Teacher Training Recommendations – Interim

VISCED
A Transnational Appraisal of
Virtual School and College Provision

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Abstract	The report offers a presentation and discussion of distance education (DE) history and background. It argues, that e-learning and DE initiatives have often been too concerned with technology and technological issues, and suggests that teacher training towards successful DE offers must focus clearly on "IT pedagogy" and development of skills different from those suitable for teaching in class or lecture rooms. The report finally presents suggestions for focus areas for teacher training. A suggested checklist for evaluation of online course pedagogy designs and strategies is offered as an appendix.
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1 The brief

This is Deliverable D3.6 from Work Package 3. The description from the work plan states:

The recommendations will cover not only "what" is to be taught (with a strong focus on "21st century skills for teachers" but also "how" it should be taught (distance, classroom or school-based), with consideration of the potential benefits of teaching ICT-based pedagogy through ICT-based pedagogy

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2 Introduction

This report addresses initiatives concerning teachers' innovative use and integration of digital media in online teaching and learning processes for young adults (age 14 – 21). It reports on the level of implementation and status of "educational social media", EST (Anderson, 2011) in educational practices of teacher training initiatives.

With reference to research literature on the topic, indirectly mirroring the state of the art in terms of training initiatives for teachers to become skilled in teaching virtually and through use of digital tools, the report makes an attempt to further identify recommendations for a kind of teacher training, which is likely to meet societal demands of the future.

The field of virtual schooling and distance education is still a developing field, in research as well as in its practise. Where knowledge and established methods of best practise have longstanding traditions for educational settings with face to face teaching and learning, e-learning and distance education in the form of virtual schooling via networked systems are still emerging fields.

(The concept "distance education" originally covers various media uses, such as correspondence courses, but since the emergence of the Internet, it has become synonymous in modern daily use with education via digital networks, or virtual schooling. Therefore distance education, henceforth: DE, will be used as a shorthand term for digital and networked education in this report).

Arguably and understandably this relatively new field of educational methods and contexts has been strongly influenced by questions of technology use, the roles technology itself could or should play, and the teacher and learner roles implied by (different) digital technologies. An important point in this report is that while these questions are necessary, they have also led to a tendency in e-learning and DE initiatives to focus heavily on the technologies, often at the expense of the pedagogical intentions and pedagogical method development that would appropriately be the primary focus of educational development initiatives in most other contexts.

In the VISCED project it was expected that the Global gathering of data about DE offers for young people aged 14-21 would lead to a somewhat clearer picture of best practise traits that would serve to establish recommendations for teacher training; recommendations for the purposes of training teachers to become online teachers, and online teachers to improve and further develop their work and work methods.

However, while the data resulting from the first year of the VISCED project (running in 2011 and 2012) does establish a systematic knowledge of existing offers, it does not clarify the background, challenges, solutions, strategies etc. of successful initiatives.

Studies of successful initiative exemplars in 2012 may lead to observations that can potentially be transferred cross-culturally, thus enabling a general understanding of DE best practise for the VISCED target group.

Meanwhile, the best approach to recommendations for teacher training will be in generally studying trends in DE and e-learning, research into the impact of digital technologies and virtual spaces on teaching and learning roles and methods, and extrapolating feasible recommendations from such observations.

Using this approach, the following report will draw upon observations from global research, but also on Danish and Scandinavian approaches to pedagogy that may yield relevant perspectives to questions about teacher and learner roles in DE and relevant and recommendations for teacher training.

3 Using This Report

The “journey” of the report falls in three parts. Part one (chapters 4 - 6) gives an account of the theoretical perspective behind the report. This part is relevant for understanding DE background and pedagogical perspectives on a broader basis. Chapter 4 presents a general background approach, chapter 5 presents research that points towards an "IT fixation" that is inherent in, but also a possible barrier to, development of relevant teacher skills in IT pedagogy, and chapter 6 presents research based observations significant for the online teacher role and methodology.

Part two (chapter 7) presents and discusses experience relevant to teacher training from three VISCED partners. This part is meant as an experimental attempt at uncovering issues relevant to teacher training respect of DE from a narrative approach to professional experience.

Part three (chapters 8 and 9, together with the Appendix) presents suggestions for teacher training based on observations laid out and presented in part one and two.

4 Part 1: DE History and Theoretical Background

While originally covering phenomena such as correspondence colleges and schools, and later on initiatives such as school TV, DE has changed with the continuous development of digital media over the last few decades. Today, in the daily use of the term, DE has become synonymous with "virtual schooling", where content, tasks, collaboration, and dialogue unfold in virtual spaces and with use of digital resources online.

Many of the challenges that have faced teachers and learners (as well as entire educational institutions and policy makers) when trying to establish, maintain, or deal with DE in the present-day sense of "virtual schooling" can be explained from observations that:

- DE in the sense of "virtual schooling" is still a relatively new phenomenon (particularly in Europe) where a tradition did not exist originally, and is still in the process of being established.
- Pedagogical methods from correspondence schools are inadequate for modern DE because they fail to embrace the dialogic and interactive nature of the new digital and online virtual spaces.
- Pedagogical methods from physical educational contexts are inadequate for modern DE because they fail to embrace the ways that the dialogic and interactive nature of the new digital and online virtual spaces and new opportunities, while at the same time lacking many traits of a true physical space.
- DE as virtual schooling must be understood and approached in a societal context, as well as in the contexts of established pedagogical traditions and attempts at transferring, adapting and transforming such traditions in teacher attitudes and approaches to virtual schooling.

T his first part of the report will present a societal perspective on historical and present-day educational needs and challenges, observations on teacher attitudes and behaviours in the established (non-virtual) pedagogical traditions, and challenges encountered in respect of establishing and maintaining offers of virtual schooling.

4.1 Education and society

"Educational development" and "erudition" (http://en.wikipedia.org/wiki/Erudition) (in German "Bildung", in Danish "Dannelse") are two intertwined phenomena in the Danish pedagogical tradition – relating itself to the need of society. They have always been two sides of the same coin. They both developed hand in hand with the peasants' liberation from the feudal system in the late 1700. Educational development and the concept of "dannelse" are two processes, which in Denmark developed hand in hand. Through educational policy, an institutionalized education system (inspired by the Danish philosopher, minister, politician and poet, N.F.S. Grundtvig as the main character) and a pedagogical approach oriented towards seeking to support learner empowerment and a

maintenance of democratic dialogue (participation), a stable aim of the Danish educational system has been to promote learner autonomy in education. To be educated to adult working life and in practical skills with the purpose of realizing – through information, knowledge and education - a person's individual skill and independence.

Today we have an education system, which has the overall aim to inspire the individual person to **become motivated** and suited for – through the acquisition of special skills – a **lifelong involvement** in the work force.

Viewed in a global perspective, it may be anticipated that this "eruditional" model or way of thinking suggests a fruitful path to follow for addressing the global educational challenge in terms of enhancing pedagogical approaches for education, involving intercultural collaboration in teacher education..

4.2 Teacher attitudes and behaviours inherent in pedagogic tradition

As observed already in the 1990s, the broad and strong idea of North American pedagogical thinking viewed teaching and learning processes as separated from the role of delivery. Although, in North America, the pedagogical concept of Problem-Based Learning (PBL) is widely recognized, teaching and learning are governed, structured and strongly standardized, and instruction often consists of processes of a top-down nature. Viewed in the perspective of digital technology, this is likely to puts more emphasis on "how may the teacher be helped technologically" to "control" classrooms. This also counts for "classrooms enabled and established through the use of technology". In other words, an important inherent concern focuses on supporting the teacher's role as "instructor" and "controller" - a role with clearly defined pedagogic-didactic (controlling) techniques.

In a Scandinavian setting the pedagogical tradition does not prescribe a division of roles between educational design and educational delivery. Teachers are designers of their own products (teaching/learning processes). As a consequence, the pedagogical tools and techniques are often not "standardized". The designer/teacher usually makes his/her own "free" decisions and choices regarding not only pedagogical approach, but also digital integration and choice of tools/techniques.

This also counts for the interpretation of the concept of e.g. collaborative learning, - as e.g. the POPP approach (Dirckinck-Holmfeld et al., 2004). POPP (Problem-Oriented Project Pedagogy) appears to be a central pedagogical foundation for design, also of e-learning approaches in Scandinavia. POPP integrates well with the concept of "collaborative learning". Among other things this approach implies that "a problem studied" cannot be a repetition of an earlier implemented instruction or teaching strategy, i.e. something formalized in digital technology. Although POPP shares some features with PBL, one important distinction between the two is that while PBL is problem-centred, the premise of POPP is that students themselves identify the problem to work with.

This has a consequence for the perception of teacher role, digital technologies as well as pedagogical strategy, which traditionally has been focused on promoting and facilitating learner dialogue as not only a catalyst for learning, but as the very medium and premise of authentic learning with the overall twofold goal: making the learner *erudite*, and *educating* the learner. This double phenomenon is deeply rooted in the development of the Danish culture and pedagogical tradition.

From a Danish viewpoint it is impossible for a modern society to think about educational and knowledge processes without incorporating a fundamental democratic foundation. It is a Danish tradition to use pedagogies/strategies as tools for creating "a state" – to utilize the pedagogical approach as a tool for creating a state – a habitation/people, through the following principles (Pedersen, 2011):

- To establish an understanding of community with pedagogy as the tool. Through a certain type of pedagogy to enlighten about the dignity of the individual, and through that to promote a self-understanding, self-consciousness and self-feeling.
- Through erudition of self-consciousness to develop an understanding about whom we share the idea of this self-understanding with.
- There is a close connection between individuality and understanding of community, as we are all of us offered *erudition*, and development of similar individuality. Thus, we all have the commonality that we have the same self-understanding.
- The process – through which an individual is given an understanding of him-/herself as a part of a community, contains at the same time an element of education, which is not necessarily is closely related to the question of erudition an individual's self-understanding, but is rather directed towards providing the individual with some practical skills, which the individual may work with, and which may make the individual available for the labour market – which may form the individual to become a practical participating citizen in society.

In this perspective, the goal of education is not to transfer knowledge of truth but rather to form people to be able of creating, maintaining and re-constructing social life in a fruitful way (Brinkman, 2011). When we together create social life, in a way where everybody's experiences are valued, we call it 'democracy'. Not just as a formal system with voting rights, but – in agreement with Dewey – democracy as a way of life, which relates itself to the world and the others in ways that may contribute to creating social life and human growth in fruitful ways.

From a school perspective, it becomes essential that we are skilled in social activity and community life.

This view of interwoven erudition and education is something very fundamental in a Danish pedagogical perspective. Thus, it also becomes a key fundamental element in terms of forming the teacher – and thus, the education of the teacher. This counts for the way we think about the challenge of teacher education, be it in the traditional mode or by DE.

If this complexity in pedagogic traditional background is viewed in a technological perspective, we can cite with Bates, who – as early as in 1995 - was stressing that to transcend cultural, pedagogical and conceptual barriers of tradition is not a simple challenge (Bates, 1995), and that the challenge becomes even more complex, when technology is involved.

5 The Question of IT Readiness

IT readiness (in the sense that it technology is present, connected to the internet, and that user skills are sufficiently developed to use the networked technologies) is a factor that is generally considered a prerequisite to a deeper integration of technology towards phenomena such as "digital citizenship", "e-learning", "distance education", and looking for and considering questions of IT readiness in schools and colleges has indeed also been a part of the original topology for the VISCED project.

The question of IT readiness is interesting for two reasons:

It is obviously correct that a school cannot become "a virtual school" without a necessary amount of IT equipment, network connections, and user skills. But on the other hand: While the necessities of hardware, software and skills cannot be argued, their obvious role as a *sine qua non* prerequisite also implies an inherent IT fixation. If we want to develop e-learning, is the technology at hand sufficient? Are the necessary (technological) skills present? Is IT support adequate?

Many e-learning initiatives have indeed been designed with a focus on making hardware, software, courses in IT use, and IT support available to teachers and/or students - where the clear and indisputable understanding of the important role of technology in the end was at the cost of a more basic approach towards understanding the technologies in a pedagogical perspective (see examples in the chapters: "IT Integration in Short-cycle and Medium-cycle Higher Adult Vocational Programmes", and "IT Integration in Scandinavian Universities").

If teachers have been reluctant to embrace digital technologies and virtual spaces in or out of classrooms, a technology fixation may well be the most important explanation for this. And if students have been reluctant to engage in virtual debates, or have found it difficult to follow distance courses, a lack of pedagogical clarity and awareness may well be the reason.

For years, Denmark has consistently been among the leading countries in IT readiness in the general populace (Danish Ministry of Science, Innovation and Higher Education 2010). This is also the case with Sweden, Finland, and Norway.

Looking at e-learning and distance education from a Danish and Scandinavian perspective is therefore a good starting point for understanding what is important for teachers' development of e-learning and distance education offers when the prerequisites of technology are already met.

It should be noted here that there has been found surprisingly few exemplars of virtual schools and colleges for the VISCED target group of young adults age 14-21 in Scandinavia. This may in part be explained from strong humanist traditions in Scandinavia emphasizing personal presence and the personal, face to face, meeting, as well as from infrastructures which in various ways facilitate a tradition and expectation in young people of "wanting to go where the other young people go".

The examples and observations used are therefore concerned with understanding e-learning in a broader sense than distance education - with the goal of establishing general observations of the skills and attitudes needed for teachers to "go digital" in their teaching methods and processes.

The following subchapters should serve as an approach to understanding teacher attitudes towards technology and e-learning, and b) the pedagogical impact of virtual learning spaces.

5.1 IT Integration in Short-cycle and Medium-cycle Higher Adult Vocational Programmes

In 2007 the Danish National Centre for e-Learning conducted a survey for the Danish Ministry of Education, " Status of IT Integration in Short-cycle and Medium-cycle Higher Adult Vocational Programmes" (Harlung et.al. 2007). The target group for these educational offers and institutions is primarily adults, but since the admission age is 18+ the target group of VISCED is also partly covered.

The educational offers concerned were generally not designed or offered as distance educations, but the results are still relevant to a broad picture of teacher attitudes towards IT and e-learning, as well as organizational level observations.

The purpose of the report was to map the extents of IT integration in the vocational colleges, and to recommend institutional strategies for future development.

IT integration was mapped at three levels:

a) IT supporting the distribution of study-relevant information and content such as study plans, exemplary solutions,

b) IT based communication and knowledge sharing relating directly to specific disciplines, courses, etc.

c) direct IT based enhancements of teaching and learning processes (e-learning as established pedagogical approaches to teaching and learning).

The most relevant observations from this survey were:

There is a gap between IT use and e-learning:

IT was generally very well integrated as an administrative tool, as well as a study facility for students, in the sense that IT systems were available and used for administrative purposes and coordination, and that wifi networks were generally accessible to teachers as well as students.

However, while the IT systems were frequently used for distribution and communication (e.g. more than 80% of teachers frequently used IT systems for sending messages to colleagues or students, and 75% of the teachers would often distribute content electronically rather than as photocopies;

Ibid. p:8), less than 20% of the teachers had integrated IT tools as direct means to support or enhance the learning processes specifically (Ibid. p:7-8)

There is a gap between teachers' and leaders' perception of strategies and visions for e-learning

The survey uncovered marked differences between teacher and leader perceptions of plans, strategies, knowledge use and knowledge sharing at the institutional level:

71% leaders vs. 21% teachers thought that their institution made active use of practise experience with IT uses.

45% leaders vs. 18% teachers agreed that their institution had a well defined strategy for continuing development of e-learning.

85% leaders vs. 12% teachers thought that knowledge gained from supplementary and in-service courses was actively used.

(Ibid. p:11)

While questions about teacher roles and attitudes were studied in the survey, the gap between leader and teacher perceptions of strategies and actual use and sharing of knowledge was the most significant observation in respect of recommending future strategies at an institutional level. Not surprisingly, the main recommendations were concerned with administrations and leaders being clearer about strategies, and following up on visions, while at the same time taking a stronger focus on actively supporting (e.g. by allowing time for) integration of new methods, knowledge sharing, etc.

The importance of leadership and leader roles for supporting, maintaining and ultimately realizing e-learning and DE strategies corresponds with the International Society for Technology in Education's (ISTE) listing of conditions “necessary… to effectively leverage technology for learning” from 2009, which include an observation on the necessity of supporting policies and incentive structures (the 13th condition, please see Searson et al. 2011 p: 2).

As it is also the case with the ISTE recommendations from 2009, the 2007 Danish survey does not point directly towards specific methods or teacher attitudes that would help teachers improve "e-pedagogy", but it supports the notion that the traditional approach to e-learning initiatives has been mainly concerned with getting technologies in place, and has lacked a focus on integrating IT in teaching and learning methodologies.

5.2 IT Integration in Scandinavian Universities

In 2007, Simon Heilesen presented results from a report made for Roskilde University at a seminar held at Center for IT and Learning at Aarhus University.

While available to the public, the report was primarily aimed at establishing recommendations for future e-learning strategies at Roskilde University, but the work was based on studies of IT strategies and e-learning initiatives at 14 different e-learning units located in different departments at five Danish universities and four Swedish universities. The presentation (Heilesen 2007) was concerned with the general trends observed and their general meaning in respect of e-learning strategies.

Most of the e-learning units provided centralized services, and referred directly to the university administrations. Rather than working at strategically changing or transforming teaching methods or staff, the e-learning units were established as a sort of extended IT system providers and supporters. (Heilesen 2007 P:3)

The most significant approach towards facilitating pedagogical change observed in the study was introduced as "the Swedish model": Swedish universities had used a project based model, where teacher time was allocated to e-learning development projects. The most systematic uses of this approach were found in Sweden, but some instances of this model were also found at Danish universities. (Ibid. p:4)

The report emphasizes the values of this specific model, pointing out that the teachers that are allocated part time involvement in projects thus get the time needed to solve relevant problems or challenges from their own practice, that the his model facilitates cross-disciplinary exchanges between different faculties (or disciplines), and that the teachers who participated in development projects will afterwards serve as "ambassadors" for development and collaboration (with the e-learning unit) among their colleagues. (Heilesen et. al. 2007 p: 10-12)

But the overall trend was that e-learning units could be seen as institutional systemic investments in technology and technology expertise apart from the educational environments at the institutions, and without the full potential or intended impact on teaching and learning practice, possibly because investing in hardware and software (and technical expertise to go with it) seems safer to leaders and administrations than investing in "brainware" in respect of getting quantifiable results. Another observation in support of this interpretation was that work hours allocated to teaching simply did not leave room for developing e-learning initiatives. (Heilesen 2007 p:7)

Heilesen presented a number of political "litanies" such as, "innovation" and "improvement", and systemic intentions such as, "globalization" and "expansion", as reasons given specifically at political and administrative levels for the importance of developing e-learning initiatives (Ibid. p:5-6), and moved on to point out that political and institutional support of e-learning initiatives tended to stop

after the" litany" and "systemic" levels, and without resulting in actual change at "world view" and "sense making" levels. (Ibid. p:8-9)

At a more tangible level it was observed that the ambition levels and allocated resources for e-learning initiatives tended to culminate and fade after the initial "startup" phases, thus failing to follow up on projects or initiatives for full and successful development and implementation. (Ibid. p:10)

5.3 IT Fixation as a Possible Barrier Against Successful DE Development

The examples established from surveys of IT readiness and e-learning trends at Danish vocational colleges and Scandinavian universities point towards an "IT fixation" where a focus on hardware and software is dominant, and where time and resources for actual development of pedagogy; room for experimentation, knowledge sharing, and generally establishing a bulk of shared and substantiated experience are not given sufficient attention.

If "teacher training" should primarily be concerned with making teachers better at teaching, and if there is a general trend in e-learning and DE initiatives to focus on technology and development of technological skill - then there is an inherent contradiction in the focus on technology:

However necessary it is for technology using teachers to have a certain level of skills in using the specific and relevant technologies, teacher training should have a clear focus on pedagogy.

The strong tendency of lacking or dissatisfying outcomes of actual e-learning pedagogy shown in both of the studies above support a notion that **"technology is not important - it is how the technology is used, that is important".**

For this reason, and while still acknowledging that basic technological skills are obviously necessary for DE teachers, this repost will propose that teacher training should first and foremost have a clear focus on development of e-pedagogy, and offer thoughts on relevant items in this context.

6 Success Factors in Distance Education

This chapter presents two research-based perspectives on success factor for distance education, emphasizing a focus on e-pedagogy. The first part focuses directly on the teacher role, while the second part focuses on success factors in the overall pedagogical design of distance education courses.

As in the previous chapter, the research examples and observations are derived from studies of DE targeted at adults, but this is with good reason: modern and online DE generally demands a certain amount of maturity and self discipline in the student(s), and has therefore mostly been targeted at adults, wherefore systematic studies of DE pedagogy for younger target groups are called for. (Ferdig et al. p:204).

Since the study of virtual schools for younger target groups is at best an emerging field, the most feasible approach to establish meaningful suggestions for teacher training will be by using general observations from adult or higher level DE. While direct research into DE for younger target groups may yet lead to new observations on best practice for this specific target group or its subgroups, the general approach will still address the overall basic needs for best practice.

While different target groups and target group ages certainly call for different pedagogies and teaching methods, any teacher of any discipline and at any level is an expert in teaching his or her field at the specific level. The impact of online and digital media and teaching/learning environments and resources on teaching methods and pedagogy does not affect the teacher's specific expertise and level as much at it affects the ways and possibilities of communication, self study, evaluation, assessment, reflection, differentiation, etc. Thus, the pedagogical impact of digital media can to some extent be studied as a separate phenomenon. In other words, looking at methods and approaches that work - or do not work - at any educational level can also inform the challenges for teachers and teaching at a general level. This argument for the value of an overall general approach is supported by observations such as:

"The skills needed for teaching in an online learning environment support an educator’s functions and come at the point of intersection for pedagogy, technology, and content (Russell, 2004; Savery, 2005), which is also known as TPCK (Ferdig, 2006; Mishra & Koehler, 2009). The selection and coordination of pedagogy, technology, and content is a primary task for educators in order to provide students with quality online learning opportunities (Kurtz, Beaudoin, & Sagee, 2004; Olson & Wisher, 2002). Implementing these new strategies associated with the use of TPCK and instructional design can require educators to undergo a major shift from what they have experienced in off-line settings (Coppa, 2004; Lee & Hirumi, 2004; O’Neil, 2006)." (Ferdig et. al. p: 206)

The notion that general best practice observations from higher level and adult DE can also be applied to DE is also supported in specific details from best practice suggestions for virtual schools. For example, the importance of virtual school teachers to foster discourse and sense-making in

online learning processes is a common trait in suggestions for best practice listed in Ferdig et al. (p: 207-209), as well as a large number of very specific suggestions, for example that teachers are urged to post welcoming messages, and to be visible and available, in active contact with online students on a regular basis (Illinois Virtual High School Instructor Handbook (2004), see Ferdig et. al. p:208) - coincide with the observations in the comparative study presented in this chapter. The observations in this chapter serve as the rationale for the recommendations for pedagogical development aspects of teacher training in the final part of the report.

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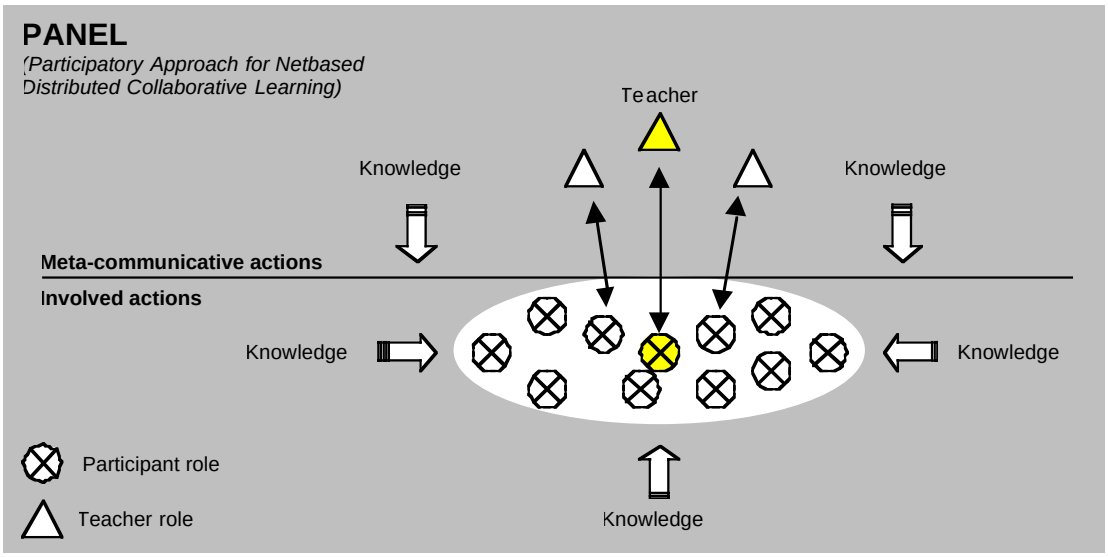
6.1 The Teacher Role

> *Learning (...) takes place through our engagement in actions and interactions, but it embeds this engagement in culture and history. Through these local actions and interactions, learning reproduces and transforms the social structure in which it takes place (...). Learning is the vehicle for the evolution of practices and the inclusion of newcomers while also (and through the same process) the vehicle for the development and transformation of identities.*
>
> (Wenger, 1998, pp. 13)

- Starting with Wenger's concepts and the nuances in his views on learning, we may form a list of essential criteria of online teacher behaviour aiming at enhancing establishment and quality in online collaborative learning designs:
- create interaction between the participants (with reference to the concept of "participation");
- make use of participant experiences and to operationalize them as resources (to create relevance, motivation, and ownership) and to collect teachers and learners in a kind of "shared" learning project (with reference to the concept of "mutual engagement");
- structure, via the logic behind the creation of discussion fora, a student centred process of interaction and collaboration (with the purpose of bringing participant perspectives and opinions into the discourse, and to make space for a differentiation not predicted and determined by the teacher).;
- make use of different roles (to make the participants feel "security of identification" in relation to expected communicative behaviour, and in order to ensure a narrative maintenance of – and presence in - the interaction (Sorensen, 2002 & 2004);

- operationalize the reflective character of the virtual universe as well as the learning value of formulating oneself in writing (Mason, 1993) with the purpose of supporting processes of (self)reflection on the one hand, and to use writing as ”a technology of thinking” on the other;
- the need to design models that incorporate participant experiences into the CKB process seems especially outspoken in the context of continuing education (Sorensen, 2000 & 2005).

On the basis of the above criteria, PANEL, a model for instructional design of collaborative knowledge building (CKB) processes on the net, has established itself as a standard (Sorensen, 1994, 1995, 1996, 1997 & 2002). PANEL denotes a teaching/learning process centred on collaborative knowledge building and qualified by participants. The figure below illustrates the main ideas of PANEL (figure 1).



”PANEL”: Pedagogical/instructional Approach for Net-Based Distributed Collaborative Learning

In sum, the PANEL model:

- stimulates ”participation” and ”engagement”
- is process oriented (focuses on the KB process)
- denotes an open concept (a continuous flow of knowledge from participants)
- is participant oriented (focuses on the learners – not teachers)

- draws on participant experiences (uses participant input)
- operationalizes participant experiences (integrates participant input into the KB process)
- creates participant ”ownership” (the participant perspectives are taken seriously)
- equals out teacher and learner roles (uses dynamically interchanging roles)
- is, in principle, a lifelong model
- invites assessment of process (focus on KB process invites evaluation of KB process).

The PANEL model of instruction implies a student-centred, open process in which knowledge resources enter dynamically from outside via the participants as well as through the teacher(s). This process is driven and motivated by the participants and their individual knowledge (the latter is an important factor in adult education, where each participant are “experts” in their individual working contexts). It illustrates the dynamic interchange between teacher and learner roles. It also provides a rough indication of how much of the teacher role evolves at a meta-communicative level.

6.2 A Comparative Study of Two Distance Education programmes

In a dissertation from 2003 (Harlung, 2003) a comparative study of the effects of DE pedagogy in two Danish master programmes which were both designed as mostly DE is presented and analyzed. The design of both programmes was blended learning, with 3-4 physical seminars (2-3 days each), and with online work and studies between seminars as the actual main activity. Each master programme had more than 40 students.

The comparative study aimed at establishing a holistic theory on e-learning and DE using rhetoric as a qualitative approach to communication. It combined a year of participatory observation studies from 2002-2003 (observing and reflecting on course and task designs, and behavior and reactions during one year of master studies), and documentary studies of documents, messages, and participation and message frequencies found and available in the online study environments of the two programmes from the same year as the observation studies. The participatory observations allowed motoring of changes and adjustments and their effects as they occurred, while the documentary studies established hard data in support of the observations (e.g. message frequency depending on specific pedagogical designs or teacher behaviour).

One of the master programmes was highly successful in engaging the students in collaborative online work, knowledge sharing, debates, and study activities, while the other was less successful in this area. Observations of strategies and teacher behavior could clearly be related as explanations for observations on participation, task awareness, etc.

For example, one of the master programmes presented the students with a hands on course in the online environment, explaining the setup of conferences and their various purposes, pointing out where overviews and resources were available, and giving the students small assignments with creating test conferences, uploading files, sending messages etc., while the other master programme began with only sending out a short tutorial of how to access the online environment as a physical document in a welcoming and informational letter to the students. After the first physical seminars in the respective programmes, the students all came online and began study activities in the programme that had the hands on course, while only a third of the students in the other programme came online at all, and actual study activity was negligible. In the master programme that did not have the hands on course at the beginning, the last two thirds came online after a hands-on course was given at the second physical seminar.

These observations strongly support the argument that a very clear introduction to a DE environment detailing where the students are supposed to do what, and why, is crucial in order to establish motivation and online navigation skills necessary for students to engage in online learning processes.

Other observations such as observations of online teacher activity and participation further supported that teacher presence and ability to assist and help students to keep track of tasks and relevant topics were crucial for the level of student participation and learning. Observations on teacher roles were strongly influenced by the work of Elsebeth Sorensen as suggested in the PANEL model presented in chapter 5.2 in this report.

While offering a hands on course is by definition not possible in a fully virtual school, the importance of establishing a clear overview of tasks, purposes, and resources as a factor for initiating and nurturing student participation have the rhetorical traits of a) being logical in retrospect, and b) being supported by observations of practice.

Because of the aim at developing a modern use of rhetoric as a theoretical approach to planning, describing and analyzing modern and online DE, the observations presented throughout this chapter are spread out in the dissertation, commented upon and related to theory development consistently with an intended broad and holistic approach. The full observations and discussion of their significance are laid out in Harlung, 2003 p: 32-44, 50-72 and 73-75.

The success factors for establishing a successful DE environment supported by the observation and documentary studies were presented and used in teacher training courses offered by the Danish National Center for e-Learning (eVidenCenter) in 2006-2009, e.g. for high school teachers who wanted to develop online courses.

They are presented here, and additionally they are used as a basis for a suggested evaluation form in the Appendix.

6.3 Success Factors for DE Design and Teacher Roles

Availability of technical support is a necessity that obviously must be addressed. Students who cannot send messages, upload files, find existing content via search functions, or inconveniently experience "down time" will justifiably become frustrated if help is not available to a reasonable extent (which of course depends on the specific context, but usually will be at least within normal work hours).

But since technical support demands separate educational backgrounds other and apart from those of specific educational disciplines, technical support should generally be supplied and delivered at an administrative level. In this report technical support is viewed as something that is not, or should not be, a primary concern for DE teachers.

The focus of the following success factors does not disregard the importance of technical support, but the qualifications needed for being able to give technical support are not regarded as a feasible topic for teacher training.

6.3.1 Virtual space awareness

It is crucial for student motivation for starting and engaging in online learning processes that tasks and expectations for students are clearly defined and an overview of tasks, expectations, and reasons for the design has been presented to the students.

If the tasks and the organization of content, work spaces, task overviews, places to seek help etc. are not transparent students will be frustrated, disoriented and lose motivation.

The teacher or teachers should therefore be able to plan their online pedagogy to an extent where the ideas and expectations can be presented with full or very nearly full transparency to the students.

6.3.2 Teacher role - communication

The teacher role in a course should be a "mentor" role, where the teacher is responsible for the overall course and task design, and in the online environment is visible a) as an interested participant, and b) in helping the student(s) to keep track of the tasks at hand rather than providing or suggesting specific solutions.

There is a visible difference between student activity where the teacher is visible and where the teacher is less visible. The more visible the teacher is - without adding remarks that students perceive as final or concluding, but at an interested and helpful participant - the more the students will be motivated to follow the teacher's example in adding new thoughts, observations and resources to the ongoing learning processes.

Therefore the teacher should be easily available for helping out with doubts, and should also act as a forerunner, adding the in initial welcoming remarks in any new virtual context.

6.3.3 Teacher role - media use

The teacher(s) should use the chosen media for the course in the same manner as he/she expects from the student(s). For example, if the online process will be in an asynchronous online environment where participants are expected to write thoughts and comments directly, the teacher should do so also; if the teacher uploads documents instead of writing directly as expected from the students, the students will perceive this as an accepted way to contribute, and the direct interaction in the online environment will be lost, in fact reduced to a messaging and document handling system rather than a learning environment.

This observation is an extension of the previous observation that in a virtual environment, the teacher teaches by example. In respect of teacher training it has a double meaning:

a) This is the specific reason why teachers should master the technologies used at the level expected from the students. He or she should be able to act like a peer on a daily basis; no more and no less.

b) The teacher should be aware of himself/herself as an important person whose personal example will set the standards of the learning that will take place.

The teacher's role as a course designer, and the need to present the teaching and learning environment and tasks in a coherent and transparent way calls for planning ahead. Since the expectation is that students should learn, since the teacher should teach by example, and since all plans are merely attempts to anticipate what will actually happen - teachers must be ready to "learn" that their design did not allow for a specific need, or can be improved in some way - and ready to negotiate and change their design. A change of design applied openly and with good reason is not an admittance of failure to plan well enough; it is the virtual parallel to negotiations that also go on in the classroom or lecture room in physical contexts, when students ask for modifications of tasks or curricula, or to be allowed to pursue a special interpretation of a task.

It is in the nature of digital media and virtual spaces that meaning is created on an ongoing basis of negotiation and interaction.

In respect of teacher training it is important that teachers understand that digital media and virtual spaces are characterized by interaction, and that users may lose interest and respect in situations where negotiation proves impossible.

Virtual leadership calls for setting good examples constantly, not for being flawless from the beginning, but from being excellent in pointing towards and implementing solutions as needed.

(While the observations on the teacher role in media use means a less authoritarian role than that which is possible in classroom and lecture room contexts, it also lends an new kind of authority to

the teacher role, similar to the master/disciple relation of teachers and learners in antiquity. The teacher role may lose some of the control known from classroom teaching, but may also at the same time gain a new kind of respect in the process.)

6.3.4 Coherence and consistency

In any teaching and learning environment, and especially if there are many teachers and disciplines, it should be expected that students will have very different tasks and be expected to work in very different ways with these.

In traditional face to face educational settings this may seem natural, partly because the students may always ask, and teacher will always have the opportunity to answer questions regarding reasons for the specific approach, expectations, etc.

In a virtual learning environment different tasks and expectation may easily become confusing and lend a feeling of inconsistency to the learning experience for the students.

For this reason, an overall transparency of the entire course with all tasks, resources, expectations etc. should be readily available and easy to understand and navigate for the students.

This means that the individual teacher should make an effort to plan and explain different tasks in a way where students will understand the changing natures of tasks and work expectations or designs.

If there are more teachers and disciplines, an effort should be made to coordinate a full and meaningful presentation of a coherent course or education.

This does not mean that all teachers should agree on the same methods or approaches. But it does mean that an important factor for teachers is to plan ahead, and to coordinate individual tasks and approaches into a larger design, which can be presented from the beginning of a course or an education.

6.3.5 Peer collaboration

Working together towards solutions, creation of meaning or products, and in pursuit of common interests is strongly inherent in the potential of online activities in online media. In non-educational virtual spaces for personal or professional purposes, collaboration is the way that people work and communicate online, and this should as much as possible be used actively in learning contexts with more than one student:

If there are more students, the learning design should strongly suggest or directly depend upon peer collaboration.

Collaboration strengthens the motivational and commitment factors to participate in a virtual learning process, and at the same time students who have to present their thoughts and work in

mutual collaboration towards an educational outcome will be challenged to reflect upon the tasks at hand more profoundly than in individual work.

Teachers should therefore be trained to integrate peer collaboration between students in the task design, e.g. as group tasks or projects, or by maintaining online "class discussions".

6.3.6 Task navigation and transparency

Not only should tasks and course designs be presented and descriptions of these be readily available; the design of the virtual space or spaces used for the learning processes should also be well designed and easy to navigate.

For example:

a) It should be considered if forums are aptly named. If student groups are expected to work together of different tasks, fora for the individual tasks may be called for, rather than just a general (and thereby amorphous) space for "group x".

b) It should be easy to access any course relevant information in the virtual space without leaving it. While a document may be a resource, a description of the course, or a list of relevant external links, should not be a document, but instead be present as an integrated part of the virtual environment, appropriately named and easy to find.

c) Anything that belongs to a category should be easy to find in a space reserved for this specific purpose. And anything that belongs to a sub category should be easy to find in the main category. For example, a library of resources may appropriately be called "Resource Library", but if there are resources for different tasks or disciplines, sub libraries should be found within the "main library".

The more easily one can find something in a virtual space, the less time one will spend looking for it and losing personal energy and motivation by being frustrated. This goes for students as well as teachers, and it goes for websites as well as for virtual learning environments.

Teachers should be trained to present virtual course designs to students that are structured in logical ways that are obviously consistent with the presented course design.

6.3.7 Intentions and goals transparency

The opportunities for negotiation of task meaning and task designs that can take place directly and on an ongoing basis in physical educational contexts are not readily at hand in a virtual environment.

The collaborative nature of negotiation and meaning creation of virtual spaces touched upon previously not only calls for clarity about "what, when, and where" in respect of tasks and learning processes, but also on clarity about "why". The "why" is crucial to understanding the purpose. If a

task is perceived as unclear, on even unpleasant, the underlying reasons for the task may well serve to clarify intentions, and to justify the reason.

Therefore, tasks should not only be given and explained, their underlying purposes - and the underlying purposes of the specific task design - should also be made clear. (This once again calls for teacher willingness and readiness to modify tasks if students ask for alternatives that will lead to the intended goal in a way they will find easier or more pleasant to fulfill - and at the same time serves as a negotiation platform that may help maintain the educational intentions and outcome).

Clarity on underlying purposes can be obtained in many ways, e.g. in background explanations on the purposes and intentions behind a task in the overall course description and/or in opening remarks from the teacher when starting the task.

Teachers should be prepared to reflect upon, openly present and - within reason in respect of educational goals - to negotiate tasks designs. While this is an integral part of the teacher role suggested above, it may be difficult to train directly - but knowledge sharing among colleagues based upon experience may help individual teachers to develop their own ways of integrating and presenting and openness about their pedagogical intentions in their own practice.

6.3.8 Meta level support

In an educational context, questions about tasks, expectations, alternative ways to solve tasks, alternate resources, and general evaluating discussions (of process, personal learning outcome, course design etc.) will arise.

Just as technical help should be available, the meta level issues about course design and tasks should be addresses in a virtual context.

In order to support navigation and task and course awareness, there should be distinct "places" for:

- Practical information and issues,

- Raising questions about tasks, or suggesting or asking feedback on specific interpretations of tasks or alternative ways to solve them,

- Sharing references of more or less peripheral relevance,

- Social interaction,

- Other issues depending on context and complexity. New relevant spaces may obviously be created as necessary if it was not foreseen in the planning process that they would be called for.

For short courses, one "meeting place" between students and teachers may be enough, but the more time, tasks, disciplines, courses, teachers, or students an online course or education will

include, the more complexity there will be, and the more need for meta level discussions and spaces will be called for.

The call for meta level reflection as an integrated part of course design is, like the call for background transparency suggested above, an integral part of the teacher role suggested in order to meet the collaborative and negotiating nature of online and virtual spaces. It is a point teachers should consider, and will best be able to develop through personal experience and knowledge sharing.

7 (Part II) An Experiential Approach to Teacher Training

The approach, on which the present report is based, is mainly “experiential”. Each of the four partners of the project was asked to describe the following:

- Their e experience with barriers and solutions concerning "virtualizations" of educational programmes - in particular, with focus on what is relevant in relation to the competences of the teachers.
- Their possible concrete experience (or practice) with respect to teacher training.
- Their views on (within their frame of experience), what should be qualified/sustained in relation to:
    A. non-virtual teachers becoming new virtual teachers
    B. established virtual teachers improving their competencies as virtual teachers (including considerations of national and cultural contexts).

Methodologically, the idea here is to use a kind of dialogic approach. An approach, which - as emphasized in the Denmark influence map in D3.2 *Influence Maps* - adds a qualitative experience-based perspective in the shape of a variety of experiences, which can then be related to theory and literature.

As a consequence, this chapter presents and discusses experience relevant to teacher training from three VISCED partners. Essentially, this part is meant as an experimental attempt at uncovering issues relevant to teacher training respect of DE from a narrative approach to professional experience.

7.1 Sweden

7.1.1 Background

In Sweden there are only four pure virtual schools due to laws. The schools are Värmdö Distans and Korrespondensgymnasiet for upper secondary, Sofia Distans for secondary school and NTI for adult education (upper secondary level). [1]

Method

Värmdö Distans: Interview with Åke Lindgren (Distanschef at Värmdö Gymnasium) 19/12-2011 and two teachers Peter Almassy and Anna Häll at the same visit.

Sofia Distans: Sent questions by email to Ronny Karlsson (Chef at Sofia Distans). He answered the questions 7/12-2011

Karlstads University: Interview through Skype with Dan Åkerlund (Lecturer & PhD student Media and Communication Studies at Karlstad University) 13/12-2011. He studies how to use technology in school and have lectures for teacher students at Karlstad University.

The interview was based on the questions sent out by Elsebeth Sörensen from Aarhus.

1) Their experience with barriers and solutions concerning "virtualizations" of educational programmes - in particular, with focus on what is relevant in relation to the competences of the teachers.

2) Their possible concrete experience (or practice) with respect to teacher training.
3) Their views on (within their frame of experience), what should be qualified/sustained in relation to:

A. non-virtual teachers becoming new virtual teachers
B. established virtual teachers improving their competencies as virtual teachers (including considerations of national and cultural contexts).

7.1.2 Barriers and solutions

Both Dan and Ronny mentioned that the teachers in Sweden still use quite traditional methods. Ronny thinks that the teachers still want an ordinary class room structure, which means that the students have to learn at the same pace at a certain age and time, and that they have approximately between 6 and 8 one hour sessions/ subjects each day. In this kind of school the structures and the classroom situation will be more important than the individual qualifications. This leads to reduced

[1] only the furst three of these are currently represented in D2.3 *Interim List of Exemplars*

motivation, when the students can't command their own time, but are stuck in an organization. When teachers use technology is used they almost exclusively use some kind of presentation programme (such as Microsoft Power Point). This is also the conclusion of Kairos Future's most recent study of the use of technology in the Swedish schools. Dan points out that teachers still don't have the basic technical skills. Åke Lindgren at Värmdö Distans agrees in the above and adds the problem of how to motivate a student on the other side of the world through a computer. He thinks it's easier to motivate the student when you are in the same room at the same time than if you communicate asynchronic with text.

Solutions would be both technical and pedagogical education for teachers and pointing out the advantages for the teachers. Värmdö recruits all their teachers from their Gymnasium (non virtual) and tries to find the teachers who already know how to use the technology and want to be virtual teachers.

7.1.3 Experience with teacher training

Neither Värmdö Distans nor Sofia Distans has any experience with teacher training programmes. Dan Åkerlund does train teacher students and teachers in how to use technology in school and does studies. He is very critical of the new teacher training programme in Sweden now. From 2011 is that students now do not study any pedagogy during the first year of training except for one to two hours (in total year one) in the use of ICT. This is at Karlstad University.

7.1.4 To become a virtual teacher

There is a big need for education of teachers in Sweden, both in technology and pedagogy.

Non virtual to virtual

Åke Lindgren says there is no need for the universities to educate teachers for virtual schooling in Sweden and they will not do it. That is because it is illegal to have a completely virtual school in Sweden. You must have a special licence from the state and at the moment there are only for schools in the VISCED age range that have that licence. It affects at the most 1000 students. But all agree that the universities and högskolor must be better in teaching how to use technology as a pedagogical tool. Ronny at Sofia Distans says that these teachers have to think in new ways and do not get stuck in traditional ways and simulate the classroom in a digital area. They also have to have excellent skills in their subject.

Värmdö Distans recruit their teachers from within their own non-virtual school and takes care of their education in virtual schooling itself. They have written manuals of how to use different technologies and how to communicate with the students. They also have all the courses written down and share them with all the virtual teachers so the courses can evolve.

Raise competence of virtual teachers

It is important that the teachers learn to use different and new computer programmes, i.e. picture- sound- and video programmes so that they can improve the communication with the students. It must not be the most difficult or the most modern programmes all the time, but the teachers must have an interest in learning new things to make the communication and teaching more clear and easier for the students. Today almost every child has an iPhone so they can easily film their assignments in, for example, Physical Education, Needlework or Speech. It is important that the teachers continue to educate their skills regularly, both regarding their subjects and computer learning.

The teachers at Värmdö Distans meet once every week and discuss new and old methods. They share their experiences. In that way all the teachers improve as virtual teachers.

Because there is no official education for non-virtual teachers there is obviously any training for the virtual teachers in Sweden.

(Contribution from Mats Öström, ROSS Tensta Gymnasium, Sweden)

7.2 Finland

Recommendations for teacher training in Finland

7.2.1 Background

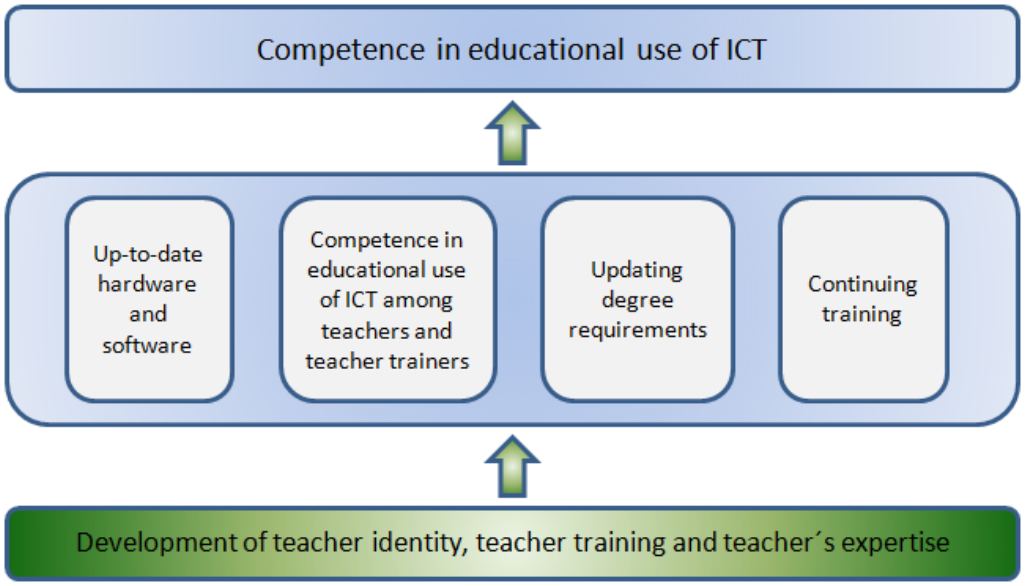
In Finland perhaps one of the biggest problems in ICT in education is the difference between schools and municipalities. Technological infrastructure requires great investments and maintenance is also a huge cost. Decision-making is based on political decisions and practices vary a lot depending on the municipality. Even though schools within a municipality can be equal, can differences between municipalities be huge. It also seems that the smaller the municipality, the smaller are the investments on technical infrastructure.

The ICT skills of new teachers vary greatly depending on which teacher training department they graduate from. Even now it is possible to graduate as a teacher without learning about the educational use of ICT and media literacy skills. In addition to new teachers, those already working at schools should receive continuous and diverse ICT education and education on pedagogical skills on using ICT in education.

Many of the best ICT in education practices and virtual schools are formed within advanced municipalities, innovative and often even self-learned teachers. Of course, one facilitating factor in Finland is the long distance between small towns so networking with other educational organizations is essential in order to be able to offer a wide enough course selection.

In the National Plan for Educational Use of ICT there are proposals for action in order to enhance ICT in education:

1. Up-to-date hardware and software to every teacher training department and teacher training school. Both technical and pedagogical support arranged so that implementation succeeds.
2. Degree requirements need to be updated in terms of educational use of ICT and media literacy education.
3. Teacher trainers' and student teachers´ competence in educational use of ICT has to be improved.
4. Make existing material available and exploit for example Ministries´ funding to improve educational ICT competence.
5. Basic education curriculum and teacher's training has to move towards educational use of ICT.



Kuva 1: Teacher training and pedagogical expertise

7.2.2. The Finnish school system and teacher training

Age	School	Teacher
0-6	Kindergarten and preschool	Kindergarten/preschool teachers

6	Optional preschool	Preschool teachers or classroom teachers
7-15	Comprehensive school, 9 years	Classroom teachers and subject teachers
16-	Upper secondary school, 3 years	Subject teachers
16-	Vocational schools	Vocational school teachers
19-	Higher education	Teachers with higher academic degree

Teacher training in Finland is arranged by universities and vocational institutes of higher education.

Pre-school teachers get a bachelor's degree in educational science, the extent of which is 180 credits (ETCS). This degree qualifies to serve as a kindergarten teacher and as a preschool teacher.

Classroom teachers get a master's degree in educational science (ETCS 300 cr). This degree qualifies to serve as a classroom teacher and as a preschool teacher.

Subject teachers get a Master's degree, the extent of which is 300 credits (ETCS). There are two possibilities to get in to the subject teacher education. The more common way is to start studying the subject at the university first and then later the pedagogical studies. After these pedagogical studies one is qualified to teach the subject in question. The other way is to apply directly to the subject teacher education. This direct selection to teacher education is getting more common, but so far it is only possible in few subjects.

Special-education teachers get a Master's degree in educational science (ETCS 300 cr). This degree qualifies to serve as a special-education teacher in comprehensive schools, and as a classroom teacher.

Vocational school teachers as a rule get a degree at a university or at a vocational institute of higher education, then they work for a few years, and after that they do the pedagogical studies at a vocational institute of higher education to qualify to serve as teachers.

7.2.4 Strategies to improve educational use of ICT in Finland

Both The National Board of Education (NBE) and the Ministry of Education and Culture have strategies and reports on improving educational use of ICT. Teacher education in Finland is responsibility of Teacher Training Schools. They have several joint projects on ICT in education and have also created a model to define ICT in education strategies for each training school.

Learning and competence 2020, Strategy of FNBE

The Finnish National Board of Education (FNBE) guides, monitors and develops education, training, teaching and learning. The vision of FNBE is that broad-based education and excellence guarantee a sustainable future, well-being and economic competitiveness. As critical success factors in fulfilling the vision are excellent expertise, motivating leaderships, committed personnel and effective guidance.

Strategic objectives at basic and general upper secondary education contain following statements on ICT (from both students´ and teaching personnel's perspective):

- **Basic education**: to enable efficient use of information and communication technology; to promote digital learning and to make efficient use of new learning environments; to develop the competences of teaching personnel.
- **General upper secondary education**: to utilise information technology in the matriculation examination and in the upper secondary school student assessment; to develop the competences of teaching personnel.
- **Vocational education and liberal adult education**: in the strategy there are no specific indications on ICT in education or in teacher training.

NBE states in its strategy that developing the competences of teaching personnel is one of the key factors to enable efficient use of ICT in education. The effectiveness of professional development for educational staff needs to be improved in order to enhance teachers´ opportunities to lifelong learning. Also co-operation and partnerships between education and scientific communities improve possibilities to adapt new educational technologies and learning environments.

ICT in Finnish Initial Teacher Education

ICT in Finnish Initial Teacher Education is a country report for the OECD/CERI New Millennium Learners Project "ICT in Initial Teacher Education". It was published in 2010 by the Ministry of Education and Culture. The goal of the project was to investigate the current status and to present recommendations for development in this area as well as actually implement national ICT strategies to teacher education. The study was on three levels: 1) strategy analysis on national level, 2) analysis of curricula, course descriptions and infrastructure and 3) experiences on actual learning situations.

In general it seems that ICT in teacher education is a growing element but changes are very slow, especially because there are no direct transfers from strategies to practice. Also ICT in teacher education has not been systematically focused on various strategies, and even when it is, strategies only have on minor influence on the adaption. Written strategies clearly are not enough, but is has to be ascertained that they are actually implemented to practice.

Often big problems on implementing ICT in teacher education seem to be that there are not enough resources, technical or pedagogical guidance and support and even the actual school buildings could

need renovating. Yet the biggest problem is seen on individual level: lack of time to concentrate on learning new technologies or do relevant research. In Finland this barrier is very clear because of the staff structure - teachers have more hours allocated to teaching and less to research.

Personal ICT competence of the teacher educators and mentors many times is not high enough to promote using ICT in teacher education. Educators do not feel confident enough to use ICT in classroom. Also lack of advanced ICT tools (digital camera, whiteboard, pedagogical support) were seen as obstacles. And finally, actions are too often depending on individuals instead of strict rule that should be obeyed.

Teacher training recommendations in this report have been divided into five categories, under which key factors have been listed. The recommendations from this report are:

1. Strategy level

- better coherence of different strategies, for example general teacher education and ICT strategy;
- knowledge based research, including quantitative and qualitative data on both the use and competence of ICT as well as evaluation of strategy implementation;
- implementation of strategies should be bottom up, rather than top down;
- strategies should always include an implementation plan;
- in this dynamic situation, priorities should be made clear.

2. Teacher education programme

- strategies should include an implementation plan;
- clear goal descriptions on ICT use in learning, motivation and a focus on doing;
- ICT has to be integrated to all courses and practices in teacher education and supporting activities have to be offered. There has to be a clear plan on how ICT is expected to be implemented in education;
- ICT should prove to be emphasizing activity, intentions, reflection, collaboration and interaction, amongst other motivation factors;
- learning programmes and courses need to describe ICT use and skills clearly as concrete learning outcomes;
- student teachers need to see that the use of ICT facilitates reaching goals for learning;

- teacher trainers need to use social media to facilitate information on learning communities and others.

3. Staff development programmes for teacher educators and mentor teachers

- implementation plan of strategies on how they are linked to staff development programmes;
- a clear staff development programme containing co-operative and communication aspects; reflection; starting from individual knowledge level; developing technologies, personal and pedagogical skills at the same time; collecting evaluation data; systematic and continuous development programmes; facilitate creative and innovative atmosphere.

4. Research and development activities

- strategic implementation plan should contain a plan for implementation on research and development activities;
- new innovations to teacher education need to be researched and the outcomes of research should inform development work;
- local innovations and research results need to be spread locally, nationally and internationally;
- internal co-operation has to be maintained and strengthened.

5. Monitoring and evaluation of the strategy implementation

- monitoring and evaluating strategy and its implementation yields evaluation data which should be reviewed before the next strategy is developed.

ICT in education strategy for Teacher Training Schools in Finland

eNorssi is a Finnish co-operation network for teacher training schools and teacher educators. There is also an eNorssi www-portal (www.enorssi.fi) that is being developed to support teacher education in practice. Teacher training schools and institutions, SOOL (Teacher Student Union of Finland) and the Ministry of Education and Culture are all participating in this development work.

In January 2009 eNorssi published an ICT in education strategy for Teacher Training Schools. Teacher training schools have an important role in the Finnish teacher education. Therefore joint goals and plans are targeted to guarantee high-quality teacher education, versatile learning environments and positive learning results both in teacher education and at schools. Teacher education quality, constant development and collaboration are also key points of the strategy. The strategy work was done collaboratively and it was open to all parties, using a wiki platform.

The vision for teacher training schools states that effective and innovative use of ICT is part of teacher training schools´ curricula, teaching and learning and apprenticeship. Research and development within new learning platforms and methods, technical applications and web based services should be constantly done and reported. During apprenticeship future teachers should learn to use ICT in education technically, pedagogically, socially and ethically correctly.

The vision also states that in each teacher training school ICT equipment must be adequate, new techniques well planned and unnecessary purchases avoided. There should be good technical and pedagogical support for teachers, teacher students and students. ICT should support co-operation between school, home and other interest groups.

ICT in education should be included in the curriculum of each teacher training school, making ICT skills and aims clear for future teachers. During the apprenticeship period, teacher training should contain common ICT skills, pedagogical ICT skills and skills to organize distance learning courses.

According to eNorssi, emphasis on teacher training is and should be embedded in updating (career) training. It is seen that teacher training should form a continuous trend, where basic teacher training, a new teacher first career steps and updating training form a whole where continuous personal development and growing expertise happen naturally. Increasing and developing distance education increases pedagogical challenges as well as highlighting the need to collaborate with other teachers, schools and interest groups.

Continuous training is an important way to support inquiry-based and phenomenon learning, collaboration as well as adaption of new techniques and platforms. Joint projects should support continuous training and also create motivation to further education.

ICT in teacher training should:

- improve readiness (and willingness) to use distance and eLearning techniques with good-quality skills;
- improve readiness to take new active and collaborative work methods and learning environments into teaching;
- improve both technical and pedagogical ICT skills and distance teaching skills;
- improve teachers´ skills to face students with special educational needs;
- develop teachers´ skills to teach ICT and Finnish information society elements both in a multicultural environment and to foreign students;
- improve readiness to give good-quality media literacy education.

There should be regular surveys for teachers testing their ICT skills. Results of these surveys should form a base when planning updating training. Teacher training schools and organisations should work closely together when planning and arranging updating training.

7.2.4 Summary of teacher training recommendations for Finland

ICT in education and teacher training has been under discussions and in strategies for more than ten years. Researches and surveys have been done, reports have been written, project funding have been used but clear strategic implementation to teacher education and from there on to teaching has not yet happened.

At the moment there should be a clear national strategy and funding which would make sure that all teacher training schools and organisations are at the same level. Then teacher educators´ ICT skills in each training school should also be in a uniform level and co-operation between teacher training schools, universities and other interest groups should be continuous and natural.

Development work should be based on research work and research should be both national and international. Innovative teachers have to be encouraged, information on good projects and methods need to be spread widely - locally, nationally and internationally.

Each strategy needs also an implementation plan. Strategies and implementation plans have to be monitored and evaluated. New strategies can happen only after the previous has been properly implemented.

Curricula in teacher education as well as in basic education have to be updated. Curricula have to correspond to modern world's information society requirements. Updating curricula also need an implementation plan and follow-up points.

7.2.5 References

- Strategy of Ministry of Education and Culture http://www.minedu.fi/OPM/Julkaisut/2010/strategia_2020.htm
- Learning and Competence 2020, Strategy of the Finnish National Board of Education, 2011
- National Plan for Educational Use of Information and Communications Technology, 2010
- ICT in Finnish Initial Teacher Education: Reports of the Ministry of Education and Culture, Finland 2010:25
- The school of opportunities - towards every learner's full potential, FNBE 2011

- ICT in education strategy for Teacher Training Schools in Finland, http://www.enorssi.fi/opetus/tvt-strategiat-1/Harjoittelukoulujen_TVT-strategia_2009_2012_VALMIS.pdf
- CICERO Learning -selvitysraportti: tieto- ja viestintäteknologian hyödyntäminen opetuksessa ja opiskelussa, 2008, http://www.cicero.fi/sivut2/documents/CICERO_TVT-selvitysraportti.pdf
- Kankaanranta & Puhakka, 2008: Kohti innovatiivista tietotekniikan opetuskäyttöä; kansainvälisen sites 2006 -tutkimuksen tuloksia, http://ktl.jyu.fi/img/portal/13823/d087.pdf

Other useful links

- Description of teacher education in Finland (http://www.oph.fi/english/education/teachers)
- Teacher Student Union of Finland - SOOL (http://www.sool.fi/sool/in-english/)
- Network for teacher educators at Teacher Training Schools (http://www.enorssi.fi/)
- eNorssi: http://www.enorssi.fi/
- School 3.1 - sharing good practices of collaborative media in education in Finland (http://koulu31.blogspot.com/)
- SlideShare: Kaisa Vähähyyppä FNBE: http://www.slideshare.net/AnneBurman/tvtn-opetuskytn-linjauksetkaisa-vhhyypp
- SlideShare: Heikki Kynäslahti: http://www.slideshare.net/AnneBurman/palmenia-heureka-kynaslahti

(Contribution from Merja Sjöblom, Tieke, Finland)

7.3 England

A major barrier to virtual schooling in the UK is the way classes are funded. Online courses are funded in the same way as face-to-face classes and by this crude measure they often appear to be more expensive because they tend to be more time-consuming, demanding 1-1 attention for the students rather than dealing with a large group at once. When the Sheffield College performed an audit of which courses were most profitable, the Online College came near the bottom of the list. What is not usually taken into account is the huge savings in terms of classrooms, buildings, facilities, heating, etc. When these cost savings were applied in the case of Sheffield College, the online courses moved well up the list of profitable courses.

Online courses also tend to look worse in terms of retention rates when compared to full-time, face-to-face classes, but this fails to take into account the different kinds of students that are attracted to online learning: part-time adult learners are always more likely to drop out of courses than 16-18 year-olds in full-time education. The Sheffield College experience is that although retention rates may be lower, the success rates of those students who complete courses is far higher than they are for conventional students. The courses are also more accessible for students with special needs.

The real money for colleges and 6th forms in the UK comes from full-time students in the 16-18 age range. However it seems likely that, if current funding arrangements persist, colleges will develop part-time online degrees which they will be able to offer at a cheaper rate than universities.

One of the biggest barriers to teachers developing a competence in online teaching is that blended learning is not properly acknowledged in funding. So teachers in face-to-face classes who provi de online tuition or learning materials are doing so without any being paid for it. Class contact time is only recognised when face-to-face, which makes it difficult for teachers to make a gradual transition to online delivery, developing the requisite new skills on the way. This also makes it difficult for teachers to know if they might be suited to online teaching, so they are reluctant to take a leap into the unknown of online teaching.

One solution to this barrier is **LeTTOL** (Learning to Teach Online: http://www.online.sheffcol.ac.uk/index.cfm?pid=96dd63e2-eccb-4a62-96d9-b89f561b71f4) an online course that has been delivered by Sheffield College since 1997 to almost 3000 learners. Because it is delivered online, teachers are able to experience first-hand what it's like to be a student on an online course, developing empathy for learners' needs. Students learn how to communicate online and manage forums, with an emphasis on making students feel that they belong to a vibrant community which rewards online activity. To tackle the problem of retention, there has to be a particular emphasis on maintaining student motivation, promoting interactions and providing explicit instructions to guide the studying and learning process, taking account of the fact that the kind of instant clarification available to face-to-face students may not be available. Formative feedback is also critical to reassure students that they are on the right track.

(Contribution from Nick Jeans, SERO, UK)

7.4 Discussion of Experience Based Perspectives on teacher Training

The marriage of teachers, innovation and ICT will only occur when ownership is taken by teachers of their own future, a bottom-up approach, to effective, invisible, soulful and transformative

integration of ICT in the daily lives of all educational institutions. Change permeates all aspects of life and the only thing to fear in this marriage is fear itself. No computer will ever replace an innovative teacher!

Outdated Model	**21st Century Model**
Students are passive learners throughout their *entire* educational experience.	Individualization will be enhanced using networked personal workstations.
Collaborative work is not valued.	Team learning will be encouraged using collaborative software tools. E.g. email, bulletin boards, chat, net conferencing
Teachers are assumed to be omniscient.	Teachers will become guides to student learning through the use of networked experts.
The course content is stable.	Networks and new software publishing tools will allow us to adapt to rapidly changing subject matter content.
The course is homogeneous.	Diversity of interactions - who is doing what for what reasons- will become the norm replacing the homogeneous 'one size fits all' approach to education.

Education models adapted from information in Lagowski, 1999.

One very persistent feature of online teaching/learning is the challenge of securing participation in online teaching/learning.

Summing up, what can we say about innovation and collaborative aspects of enhanced quality in teaching and learning as a result of implementation of ICT? - e.g. about teaching models emphasizing student-student collaboration and student-teacher collaboration, innovative teaching-learning?

We may list the following issues as strong elements in the process of supporting pedagogical innovation and change in teacher/leader behaviour in online teaching and learning processes:

- Leadership guided by vision and insight;
- Access to qualified and on-the-spot technical support for teachers implementing ICT in their teaching;
- Equipping teachers with equipment – and a requirement to use it;
- Space and time for teachers to initiate and explore;
- Incorporate student collaboration in the use of ICT in the teaching and learning processes;
- Differentiation and an active participatory learning approach;
- Leave teachers with a considerable amount of freedom to take initiatives and practice new pedagogical ideas;
- Good ICT skills are important, but does not automatically push for pedagogical innovation using ICT.

As educationalists and researchers situated in Europe, we must be ready to inform European educational policy makers of visions, identified qualitative practices of implementation of ICT in education, and of the pedagogical and learning theoretical rationale, in order to be able to indicate the most fruitful paths of educational policy to be followed, at all educational levels, in the future.

From the perspective teacher education, what are the key issues that seem to be decisive for the level of innovative success? What are the pertinent factors in terms of what it takes to optimise the probabilities of innovation and change at the pedagogical and methodological level? Or, phrased differently, how does this investigation inform European educational policymakers in terms of characteristics for best practice?

8 Part III: Recommendations for Teacher Training

An overall policy to enhance teacher competencies and skills in respect of e-learning and DE by addressing this directly and specifically in the curricula of teacher education is called for and without a doubt an important policy change will be required in many countries.

Likewise, the institutional leadership role is crucial for developing, maintaining, and facilitating changes and development in pedagogy and overall strategies.

As discussed in chapter 4, institutional administrations have tended to focus on measurable and visible investments, rather than investing in more abstract concepts such as "knowledge sharing" and "pedagogical development", but history shows us that paying for a piece of hardware, or for a specific course, does not in itself or automatically lead to the investment being put to practical use, at least not in ways that tangibly lead to innovation or development of e-learning and DE practice.

In respect of the focus on e-pedagogy called for, this means that time - more than any other resource - but also other resources such as in-service courses, must be allowed for teacher training to take place and to take hold. Investments strategies that will take a "leap of faith" and invest in less tangible aspects of pedagogical strategies than hardware and courses (such as, time for knowledge sharing, time for developing new pedagogical designs, time for working in teams) are strongly called for in order to acknowledge the needs for further development of successful DE.

The questions of policy recommendations and recommendations for leaders will be addressed in separate reports in the VISCED project. But before moving on to the specific recommendations for teacher training it remains important to stress that no political or institutional vision will come true without allowing time, money or resources for the intended developments.

8.1 Technology use and skills

Training should be provided in basic technological skills whenever teachers have to use technologies that are new to them.

But considering that technical expertise is a field of its own with different educations qualifying for a row of sub disciplines (such as network and system administration, programming, IT security, web design, multimedia design etc.), a teacher of any other discipline; say history, mathematics, or literature - cannot within reason be expected to master technology at an expert level. This is simply not his or her field of choice.

Therefore, courses in technology use should be offered to teachers as needed, but the focus should clearly be on qualifying the teacher for average user skills on the same level as, but not necessarily surpassing the user level necessary for the students.

8.2 Success Factors for Teaching and Learning in Virtual Spaces

Teacher training should have a clear main focus on qualifying technology uses in developing or engaging in new pedagogical practices.

A common factor underlying all observations presented in this report is that digital communication and media present users - teachers and students alike - with possibilities, challenges and work forms different from physical face to face teaching and learning contexts. As quoted from Ferdig et. all in the beginning of chapter 5, "*The skills needed for teaching in an online learning environment support an educator's functions and come at the point of intersection for pedagogy, technology, and content (...). The selection and coordination of pedagogy, technology, and content is a primary task for educators in order to provide students with quality online learning opportunities.*"

Teacher training for DE teaching should be directed towards this mainly pedagogical goal, and can be implemented in a number of ways:

8.2.1 Courses in e-Pedagogy

Where possible, and as far as teachers welcome the opportunity, external courses focusing directly on development of e-pedagogical skills is an obvious way to enhance and qualify the practices of online teachers.

However, it is worth considering that a course alone will not guarantee successful implementation of new knowledge and skills, and also that single teachers following courses will not have access to the level of reflection and relevance as in a course for several teachers with shared interests, e.g. from the same institution, or representing the same or related disciplines.

In-service or supplementary courses should be **Online** courses or knowledge sharing forums trying the very means and approaches the teachers envision for their students. This will lead to improved understanding of learning processes virtual spaces, and will support development of the individual teacher's e-pedagogy skills better than "hands on courses" using specific technologies.

If possible, teachers should be offered external courses with peers or colleagues with whom they have a shared and vested interest in developing specific areas of teaching and solutions for specific challenges in their common practices. A shared focus will also help the course content to remain clearly aimed towards a relevant outcome.

In order to make the most of a course, the teachers that attended it should be given allocated time to a) integrate new methods and ideas in their own practice, and b) share new knowledge and perspectives with colleagues that did not attend the course. If not, little or no gain can be expected from external courses.

8.2.2 Development Projects

As observed in chapter 5.2 an important and valuable approach to teacher training can be found in the "Swedish model", where teachers are given allocated time to develop and participate in projects aimed at developing content, new methods, or integrating technologies or new uses of technology relevant to their own practice, typically in collaboration with technicians, programmers, and/or e-learning units.

This approach is motivating in acknowledging the teacher's expertise and personal ownership of his or her own perspective and focus, and ensures that the teacher has time necessary for working systematically towards developing satisfying and promising solutions.

As pointed out in Heilesen et. al. (2007) teachers who have participated in such development projects can become advocates not only of new practices, but also for other teachers to make use of the possibilities supported by active collaboration with an e-learning units or similar.

8.2.3 Support for Knowledge Sharing

Support for knowledge sharing in the institutional culture and with allocated time is an aspect of teacher training which is relevant to the questions of time for developing e-learning solutions and methods, as well as to share and integrate knowledge gained from course or project participation, as well as from the individual teachers' daily practices.

Knowledge sharing cannot be expected to happen automatically by simply encouraging it verbally, or by having content management systems at hand. Knowledge sharing is nurtured through active support, especially by allocating time for it.

It is recommended to arrange knowledge sharing days or events, where teachers teach other teachers, and where the pressure of daily tasks are out of the way. Knowledge sharing days in physical sessions are recommended if possible. The focus of knowledge sharing days should lie in sharing and discussing personal experience and ideas, and therefore technology should not be involved more than appropriate or necessary: knowledge sharing among DE professionals should result in technology use rather than depend upon it.

One of the ways to facilitate or nurture a knowledge sharing culture and collaboration towards development of e-pedagogy could be through teachers working in teams and/or peer supervision.

Teacher teams working directly together on the same courses can better handle technological issues and more importantly, unforeseen pedagogical issues. Solutions and outcomes will be shared and integrated in the team as they are developed and tried.

Peer supervision is an alternative approach, but teams will be more directly motivated towards mutual support in finding mutual solutions.

8.2.4 Self evaluations and Student Evaluations

As in all other educational contexts, DE teachers can improve and develop their methods by evaluating and reflecting upon their own practice and course designs, and by getting significant input from students through well structured student evaluations. Self and student evaluations may well lead to new insights pointing towards better solutions for specific issues.

The best results of evaluations will obviously be developed in knowledge sharing cultures where new ideas and solutions may prove relevant to more than one teacher, and where discussions of feedback patterns may also lead to motivation for specific teacher training courses or other initiatives.

A suggested checklist for this purpose is offered in the Appendix. It is directly based upon the observations in course design presented in chapter 6.2, and should be seen as an inspiration where additional or alternative questions can be inserted in order to better fit specific contexts.

8.3 Additional Suggestions for Teacher Training Based on VISCED Partner Experiences

Integration of ICT and teacher education should *lead to a real change in practice and innovation in teachers and teaching and learning methodology* or *alterations of teacher authority, teacher-student roles and power relationships* within the learning processes.

As mentioned earlier, the ethos of all education is to educate individuals to become educated global citizens able to adhere to democratic principles, processes and techniques in the effort of creating a global society built on collaborative knowledge building dialogue. However, we need to be conscious of the characteristics of global democratic citizenship in order to uncover and construct educational processes, which work towards this ideal. The characteristics include such skills as actively listening to others, reforming one's own position, and being able to formulate and put forward for discussion and dialogue new positions.

The teacher is still "in control". A more established, conscious and possibly theory-informed strategy for pedagogical innovation is wished for.

8.4 Concluding remarks

The suggestions for teacher training are concerned with the pedagogical use of digital media and virtual spaces, and thereby all centered on questions of teacher roles and attitudes towards course and task design, and towards the leadership role in respect of the students.

This calls for attitude changes from teacher roles established in traditional classroom and lecture room settings; changes which can hardly be forced or taught, but which are inherent in understanding interactive and online media, where any user - whether teacher or student - will expect a level of personal control and ease of access that is strongly different from the one way communication in mass media ... or in a traditional lecture.

The crucial factor underlying the observations and suggestions laid out in this chapter lies in understanding online media, and thereby understanding their differences in potentials and limits from physical educational contests.

Future research, e.g. from closer studies of exemplar virtual schools identified in the VISCED project may lead to specific knowledge of best practices in DE offers of high school, vocational training, and other DE initiatives targeted at young people, that can be identified as pointers for teacher training that can further help teachers to understand, develop and integrate appropriate "virtual practices" in their work as online teachers.

9 References

Barbour, Michael (2009): Today's student and virtual schooling: The reality, the challenges, the promise, Journal of Distance Learning (2009) Volume: 13, No. 1, Pages: 5–25; http://www.michaelbarbour.com/research/pubs/jdl-2009.pdf

Barbour, M.K. & Reeves, T., 2009. The reality of virtual schools: A review of the literature. *Computers & Education*, 52(2), pp.402-416; http://linkinghub.elsevier.com/retrieve/pii/S0360131508001450

Brief Report from Thematic Working Group TWG 5 on Assessment (2011): Assessment To Move Education into the Digital Age; http://edusummit.nl/attachments/session=cloud_mmbase+2375713/5_EDUsummIT_2011_assessment_expanded_brief_paper.pdf

Brinkman, S. (2011). Social kreativitet. Danskernes Akademi. http://www.dr.dk/DR2/Danskernes+akademi/Kommunikation_Medier/Social_Kreativitet.htm

Brown, A., Dawson, K., Sorensen, E. K., Bull, G., & Rodriguez, J. (2002). Planning to Develop an Intercultural Dimension for Teacher Education?. *Society for Information Technology and Teacher Education International Conference 2002*(1), (pp. 1022-1023).

Danish Ministry of Science, Innovation and Higher Education (2010): Denmark Ranking High in E-Readiness, http://en.fivu.dk/press/2010/denmark-ranking-high-in-e-readiness

Dirckinck-Holmfeld, L; Sorensen, E.K.; Ryberg, T.; Buus, L. (2004). A Theoretical Framework for Designing Online Master Communities of Practice. Networked Learning Conference, 2004.

Davis, N.; Eickelmann, B.; Patru, M., Schulz-Zander, R.; Dzvimbo, P. (2011): TWG1: Restructuring educational systems to move into the digital age; http://redactie.kennisnet.nl/attachments/session=cloud_mmbase+2377896/Edusummit2011_TWG1_extended_paper.pdf

Davis, N., Rose, R., & NACOL Research Committee and Working Group (2007): Professional development for virtual schooling and online learning; http://www.nacol.org/docs/NACOL_PDforVSandOlnLrng.pdf

Double, P. (2008): K-12 Online Teaching Endorsements: Are They Needed?, THE Journal 2008; http://thejournal.com/articles/2008/01/10/k12-online-teaching-endorsements-are-they-needed.aspx

Eickelmann, B. (2011): Supportive and hindering factors to a sustainable implementation of ICT in schools, Journal for Educational Research Online, Vol. 3, No 1 (2011); http://www.j-e-r-o.com/index.php/jero/article/view/99/107

European eLearning Forum for Education (ELFE) (2006): FINAL IMPLEMENTATION REPORT to the European Commission; http://www.elfe-eu.net/files/28/final_report.pdf

Ferdig R. E.; Cavanaugh, C.; DiPietro, M.; Black, E. W.; Dawson, K. (2009): Virtual Schooling Standards and Best Practices for Teacher Education, Journal of Technology and Teacher Education (2009)Volume: 17, Issue: 4; http://florida.academia.edu/CathyCavanaugh/Papers/147473/Virtual_Schooling_Standards_and_Best_Practices_for_Teacher_Education

Harlung, A. (2003): A Rhetorical Theory on Computer Supported Collaborative Learning (Da.: En retorisk forståelsesramme for Computer Supported Collaborative Learning), Aalborg University 2003, http://projekter.aau.dk/projekter/files/6141458/asger%20harlung%20-%20en%20retorisk%20forst%C3%A5elsesramme%20for%20cscl.pdf

Harlung, A.; Fjeldsted, S.; Lund-Larsen, M.; Kølsen, C. (2007): "Status of IT Integration in Short-cycle and Medium-cycle Higher Adult Vocational Programmes" (Da.: Kortlægning af it-integration i undervisningen på kvu og mvu) (co-author), Danish National Center for e-Learning 2007; http://avendoc.advsh.net/vismateriale.asp?Rediger=5&Skole=adv&materialeID=idcaZQbsd47A

Harris, D. N., & Sass, T. R. (2007). The effects of NBPTS-certified teachers on student achievement; http://www.nbpts.org/resources/research/browse_studies?ID=139

Heilesen, S. (2007): E-learning in the organisation (Da.: E-læring i organisationen), presentation at a seminar on "Future Strategies for E-learning" (Da.: Fremtidens e-læring), held at Center for IT and Learning (Cil), Aarhus University, September 2007 (http://www.cil.au.dk/index.php/arrangementer/4-cilarrangement/49-seminar-fremtidens-e-laering). Slides from presentation at: http://www.cil.au.dk/documents/20070924_FremtidensElaering_SimonHeilesen.pdf (DATO ???)

Heilesen, S.; Jónsson, G.;Randrup, B. (2007): Developing ICT Competencies in Teaching and Communication at RUC (Da.: IKT-kompetenceudvikling inden for undervisning og formidling på RUC), Roskilde University 2007, http://hdl.handle.net/1800/2691

King, L. H.; Williams, J. B.; Warren, S. H. (2011): Preparing and Supporting Teachers for 21st Century Expectations through Universal Design for Learning, Delta Kappa Gamma Bulletin Vol. 77, No. 2 (Winter 2011): 51-55; http://www.dkg.org/atf/cf/%7B70E631E4-44B9-4D36-AE7D-D12E4520FAB3%7D/3-2011-WINTER%202011_MORALITY%20IN%20EDUCATION-WEB.PDF

Lagowski, J. J. (1999). The role of distance learning in chemical education. *Pure and Applied Chemistry*, *71*(5), 845-850.

Mason, R. D. (ed.) (1993). *Computer Conferencing: the Last Word*. Beach Holme Publishers, Victoria, Canada.

McArthy, S. A. (2009): Online Learning as a Strategic Asset. Volume I: A Resource for Campus Leaders. Results of a National Faculty Survey, Part of the Online Education. Benchmarking Study Conducted by the A♦ P♦ L♦ U-Sloan National. Babson Survey Research Group. http://sloanconsortium.org/publications/freedownloads#Publications

Pedersen, O. K. (2011). Dannelse, Uddannelse og Grundtvig. Danskernes Akademi. http://www.dr.dk/DR2/Danskernes+akademi/Kultur___Sprog/Dannelse_og_uddannelse.htm

Russell, G., 2006. Online and virtual schooling in Europe. European Journal of open and distance and elearning; http://www.eurodl.org/materials/contrib/2006/Glenn_Russell.htm

Rice, K., & Dawley, L. (2007). Going virtual! The status of professional development for K-12 online teachers; http://edtech.boisestate.edu/goingvirtual/goingvirtual1.pdf

Schiefner, M. (2011): Digital Critical Literacy in Teacher Education – Findings From a German Research Project. 17th Annual Sloan Consortium (Sloan-C) International Conference on Online Learning, Nov. 9, 2011. Florida. http://sloanconsortium.org/conferences/2011/aln/digital-critical-literacy-teacher-education-findings-german-research-project

Seaman, J. (2009): Online Learning as a Strategic Asset. Volume II: The Paradox of Faculty Voices: Views and Experiences with Online Learning. Results of a National Faculty Survey, Part of the Online Education. Benchmarking Study Conducted by the A♦ P♦ L♦ U-Sloan National. Babson Survey Research Group http://sloanconsortium.org/publications/freedownloads#Publications

Searson, M.; Laferriere, T. ; Nikolow, R. (2011): Barriers to Successful Implementation of Technology Integration in Educational Settings; http://edusummit.nl/attachments/session=cloud_mmbase+2375768/7_EDUsummIT_2011_essential_conditions_expanded_brief_paper.pdf

Sorensen, E.K., Jedeskog, G., Ó Murchú, D. (2005): Teachers and Innovative Use of ICT – A Marriage Searching for Quality. Presented at the *Second ELFE Conference in the European eLearning Forum for Education and EU-Union Policy on Use of ICT in Schools*, held at Comwell Borupgaard, Copenhagen, Denmark, 21-22 November 2005.

Sorensen, E. K. (2002). Part of the Online Teachers Curriculum: Designing for Collaborative Knowledge Building Online, in: *Proceedings of the conference of Society for Information Technology & Teacher Education 2002* (SITE 2002), Nashville, USA.

Sorensen, E. K. (2000). Interaktion og læring i virtuelle rum, in Heilesen, S. B. (ed.) *Universiteter i udvikling*. Samfundslitteratur, København

Sorensen, E. K. (1997). *Learning in Virtual Contexts. Navigation, Interaction, and Collaboration.* Ph.D.-thesis. Aalborg University. Denmark. ISBN 87-89701-12-7

Sorensen, E. K. (1996). *Learning Online through Linguistic Interaction.* COSTEL, Comett Scientific Report. In *Innovation in Teaching and learning: An International Journal for the Critical Practitioner,* Vol. 2, no. 2. Bradford, UK: MCB Press Limited. (pp. 12-17)

Sorensen, E. K. (1995). Kommunikation og læring i den virtuelle skole (Communication and learning in the virtual school). In *KvaN - Pædagogiske tidsstudier (Pedagogical time studies)*, no. 42, 1995. (pp. 29-44).

Sorensen, E. K. (1994). *Qualification of Teachers for Distance Education. A Preliminary Investigation of Initiatives in the Nordic Countries.* Report, Aarhus, Denmark: UNI•C.

Twining P.; Albion, P.; Knezek , D. (2011): Report from TWG3: Teacher Professional Development; http://redactie.kennisnet.nl/attachments/session=cloud_mmbase+2377897/3_ExpandedTWG3Report_final.pdf

Voogt, J.; Erstad, O.; Mishra, P. (2011): TWG6: 21st century learning; http://edusummit.nl/attachments/session=cloud_mmbase+2375726/6_EDUsummIT_2011_21st_century_learning_expanded_brief_paper.pdf

Ward, L. & Parr, J. M. (2011): Digitalising our schools: Clarity and coherence in policy, Australasian Journal of Educational Technology, Vol. 27 No. 2, 2011; http://www.ascilite.org.au/ajet/ajet27/ward.html

Wenger, E. (2000). *Communities of Practice. Learning, Meaning, and Identity.* Cambridge University Press, Cambridge.

Appendix : E-Pedagogy Checklist

The following checklist is based upon the eight observations derived from observation studies conducted by Asger Harlung in 2003 and described in chapter 5.2 in the VISCED report, "Recommendations for Teacher Training" by Elsebeth Sorensen and Asger Harlung.

Suggestions for use:

1) Teachers can evaluate their own pedagogical distance education designs using the list.

2) Teachers can ask students to evaluate the course design using the list.

3) Teachers consider ways to improve points that are found to be lacking in their own and/or the students' opinion. Discussing problems identified with colleagues is strongly suggested, as well as seeking courses or institutional support in order to develop solutions if a specific problem is shared in the teacher staff.

Please notice that for distance education in the modern form of virtual schooling, technical support for students as well as teachers is more or less a sine qua non, but that teachers cannot within reason be expected to add the level of technical expertise necessary for providing actual support to their qualifications. Technical support should be available from separate IT specialists, e.g. in an IT department, or an e-Learning unit.

If the suggested evaluation form is used at an institutional level in the present, or a modified form, a question as to whether technical support (and possibly also technical features in general) is sufficient should be added.

E-Pedagogy Checklist

For evaluation and self evaluation purposes. Is using or distributing the checklist, please refer to

Please mark "Yes" or "No". Comments are optional.

If a question cannot be answered with" yes" or "no", for example because a course was offered to a single person wherefore no student collaboration was possible, please note "No answer" and explain if needed under "Comments".

Criterion	Yes	No	Comment
(Virtual space awareness) Tasks and expectations for students are clearly defined and an overview of tasks, expectations, and reasons for the design has been presented to the students.			
(Teacher role - communication) The teacher role in the course has been a "mentor" role, helping the student(s) to keep track of the tasks at hand rather than providing or suggesting specific solutions.			
(Teacher role - media use) The teacher(s) have used the media for the course in the same manner as was expected by the student(s). For example by writing directly in ongoing debates or documents, rather than sending/uploading separate documents or items.			
(Coherence and consistency) Different tasks and disciplines have been presented to the student(s) in a consistent manner, where the same expectations and work patterns applied, or where necessary differences were clearly introduced and explained.			

(Peer collaboration) Peer collaboration between students (if more) has been integrated in the task design, e.g. as group tasks, or by maintaining online "class discussions".			
(Task navigation and transparency) All tasks and relevant resources are well described and easy to find on the online study environment.			
(Intentions and goals transparency) The goals of all tasks are well described and easy to find in the online environment, for example in a full plan for the entire course.			
(Meta level support) Supplementary "spaces" for study relevant information, work, and questions are facilitated apart from the tasks at hand. For example in support of "administrative questions", "practical questions", "questions about tasks or study content", "technical support", "group work spaces".			

Possible relevant additions, but not directly relevant for the teachers' methods and pedagogy:

- Availability of technical support is satisfactory.

- Quality of technical support is satisfactory.

- Technical possibilities when navigating or working in the virtual learning environment are satisfactory.

- Possibilities for implementing or imbedding external media are satisfactory.