

# Innovative E-learning in Rural Areas: A Review

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## **Network Promoting e-Learning for Rural Development** **e-Ruralnet**

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# 1 Introduction

This review tries to relate the innovative capacity of e-learning to Information and Communication Technology (ICT) and Rural Development Policies, and to identify and specify e-learning innovations that are directly relevant to the needs of rural SMEs and micro-businesses within the EU. This requires linking various different European policy arenas - Common Agricultural Policy, Information Society, Business policies, Educational Policy as well as Social and Regional policies - and research areas like e-learning, rural studies or small business research. This concept is reflected in the structure of the report. Section 2 briefly discusses potentials of e-learning and barriers that slow down the rate of its adaptation. Here, I particularly refer to cognitivist and constructivist learning theories which are broadly discussed in the context of e-learning. Innovative e-learning is understood as the implementation of solutions to overcome existing barriers. At the end of the section, two examples of criteria lists for innovative e-learning are described. In section 3 a brief characterisation of rural areas is given and main EU policies, which are relevant for the development of ICT supported lifelong learning in rural SMEs, are outlined. A main issue, which European policies address in this field, is the existing (urban-rural) digital divide. This is analysed in section 4. The fifth section focuses on the specifics of small and micro-businesses, their usage and uptake of ICT, and experiences with specific e-learning solutions that target SMEs. In section 6 some evidence from the e-Ruralnet research is related to literature review. The final section summarises the main findings and draws some conclusions for policy makers and training providers, with regard to innovative e-learning for rural small and micro-businesses.

## 2 E-Learning

### E-Learning: Potentials, Barriers and Innovation

There are many different approaches which aim to define e-learning. The concept is also often criticized, and many authors try to replace it with alternative concepts. Other authors simply list possible learning arrangements, which are understood as forms of e-learning. In this paper an analytical, but perhaps not fully comprehensive, definition of e-learning is applied. *E-Learning describes a group of learning arrangements, which are characterized by the use of modern information and communication technologies in particular personal computers (or other/newer electronic end user devices) and the Internet.* There are, of course, some e-learning arrangements, which do not necessarily require the Internet, for instance the so-called computer based learning, where learners use specially designed learning software without connection to the Internet. However, Internet connection is crucial, when discussing the benefits and potentials of e-learning in general terms and more particularly in the context of rural development.

### Potentials of E-Learning

The application of modern technological devices in particular personal computers, and thus with progressing technological development mobile phones, media players, game consoles and tablet PCs offers two major advantages for education and teaching. Firstly, it allows a scope of different media (text, pictures, graphs, audio files, movies) to present learning content to the students. Secondly, in connection with standard or special software the students may actively use such content, modify it and therefore create new content. Internet connection allows easy access to a huge amount of information, both for teachers and learners, and it provides the infrastructure for various forms of communication at a distance via email, online chatting, as well as audio and video conferencing. In recent years so-called Web 2.0 technologies have been widely discussed. Web 2.0 refers to web applications that facilitate interactive information sharing, social networking, collaboration and user-centred software. Thus, the advantages of e-learning are seen in the potential to overcome existing barriers (SCHULMEISTER, 2006):

- *Time barriers*: Reducing the time it takes to access learning materials; solving time conflicts through a-synchronic communication, using technologies to change the flow of time (time lapse, slow-motion).
- *Spatial barriers*: The connection of learning communities and learning objects independent from their location. Contact of or between experts in distant locations. Study locations without travelling. The application of techniques and experimentation in virtual spaces.
- *Analog-digital barriers*: Combining any text, audio, video and animation. Animating learning content. Exploring and modifying learning objects, understanding, practicing and constructing without changing the device.
- *Norm barriers*: Being a parent, employment or physical handicaps are no barriers to participate in training courses. Shifting role of learners from pure consumers to active co-producers of learning content.

Such potentials have formed the basis for great enthusiasm about the future of e-learning, particularly at the beginning of this decade. Undeniably, there has been a steady increase in the use of e-learning in various contexts. However, the adaptation of e-learning has been moderate at least in comparison to early expectations, and differs between regions and industries. Thus, early enthusiasm has been replaced by greater, yet still optimistic realism. Realism offers a better understanding of e-learning didactics as well as practicalities that are connected with the e-learning designs.

## The Adaptation of e-Learning

The diffusion of innovations, such as e-learning, is always a complex communicative process. The rate of adaptation - that is the relative speed with which an innovation is adopted by members of a social system - is determined by many groups of variables, such as the perceived attributes of an innovation, the type of innovation decision (optional, collective, authority), the communication channels through which the innovation is communicated (e.g. mass media, interpersonal), the nature of the social system (e.g. norms, degree of interconnectedness) and the extent of change agents' promotion efforts (ROGERS, 2003, 229 pp.). A comprehensive account of all

those aspects is far beyond the scope of this report. Respecting this, only a few selected aspects of this process are discussed in the following passages with regard to e-learning, ones which are particularly relevant as far as rural areas are concerned.

### Relative Advantage

Relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes (ROGERS, 2003, 229). In economic terms relative advantage can be expressed as the relation of benefits and costs. The initial costs of e-learning for the learner are:

- Hardware and software costs;
- Costs and possibility of (broadband) Internet access;
- Learning costs to use computers/ adaptation to learning platforms, etc.;
- Costs of learning (Course fees, opportunity costs, etc.).

Given a comparable learning outcome, learning costs of e-learning can be lower, especially when time and mobility constraints exist that make the participation of training courses costly. This is particularly useful in the context of workplace learning, but also for those individuals who are time poor or may have impaired mobility (e.g., handicap people, parents, and people without cars or driving licenses).

E-learning providers are also confronted with considerable costs that impede the adaption process, such as:

- Costs of producing software, multimedia content and managing learning platforms are substantial. A major issue is the often-limited recyclability of learning objects and learning scenarios; then if learner groups are small, return on investment may be insufficient.
- Training of trainers: e-learning requires special pedagogical and technical skills (see the following section).

Markets of e-learning also suffer from transaction costs and biases. Since education and training is in European public interest, price mechanisms are often do not function. Further, providers are also confronted with the problem of *free riders*. It is

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difficult to prevent the free use of teaching modules or teaching content. Providing teaching contents for diffuse user groups, such as small enterprises, is thus a problem of collective action (Laschewski, 2009). This means that transaction costs of e-learning providers are high. According to economic theory it is thus likely that e-learning arrangements will be established in hierarchical organisations such big companies or universities (Williamson, 1994). In practice, it is true that e-learning is more common in large businesses.

## Complexity

Many studies have revealed the issue of pedagogy and e-learning didactics as critical. E-learning does not simply mean to replacing or replicating traditional classroom learning. Research on effects of multimedia has been characterised by inconsistent findings; this is because of the myriad of contingent factors that have been shown to moderate multimedia effects. Research in the field cognitivism stresses the importance of cognitive processes and individual learner characteristic (ALLY, 2008, REY, 2009). A major constrain of multimedia learning is seen in the limited capacity of the working memory. For instance, is obvious that too a large extent e-learning success is dependent on the users experience with learning platforms and previous knowledge. For learners with little experience a tight user control might be useful. However, a tight user control of more experienced learners may become an impediment for the learning success. Also, research on how people process audio-visual information has highlighted many complexities “with half the studies showing that redundant audio and video channels improve retention of information and half showing redundancy impedes retention” (HEDE, 2002, 178). To cope with such contingencies Hede (2002) has suggested an integrated model that comprises the following elements:

- Multimedia input (visual input, auditory input, learner control);
- Cognitive processing (attention, working memory);
- Learner dynamics (motivation, cognitive engagement, learner style);
- Knowledge and learning (intelligence, reflection, long-term storage, learning).

Without going into detail it becomes apparent that this model suggests that e-learning providers only have a limited influence on multimedia learning success. E-Learning providers have to include *learners' characteristics* into the design of the learning platform and the selection of media content. The production of compelling multi media material requires specific technical, but also pedagogical skills, which is often not achieved. In practice, “e-learning materials remain essentially text based. As such they do not provide a compelling learning environment an are often dull and inappropriate for learners” (ATTWELL, 2004, 4).

Despite its potential to give concrete recommendations for design principals for e-learning and the use of specific media elements, cognitive theories of learning have been criticised on many grounds (ALLY, 2008, REY, 2009). Firstly, cognitive theories tend to ignore learner’s motivation or treat it as given. Secondly, cognitive theories focus on memorising more or less given informational facts. In e-learning practice this is connected with a focus on presenting material. With regard to Anderson and Krathwohl’s Taxonomy of Learning (see Table 1) it can be argued that very often only lower levels cognitive processes are addressed (BAUMGARTNER, 2007).

**Table 1: Taxonomy of the Cognitive Domain**

The Knowledge Dimension	The Cognitive Process Dimension					
	1 Remember	2 Understand	3 Apply	4 Analyze	5 Evaluate	6 Create
A: Factual Knowledge						
B: Conceptual Knowledge						
C: Procedural Knowledge						
D: Meta-cognitive Knowledge						

Source: Anderson and Krathwohl (2001).

Thirdly, cognitivism pays no attention to the social context in which learning is embedded. This is particularly stressed by various schools of social constructivist theories of learning. Social constructivists highlight two aspects of social context that largely affect the nature and extent of the learning. For example, learners are members of a particular culture. Thus, they learn throughout their life’s culture specific symbol systems, such as language, or signs. Subsequently, social



constructivists view learning as a social process. It does not take place only within an individual, nor is it a passive development of behaviours that are shaped by external forces. Meaningful learning occurs when individuals are engaged in social activities. Without the social interaction with more knowledgeable persons, it is impossible to acquire social meaning of important symbol systems and learn how to use them. In practice, e-learning is always in peril of presenting de-contextualised multimedia content and ignoring the learning object relevant participatory and practical context (ARNOLD, 2007).

In this context the concept of “communities of practice” (CoP) (WENGER, 1998) has found wide recognition. CoP are seen as a “kind of community created over time by the sustained pursuit of a shared enterprise” (ibid., 45). Learning is seen as much as a social process of becoming a member of a community (learning as belonging), of creating an identity (learning as becoming), of creating meaning (learning as experience), as it is a cognitive process of knowing facts or acquiring practical skills. Based on this “social theory of learning” Wenger proposed four dimensions of educational design:

- Participation and reification: how much to reify learning, its subject and its object.
- The designed and the emergent: the relationship between teaching and learning is not one of simple cause and effect.
- The local and the global: educational experiences are connected to other experiences.
- Identification and negotiability: there are multiple perspectives on what an educational design is about; its effect on learning depends on inventing identities of participation (ibid., 264).

Finally, the concept of communities of practice highlights the importance of informal learning. Formal learning is only one among many other possible contexts in which learning is possible. “Instruction does not cause learning: it creates a context in which learning takes place, as do other contexts” (WENGER, 1998, 266).

The concept of Communities of Practice has found recognition with regard to e-learning in two ways. Firstly, and more dominantly, it has facilitated a debate on virtual communities. Virtual communities are particularly interesting in situations, when communities of practice are difficult to create, for instance, when the number of possible participants in a location is too small. Here, the community (or network) of learners is considered to be a community of practice that shares the practice of learning, even if they do not form a community of practice through collaboration in everyday context (GANNON-LEARY and FONTAINHA, 2007). Secondly, e-learning, like any other learning arrangement, has to be situated in the context of social and cultural practices (the communities of practice), in which learners are engaged in (ARNOLD, 2007). In this sense, e-learning, in particular the application of Web 2.0, is considered a way to enhance and improve already existing learning activities in real world CoPs. For both views general rules have been drawn, such as:

- Sense of purpose: a (virtual) CoP must have a purpose and it must be achievable
- Time and space for communication among participants
- Open and active forms of participation
- Uncovering individual contexts
- Integration of practical expertise
- Close linkage between learning content and practical application

### Compatibility

Compatibility of an innovation is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters (ROGERS, 2003, 240). The former section has shown that e-learning requires new didactic concepts and skills. Also, the concept of community of practice stresses the significance of the wider context of informal learning processes. This is challenging the existing skills of teachers and questioning the traditional way learning is organised. Subsequently, the *attitude of teachers and trainers* is often seen as barrier to the implementation of e-learning. Teachers and trainers are seen as lacking the skills

to apply e-learning as well as often being hostile to the use of ICT for learning (ATTWELL, 2004). The skills gap, often referred to as *digital illiteracy*, is also evident at the users side. However, beyond this, technical skills, e-learning and lifelong learning seems to suggest a shift from learning as a collective undertaking in classes and organised settings towards a highly individualised, self-organised process. It has been suggested that that young generations that grow up with ICT as an everyday experience will show fundamentally different *learning behaviour*. "To what extent this contrasting situation makes them feel disappointed with school practices, or even increasingly disaffected from school life, has not been thoroughly investigated yet, but some indications exist pointing to a growing gap between pupils and teachers perceptions regarding the quality of the school experience" (PEDRO, 2006, , 13). This suggests that, at least at schools and increasingly in higher education, learning behaviour is changing more quickly with regard to ICT usage than educational institutions.

A further issue is *technical compatibility*. Much attention has been paid on how to ensure interoperability between different learning systems and platforms and how to ensure migration of applications and learning materials between systems (ATTWELL, 2004). With regard to e-learning whilst investment has been considerable in platforms and software, and often great effort expended in producing learning materials, the rapid rate of technological change and incompatibilities of soft- and hardware, has rendered much of the expense and effort redundant. Many so-called proprietary standards owned by some software companies exist that are incompatible to similar software provided by other companies. Despite the fact that industrial standards for hardware (e.g. USB and Ethernet) as well as software (e.g. ftp, email, hypertext, rss) have found wider recognition in recent years, until today we find incompatible software [e.g. chat and conferencing software (ICQ, Skype, AOL-Standard (including Apple's iChat), Microsoft-Messenger) or media streaming software (MediaPlayer, RealPlayer, QuicktimePlayer)] and file formats of standard software<sup>1</sup>. In some cases proprietary standards have become quasi-standards (e.g.,

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<sup>1</sup> Recently a new version of the software 'Graphic Converter' has been announced. This is a popular tool for Apple computers. It claims to be able to import 200 graphic formats and to export 80 graphic

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Microsoft's .doc or Adobe's .pdf). A major issue for e-learning is Internet access and bandwidth. This will be extensively discussed in chapter 4.

Finally, in the *absence of measurable quality standards* the quality of e-learning courses has differed greatly. This has caused considerable uncertainty on e-learning markets. International Organisation for Standardisation has as a response published a quality framework for ICT supported learning (ISO/IEC 19796-1:2005), which is considered to be still preliminary and "only the first step towards a harmonised quality framework."<sup>2</sup> This has only recently been supplemented with a harmonised description of the methods and metrics required to implement quality management and quality assurance systems for stakeholders designing, developing, or utilising information technology systems used for learning, education, and training (ISO/IEC 19796-3:2009).

## Innovative E-Learning

From this account some principals of innovative e-learning can be drawn (the order does not imply a hierarchy):

- *Learner orientation*: E-learning has to be open to individual learning styles and capabilities; it should allow individuals to create its own personal learning environments.
- *Interactivity / Community development*: Since learning is a social process innovative e-learning is about building communities, fostering interaction and contextualising learning content.
- *Micro-learning*: Micro-learning refers to short forms of learning and consists of short, fine-grained, inter-connected and loosely-coupled learning activities with micro-content (BUCHEM and HAMELMANN, 2010). It may be considered as alternative to (formal) courses and as a form of learning that may be particularly useful in the context of lifelong learning and work-based training.

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formats! (<http://www.lemkesoft.com/>)

<sup>2</sup> [http://www.iso.org/iso/iso\\_catalogue/catalogue\\_tc/catalogue\\_detail.htm?csnumber=33934](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=33934).  
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- *Interoperability*: Rather than to focus on the “newest” technologies it has to focus on technical compatibility and must be based on standards. Learners should be able to access content and to work with learning material independent of the platform and software they commonly use.
- *Efficiency*: Getting costs down is fundamental. Innovative e-learning includes new approaches to recycling content (content sharing) and learning scenarios. Modern computers are generally over-specified for the needs of most e-learning applications. Servers do not require high performance machines. Many countries have schemes where older computers are recycled from industry and commerce to education (ATTWELL, 2004). One possible answer for access to hardware, which some interest, is the possible use of handheld devices, palmtop computers, PDAs and mobile telephones. Whilst many are sceptical due to the small screen size, other researchers have pointed to the intensive use of mobile telephones by young people for a wide range of applications (ibid). Open source software may be a further option.
- *Institutionalisation*: Institutionalisation of e-learning is crucial. Integration into existing learning arrangements and the development of new institutional structures may both innovate ways to explore the potentials of e-learning.
- *Quality Management and Evaluation*: Meeting user demands and offering quality is fundamental. Thus, innovative e-learning is about the development of quality standards, quality management and continuous evaluation.

This list is, perhaps, not fully comprehensive. Also, other authors may put different emphasis to various aspects. As example the following boxes include two lists of criteria for innovative e-learning. The first list has been used in the i-AFIEL project. The second is the criteria list of the D-ELINA award (German e-Learning innovation and young developer award). Both lists are good examples how innovative e-learning can be understood.

**Box 1: Criteria for Innovation: The i-AFIEL methodology**

i-AFIEL (Innovative Approaches for a Full Inclusion in eLearning) is an European Project which applied a methodology to measure innovation in eLearning projects developed by the Spanish OVSI Foundation.

1. Open work methodology: Students should be able to move into the technological platform, progressing at their own pace and choosing their own options in the training itinerary.
2. Interactive: System should response every intervention depending on its nature; this response is prompt and specific.
3. Integrative: System arranges virtual places which allow direct personal or group communication amongst the individuals both in training situations and relationships.
4. Participative: There should be procedures and tools in order to collect all interests and expectations of the participants. This means that, eventually, this collection could carry out effective changes in the system.
5. Technologically innovative: System includes contributions from the newest technological advances.
6. Transparent: Technological aspects do not disturb, only the unavoidable, the learning process, that is, it does not add conceptual confusion due to informatics resources or technical terminology.
7. Independent of the space, time and technology: Students should participate in the course/programme from anywhere, any time and any computer.
8. On-line resources: System has accessible training resources on-line: training resources, query resources, practice, guidelines, assessment, etc., and it also should allow access to Internet resources through guides, bookmarks, etc.
9. Intercultural: System should allow intercultural communication, that is, the participation of students and trainers from different cultures, countries and languages.
10. Non-exclusive or non-discriminative: System has resources to avoid barriers and obstacles in the learning due to geographical, cultural, gender, age and/or other differences.
11. Easy development and updating: Contents, materials and resources should be modified and updated in an easy way independent from the location of the trainer.
12. Security: Data protection and privacy is ensured, both the intellectual production and personal data of students and teachers. Access to the platform should be personal and different by functions.
13. Collaborative: System ensures procedures and resources for collaborative working, so that it is possible the joint work as well as discussion and knowledge exchange to reach the training goals.
14. On-line and distance assessment: System allows the evaluation using on-line procedures so that the student could know his/her progress from anywhere.
15. Excellence in the training resources supply: All involved resources in the system should look to offer added value services: manuals, instructions, teacher's preparation, etc.

16. Effective communication strategy: Dissemination and information about the programme/course should be congruent with reality in order to avoid misunderstandings as well as to enable an effective communication.

(CROSTA and PRIETO, 2009)

**Textbox 2: D-ELINA (German e-Learning innovation and young developer award)**

1. Sophisticated application of innovative future technologies and media ->Integration of Web 2.0 tools such as blogs, wikis, podcasting, twitter or rss-Feeds etc. in learning environments, simulation and game-based applications, implementation of virtual realities, 3-D Simulations, ambient technologies. Consideration of media didactic aspects.
2. Integration into schools and classes/ organisations and businesses/knowledge management structures> Compliance with curricula (at schools)/ Integration of concepts and products; prototypes at institutions of higher education and in businesses. Exemplary connection of knowledge management and e-Learning or new ways of merging work and learning (workplace training).
3. Originality of concepts-> Own (further) developments of products, applications or concepts with a visible own contribution.
4. Facilitation of informal processes-> Integration of collaborative forms of learning, creation of learning groups/communities; integration and support of active role learners.
5. Approach to and motivation of learners (User-Marketing) -> Approach to target groups, integration and motivation of learners, e.g. by easy and self-explaining techniques and tools. Consideration of media didactic aspects.
6. New methods and processes for the development of learning content/ content sharing-> Successful concepts and solutions for the multiple use of content, optimisation of process management and the development of adequate tools.
7. Potential for transfer-> Transferability of concepts/products to other organisations/user groups.
8. Efficiency-> feasibility in the context of given budgets, potentials to attract funds (schools)/ Benefits vs. development, implementation and maintenance costs, potentials for cost reduction in face of existing/traditional learning concepts, potentials for further development and marketing of product/service.

<http://www.d-elina.de/teilnahme/bewertungskriterien/>

(Orig. German, translation by the author)



## 3 Rural Areas and Rural Policies in Europe

### Rural Areas in Europe

There are various definitions of “rural” areas in the policy planning practice. Because of practical reasons the European Commission in its official documents refers to a definition offered by the OECD that distinguishes between:

- Predominantly Rural region (PR): if more than 50% of the population of the region is living in rural communes (with less than 150 inhabitants / km<sup>2</sup>)
- Intermediate Region (IR): if 15% to 50% of the population of the region is living in rural local units
- Predominantly Urban region (PU): if less than 15% of the population of the region is living in rural areas/communes

Local units (e.g., municipalities) are identified as rural if their population density is below 150 inhabitants per square kilometre. Following this definition, rural areas in the EU-27 “(predominantly rural and intermediate regions) represented 90% of the territory and 56% of the population in 2006. The corresponding shares for predominantly rural areas were 54% of the territory and 19% of the population. Rural areas are therefore particularly important in terms of territory. (...) Even if economic activity tends to be concentrated in more urban areas, rural areas generate 43% of the Gross Value Added (GVA) in EU-27 and provide 55% of the employment, these shares being larger in the new Member States (70% and 79% respectively)” (EUROPEAN COMMISSION DG AGRI 2009, 9).

European rural areas differ greatly with regard to population density, settlement structures, distances to urban agglomerations, economic structures in particular with respect to the importance of primary/agriculture sector and food industries, economic performance, rural amenities, history/cultural traditions and ethnic diversity (e.g., ‘native’ ethnic minorities are mostly found in rural locations). In order to capture this diversity various approaches have been applied to cluster rural regions. Common distinctions are made between Northern-Southern (Mediterranean) regions or Western and Central-Eastern (Post-socialist countries,

“New Member-states” of the EU). Such conceptualisations cover structural, historical and cultural patterns. Others have argued that rural areas within Europe are divided between an industrial core and a peripheral “green ring”. Thus the major division in relation to rurality “is a division between those countries in which urban industrialisation developed early (...) and those countries, largely found on the geographic periphery, in which agrarian interests, groups, culture and concerns retained considerable societal significance until late into the 20th century” (Granberg/Kovach/Tovey 2001, 366).

Beyond such dualistic conceptualisations many studies have tried to create empirically based typologies applying statistical clustering techniques. For instance, the consortium that wrote the synthesis report of the ex-ante evaluations of the current Rural Development Programmes 2007-2013 applied such an approach (Todtling-Schonhofer et. al. 2008). On the basis of economic, demographic and land use indicators this study identified 10 clusters out of 94 programming areas that vary significantly with regard to structural pattern included in the analysis.

Despite the diversity there rural areas show commonalities in particular in regard to:

- *Low population density and small settlements:* This means that overcoming distances to participate in any kind of social activity is an everyday experience of rural dwellers. Low population density also sets natural limits to the size of social groups and organisations. Thus, possibilities for division of labour and specialisation and therewith gains from economies of size are reduced. The provision of infrastructure is very often more costly.
- *Importance of land-use activities and the exploitation and management of natural resources.* Although the employment share of “productive” forms natural resource uses, such as agriculture, forestry and fishery has declined over recent decades, it remains significant in many rural areas. This is particularly true, when forward and backward industries are considered. Also, new forms of natural resource based production (e.g. renewable energy) emerge. In addition, new “consumptive” forms of natural resource uses (e.g. tourism,

environmental protection) have turned out to be the economic basis for many rural areas.

- *Significance of small and medium size business (SMEs).* The predominance of SMEs in the rural economy is often mentioned as its typical characteristic. Yet, this predominance is true for the European economy in general: “There were almost 20 million enterprises active within the EU-27 in 2005 in the non-financial business economy (...). The overwhelming majority of these (99.8 %) were SMEs, with less than 250 persons employed” (eurostat 2008, 1). The same statistic also suggests that over 90 % of all enterprises (in the non-financial business economy) are micro-businesses. Thus, even if the shares may be slightly higher in rural areas it is the *absence of large businesses* rather than the predominance of SMEs that is characteristic of rural areas. In addition, large public sector institutions such as ministries, national banks or universities are mostly located in urban areas. Therefore, highly qualified and highly paid jobs are less likely in rural areas, and average incomes of rural households tend to be lower even in rural areas with good economic performance.

## Selected European Policies

The theme of this review is subject to many policy areas of the European Union (ICT policy, Educational Policy, the Common Agricultural Policy, Industrial Policy, Regional Policy, and Social Policy) and therewith of different General Directorates of the European Commission (DGs). Some selected policies are briefly described in the following.

### i2010 and the Digital Agenda

The Commission’s ICT strategy for the years 2005 to 2010 has been laid down in its i2010 initiative which outlined three priorities:

- to create an open and competitive single market for information society and media services within the EU.
- to increase EU investment in research on information and communication technologies (ICT) by 80%.

- to promote an inclusive European information society. To close the gap between the information society “haves and have nots”.

Rural areas have been a special concern in this strategy with regard to the so-called urban-rural broadband gap. This will be discussed in more detail in section 4. In 2009 the Commission published a Communication 'Better access for rural areas to modern ICT' (EUROPEAN COMMISSION, 2009a) which has amended the Council Regulation on support for rural development by the European Agricultural Fund for Rural Development (EUROPEAN COMMISSION, 2009c) (see the following section). The Commission has summarised the results of the strategy in an extensive report (EUROPEAN COMMISSION, 2009c).

The i2010 initiative is followed by the Digital Agenda for Europe 2010 -2020, which defines seven goals:

- A new Single Market to deliver the benefits of the digital era. Citizens should be able to enjoy commercial services and cultural entertainment across borders
- Improve ICT standard-setting and interoperability
- Enhance trust and security
- Increase Europeans' access to fast and ultra fast Internet. The 2020 target is Internet speeds of 30 Mbps or above for all European citizens, with half European households subscribing to connections of 100Mbps or higher
- Boost cutting-edge research and innovation in ICT
- Empower all Europeans with digital skills and accessible online services
- Unleash the potential of ICT to benefit society

The new strategy will in particular be reflected in the EU policies in the coming budgetary period of 2014 to 2020.

### **European Agriculture Fund for Rural Development**

The European Agriculture Fund for Rural Development (EAFRD) is one of the two instruments financing the Common Agricultural Policy (CAP). It finances actions in

the field of rural development in the Member States in line with the rural development plans submitted by each country. The main objectives of EAFRD are:

- Improvement of the competitiveness of agriculture and forestry by supporting reconstruction, development and innovation
- Improvement of the environment and the countryside by supporting land management
- Improvement of the quality of life in rural areas and encouraging the diversification of economic activities

EAFRD is comprised of four axes. While three axes target just one of the above objectives, the Leader axis (axis 4) contributes to all of the objectives. The LEADER approach is a bottom-up approach aiming to build local capacity for employment and diversification of the rural economy. It has a multi-sector design and the implementation of the strategy is based on the interaction between actors from different sectors of the local economy. Local action groups (LAGs) implement the local development strategy. LEADER also plays an important role for improving governance and mobilising the endogenous development potential of rural areas. Eligible areas for funding under EAFRD are all rural areas for the first three axes, and only selected territories under the Leader axis.

In the framework of EAFRD vocational training and information actions can be funded - including diffusion of scientific knowledge and innovative practices, for persons engaged in the agricultural, food and forestry sectors and training and information activities for economic actors operating in the field of axis 3 (quality of life in rural areas and diversification of the rural economy), - if they are not a part of systems of agricultural or forestry education. While the original COUNCIL REGULATION (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development did not include any measures to promote ICT, this has changed with an amendment of the regulation in May 2009 (COUNCIL REGULATION (EC) No 473/2009) when “broadband Internet infrastructure in rural areas” has been added as a new priority including three new operations (creation of and enabling access to broadband infrastructure including

backhaul facilities and ground equipment, upgrade of existing broadband infrastructure and laying down passive broadband infrastructure also in synergy with other infrastructures). The EU and the member states allocated 1.02 bn € for broadband through the European Agricultural Fund for Rural Development (EAFRD) on 20 March 2009.

### **Lifelong Learning**

The Lifelong Learning Programme aims to contribute to the development of the European Union as an advanced knowledge society, with sustainable economic development, more and better jobs and greater social cohesion. It integrates major programmes focusing on specific sectors (Comenius, Erasmus, Leonardo da Vinci, Grundtvig, and Jean Monnet), as well as a transversal programme supporting specific key activities, such as language learning. The Programme also supports activities promoting policy cooperation in the field of Education and Training, in which information-communication-technologies are considered to be a key activity. EU actions aim to harness the power of Information and Communications Technologies (ICT) to develop innovative education and training practices, improve access to lifelong learning and help develop advanced management systems. The promotion of ICT based learning is a priority of the 'transversal' part of the EU's Lifelong Learning Programme, which supports action on general issues in education and is integral to the Comenius, Erasmus, Grundtvig and Leonardo sub-programmes.

### **Small Business Act**

In June 2008 the Commission launched a Small Business Act for Europe (SBA) to put SMEs at the forefront of decision-making, to strengthen their potential to create jobs in the EU and to promote their competitiveness both within the Single Market and on the global market. The SBA's implementation in the first year focussed delivery on the following priorities (EUROPEAN COMMISSION, 2009d):

- Reduction of administrative burden for SMEs. All new European legislation and legislation in some Member States (e.g. Belgium, Denmark, Finland,

Germany) now passes through an "SME test" to ensure that it is business friendly.

- Access to finance: Simplified EU state aid rules allowed Member States to better help SMEs.
- Access to markets
- Promotion of entrepreneurship

The Small Business Act will shape future European Policies.

### **Convergence, Regional Competitiveness and Employment, and European Territorial Cooperation**

About 45 % of the EU-Budget is allocated under the header "Convergence, Regional Competitiveness and Employment, and European Territorial Cooperation." through the European Fund for Regional Development (EFRD), the European Social Fund (ESF) and the Cohesion Fund. The rationale of the Convergence objective is to promote growth-enhancing conditions and factors leading to real convergence for the least-developed Member States and regions. In EU-27, this objective concerns 18 Member States, 84 regions with a total population of 154 million, with per capita GDP of less than 75 % of the Community average, and another 16 regions with a total of 16.4 million inhabitants and a GDP only slightly above the threshold, due to the statistical effect of the larger EU. The amount available under the Convergence objective is 282.8 billion euros, representing 81.5 % of the total. Outside the Convergence regions, the Regional Competitiveness and Employment objective aims at strengthening competitiveness and attractiveness, as well as employment, through a two-fold approach. Firstly, development programmes will help regions to anticipate and promote economic change through innovation and the promotion of the knowledge society, entrepreneurship, the protection of the environment, and the improvement of their accessibility. Secondly, more and better jobs will be supported by adapting the workforce and by investing in human resources. In EU-27, a total of 168 regions are eligible, representing 314 million inhabitants. The amount of 55 billion euros represents just below 16% of the total allocation. The objective concerns regions in 19 Member States.

The European Regional Development Fund (ERDF) aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. In short, the ERDF finances:

- Direct aid to investments in companies (in particular SMEs) to create sustainable jobs;
- Infrastructures linked notably to research and innovation, telecommunications, environment, energy and transport;
- Financial instruments (capital risk funds, local development funds, etc.) to support regional and local development and to foster cooperation between towns and regions;
- Technical assistance measures.

The European Social Fund (ESF) is the EU's financial instrument for investing in people. The ESF channels European funds into helping Member States meet the goals they have agreed together to create more and better jobs. Its mission is to help prevent and fight unemployment; to make Europe's workforce and companies better equipped to face new challenges, and to prevent people losing touch with the labour market. It intervenes in the framework of the Convergence and Regional Competitiveness and Employment objectives. The ESF supports actions taken by Member States in the following ways:

- Adapting workers and enterprises: lifelong learning schemes, designing and spreading innovative working organisations;
- Access to employment for job seekers, the unemployed, women and migrants;
- Social integration of disadvantaged people and combating discrimination in the job market;
- Strengthening human capital by reforming education systems and setting up a network of teaching establishments.

The Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90% of the Community average; it serves to reduce their economic and social shortfall, as well as to stabilise their economies. It supports



actions in the framework of the Convergence objective. It is now subject to the same rules of programming, management and monitoring as the ESF and the ERDF. For the 2007-2013 period the Cohesion Fund concerns Bulgaria, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. Spain is eligible to a phase-out fund only as its GNI per inhabitant is less than the average of the EU-15.

The Cohesion Fund finances activities under the following categories:

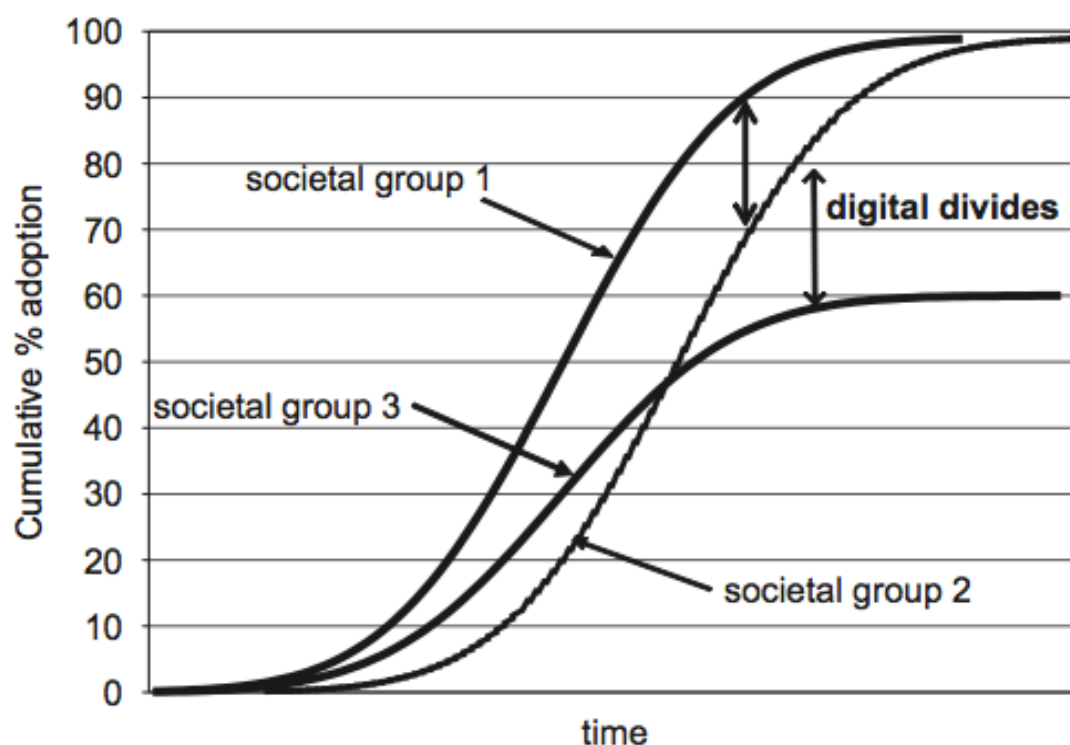
- Trans-European transport networks, notably priority projects of European interest as identified by the Union;
- Environment; here the Cohesion Fund can also support projects related to energy or transport, as long as they clearly present a benefit to the environment: energy efficiency, use of renewable energy, developing rail transport, supporting intermodality, strengthening public transport, etc.

The support for SME and the promotion of ICT is also the subject of other EU programmes. The Competitiveness and Innovation Framework Programme (CIP) is comprised of three specific programmes: the Entrepreneurship and Innovation Programme (EIP), the Information and Communications Technologies Policy Support programme (ICT-PSP) and the Intelligent Energy-Europe Programme. The Information and Communication Technologies Policy Support Programme (ICT-PSP) aims at stimulating a wider uptake of innovative ICT based services and the exploitation of digital content across Europe by citizens, governments and businesses, in particular SMEs.

## 4 Urban-Rural Digital Divide

### Digital Divide

The uptake and impact of modern telecommunication technologies differ between rural regions as well as different social groups in rural areas themselves. This has been largely discussed under the concept of a "*digital divide*" (HÜSING, 2003, SCHLEIFE, 2008b, TALBOT, RICHARDSON, et al., 2007, WARREN, 2007, WILLIS, 2006). A Digital divide describes the uneven access and usage of ICT in society. It derives from an understanding of Internet usage as process of diffusion of technologies. In this view, society as whole will adapt to new information technologies over time. However, different social groups may differ significantly in the speed of technology adaptation as well as in depth of technology usage. In so far Internet usage does not differ from any other new technology.



**Figure 1: Multiple adoption curves and the adoption divide (WARREN, 2007, 375).**

The digital divide is originally about the divide between social groups. A shift that gives more prominence to the spatial nature of provision occurs with the EU's i2010.

"This signifies an important change in emphasis – that the liberalised market will not always provide and that there are spatial differences in how effectively the

telecommunications market works" (TALBOT, RICHARDSON, et al., 2007, 10). Also, it is an expression about the huge differences in the supply and quality of the physical infrastructure in the European Union, which increased in course the Eastern Enlargement.

The main issue of a spatial digital divide is the possibility of access to Internet services and its uptake. The Digital Divide in this (technical) sense is not a dualistic concept, which distinguishes between having access or not. It refers to a number issues such as bandwidth and price. The European Union's goal is to ensure full "broadband coverage" in Europe. In the context of i2010 several documents have been published that report about the progress (EUROPEAN COMMISSION, 2009b, 2009c, 2010, IDATE CONSULTING & RESEARCH, 2009). According to the i2010 Benchmarking Framework the reports distinguish "broadband coverage" (percentage of population reached by switches equipped for DSL and/or living in houses passed by an upgraded cable) and "broadband take up" (number of subscribers broken down by platform (DSL, cable, fibre, 3G, wireless connections)). Also, subscription numbers broken down by speed with the thresholds 256, 512, 1024 (Kbps), 2 and 4 Mbps are reported (i2010 HIGH LEVEL GROUP, 2006). According to European Data, broadband (DSL) coverage in Europe was close to 93 percent. At the same time DSL coverage was only 77% in rural compared with 97,9 % in urban areas (IDATE CONSULTING & RESEARCH, 2009, , 7). However, the rural broadband gap varied widely between countries. In general, in countries with the highest total broadband coverage (Netherlands, Denmark, France, Luxembourg, Belgium, the United Kingdom) no rural broadband gap remains, while countries with a generally low DSL coverage rate (Poland, Estonia, Romania, Slovakia, Bulgaria, Cyprus) still show a very high rural broadband gap. DSL penetration rates (rate of both DSL private and business subscriptions as percentage of population) in the EU ranged from 3,1 to about 30 % with a weighted average of 18 % (IDATE CONSULTING & RESEARCH, 2009, , 8). Only 1.7% of DSL users subscribed to offers with speeds of over 2 Mbps.

The IDate study also reports of gaps of 0% to 13% between DSL penetration in rural areas and national DSL penetration, which, in relative terms are higher than the gaps in DSL coverage (ibid). Indeed, it is a common experience in many countries that the

uptake of (broadband) Internet in rural areas remains lower even when Internet access is available. The IDate report suggests that the penetration gap has a time-lag that follows out of a late availability of broadband (ibid). However, with regard to adoption of Internet in general research suggests that other, mainly social factors may explain such differences (SCHLEIFE, 2008a, WARREN, 2007, WHITACRE and MILLS, 2007). Mills and Whitacre (2003) found that differences in household characteristics, particularly lower income and education levels in rural areas, accounted for approximately two-thirds of the rural-urban gap in the US. Similar studies elsewhere confirm these findings (e.g., SCHLEIFE, 2008a, WILLIS, 2006)). Thus, the urban-rural Internet access gap is influenced by the different social composition of rural population rather than geographical characteristics such as population density or distance to urban centres. However, the gap in high-speed access may be caused by different factors than those underlying in the previous gap with regard to dial-up access. In a follow up study Whitacre and Mills (2007) found that “the presence of DCT infrastructure is not a major determinant of the rural-urban high-speed divide. Rather, differences in education and income, along with network externalities, are the most important contributors to the high-speed access divide” (WHITACRE and MILLS, 2007, 264). Network externalities describe the fact that each network member’s utility increases as more members enter the network. According to this study they play the largest role in the high-speed divide, making up between 23 and 40 percent of the variance. The author’s conclusion is that the provision of high-speed Internet access may be not sufficient and they call for demand-oriented policies to bridge the rural-urban divide in high-speed access (ibid, 265).

### **Usage of Personal Computers and Internet: The Second Digital Divide**

While the digital divide literature is mainly concerned with the access to (broadband) Internet access and computers as precondition to benefit from services offered through and by modern ICT, additional concern has been addressed by differentiated patterns of Internet and computer usage. It has become apparent that users, despite having access to computers and Internet, lack sufficient skills to sufficiently benefit from its use. There have been various studies about varying usage patterns. For instance, a recent survey of computer usage patterns in Germany

revealed that 35 % of the population is not actively using ICT, while another 30% uses ICT only casually. Thus, active users remain a minority (INITIATIVE D21, 2010). “Casual users” are described to have basic knowledge about computers and Internet and to benefit passively from the existing ICT infrastructure and skills in a household or personal networks. The report also reveals that active computer usage is closely related to employment and professional work. For instance, it describes a user group (the “occupational users”) that use computers and Internet whilst working, but show almost the same usage patterns like the “casual users” at home (ibid, 15).

Various studies have confirmed that ICT usage differs with age (decreasing); with income (increasing); educational levels (increasing); employment, and ICT skills. The latter has been addressed by the EU’s information policy strategies (i2010, digital agenda) under the term “*digital literacy*”. This includes both the ability to use new ICT tools and the media literacy skills to handle the flood of images, text and audio-visual content that constantly pour across the global networks. In 2009 the Danish Technological Institute granted an extensive report commissioned by the General Directorate Information Society of the European Commission analysing digital literacy (HILDING-HAMANN, NIELSEN, et al., 2009a, 2009b, SHAPIRO, 2009). The findings suggest that “Eurostat data indicate a reduction in the first digital divide (access) as the proportion of non-computer users has diminished over time. However, developments in ICTs could lead to a second digital divide associated with higher intensity and quality in Internet use and skills for critical assessment of information sources” (SHAPIRO, 2009, 5). The study revealed that the urban-rural divide remains prominent. Furthermore, the analysis of initiatives to improve digital literacy, among which are also many e-learning projects, have often failed, since they were insufficiently tailored to the circumstances of an individual. The report lists a number of barriers to a more intensive ICT use (SHAPIRO, 2009, , 26):

- The rapid change in platforms and services.
- Language barriers. Much digital content is only available in English.

- Lack of professionalism. Many of the digital literacy initiatives build on NGOs and volunteers commitment. If they are not familiar or comfortable with ICTs and the use of WEB 2.0 technologies for more interactive purposes, initiatives will tend to remain focused on basic ICT skills.
- Outdated standards, e.g. the ECDL certificate are important because individuals with basic ICT skills in place might be motivated to progress, these activities are no longer attuned to the current ways of using ICT in different life spheres.
- (Lack of) Accessibility.
- The perceived relevance of digital content.

This report, like other studies, reveals also gender differences. However, similar to the urban-rural divide the gender gap can largely be explained by other social factors, such as education, income and, most importantly, by lower levels of employment of women and gendered occupational structures (e.g. WILLIS, 2006).

The focus of the European digital literacy debate is still very quantitative in nature, addressing the time spend and counting various forms of usage of technologies. A more qualitative approach is the concept of *information literacy* as the American Association of College and Research Libraries have named it. According to this the “information literate individual is able to:

- Determine the extent of information needed,
- Access the needed information effectively and efficiently,
- Evaluate information and its sources critically,
- Incorporate selected information into one’s knowledge base,
- Use information effectively to accomplish a specific purpose,
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally” (THE ASSOCIATION OF COLLEGE AND RESEARCH LIBRARIES, 2000).

Information literacy requires digital literacy, but goes far further. New ICT offer access to a vast amount of information. The user is more and more forced to define their informational needs and to select required information. However, various studies show that users often know how to use ICT for private purposes, but lack the capabilities to critically and efficiently assess and select information (HEINZE and SCHNURR, 2009). This is also true for the young “network generation”. In an assessment of the informational needs of students at the University of Augsburg Heinze (HEINZE, 2008) has shown that students know how to use ICT, but lack skills of data enquiry and management. Despite the fact that students claim to be aware of the relevance of information literacy they have shown little interest to improve those skills. The main cause for this is over-confidence. “It is noticeable that the self-evaluation of the students in the area of information literacy is too positive. Just about half of the respondents can answer questions of knowledge in the area of Internet research correctly. Furthermore the skills in the area of common Internet research tools are insufficient” (HEINZE, 2008, 3).

While the literature about digital and information literacy sees differences in ICT usage as *inequalities*, Niesyto (NIESYTO, 2009) points out that differences in quality and intensity may also be a result of socio-cultural *differences*. In his review he cites a body of literature that suggests that an actor’s usage patterns may differ with regard to preferences and navigation strategies and the selection and usage of content. Such patterns often reflect cultural or social milieu specific differences, but they do not necessarily reflect inequalities. However, the literature review also reveals that consumption oriented patterns of Internet usage are wide-spread, while the usage of ICT as an information resource, and for the creative generation of own content, is more widely used by young Internet users from an education-oriented middle-class background. Similar to the findings in the former paragraph he concludes that the many (young) users, are able to make use of various media contents, but the picture changes as soon a more reflective usage is required in order to solve communicational problems. Many (young) people lack sufficient support to learn to use ICT in a reflective fashion.

In sum, the more the digital divide differs in the access to computer and Internet, the more differences in usage skills and usage patterns become relevant. E-learning has to be sensitive to the specific ICT competences and needs of the targets groups, but also its socio-cultural specifics.



## 5 Small and Microbusiness

### Understanding Small and Micro-Businesses

According to the European Union's definition, small enterprises employ fewer than 50 workers and have an annual turnover not exceeding EUR 10 million or an annual balance sheet not exceeding EUR 43 million. Micro-business employ fewer than 10 workers and have an annual turnover not exceeding EUR 2 million or an annual balance sheet not exceeding EUR 2 million. Partner companies or affiliated companies are not included in these calculations.

Enterprise category	Headcount: Annual Work Unit (AWU)	Annual turnover	or	Annual balance sheet total
Medium-sized	< 250	≤ €50 million (in 1996 € 40 million)	or	≤ €43 million (in 1996 € 27 million)
Small	< 50	≤ €10 million (in 1996 € 7 million)	or	≤ €10 million (in 1996 € 5 million)
Micro	< 10	≤ €2 million (previously not defined)	or	≤ €2 million (previously not defined)

**Figure 2: SME Definition**

In 2005 there were almost 20 million enterprises active within the EU-27 in the non-financial business economy. About 18 million enterprises (91,8%) are micro-businesses and another 1.35 million are categorised as small businesses (SCHMIEMANN, 2008). According to this statistic SMEs employ about two thirds of the total labour force in the EU. Micro enterprises provided jobs to 29.6 % of the workforce, small enterprises to 20.6 % and medium-sized enterprises to 16.8 %. The size of businesses and the share of micro-businesses vary between economic sectors. "On the basis of an analysis of activities on the level of NACE divisions, real estate services constituted the only activity where the majority (55.8 %) of sectoral employment was concentrated within micro enterprises (employing between 1 and 9

persons). Between 42% and 45% of sectoral employment was concentrated within micro enterprises for three other service activities: hotels and restaurants; motor trade; and retail trade and repair; as well as for the construction sector" (ibid, 5).

This statistic did focus on NACE Sections C to I and did *not* include Agriculture and Fishing.<sup>3</sup> In particular in the agricultural sector employment the vast majority of businesses are micro-businesses according to with regard to the Annual Work Unit (AWU) and the turnover threshold of the EU definition. However, since agriculture is very capital intensive there may be a considerable number of farm businesses that pass the Annual balance sheet total threshold, and may be considered as small or even medium size businesses. Also, there was "a considerable variation between Member States, as the relative contribution of micro enterprises to non-financial business economy employment ranged from a high of 56.5% in Greece to a low of just 13.0% in Slovakia; this range was larger than that recorded for either small or medium-sized enterprises, where the contribution of each size class to total employment was considerably more uniform across countries" (ibid, 5).

Despite this overall importance for the economy it is only recently that SMEs have found greater recognition in EU policy. In many reviews small and micro-businesses are still perceived as somewhat faulty when compared to large businesses. In this view large companies are defined as reference point and a characterised in a positive manner as being strategic, rational and well organised, while small and micro-business lack those characteristics. As we will see in the following sections such views still shape many studies about businesses ICT uptake and use of e-learning. In the recent decades, however, there has been a major revision of such rather negative conceptualizations of small and micro-businesses.<sup>4</sup> Instead, small and micro-businesses are seen as organisational forms in its own right, which show some deficits, but also considerable advantages in comparison to large companies. In general, small and micro-businesses are considered to be more flexible and responsive to changes in the business environment, since hierarchies are flat and

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<sup>3</sup> for NACE Code Classification see <http://ec.europa.eu/eurostat/ramon/>.

<sup>4</sup> In the following I will focus on small and micro-businesses rather than SMEs. Medium sized businesses are formal organisations and are, thus, conceptually different to small and micro-businesses.

internal communication is quick. Small and micro-businesses are not burdened by bureaucracies and extensive decision making processes. Thus, rapid innovation and learning is attributed to small businesses rather than to large companies. They perform better in sectors that require flexibility in the production process or market environments that ask for responsiveness and great diversity due to consumer demands.

**BOX 3: Why do agricultural family businesses survive?**

In agricultural economy and rural sociology there is an enduring debate; why most countries that have relatively free agricultural markets farming remain a last bastion of family production. Interestingly economists as well as sociologists have stressed the specifics of agriculture production (ALLEN and LUECK, 1998, FRIEDMANN, 1986, GASSON and ERRINGTON, 1993, MANN and DICKINSON, 1978, SCHMITT, 1991, SHANIN, 1973). "Production stages in farming tend to be short, infrequent, and require few distinct tasks, thus limiting the benefits of specialization and making wage labour especially costly to monitor. Only when farmers can control the effects of nature by mitigating the effects of seasonality and random shocks to output does farm organization gravitate toward factory processes, developing into the large-scale corporate forms found elsewhere in the economy" (ALLEN and LUECK, 1998, , 379). The use of family labour reduces transactions costs, increases the flexibility required by agricultural production processes. In addition, family farms tend to be embedded in local networks and cooperation relations.

While small and micro-businesses are more flexible and often more innovative, their disadvantage is the lack of capital and lack of long-term strategic planning and investment. "As a result of short internal decision-making processes, SMEs are able to run their operations in a flexible manner. However, the advantages of their open structure at a functional level become a disadvantage when they have to make information- and knowledge-based decisions about the future, which comprise long-term and complex human resource planning (...). This means that the organisational structure, which guarantees the success of the SME, impedes the systematic development of sustainable human resource management. Accordingly, the shortage of resources in terms of time and personnel in SMEs can make it incredibly difficult to plan and realise comprehensive strategies adjusted to individual needs. (...) Secondly, SMEs may fail to implement measures because comprehensive measure

packages tie up financial and personnel resources. When order books are empty, companies lack the financial means to invest in continuing training and healthcare measures for employees. During times of economic prosperity, on the other hand, manpower is stretched to such an extent that employees are tied up in work processes and they lack the time to participate in continuing training measures" (KNAPP and ZSCHUNKE, 2009).

While many studies take an individualistic view on small and micro-businesses, small business research has become increasingly interested in the networks, in which they are embedded (BRÜDERL and PREISSENDÖRFER, 1998, JOHANNISSON, 1994). It has been shown that small and micro-businesses tend to "concentrate on cultivating long-term cooperative relationships that have both individual and collective benefits for learning, risk-sharing, investment, and speeding products to market" (UZZI, 1996, 693). Small business economies are network economies. In the last decade businesses' social relationships and network embedded nature have been related to the concept of social capital (ANDERSON and JACK, 2002, FLORA, 1998, PHILLIPSON, GORTON, et al., 2006, WOOLCOOK, 1998). In general, it can be said that performance, innovation and learning processes of small and micro-businesses depend on the nature of network relations - the social capital - that they can exploit.

In a ground-breaking analysis Piore and Sabel (PIORE and SABEL, 1984) have described a societal shift from an era of mass production towards a an era of "flexible specialization" driven by an increasing diversity of consumer demand. Thus, the international economy increasingly favours firms and regions which are able to learn, change and adapt faster than their competitors, and where the most appropriate forms of economic, political and social organization are those which facilitate learning and innovation. Subsequently, small and micro-businesses (networks) are considered to play even a greater role in the future, and governments all over the world have set up schemes to support start-ups and self-employment. This has been followed by conceptualizations of regional economic growth in industrial districts (BATHELT, 1998, IACOPONI, BRUNORI, et al., 1995) or the creation of innovative milieus (MAILLAT, 1995). Also, the recent decades have seen a reorganisation of large firms towards more flexible network organisations that

consist of small and rather independent business units or profit centres in order to link the benefits from large businesses (capital accumulation and strategic planning) and small and micro-businesses (flexibility and creativity). In sum, this literature suggests that the focus should shift away from individual businesses towards business communities and networks.

As the European statistics cited above have shown the relative small and micro-businesses' share of the total business population varies significantly between countries. This indicates that the development of a small and micro-business sector is not solely dependent on technical or economic factors, but also the political-institutional environment that shapes it. Many countries that have supported the unemployed to set up their own businesses have seen an increase of the number of micro-businesses in recent years. Bureaucratic regulations, e.g. for registering a business, or complying with legal standards or tax laws, also shape the size of a small and micro-business sector. Ineffective or heavy taxation may have an adverse affect on the number of officially registered businesses, when entrepreneurs try to avoid taxes and get engaged in the black economy. In some professional fields specific policy regulations exist that either protect or hinder micro-firms. For instance, the Health Sector is usually heavily regulated in most countries. In the United Kingdom the Health Sector is organised by the state, and medical doctors, nurses or midwives are mainly employed by the National Health Service, while in other countries they are self-employed. Here, regulations may exist that even do not allow professionals to form companies.

There are also socio-cultural factors that influence the role and importance of small and micro-businesses. Societies differ with regard to their culture that is the patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behaviour. This is also true for the idea of entrepreneurship. Research investigating the culture of entrepreneurship has revealed that small-scale entrepreneurs in today's world are not rugged individualists. They tend to operate within complicated social webs in which the family plays an important role (BERGER, 1991). Thus, familism is an important cultural element that has to be considered, when we discuss micro-business development. In rural areas small business

formation is closely related to historical patterns of land-ownership and land use rights. In regions with a history of small scale family farming, business activity is likely to be higher than in regions that have been dominated by large (feudal) farm estates (LASCHEWSKI and SIEBERT, 2004).

## ICT access and usage

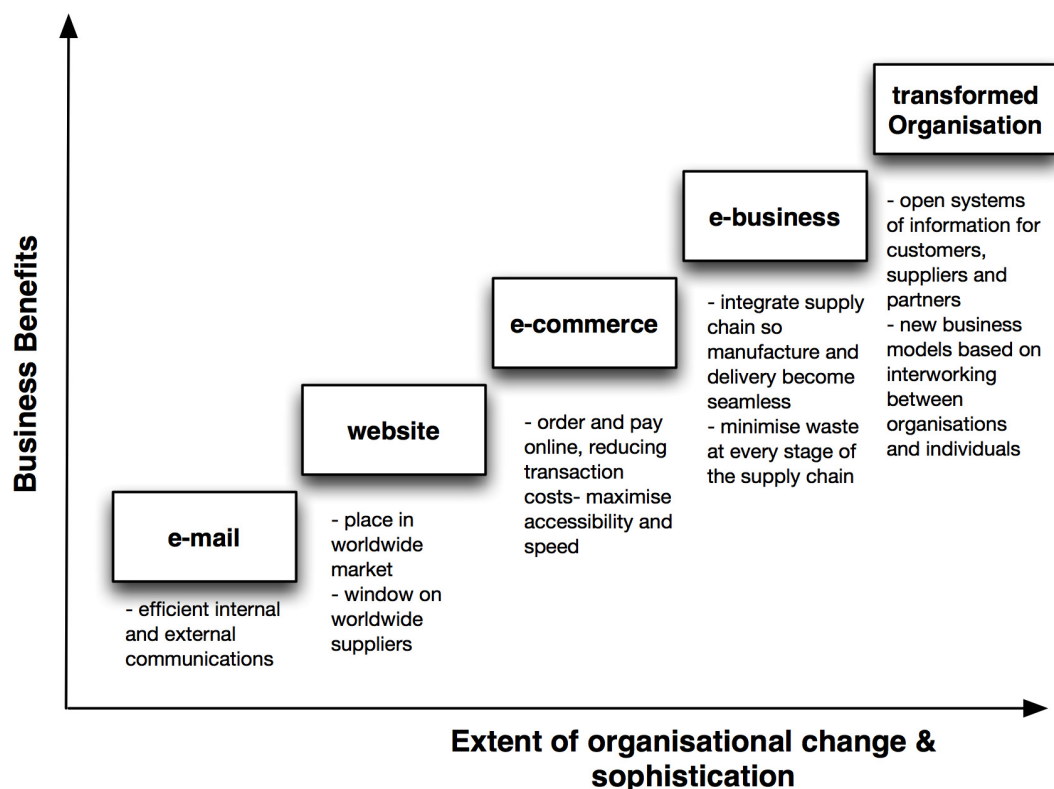
Eurostat, the European Statistical Office, regularly reports about ICT usage in businesses and ebusiness activities.<sup>5</sup> According to an Eurostat survey 93 percent of all European businesses with at least 10 employees have Internet access and 82 percent have fixed broadband access (SMILHILY and STORM, 2010). The analysis shows that ICT uptake and usage differs according to business size, sector and country. However, in this survey micro-businesses - that is more than 90 % of all businesses - are not included. Until now there is comparatively little research about the ICT uptake of micro-businesses. It is only in the last decade that policy makers and ICT companies became interested in the role of SMEs in the information economy (CRUICKSHANK, 2005, GRIMES, 2003, ILBERY, CLARK, et al., 1995, PIERSON, 2003, SKERRATT, 2006, WARREN, 2009). In general, use of computers and Internet is still not very common among many small and in particular micro-businesses. The patterns that explain that micro-businesses *have* a computer differ from the factors that explain *Internet access*. Pierson (2003) has shown that having a computer is mainly influenced by sectorial and personal characteristics, while having a computer with online access is linked to business size rather independent of the kind of business and the kind of business owner.

SMEs' adaptation of ICT itself is a rather complex and non-linear process. For instance, it has been shown that it is useful to distinguish between initial and on-going adaptation. Such a view is leading away from a linear process of diffusion to cyclical processes of permanent learning and knowledge creation. Also, the assumption that a technology provides benefits in general has to be questioned. "It is important to distinguish between adoption and continuance. It is not sufficient for an SME to adopt e-business; exploitation is the key to success. Benefits should not be

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<sup>5</sup> [http://epp.eurostat.ec.europa.eu/portal/page/portal/information\\_society/introduction](http://epp.eurostat.ec.europa.eu/portal/page/portal/information_society/introduction)  
Innovative e-learning in rural areas: A review  
[www.e-ruralnet.eu](http://www.e-ruralnet.eu)

over-hyped but rather a more realistic approach needs to be portrayed in order to ensure continued adoption and avoid disillusionment. Even some public sector bodies are still exaggerating the benefits” (CRUICKSHANK, 2005).



**Figure 3: An e-adoption ladder (WARREN, 2009, 438).**

Several studies reveal that micro-businesses “if engaged at all in the digital economy, only taking the most basic steps in terms of exploiting the potential” (GRIMES, 2003). Some research has adopted the model of an e-adoption ladder to describe ICT uptake by rural micro-businesses (figure 3). “Using the ‘ladder’ most non-agricultural businesses, and many of the agricultural ones, have moved from the bottom steps towards use of their own website, and many are now using online processes for ordering and paying for supplies. However, few have progressed much further, and there is not a great deal of evidence of movement in this. In particular, integration of systems proves to be the province of a tiny minority. (...) One explanation could be that radical change is not appropriate to these businesses per se, by virtue of type of business (especially, perhaps, the agricultural businesses) and/or the opportunities for adding value through use of the Internet. It is equally possible, though, that the ascent up the ladder has merely been delayed, and the



point at which the business begins to redesign itself around online systems will be further down the line” (WARREN, 2009).

On the one hand, there is fear that many micro-businesses may become increasingly disconnected from potential benefits of the e-economy. Large enterprises can gain a disproportionate advantage from e-business by exploiting economies of scale. Their operations have critical mass to make use of advanced ICT systems. Surveys confirm a linear increase according to firm size for the diffusion of ICT systems for internal and external process integration. Many smaller companies, by contrast, still struggle with the requirements of getting digitally connected with their suppliers and customers. Thus, a better understanding of ICT usage in micro-businesses is required. On the other hand, there is also an argument that the benefits of ICT are often exaggerated. For many micro-businesses ICTs are of little significance because they consider them irrelevant for their everyday professional life.

ICT uptake and e-business activities differ considerably between sectors. In the context of this review it is impossible to analyse sectorial differences in detail. Thus, in this review I focus on two sectors, agriculture and tourism, that are characteristic for rural economies and that show huge differences with regard to ICT uptake. In the context of the Lisbon strategy the European Commission has set up a monitoring system to watch e-business progress.<sup>6</sup> In the so-called e-business reports detailed sector studies of ICT usage have been published including one analysis of the tourism industry (EMPIRICA, 2007). This study sees tourism in the vanguard of ICT adoption and e-business in the area of e-marketing and online sales. In this area of customer-facing e-business activities “e-tourism has taken off”. Yet, in a ranking of the 10 sectors studied in 2006, the tourism industry only scores in the middle field regarding the overall use of ICT and e-business. Especially regarding the deployment of ICT infrastructure and the adoption of e-integrated business processes, tourism companies are still lagging behind their counterparts in other industries. Overall, customer expectations and market competition are the main drivers of e-business in the tourism sector, while the small size of most companies

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<sup>6</sup> <http://www.ebusiness-watch.org/>  
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[www.e-ruralnet.eu](http://www.e-ruralnet.eu)



and the considerable costs associated with acquiring technologies constitute the main barriers for a stronger uptake of e-business.

ebusiness-watch has not yet provided a similar analysis of the agricultural sector. Cross-sector studies regularly report that the agricultural sector is the industry with the least level of ICT adaptation (e.g., PIERSON, 2003). However, there is no common European Statistic that reports about agriculture ICT usage unlike the USA, where a biannual survey exists since 1999 (UNITED STATES DEPARTMENT OF AGRICULTURE, 2009). According to the most recent survey of a total of 59 per cent of U.S. farms now have Internet access, compared with 57 per cent in 2007. Sixty-four per cent of farms have access to a computer in 2009, but only 36 per cent of farms using computers for their farm business. In Germany regular information about Internet usage is included in a media use analysis regularly published by a network of agricultural publishers. According to the recent survey about a third of farmers between the ages of 30 and 59 and 43% of farmers under the age of 30 use the Internet regularly to search for information. The number of Internet users among German farmers has increased continuously in the recent decade. However, printed media are still considered to be more important than the Internet. Further information about farmers' ICT uptake and usage is wide-spread in various studies mostly with regional focus and rarely a representative coverage, many of which can be found at the webpage of the European Federation for Information Technology in Agriculture, Food and the Environment (EFITA).<sup>7</sup> Like many of the studies cited above, adaptation research in the farming sector often addresses personal characteristics or structural patterns of the farm business to explain differences in ICT uptake.

In an analysis of expert statements collected at EFITA-Conferences over the period of 1999 to 2009 Gelb and Voet see ICT adopters in agriculture today as Roger's 50% 'Late Majority' and the major adaptation problem based in the complexity of agricultural production and the relative uniqueness of specifically identified ICT. "The years reviewed by the questionnaires are characteristically a transitional period of technological change with dynamic developments, upgrading and adjustments made by ICT providers, ICT service providers and the ICT users themselves. One

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<sup>7</sup> <http://www.efita.net>

dominant characteristic of such a transitional period is an identified 'Top Down' reality. In this case ICT producers provide their standard wares – with applications not necessarily tailored to farmer and/or extension specifics” (GELB and VOET, 2009, 9).

In a recent more detailed study about the usage of specific information systems for pig farmers the authors suggested that neither socio-demographic nor farm structure characteristics are relevant factors to explain for the usage of Internet-based information systems. Instead the institutional context, the perceived benefit, data safety, simplicity to use and social influences have shown to be very relevant (BAHLMANN, SPILLER, et al., 2009). Similarly, in a survey among German farmers’ usage of Web 2.0 technologies the authors identified three user groups. „Smart User“ that covered 39% of the sample, „Heavy User“ (19,9%), and the „Internet ignorant Users“ (41,1 %) (VOSS, SPILLER, et al., 2008). Smart Users use the Internet regularly, but mainly for core content such as weather and price information or email. Only the minority of “heavy users” also make use of the Internet for advanced business purposes such as buying or selling online. Interestingly the share of part-time farmers is particularly high in this group. This again indicates that social relationships play a significant role in ICT adaptation. It supports the network externalities thesis mentioned earlier. Finally, even in the group of heavy users the authors report that e-learning ranks among the least relevant forms of Internet usage.

## E-learning in SMEs

While a special interest in ICT adaptation and usage of small and micro-businesses has evolved in the last decade, e-learning application for these businesses has found wider recognition only most recently. After 2005 a number of European projects have tried to analyse e-learning practices and applications for SMEs such as ARIEL,<sup>8</sup> SIMPEL,<sup>9</sup> ICT-VET,<sup>10</sup> or the Euracademy observatory<sup>11</sup>. All these - and some other projects - have produced a lot of material, which to present is beyond the scope of

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<sup>8</sup> <http://www.ariel-eu.net/>

<sup>9</sup> <http://www.simpel-net.eu/>

<sup>10</sup> <http://www.smelearning.org>

<sup>11</sup> <http://www.euracademy-observatory.org/>

this review. A common experience of these projects is that there is a lack of good practiced examples and successful implementations of purposefully designed e-learning for small and micro-businesses. In the particular field of e-learning, most countries have only been working to implement it for a few years, and for this reason their experiences of doing so remain quite limited (LASCHEWSKI, 2006, SCHNEIDER and HODGSON, 2006). Further, there is common feeling of a gap in studies that analyse needs, requirements and usage of e-learning in SMEs in the light of the specific nature of small businesses and a call to increase research, policy focus and coordination to support the implementation of actions aimed at making a meaningful and efficient use of new technologies in the workplace (DODOURAS, 2006, MCPHERSON, 2008).

The results of these studies also directly or implicitly criticise the technocratic assumption that e-learning provision is generally a better solution than other learning designs. "E-learning is not a goal in itself but a vehicle that contributes to accelerating and consolidating the transformation of individual and organisational learning. It is important to view e-learning as a tool for innovation and a key enhancer of change for the individual" (PRISMA, 2007). Overall, e-learning for small and micro-business has not yet found wider acceptance. It is apparent that those, who provide ICT supported learning for small and micro-businesses offer it in almost entirely as a form of blended learning courses. Thus, ICT very much complements rather than a substitutes traditional classroom learning. A main barrier for e-learning, even in form of blended learning, is the need to tailor e-learning content to the specific needs of targeted small and micro-businesses. Small and micro-businesses are interested in e-learning, if they perceive a measurable benefit for their business activities. Standard arguments relevant to large companies such as the quick dissemination of learning content or a reduction in training days are not pertinent to small businesses (BEER, HAMBURG, et al., 2006, PRISMA, 2007). The main benefit of e-learning seems to be its flexibility rather than time saving or cost efficiency (LASCHEWSKI, 2009).

As it has been described earlier small and micro-businesses differ very much with regard to personal characteristics of the entrepreneur and the staff, their attitude

towards ICT and learning, the requirements of their economic activities, the structure and capacity of the business and the structure of the networks, in which they are embedded (N.N., 2006, PRISMA, 2007). Thus, for the e-learning provider this requires substantial effort to identify needs and to set up multidisciplinary teams that develop e-learning content and engage competent trainers. All studies reveal a lack of trained staff and high development costs (and accordingly a lack of funding) as major impediment (BEER, HAMBURG, et al., 2006, LASCHEWSKI, 2009, N.N., 2006, PRISMA, 2007). Since development costs are high and/or trained staff is lacking, providers tend to offer standardised content that is not meeting the often-specific needs of small and micro-businesses.

However, substantial barriers are, of course, on the side of small and micro-businesses themselves. There is an obvious need for all SMEs to have access to broadband networks and modern technologies. In line with analysis outlined above in many rural areas the rural broadband gap remains a significant unsolved problem (LASCHEWSKI, 2006). Even if the infrastructure is available, Internet and computer usage for business is still uncommon in a particular in micro-businesses. Especially, for private households, self-employed persons and micro-enterprises with low incomes, regular costs of Internet use, but also costs of modern computer equipment may be considerable obstacles. Thus particularly groups, which potentially have a high demand for further training and education, are at a considerable disadvantage when using this technology.

Even further, those, who need training, are not necessarily those, who have access to or work at an existing computer in a company. The experience with e-learning offered to staff and entrepreneurs of small and micro-businesses reflects the reality in the wider society. The ability of using the technologies themselves is a potential obstacle (N.N., 2006). However, the case studies presented show that these barriers have to be considered of lower importance, the more so, as the provision of ICT-based learning offers can at the same time be understood as training for the use of the technology and altogether the readiness for learning ICT is relatively high. In this respect this barrier is first of all a marketing problem, because the potential users cannot be reached through the Internet itself.

E-learning in many forms appears to be a rather individualistic undertaking. It, at least implicitly, seems to start from a premise of rather self-reflective and highly self-motivated learner who, rather isolated and independent from social contacts, strives to learn. The condition of self-motivation is fulfilled in situations, where the active parties involved have very specific educational requirements (e.g. a diabetes project) and obtaining information is difficult or mobility barriers exist (e.g. further training and education during paid parental leave). Situations where further training and education are of a compulsory nature are diametrically opposed (e.g. qualification measures of the employment agency). From a sociological point of view the individualistic conception of e-learning is socially selective. It shows the tendency of being orientated towards rather better qualified middle classes, whereas fringe groups with rather negative learning experiences tend to be more excluded (LASCHEWSKI, 2009).

There is a very common often-repeated request in the e-learning literature asking for a cultural shift towards a learning culture. Small and micro-businesses are called upon to develop a more strategic approach towards learning. In this view, a perceived “wrong” attitude among entrepreneurs is a barrier to e-learning. Such ideas of a “cultural lag” of small and micro-firms can be traced back to the very beginnings of innovation and adaptation research (OGBURN and DUNCAN, 1964). Based on historical experiences it appears unlikely that small and micro-firms will change something, that appears to be part of their very nature. Thus, putting it into perspective, one could argue that for many, e-learning remains in the persuasion stage of the innovation process (ROGERS, 2003, 174 pp.). Many small and micro-businesses of the e-learning innovations. Thus, much attention has to be paid to the way in which business owners learn about e-learning, its possibilities and its benefits. Respective of this, it is important that both a source and its information are regarded as credible. There is a hope that existing e-learning experiences which students acquire at school or at university level will create a spill-over effect to small and micro-businesses, when these students enter the labour market (BEER, HAMBURG, et al., 2006).

However, the probably more realistic approach is to fit e-learning solutions to the existing learning culture of small and micro-businesses culture rather than to change it. Learning in the workplace is primarily characterised by social interaction and informal ways of learning. As soon as we overcome the presumption that learning is bound to formal, institutionalised teaching, the potentials of e-learning may be exploited more appropriately. Alternative solutions may be forms of so-called *microlearning* (BUCHEM and HAMELMANN, 2010, HUG, LINDNER, et al., 2006) or the creation of virtual communities of practice (PETTER and REICH, 2007). However, even these solutions need further validation. For instance, the creation of (virtual) communities of practice requires trust and the willingness to cooperate and to share information. Thus, small and micro-businesses are confronted with a dilemma in which they might be required to cooperate with potential competitors (BEER, HAMBURG, et al., 2006, PETTER and REICH, 2007).

Rather than creating new communities for e-learning, an incremental approach has been suggested to integrate e-learning solutions in existing institutionalised structures of vocational and continuous education. The development of an e-learning infrastructure requires frameworks and support structures to promote e-learning in SMEs (ATTWELL, 2003), since SMEs are dependent on a well developed educational infrastructure. There is a common perception in many studies that the public sector has to play a key role in this field (BEER, HAMBURG, et al., 2006, REICH and SCHEUERMANN, 2006). However, national approaches in the way vocational education and continuous training is institutionalised differ significantly between member states of the EU (PRISMA, 2007). One reason for this can be seen in the priority, which is given to information technologies in the policies of different nation states. A second reason can be found in the fact that continuous education and training for rural SMEs and their employees is an area, which is usually characterized by overlapping political competences of different ministries such as Ministries for Education, Ministries for Economic and Industrial Affairs and Ministries for Labour and Social Affairs, ICT Ministries of technology and infrastructure and in some countries also the Agricultural Ministry. Institutional diversity also reflects the huge heterogeneity of the target groups and wide range of

regional conditions. Both call for a coherent and complex national strategy, which encompasses a variety of measures, but which is rarely found (LASCHEWSKI, 2009, PRISMA, 2007).

## 6 E-Learning in a differentiated European countryside: Some evidence from e-Ruralnet research

So far, this review has tried to introduce into and to link different academic and political discourses in order to relate the innovative capacity of e-learning to the Information and Communication Technology (ICT) and Rural Development Policies, and to identify and specify e-learning innovations that are directly relevant to the needs of rural SMEs and micro-businesses in the EU. It has been shown, that various aspects influence the use and the benefits of e-learning for rural small and micro-businesses. Thus, there is now simple answer to the question what innovative e-learning can be. However, there are some general aspects that have come to the fore, which will be discussed more deeply in the following in relation to evidence of the e-Ruralnet project.

In the context of the e-Ruralnet project qualitative interviews with providers and other stakeholders have been undertaken. Also, an online database has been built, in which 'innovative' e-learning solutions are compiled. While the literature review has highlighted general, common trends in e-learning, e-Ruralnet research addresses the huge diversity of rural realities with regard to e-learning practices. The E-Ruralnet consortium consists of partners from Finland, Germany, Greece, Hungary, Italy, Poland, Portugal, Spain, Sweden and the United Kingdom. Rural regions in those countries differ considerably with regard to Internet infrastructure, target groups' usage of computers and Internet, systems of education and training provision, and e-learning experiences. In some of these countries, e-learning solutions exists. In those countries (Finland, Italy, Germany and United Kingdom), e-learning has become a common approach to target SME communities in rural areas. In other countries, e-learning is rather uncommon or even almost non-existent.

**Access.** The major cause for differences in access to e-learning is ICT infrastructure. The studied rural regions in Finland and England do not only have a very good ICT infrastructure, but this infrastructure already exists for some years. In both countries e-learning has found broad political support. Thus, Internet usage is comparatively wide spread and interest to participate at e-learning courses exists. E-Learning



providers find respective learning communities and have developed substantial experiences with e-learning provision. However, providers report that individual ICT skills are still a substantial barrier for many. There is a feeling that among younger learners ICT skills are more common.

In some countries, rural ICT infrastructure is still underdeveloped or has been built only more recently. For instance, in the Hungarian case study providers acknowledge that rural people are attracted by the Internet and increasingly use it to acquire information or for self-learning purposes. However, there is substantial doubt, if they would get engaged in structured e-learning courses. Experiences in Poland and Greece are similar.

Only at first sight, ICT infrastructure, ICT skills and e-learning appear to be something that eventually will evolve over time. Yet, the case studies reveal also that positive examples only evolve, when political strategies exist to develop ICT infrastructure and promote ICT usage and e-learning as tools for lifelong learning. While a coherent political strategy is required, some experts pointed out that training providers also have to be committed to develop new solutions, marketing and, in particular, training of trainers.

**Learner Orientation.** There is one common ground in all reports, irrespectively, if substantial e-learning experiences exist or not. All interviewees highlight community needs as the main judgement criteria for e-learning provision. One commonly addressed issue is the nature of many rural jobs. Many jobs require practical skills, which cannot solely be taught through e-learning courses, but require physical presence. Subsequently, e-learning courses often can only be an add-on rather than a substitute for face-to-face classes.

Training has to be targeted to labour market needs. In some cases, interviewees report that publicly subsidized courses do not find enough participants, since they have not been sufficiently pointed to the needs of the target groups. Also, it is more important to tailor courses to the learner ICT skills rather than to apply the most up-to-date technologies. For instance, in one interview the Spanish team presented technologically “innovative” e-learning solutions to local experts. The experts’ statement was that there is a general interest in the application of new ITC in Innovative e-learning in rural areas: A review

training, as a solution for many people that live in remote areas. Also there is an interest in finding products that use this kind of technologies, but the solutions have to be *adapted to the rural community and its situation*.

**Interactivity/Community.** Many interviewees stress the significance of learning communities and interactivity. In the Finnish case, experts from a learning centre pointed out that rural people, on the one hand, positively value the benefits of e-learning, such as less driving and working from home. On the other hand, there appears to be a deep-rooted desire to attend attendance courses. This is explained by the wish to meet new people with similar interests, and to experience a pleasant change from everyday routine. Thus, pure e-learning courses often suffer from higher drop-out rates than blended learning courses.

In the Italian case of Tuscany experts stressed the need to build a new cooperation culture as a pre-condition of lifelong learning. It is reported that a common barrier is the attitude of entrepreneurs to stay close in their own market, scaring the competitiveness or simply the cooperation with other entrepreneurs. Micro-business owners also have limited resources to attend training courses, since they have to run their business. However, given widespread access to ICT infrastructure and skills, e-learning is considered to be a useful tool to overcome this inflexibility.

Further, it seems, that the potentials of interactive tools are still under exploited. Limitations derive from user skills, but also from the lack of trained trainers, who know, how to use them.

**Efficiency.** Reduce costs and, even further, a much greater **flexibility** are seen as the major benefits of e-learning. However, development costs are comparatively high. Thus, ownership of learning material is addressed as an important issue. When trainers are the (only) owner of learning materials developed for e-learning courses, institutions take a high risk, if they invest in the development of e-learning.

**Institutionalisation.** Forms of institutionalisation of e-learning appear to be as heterogeneous as the continuous education and training (CET) market among European countries. The adaptation rate of e-learning seems to be related to a general openness for innovation in the general *regulatory framework* for CET. For

instance, the Greek case highlights that until recently the Ministry of Education did not accept e-learning as a pedagogical method. However, when the regulatory framework does not give room for innovation, it is unlikely that e-learning can eventually take a greater role for lifelong learning in rural areas.

*Teacher education* has regularly been addressed as requirement in the case studies. In countries with little or no e-learning experience such as Poland, Hungary or Greece, we find great scepticism among teachers about the potentials of e-learning. Partly, this is grounded in lack of ICT knowledge and, in particular, specific e-teaching skills. On the other hand, e-learning is often promoted by ICT experts, who have little pedagogical skills, and, thus, underestimate the technological barriers for non-experts, and the specific pedagogical requirements of e-learning.

*Property rights* have already been mentioned as an important issue.

**Quality Management and Evaluation.** Despite substantial progress in some countries, e-learning still seems to suffer from heterogeneous quality. As an UK official puts it: “Quality is sometimes patchy.” Acceptance and success suffers from a lack of quality. Despite this surprisingly little consideration can be found in the interview material about the establishment of quality criteria and evaluation practices.

The e-ruralnet has compiled a database of innovative examples including technical solutions as well as comprehensive e-learning approaches. Here, I want to pick out only two comprehensive solutions, which may serve as illustrations of innovative e-learning approaches that cover most of the issues discussed in this report. Firstly, there is Veneto Agricoltura (Italy) (<http://www.venetoagricoltura.org/>) that represents an example, how e-learning is embedded in a well established institution that offers services to traditional rural industries, which make use of natural resources. Here, e-learning is not a mean in itself, but an additional, effective tool for training of rural people. Secondly, e-learning Healthcare (UK) (<http://www.e-lfh.org.uk/>) represents a different approach. Now, the focus is on e-learning provision for Healthcare professionals. In contrary to the former example, a specific community is targeted, but not a particular regional context. Both examples represent the tails of a wide range of possible approaches to e-learning provision.

Thus, these examples show that there is not a single approach, but many, depending on the target groups, the objectives of the course programme, and a variety of institutional and structural factors.

## 7 Synopsis

In this final section some general conclusions from the literature review and the case study material can be drawn. There is a set of technologies and general design principles (table 2), which can be used to describe “innovative e-learning”. The criteria list used in table 2 is taken from section 2. One additional criterion (access) has been added according to the description in section 4.

**Table 2: Innovative e-learning for rural SMEs. Specifications for Training Providers and Policy Makers**

<b>Criteria</b>	<b>e-learning providers</b>	<b>ICT and Rural Policy</b>
<b>Access</b>	Solutions for SMEs without access, non-users Targeting of e-exclusion	Internet Access and i-literacy as policy objectives of Rural Development projects Diverse priorities in different rural areas
<b>Learner Orientation</b>	Needs assessment of target communities, Tailoring e-learning to specifics needs of the professional communities, simplicity of tools, Learner support, qualified trainers	In depth needs assessment, personal development strategy for trainers etc. as possible requirement of project funding.
<b>Interactivity/Community</b>	Tools to encourage interactivity and community development of user group	Integration of e-learning component into rural development network projects (e.g. LEADER)
<b>Microlearning</b>	Developing of micro-content suitable for work-place learning	Support of exemplary content development
<b>Interoperability</b>	Feasibility of technical solutions with ICT used in SMEs	Defining standards
<b>Efficiency</b>	Full cost modelling for providers AND users,	Development and promotion of full cost calculation frameworks
<b>Institutionalisation</b>	Linking e-learning to existing communities of practice, integration/combination of e-learning Communities are also the entry points for newcomers/learners as change agents Strategies differ according to institutional context	Establishing of demonstration projects to exploit “networks effects” for the diffusion of knowledge about e-learning, Identification of possible change agents Property rights
<b>Quality Management and Evaluation</b>	Establishment of QM Systems and Evaluation	QMS as standard requirements of project funding

European rural areas form specific, but also very differentiated contexts. Further, target groups within rural regions differ very much ranging from highly qualified, skilled professionals to people with little ICT skills and learning spirit. The learning

objectives and technologies have to be "adapted to" local conditions and in particular the needs of the target community. E-learning may be suitable for some types of professions than for others. Communities may differ with regard to access to PCs and Internet, skills, perceived needs and learning interests etc., and also their context (infrastructure, regulatory and educational system; markets, etc.).

Thus, solutions are not easily transferable but have to be tailored to local context and the needs of the target community. However, what can be learned from the existing experiences with successful e-learning approaches that e-learning is more than just using a set of technological tools. Thus, to develop successful e-learning provision systems a comprehensive strategy is required. In order to support such strategies some supportive activities of rural policies are listed in the third column, which are more effective than direct subsidies for training providers or course participants. The experience shows that these subsidies are often extremely ineffective and lead to misallocation of financial resources. The list is only exemplary and not comprehensive.

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