also shaped during their course, as students, through the educational system. Rural schools are a key factor that should be mobilised in any attempt to enhance demographic retention and growth of rural areas.

3.1 Rural Schools and Community Development

In Europe, as in the rest of the world, rural schools constitute a point of reference and particular significance in their local context, a potential tool for growth, and a source of vision and hope for the future. For decades, they have provided access to education and a promise for a brighter future to all, including the poorest and the less advantaged, and

have kept small and aging communities 'alive'. Rural communities have depended on their schools to serve many social and cultural functions beyond their primary mission of educating children. In an account on the non-educational impact of schools on rural communities, Salant & Waller [32] summarise that the school-community relationship is multi-faceted, with schools having positive economic and social impacts, providing a resource for community development, as well as offering a delivery point for social services. Miller [30] proposes that rural schools, working in partnership with local leaders and residents, can have a positive impact on community viability, especially when students, working alongside adults, are given meaningful opportunities to engage in community-based learning that serves the needs of the community.

The concept of 'social capital' has been increasingly used to describe social organization and resources embedded in the social structure of the rural communities which can facilitate community development. Woodhouse [36], reporting on the findings of an Australian case study, suggests that social capital exerts a positive causal influence on economic development. The concept of social capital can indeed provide a foundation for the understanding of the strategic role schools and youth can play in community development. According to Miller [30], the school represents an important element in the community's social capital rather than merely an educational resource for the community's youth. By building the social capital of the school and youth, the community not only helps to develop responsible citizens, but also creates opportunities for tomorrow's leaders to emerge. Teachers, in particular, can play a central role as agents of innovation and multipliers of social capital in a remote small community [19].

3.2 Difficulties for Rural Schools and Teachers

Despite the crucial role of rural schools, their function is becoming more and more problematic in today's Europe; they suffer the consequences of a constantly widening economic and social gap separating urban and rural regions. The digital divide in particular, i.e. the disadvantage of rural areas in terms of access to the opportunities of the contemporary Information Society, is recognised as a threat for rural Europe [11]. Rural educational establishments experience this threat most dramatically. While education in urban areas has already become a space of innovative applications supported by broadband technologies, the exclusion of remote communities from the contemporary educational opportunities badly affects the "borderers" of the education system.

Schools in rural areas have always faced difficult challenges. The problems have been 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. Teacher shortage in rural and remote areas and the weaknesses in the provision of training and professional support to these teachers have been documented across time and space [5], [26], [12], [31], [2], [17].

In rural Greece, as in other rural areas through out the world, remote schools function as 'multigrade' [22]. Due to the very small size of the school units, teachers teach more than one age group and possibly more than one subject at the same time. Next to their teaching tasks, they typically also carry out considerable amounts of office work required for the administrative function of the school. The young teachers usually

posted to such schools are not adequately prepared through their initial training for these demanding conditions. Personal and professional isolation and the wider 'decay' atmosphere do not offer them any motivation to build ties with the school and the surrounding community.

Nevertheless, small rural schools are characterised by positive potential which a skilful and devoted teacher could turn into advantage for the school and the community. Literature is not scarce that recognises multigrade classrooms as not only an unavoidable, but actually a good-quality alternative option for education [24], [13], [6].

3.3 Using Technologies for Rural Teachers' Professional Development

The need for rural teachers' in-service training is apparent, especially in contexts in which inexperienced newly-appointed teachers serve rural schools for short periods. New knowledge and skills are required, so that the teacher can enhance their teaching and respond to the challenging circumstances.

Providing such professional development opportunities typically proves problematic. It is difficult for educational authorities to offer conventional in-service seminars to remote rural teachers, as round trips between the school and the nearest training centre may be costly or even impossible in the absence of substitute teachers.

Technology-supported distance education emerges as a self-evident option for enhanced accessibility of teacher training programs in rural areas. The literature shows a development of relevant initiatives which has generally followed trends in computer-supported learning, delivering various forms of training content [18], [29], [27], [28], [15], [16].

More recently, satellite telecommunications have been particularly focused upon as a tool for bridging the digital divide [14], [9], including the provision of distance education to large remote audiences [23]. There are many examples from the United States and Australia [7], [8], as well as less developed parts of the world characterised by populations thinly distributed over large areas [1], [10], [25].

4 Our Experience: Facilitating Rural Teachers to Respond to the New Challenges

The context outlined above clearly demonstrates that technology potential should be harnessed to offer solutions for the provision of appropriate distance training and support to rural educators, so that they can better fulfil their demanding and inspirational roles in the rural school and the surrounding community. Adopting this as a basic proposition in our work in the framework of a series of consecutive pioneering European and Greek research projects over the last seven years, our team has designed, piloted in numerous rural locations in Greece and Europe, and extensively evaluated schemes of distance training, support and networking aiming to alleviate the isolation of rural teachers and support them in taking over new developmental roles, exploiting possibilities offered by technologies.

The main questions we have addressed refer 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 not only as isolated individuals but also learn from each other, participating in informal learning experiences within a sustainable lifelong learning network.

Our efforts started from an emphasis on teacher development through training content delivered over the web (MUSE project, www.ea.gr/ep/muse), and gradually moved into testing more advanced technologies for broadband delivery over satellite, while continuing to further develop the content [cf. the ZEUS (www.dias.ea.gr); HERMES (www.ea.gr/ep/hermes); RURAL WINGS (www.ruralwings-project.net) projects]. The 'maturity' gained through the implementation of the various training activities and the increasing involvement of remote rural teachers led to the development of a human network (NEMED; www.nemed-network.org) and an increased interest in concepts and tools related to lifelong learning networks (NEMED, RURAL WINGS) and the use of social software and Web 2.0 in this direction (cf. the recently launched SoRuraLL project, www.sorurall.eu).

4.1 Evaluation

Professional development schemes piloted in the above projects have been subjected to close monitoring and evaluation, both in terms of technological appropriateness and pedagogical potential and outcomes. Evaluation objectives typically have included assessing the appropriateness of the choices made during the design stage and the overall effectiveness of the solution at three levels: the technology used, the content of training offered, and the procedures followed. Main instruments towards this have been extensive exchanges with the trainees through surveys based on questionnaires and interviews with the remote teachers and their trainers, as well as field observations and video recordings in the schools and classrooms of the participating teachers. In an overarching case-study oriented approach, the evolution of informants' views, behaviours and stances is observed and interpreted.

Several analyses of quantitative and qualitative data have been conducted in the course of the various projects. They have revealed positive and weak points in the design and implementation, offering rich experiences and good practices for future efforts in the field. Overall, teachers working in remote small rural schools have acknowledged that the piloted schemes have provided them with genuine opportunities for professional development and improved personal competences.

5 A Proposed Framework for Rural Learning through Teacher Development

Based on the accumulated experiences and findings from these projects, in the following we summarise the emerging main issues and recommendations, offering what we believe could serve as a foundation for a comprehensive framework for the realisation of the vision of 'rural learning' as outlined in previous sections.

The basic propositions are:

- Rural teachers should be offered in-service professional development and networking opportunities to enhance their performance as educators and school administrators, as well as community inspirers, development agents and multipliers in the rural context. In this process, rural teachers can learn a lot from each other, through formal and informal interactions and networking.
- The design of the professional development programmes should be grounded on a sound understanding of the rural context in which they are implemented, a thorough analysis of the local needs and an attention to important differences that exist between small rural schools and the 'mainstream' urban educational provision.
- The responsibility and control over the content and processes of the professional development should be passed as much and as soon as possible to the rural teachers themselves. Instead of imposing generic 'solutions', the emphasis should be on facilitating the teachers and their local communities to invent their own solutions to the problems they recognise as pressing or important.
- Teachers should be kept closely involved in the processes of designing the programmes, starting from the early stages of needs analysis through field surveys and workshops, to a continuous 'dialogue' between users and designers in the implementation phase, in consecutive cycles of co-design which fine-tune the programme to user response and decisions.
- The choice of technologies to be used should be seen as a dynamic process, in which the best available solution is selected each time without affecting the pedagogical rational and core objectives of the programme. Aiming to provide ever better access to richer content (e.g. faster or more reliable connectivity) is a major driving force, given the still existing obstacle of the digital divide.

In the light of these general directions, it is worth looking more closely at the points discussed below.

5.1 The Content of Teacher Development Programmes

The content we have found relevant could be described as falling under three major areas: a) ICT skills; b) pedagogy; and c) local development issues.

Professional development schemes piloted in the earlier of our projects aimed mainly at helping multigrade school teachers to develop their professional skills along two main axes: a) use of ICT both for teaching and administrative purposes, an area in which rural teachers are still quite weak; and b) application of teaching approaches which are appropriate for the multigrade classroom.

In later stages, one further important axis has been added in the teacher training curriculum. We have been inviting the rural teacher to become a change agent catalysing innovation and development in the school and the local community, taking initiatives for changing the declining school into a lively node supporting lifelong learning for everyone. The teacher is encouraged to take on a crucial role in the development and implementation of a culture conducive to lifelong learning and innovation in the school and beyond it, making efforts to link school life with the external environment, helping the school to interact with its surroundings, and creating communities of learning within and outside the school. The aim of this aspect of professional development is

multi-faceted, targeting diverse competences: better knowledge and understanding of solutions and opportunities of the Information Society, pedagogies specifically adaptable to the 'unusual' settings of the small rural school, as well as in areas that are currently scarcely present even in the most progressive teacher training curricula, such as innovation, change management, local and rural community development.

5.2 The Delivery Channels and Methods

The e-learning environments engaged in the delivery of our professional development programmes have consisted of various technologies. We have often tested various satellite solutions 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.

The ZEUS experience clearly showed that earlier one-way satellite data telecommunications (DVB) combined with non-broadband terrestrial infrastructures can support the provision of training and professional development at a distance. Nevertheless, significant technical difficulties, which in 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 had been available. Such technologies (DVB-RCS) have been deployed in the HERMES and RURAL WINGS projects, yielding more satisfactory results.

Overall, satellite broadband even in its most advanced state-of-the-art is however a limited resource which seems to lack the smoothness of operation and perceived 'unlimitedness' of contemporary terrestrial DSL broadband, especially when 'heavy' live applications (e.g. multipoint videoconferencing and webstreaming) are used. Still satellite broadband remains the best option for many remote areas before more efficient terrestrial telecommunications become available in a shorter or longer term.

However, although technical specifications do play a crucial role in a distance education scenario, the success or not of the effort depends on the underlying pedagogical design [21]. Our field activities have confirmed this. Various technical problems and faults did slightly decrease teachers' enthusiasm at times, but in the whole they did not lead to a lower appreciation of the deployed solutions.

The training programmes we have produced aim to cater for both flexibility and guidance, both interaction with others and self-paced learning. To this end, we propose a comprehensive model for training delivery, in which the central event for each 'lesson' is a live videoconferencing session, using a synchronous e-learning tool, thus covering the need of isolated teachers for communication and real-time interaction with colleagues and instructors [33]. On average, this synchronous e-learning portion of a 'lesson' takes up about 30% of the overall 'lesson' duration. 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 materials that allow them to work at their own pace, interact with the instructor and other practitioners as needed, and receive individual feedback as they apply information to their own classroom settings. For each lesson, there is introductory information on the topic covered, and preparatory activities. Participants report

on their experiences from such activities in the web-based e-learning environment as well as during the synchronous session. The cycle of each lesson closes with post-session consolidation activities.

5.3 The Importance of Networking

Beyond providing formal training, initiatives for rural teachers' professional development should explore methods to develop and foster a learning network which will provide the context for the acquisition and sharing of knowledge in an informal communication process supplementing teachers' formal professional education. The characteristics should be investigated of tools and methodologies which can foster the improvement of teachers' personal competences, and encourage and facilitate a teacher's contributions to the development of the other teachers (lifelong learning network). At the level of technology, the limitations of 'old-generation' e-learning technologies and models should be taken into account, when the issue at stake turns into how to promote and facilitate competence development through networking with peers – a lifelong learning experience of multi-site and episodic nature. It is crucial to identify the features and clarify the main issues connected with the various social media 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.

An interesting practical initiative could be Web 2.0 projects initiated and managed by teachers, aiming to develop and foster a learning network between peers. These could develop into pure 'communities of practice' as defined by Wenger [35]: communities characterised by a shared domain of interest, e.g. that of the development of multigrade teaching competences, and an established members' commitment, with teachers engaging in joint activities and discussions, helping each other, sharing information and learning from each other while pursuing their interest in their domain. Members of the community may thus gradually develop a shared repertoire of resources – a shared practice: experiences, stories, tools, ways of addressing recurring problems in their small rural school, etc.

5.4 Inspiring New Leadership Roles for Teachers

'Conventional' teacher training in ICT and pedagogical skills is necessary for rural teachers, but probably not enough if the opportunities for rural development through learning are to be fully exploited. Teachers should be encouraged to recognize new roles for themselves beyond the conventional mere realisation of their teaching duties, seeing themselves as inspirers and managers of a small 'revolution' in the rural school and community, an informal local 'reform', as designers and implementers of innovation matching local needs. Already a prominent member of the small local community, the rural teacher can in this way further and deepen the significance and local leadership of the school. He/she will be the pedagogic innovator, an instructional leader exploring new ways to improve the quality of teaching and learning in the school. Further, beyond the walls of the classroom, the teacher may develop into a facilitator of communities of learning in, around, and outside, the school, for instance

by developing synergies between the school, the community and maybe other schools in the area.

The case of making satellite broadband connectivity available to the school (such as in the HERMES and RURAL WINGS projects) is an interesting practical example. This bandwidth ought to become advantage and opportunity for all, and rural teachers are foregrounded as the agents who will enable this. They are expected to act as change agents, managers in charge of driving change in the communities. They need to diagnose and deeply understand the context, the stakeholders, their interests and interrelations, so as to consequently convince them about the need and benefits of change, tackling possible scepticism. In parallel, they act as managers and administrators of a whole community 'Learning Hub', into which they turn their rural schools and technological infrastructures. This may involve the teacher matching the lifelong learning opportunities offered with the needs he may diagnose in the local community and in specific individuals, supporting the community members to produce their own local information and content based services, and thus eventually helping local citizens to become knowledgeable and willing enough to develop their own further projects.

Moving in this direction clearly poses questions and challenges. The content and methods of the relevant teacher training curriculum need to cover diverse areas of competence including knowledge and skills about local development issues and initiatives, skills in generating innovation and managing change, subjects in general which bear no relevance with the usual teacher training content. Ways have to be found to familiarize teachers with a quite different area of expertise and practice. To mention an illustrative example, as potential change managers teachers need to learn practical ways to challenge the status quo by comparing it to an ideal or a vision, translate the vision into a specific change initiative, communicate and defend the need for change, lead and manage change, as well as understanding the cultural dynamics of change.

Serious challenges also arise in connection to possible conflicts with the traditional structures of the educational system and between formal and informal leadership roles. This new approach is inevitably in contradiction with the traditions of a highly centralized educational system, such as the one of Greece. While the system tolerates little decentralisation and autonomy of school units, the teacher is encouraged by our approach to initiate and implement an informal local 'educational reform'. This discrepancy could possibly be a source of tension – not the least in the intrapersonal level, with the teacher having to balance between his formal/recognised and informal/self-initiated leadership roles.

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