eCompetence Development Measures for Faculty in Higher Education - A Comparative International Investigation

Dissertation

zum Erwerb des akademischen Grades Dr. phil.
im Fachbereich Bildungswissenschaften
der Universität Duisburg-Essen
Standort Essen

vorgelegt von
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geboren am 31. Mai 1969 in Viersen

Tag der mündlichen Prüfung: 7 November 2007

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1. Aim of Study

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1. Introduction - Research Project, Content and Relevance

Aim of this study is the comparative analysis of organisational concepts and measures that universities implement to develop individual eCompetence of their academic staff members.

eCompetence is treated in the current scientific discussion as one element in the wider strategic objective of universities to sustainably implement eLearning into their institutional structures and work processes. The study develops a theoretical framework for the concept of eCompetence, and it investigates principles for the methodical design of competence development measures for academic staff. This theoretical framework is validated by the comparative analysis of ICT-related competence development concepts and measures in a number of universities. A specific research focus of this study is placed on innovative competence development concepts and measures which go beyond traditional training for academic staff in universities.

This study makes two *key assumptions* on technology-driven innovation in higher education. First, it assumes that a university as organisation can only successfully steer and implement technology-driven innovation, if its individual members are aware on the need to adapt their work culture to the changing environment, and if they make persistent use of the potential of ICT. The human factor is one important aspect within technology-driven innovation in higher education. Faculty staff plays a decisive role in the strategy of a university to improve and to extend its educational services with help of technology, as academic teachers determine and manage most educational processes within the institution. Second, this study assumes that the development of new competences for academic staff is not primarily achieved by training programs for individual teachers, but relies on wider organisational contexts and conditions.

Faculties face a growing demand to offer a more flexible, technology-enriched course delivery. This demand derives from students, who develop a changing learning style, and it derives from university management, which urges for a reduction of costs and an exploration of additional income sources. This demand includes for academic teachers the pedagogical challenge to design innovative learning environments, which respond to the changing needs of technology-savvy students, and which apply ICT efficiently in order to extend the flexibility of educational services. To cope with these challenges, academic teachers need to enhance given and to acquire new competences that enable them to know and to judge why, when and how to use ICT in education. Individual teachers may develop these competences through self-directed, non-formal learning. But if a university as institution wants to act in an organised way to improve the range and the quality of its educational services, it has to define a coherent strategic framework for eLearning that includes the creation of adequate support units and measures which foster the development of ICT-related competences of its academic staff.

Chapter 1 - Aim of study

Based on recent findings in eLearning research, the study assumes that traditional or conventional training courses for teachers are not sufficient in scope and impact to generate the required ICT competences for academic staff members. Accordingly, this study aims to identify and to analyse innovative approaches for eCompetence development within universities. Elements of these innovative approaches can be, for example, a well-balanced combination of formal training courses and additional measures for non-formal competence development - measures, which are embedded into the immediate work environment of the individual teacher; or measures, in which academic teachers interact and develop ICT-related competences on-the-job or near-the-job in communities of practice, peer groups or networks.

This study builds on research which has been undertaken within the *European eCompetence Initiative*, a EU-funded project that has brought together 23 European and International higher education institutions. The project has identified activities and training programs within the participating universities, which aim to foster ICT-related competences of its academic staff. The empirical data, which has been collected in the project research, consists of: a database of effective practices to develop eCompetence; case study interviews with four selected universities, in which the eCompetence-related activities and programs are described and analysed in detail; a documentation of the project workshops that have taken place; and archival records, such as program descriptions and conceptual papers on specific staff training measures in the universities.

The introductory chapter presents the current state of research on the topic of eCompetence. The state of research breaks down the different levels, which embed the topic of eCompetence, and details its role as one component within institutional strategies to implement new technologies in a sustainable way into universities. Following the introduction (part A) and the research design (part B), this study is structured in two main parts. Part C reconsiders the theoretical elements which relate to the construction of a concept of eCompetence in the higher education context. Part D proves the theoretical assumptions, which are made on the concept of eCompetence and on innovative staff development measures for the use of ICT, through an analysis of the given empirical project data. In a final step, the results of the empirical data analysis are used in part E to revise the two key assumptions of this study, and to prove the theoretical assumptions within the concept of eCompetence. The concluding part of this study also presents questions and perspectives for further research on the topic of ICT - related competence development of academic staff in universities.

This study applies a qualitative research design. The methodology includes a desktop study of research literature and a systematic analysis and interpretation of empirical project data. Qualitative and interpretative research instruments are used to provide answers to the main research questions and to judge the validity of the key assumptions. The research design chapter includes the main research questions and describes in detail the methodical steps which are taken in each part of this study.

Chapter 1 - Aim of study

This study adds insights for the efficient management of human resources in universities, and it presents approaches for staff development measures which aim to foster a sustainable use of new technologies in higher education. The study results contribute to the discussion about strategic concepts and models for a sustainable integration of eLearning into universities, addressing in particular human resources managers and faculty developers in universities, as well as university leaders, chief information officers and change managers, who are involved in strategic eLearning decisions. The development of ICT competences for academic staff is one important element in strategic plans for organisational change and innovation in universities. Post-graduate training models for young researchers, who enter an academic career, as well as staff development measures for advanced academic teachers need to reflect the growing importance of competences and skills that relate to the proper understanding and application of the potential of ICT as one innovative factor in a changing higher education system.

2. State of Research

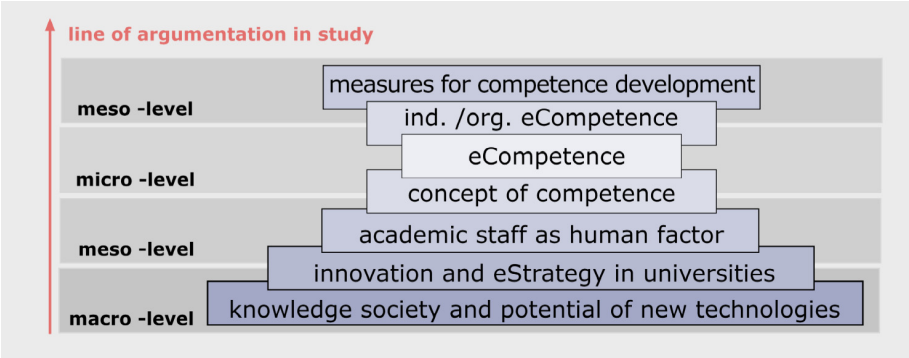
Content

2. State of Research

2.1. Introduction

This chapter debates the role of eCompetence in technology-driven innovation, which evolves in the wider field of society, and the impact of new and emerging technologies on the higher education sector; it outlines the relevant research which has been undertaken to understand and to model technology-driven innovation processes in universities; it describes the role of eCompetence development measures for academic staff, which are one important element in innovation strategies of universities; it presents the approach taken to define and conceptualise individual and organisational eCompetence; and it introduces the specific research focus, which is on university strategies that integrate individual and organisational eCompetence development in their portfolio of measures.

FIGURE: LINE OF ARGUMENTATION IN STUDY



As the terms *innovation*, *technology* and *technological innovation* are central for a containment of the wider research field and for the deduction of the eCompetence topic as main research subject in this study, this chapter starts with a clarification of these three key terms. From a sociological perspective, Rogers defines innovation as "*... an idea, practice, or object that is perceived as new by an individual or other unit of adoption*" (Rogers 2003, p. 12). This new idea, practice, or object leads to changes in patterns of human behaviour. Technology can be defined as a means or design for instrumental action in cause-effect relationships. Aim of the use of technology is to reduce the level of uncertainty within the achievement of desired outcomes. And technological innovation unifies the qualities of the terms 'technology' and 'innovation', describing the effect of new methods and mechanisms in specific domains on individual actors or social structures (Rogers 2003, pp. 12-15).

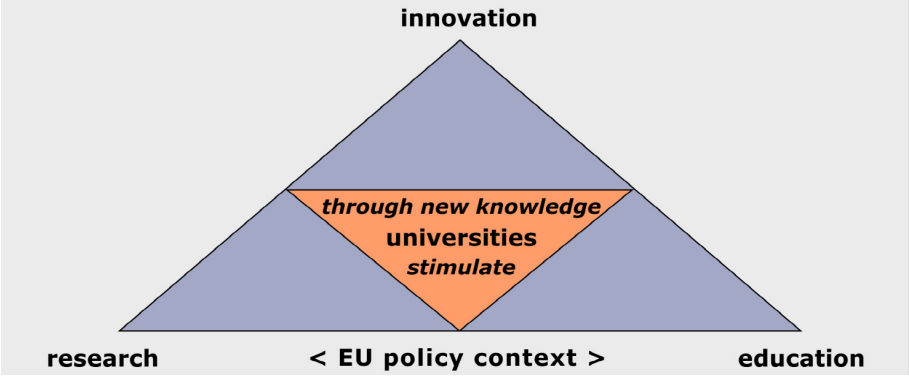
Rogers approach to define technological innovation remains at a quite abstract level. More headed towards its application in real markets, Samuelson & Nordhaus define innovation in economic terms as three distinctable processes: the introduction of a new and significantly improved product into a specific market, the introduction of a new production technique, or the development of a new market. All three innovation processes rely on research and development within science or business. Basically, we can distinguish between process innovation and product innovation. Process innovation stands for the application of engineering knowledge to existing production techniques. Product innovation describes the introduction of new or improved products in specific markets (Samuelson & Nordhaus 1995, p. 99). Accordingly, technological change or technological innovation can be defined as a continuous process of small and large improvements in production methods. Technological innovation improves given processes of production or leads to the development of new processes of production. This way, technological innovation results in a higher output from the same input into the production process (Samuelson & Nordhaus 1995, p. 43, 532-533).

2.2. Knowledge Society

Driven by technological innovation, Europe moves towards a post-industrial society, in which knowledge and research have been identified as key factors for its growth (EU Working Paper 419 2005; EU Communication 330 2005, pp. 5-8). The role of the university in societal innovation is thereby seen in the EU policy debate within the framework of the so-called Lisbon Strategy, which aims to raise Europe's competitiveness by a set of strategic objectives. These objectives are: to raise the capacity of the European Union to grow through knowledge, research and innovation; to make Europe a more attractive place to invest and work; and to create more and better jobs (Verheugen Speech 2005).

Universities play in particular in the first of the three mentioned Lisbon objectives a vital role. Science and research create new knowledge and academic teaching transmits this new knowledge to the next generation of students. In their combination, research and teaching are the core business of universities. New knowledge, which is applied in economic and social sectors, drives innovation forward. Universities influence societal and economic innovation through policy consultation and the creation and incubation of commercial spin-offs. The European Commission has drafted a '*knowledge triangle*' to illustrate the key areas in which universities act as stakeholders within the reform objectives of the Lisbon strategy. This knowledge triangle consists of the three poles education, research and innovation (EU Communication 152 final 2005, p. 2).

FIGURE: UNIVERSITIES AND THE THREE POLES OF THE KNOWLEDGE TRIANGLE



The 'knowledge triangle' can be interpreted as strong indicator for the ambition of the European Commission to stimulate and foster the higher education sector at the level of European policy-making as one important activity field for innovation. Higher education is regarded as a key influence area for the successful implementation of the Lisbon Strategy. Dynamic and efficient universities are essential to generate a progress in all three poles of the 'knowledge triangle'. In order to strengthen education, research and innovation, the European Union needs an innovative and effective higher education system (EU Communication 58 final 2003, p. 2).

The potential of universities to act as key resource for achieving the Lisbon policy goals is nonetheless weakened by fundamental reform processes which universities undergo themselves. Globalisation and technology - which are the twin drivers of the current change in society, increase both competition and cooperation between universities and they accelerate the pace of change in the higher education sector. In a broad picture, universities in Europe currently face a complex process of transformation within the system of higher education. They have to re-invent themselves from sheltered national institutions to global players which need to compete in an educational market for students, financial resources and reputation to be an excellent place for research and education. If universities want to survive in mid-range perspective, they have to sustain in this competition not only at national, but also at international level. Fundamental questions arise on the efficiency and legitimacy of the internal administrative organisation, as well as on the external presentation and the marketing strategy of universities. European universities need to cope with a whole set of upcoming challenges which they have to manage. Among these challenges for universities are: serious financial constraints, which are caused by decreasing public funding; insistent pressure to restructure its inflexible and overregulated internal organisation; a generational shift within the academic workforce; the task to improve administrative and educational services for students and faculties alike; and the emergence of entrepreneurial elements and market-driven factors which cause a growing commercialisation of higher education. This kaleidoscope of change patterns and innovation pressures on universities is extensively debated in models for new public management, which have evolved in organisational sciences (Birnbaum 2001, pp. 7-8; Enders 2002, pp. 69-71; Miles & Snow 2003, pp. 13-31).

Chapter 2 - State of Art of Relevant Research

To cope with the serious challenges they face, the responsible leadership and the main stakeholders within universities have to reflect on the impact of the change which globalised competition and the pervasiveness of new technologies bring into their institutions, and they have to ask how they can adapt existing organisational structures and work processes to the new demands and requirements within the higher education sector. Basically, universities have three essential functions in society: a research function, an educational function, and the function to connect research and education efficiently to the area of work and business. The impact of technology-driven innovation and globalised competition leads to a change in both research and education. Gibbons et al have postulated in their work a new mode of knowledge production, which has intensely coined the scientific discourse on the knowledge society, and underlined the urgent need to reform the traditional science system or to re-focus the norms of the higher education policy. Gibbons et al claim that a 'mode 2' of knowledge production is emerging. The set of social and cognitive practices in mode 2 are distinct from those practices, which until now have prevailed in science and society (Gibbons et al. 1994, pp. 3-11).

Within the conditions of the 'mode 2' of knowledge production, Gibbons et al assume that the distinction between research and education in the dual mode science system is gradually blurring. Research and teaching activities become ever more closely interconnected. Research does not remain any longer within the sheltered ivory tower of specific academic communities; instead, it is carried out closer to the context of its application in business and society. Due to the increasing complexity of modern reality, research questions gradually become more heterogeneous as opposed to remain homogeneous. Accordingly, research tends to be more and more a collective trans-disciplinary endeavour as opposed to remain a mono-disciplinary object for complentative (komplentativ) individual reflection. And the organisation of research does not remain confined within hierarchical structures and stable institutions, but unfolds in heterarchical structures and transient international networks. These qualitative and structural modifications in knowledge production generate deep changes within the established order of science and cause the necessity to re-think the established role and organisation of universities (Nowotny et al. 2001 - esp. Chapter 6, p. 88 ff.).

The argumentation of Gibbons et al on the changes, which technology is causing on the production and distribution of knowledge in higher education, lead in its essence back to the ideas of the media philosopher McLuhan. He observed already in the 70ies that electronic media have a pervasive impact on our immediate context of performance. McLuhan interpreted all media as extensions of either mental or physical human faculties. This media-based extension of the human senses immediately alters the way we think and perceive the world. As wider consequence, the impact of media causes rapid changes on the way in which we live and work - within the modern society in general, and within the higher education context as specific field of investigation of this study.

One additional idea of McLuhan is quite important for the production and transmission of knowledge in higher education. This is the idea of '*electric circuitry*', which means that electronic technolo-

gies profoundly involve us with one another through the instantaneous and continuous exchange of information. As soon as we acquire a piece of information, this information is very rapidly replaced by already newer information. In consequence, McLuhan assumes that this constant, circuit process of information update "*... is forcing us to gradually move from the habit of data classification to the mode of pattern recognition. We can no longer build serially, block-by-block, step-by-step, because instant communication insures that all factors of the environment and of experience co-exist in a state of active interplay*" (McLuhan 2003, p. 63) When we consent to this cognitive change that the influence of technology is causing in our communication and interaction behaviour, then we also have to assume that this change deeply affects the current system of research and education. The pervasive nature of new technologies and its consequences for research and educational processes have subsequently been taken up in the scientific discourse and can nowadays be treated as a widely accepted fundamental insight for research which deals with the impact of technology on socio-cultural systems in general, and with its role within eLearning in detail (Barone 2001; Barone & Hagner 2001; Bates 2000, pp. 7-8; Duderstadt et al 2003; Gibbons et al 1994; Nowotny et al 2001).

2.3. ICT Potential

Technology plays a central role within the fundamental changes in the European higher education sector. Due to its pervasive nature, information and communication technologies (ICT) have the potential to enhance the production and transmission of knowledge in universities. The application of new technologies is gradually changing the main fields of higher education: it is changing research - as the way we learn and create new ideas; it is changing science communication - as the way we discuss and communicate our research ideas within the scientific communities and to the wider public; and it is changing teaching - as the way we transmit new knowledge and research findings to our students (Bates 2000, p. 21; Nowotny et al 2001, p. 88 ff).

New technologies can be applied to innovative educational concepts and teaching and learning scenarios. Amongst other things, ICT can help to efficiently organise mass lectures through the storage and dissemination of electronic learning material; ICT can enhance flexible learning by providing students with permanent access to learning resources and by widening their learning options independent from place and time; and ICT can help to raise quality standards and to create a culture of excellence in teaching and learning by adding digital communication channels for increased interaction, collaboration and dialogue to the course setting.

Euler analyses the role of ICT in institutional innovation of universities more in detail within two separate levels: the macro-level of innovation, which deals with organisational innovation strategies of

universities, and the micro-level of innovation, which describes the application of new technologies in educational activities.

The macro-level of innovation specifies the potential role of ICT within the strategic options of a university to innovate its core business processes. Euler sees several strategic fields in which universities can efficiently apply new technologies to extend their services and to improve their profiles as institutional players in the educational market. For example, universities may extend their study programs to new markets and target groups - which would include international students, part-time students, and disabled people. Universities could employ their existing manpower in competency-areas, which go beyond the mere transmission of knowledge - this would imply a shift towards more collaborative work models in research and education. And universities could rely on modern and technology-based pedagogical concepts and learning spaces as a means for improving the recognition of their brand and reputation in a competitive educational market.

The micro-level of innovation specifies the potential role of eLearning within the pedagogical model which is used in the educational work processes of the university. Euler relates eLearning to the paradigm shift from teaching to learning, which is firmly rooted as guiding pedagogical principle in contemporary educational research (Schulmeister 2004, pp. 231-232; Wildt 2004, p. 206; Prosser & Trigwell 1999; Ramsden 2003; Laudrillard 1979). eLearning is seen as an instrument within this shift from teaching to learning - it can be applied within teaching and learning activities to foster the development of the new mode of learning at universities, which is conceptualised as a flexible, self-organised and collaborative process (Euler 2006).

The main patterns of change, which eLearning can support in the shift from teaching to learning, are listed in the table below:

TABLE: ICT POTENTIAL FOR CHANGE AT THE MICRO-LEVEL OF TEACHING AND LEARNING (BASED ON EULER 2006)

-- eLEARNING AS AN INSTRUMENT FOR THE PARADIGM SHIFT --	
➢ FROM	➢ TO
✗ Teaching	✗ Learning
✗ Delivering answers	✗ Facilitating problem-solving
✗ Directed learning	✗ Self-regulated learning
✗ Instruction	✗ Collaboration
✗ Conveying knowledge	✗ Sharing ideas
✗ Educating technical problem-solvers	✗ Educating reflective practitioners
✗ Creating instructional media	✗ Creating social spaces

But in many universities this innovative potential of technology has not been fully recognised nor systematically exploited on macro-level of their strategic options and on micro-level of their educational work processes. Technology tends to outpace strategic thinking and pedagogical design. Recent studies show that the diffusion of new technologies into educational scenarios is threatened to stall at a margin that has been dubbed '*the 5% hurdle of eLearning integration into universities*' (Barrios & Carstensen 2004, p. 309 ff.). Zemksy & Massy have made an extensive study on the integration of ICT into universities for the US higher education landscape. In this study they have come to the conclusion that eLearning is currently evolving as a '*thwarted innovation*' (Zemksy & Massy 2004). The high-flying promises of technology experts like Peter Drucker - who predicted that the teacher would soon be implemented into the teaching device and thus become superfluous, and of renowned eBusiness managers like John Chambers, the CEO of Cisco - who has become famous with his verdict, that eLearning would evolve into the next '*killer application*', which would make eMail look like a rounding error, on the innovative potential of new technologies in the educational sector have not yet been fulfilled (Galagan 2000, p. 24; Friedman 1999). eLearning is still not showing a wider impact in the daily business of universities. The sustainable integration of ICT into higher education establishments remains a major challenge (ODL Paper 2004).

Collis & Van der Wende have conducted a survey on the use of ICT in higher education in 2002. They state in the final report of this survey that the majority of universities is currently moving from an experimental period in the use of ICT, which has been coined by largely bottom-up organised pilot research and development projects, to the institution-wide encouragement and implementation of new technologies into the organisational structures. The process of technology integration is subsequently illustrated within a three-stage model. In many universities, which Collis & Van der Wende have analysed in their survey, the first stage of institution-wide ICT implementation - i.e., to establish a institution-wide technological infrastructure, is in place; the second stage - i.e., a rich pedagogical use of this technological infrastructure, is still in development; and the third stage - which Collis & Van der Wende have labelled as the strategic use of ICT with a view to different target groups of the universities, has not yet been explicitly considered (Collis & Van der Wende 2002. p. 8).

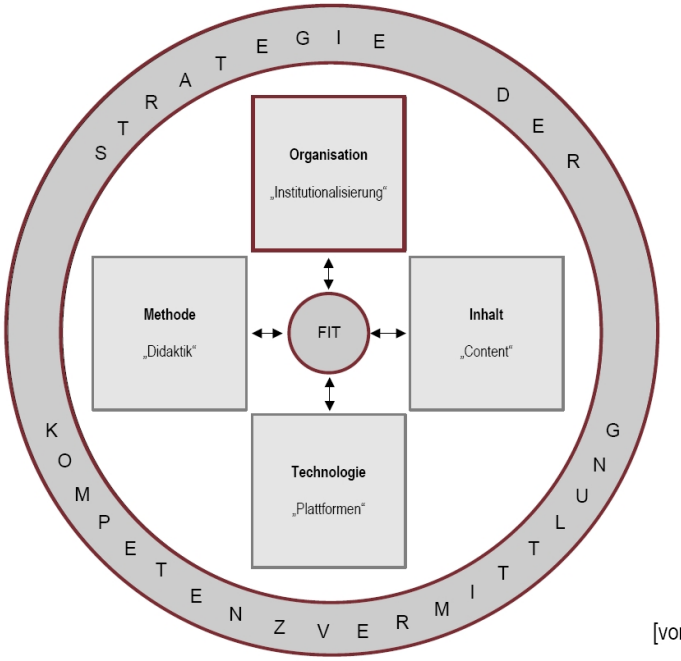
2.4. eStrategy

The question remains how the potential of new technologies can be adequately used in higher education. How can digital tools systematically be applied to the daily business of universities and complement their strategic innovation objectives as well as extend their range of teaching and learning activities?

Chapter 2 - State of Art of Relevant Research

The evolution of eLearning within higher education has undergone several periods of development since its beginnings in the mid-90ies. Vom Brocke has presented in a recent German eUniversity workshop an organisational framework for the integration of eLearning, which distinguishes technology, content, method and organisation as four relevant areas for the innovative, technology-based design of learning processes within universities. These four innovation areas need to be adjusted with the contextual conditions within a university to enable an efficient integration of eLearning into the institution. This process of adjustment - the '*fit of design*', is also basis for a strategy of competence development in the four areas of eLearning.

FIGURE: ORGANISATIONAL FRAMEWORK FOR THE INTEGRATED PROCESS DESIGN IN ELEARNING (BASED ON VOM BROCKE 2005, P. 158)



[vom Brocke 2005]

At the same time, this model represents the four main phases of eLearning which universities have experienced until now. These four phases are shortly summarised to give an impression of the origins of eLearning and of its current status in the higher education context.

The first phase of eLearning has focused on the development of technological learning environments or platforms and all kinds of digital tools and applications for use in educational activities. In this pioneer phase of eLearning, the promises and expectations on its potential within the educational landscape have been high, and the funding available for eLearning projects in higher education has been abundant. Soon a wide range of technological learning environments and digital tools have been developed, with prominent examples like the commercial platforms *Blackboard* (http://www.blackboard.com/) and *WebCT* (http://www.webct.com), but also with the evolution of

open - source platforms like the currently prominent *Moodle* (http://moodle.org/) or *ILIAS* in Germany (http://www.ilias.de/). But inevitably the next challenge for eLearning showed up. It was the question how the electronic learning environments could now be best filled with learning content.

So the second phase of eLearning in higher education concentrated on the creation and distribution of digital content. '*Content is king*' was the common understanding in the community, and a second generation of projects have been involved in the creation of a wide range of digital contents and learning objects. One of the most prominent outcomes of the second generation of eLearning projects is probably the *OpenCourseWare* project of the *Massachusetts Institute of Technology* (http://ocw.mit.edu/index.html). But, despite the growing availability of digital content, the impact of eLearning within the higher education sector still continued to be quite disappointing.

In consequence, a third phase of eLearning came into being, which this time focused on the pedagogical challenge. The main question was which pedagogical concepts and models could be developed to improve the integration of eLearning elements into the traditional way of teaching and learning in educational institutions. A number of projects discussed pedagogical models for eLearning and brought up a range of design options for technology-based or technology-enriched learning environments. But in the third phase it was also recognised that the definition of design options for the pedagogical dimension alone would not be sufficient to distinctly increase the use of eLearning in universities.

At this point, the current focus of eLearning in the fourth phase has evolved. Right now the research focus and the main strings of discussion within the eLearning community revolve around the question how new technologies can be sustainably implemented or institutionalised within higher education. The integration of eLearning into universities has become an organisational challenge, and the search for institutional strategies is currently the main issue on the agenda of the wider eLearning community in higher education.

One of the main lessons, which have been learned in the pioneer period of eLearning and through the experiences made within the pilot projects, is the conclusion that eLearning is not a means by itself. eLearning has to be understood and to be coherently integrated as one key element into the wider innovation process of universities. The project-based eLearning funding schemes have not generated sufficient impact and critical mass to spark a sustainable evolution and distribution of digital learning environments in universities. eLearning can only find its way into the mainstream of the university culture, if it is re-thought as part of a wider strategic concept for educational innovation.

The specific role of ICT within this wider strategic concept has to be defined on basis of a precise needs analysis that identifies a set of crucial integration factors - for example the main target groups for eLearning within the university population and the added value that digital learning tools can offer

to these target groups. This way, eLearning is not seen as a separate area and as a means by itself any longer, but can be applied as a tool that enhances the portfolio of educational services within a specific university (Collis & Van der Wende 2002. p. 8).

Accordingly, the need for a wider strategic approach towards technology-driven educational innovation within universities has gradually moved into the focus of the current eLearning discussion. Desideratum is the eStrategy which guides the efforts universities undertake to sustainably integrate ICT into their work processes (Duderstadt, J. et al. 2003, Bremer & Kohl 2004).

The strategic use of ICT within the educational programs of universities requires explicit reflection and decision-making on institutional leadership level as well as on level of the faculties. The experiences, which have been made with the integration of eLearning in the higher education context until now, underline the assumption that leadership involvement is one essential factor for a successful technology-driven innovation within universities. Only the top-level management has the means at disposal to make crucial structural and financial decisions that are needed to define a coherent institutional ICT policy, and to implement the university-wide use of ICT in its administrative structures and in its teaching and learning processes. In many European universities, existing support units like media centres, libraries, computer units and academic staff development centres have to be re-arranged and bundled together for a stronger cooperation, and new services have to be offered to create better synergies in the ongoing eLearning activities (Zawacki-Richter 2004, p. 115 ff.).

2.5. Change Management Models in US and EU Context

Duderstadt et al have published a prominent paper on the development of institutional strategies which universities apply in the US higher education context to cope with technology-driven change. Duderstadt et al first discuss the current trade-off of university investments between '*bricks*' - as the conventional physical infrastructure of a campus, and '*clicks*' - as the new technologies, which can be used for education. Next, they point out the need - or even the obligation of universities to collaborate nationally and internationally, if they want to face the current technological challenges in a strategic way. There is a need to raise the attention on the impact of ICT within higher education sector and to assure the commitment of campus leaders for strategic decisions to cope with this impact. Duderstadt et al observe in their analysis a discrepancy in current university leadership decisions between near-term, mostly infrastructural issues and the definition of a long-term institutional innovation strategy.

Subsequently, Duderstadt et al sum up seven recommendations for the development of institutional ICT change strategies. These recommendations address the leadership level within universities.

The first recommendation points out the urgent need for university leaders to recognise that technology-related decisions have to be made at the highest level of institutional leadership, as the pervasive impact of technological change affects the institution as a whole. The second recommendation is that strategic decisions on technological options need to be based on a fundamental revision of the core competences of the university, of its main values, missions and roles as educational institution - the added value of technological innovation can only be reasonably identified through a revision of these institutional core competences. The third recommendation claims that universities need to develop an integrated and coordinated institutional strategy on technology-driven change processes. This systemic strategy approach to implement change has to take into account different institutional work areas - such as research and education, and different structural units - such as libraries, faculties, and computer centres. Recommendation four relates to the need that university leaders understand the potential, the unique features of technology and their impact on people and activities. Key point in this recommendation is the assumption that not the production of new technologies on its own, but their application in educational contexts drives change. This leads to the need to re-examine the whole range of learning experiences in universities to make efficient use of the potential of ICT. The fifth recommendation advises university leaders to implement change in 'layered' organisational and management structures, to find a balanced approach between centralised and de-centralised decision processes, and to ensure a sufficient degree of flexibility and adaptability in the institutional transformation - in fact, the technology-driven change should be regarded as an internal research and development project of the university. Accordingly, recommendation six points out that investment and resources for the change process should not be restricted to technological infrastructure, but should be extended to the development of human resources to facilitate a new, more flexible educational model. And finally, recommendation seven concludes that technology-driven institutional change requires a well-defined set of operational strategies and tactics to get from the vision to its adequate implementation - or, as Duderstadt et al summarise, to get '*from here to there*' (Duderstadt et al 2003, pp. 48–58).

The recommendations which Duderstadt et al outine for developing an institutional change strategy are written in an abstract manner, describing rather fundamental implications of the rapid evolution of technology for higher education than to give practice-oriented advice for implementing specific change processes in real university contexts. Barone & Hagner have described in a similar way and with similar conceptual notions twelve conditions for a successful institutional transformation of universities in response to technology-driven change. Barone & Hagner's main points in their paper are the need for the main stakeholders in higher education to become aware and to adapt to the changes caused by the incorporation of new technologies into the work and life contexts of the modern student and citizen; and the need for university leaders to take direct responsibility for the definition and implementation of technology-related change strategies and decisions. The twelve conditions for strategic change, which Barone & Hagner subsequently formulate, all relate to an inclusive decision-making process on eLearning integration within the university, which is guided by a strong leadership, but which also involves all other organisational levels as much as possible and shares ownership for direct change measures in the institutional structures and work processes. Main

conclusion of Barone & Hagner is that technological integration into universities needs to be understood and conceptualised as a leadership task that takes place within a specific socio-cultural system. And the role of technology in this system needs to be defined in compliance with its culture, values and style of operation (Barone 2001; Barone & Hagner 2001).

Within the European higher education context - and more oriented towards a concrete implementation in real practice, Euler & Seufert from the *Swiss Centre for Innovations in Learning* (SCIL) of the University of St. Gallen have elaborated in a series of studies a detailed change management model for a sustainable implementation of ICT in universities. This study would like to use the SCIL model as general reference framework for its eCompetence research. Euler & Seufert refer to the integration of eLearning in universities as a complex organisational challenge that requires strategic planning and that is seen as one key element to foster educational and structural innovation.

The main implication of Euler & Seufert within the SCIL model is the one that universities need to develop a *strategic approach* that identifies the added value of eLearning within their core business processes and that responds to their specific contexts and conditions. This strategic approach for eLearning integration closely relates to the idea of sustainability, which has originally emerged in the 18th century within the forest industry to describe a careful and balanced treatment of the given natural resources within forestal regions. When it is applied to the topic of eLearning in higher education, the idea of sustainability stands for the development of technology-based infrastructures and work processes within a university, which cause a fundamental change in the teaching and learning practice; and sustainability means in this context that the eLearning structures and processes are step-by-step firmly integrated within the institution. Accordingly, the degree in which eLearning is integrated into the institutional structures and work processes of a university can also be seen as indicator for its level of success in technology-driven educational innovation (Euler & Seufert 2003, p. 6).

Therefore, the SCIL model is placing the areas of strategy and implementation on top of the subsequent theoretical framework for a sustainable eLearning implementation into universities. If a university plans to make strategic use of eLearning, is needs in a first step to identify and to reflect upon the overall strategic objectives for the development of its specific educational portfolio. Only when the university has defined and laid down the overall strategic objectives, a coherent application of eLearning, which is one important driver and instrument for innovation within the educational structures and processes, can take place. Euler & Seufert refer to strategy concepts from organisational research - like a general strategy typology which has been developed by Miles & Snow, or the specific eLearning-related strategy typology by Collis & van der Wende, to describe principles and instruments for this leadership task to define the overall strategic objectives for the educational portfolio of a university (Euler & Seufert 2004, pp. 15-18; Miles & Snow 1978; Collis & Van der Wende 2002).

Chapter 2 - State of Art of Relevant Research

The theoretical framework of the SCIL change management model includes five dimensions or implementation areas which are considered relevant for a sustainable integration of eLearning into universities: the area of pedagogy at the core of the change management process, and the areas of culture, organisation, economics and technology. Evidently, the model combines different perspectives on the integration of eLearning into the institutional structures and processes of the university. It is using an interdisciplinary approach to analyse the influence variables within each of the five relevant dimensions for eLearning integration. The dimensions are not treated as independent entities, but they closely interrelate with each other in the model.

The pedagogical dimension is placed at the center of the model. This is somehow reasonable, because eLearning is at its core dealing with the adequate use of new technologies in learning. When the application of technology in educational activities does not generate any added value for learning within the university, there is no means to push eLearning within the institution. So the pedagogical perspective within the SCIL model asks for the pedagogical added value of the application of technology within specific teaching and learning scenarios. The pedagogical research perspective analyses influence factors like: the integration of eLearning into existing curricula; the use of blended learning strategies and of concepts for computer-supported collaborative learning; the integration of eLearning modules into the existing assessment system; scalability of the electronic learning environments; and also concepts for eCompetence development of academic staff within the university. As the analysis of influence variables within the pedagogical dimension alone is not sufficient to set up a coherent strategy of eLearning integration into a university, the SCIL model complements this central component with four additional components to generate a more complete picture of the relevant change factors.

The socio-cultural dimension analyses the wider normative and cultural setting in which the eLearning change process is taking place. This includes collective influence factors which are found in models for organisational change management, like: the change readiness of the members of the university; their interest and motivation in the innovation of the existing teaching culture; the system of individual and collective values and responsibilities in education; and the active support of eLearning from the leadership level.

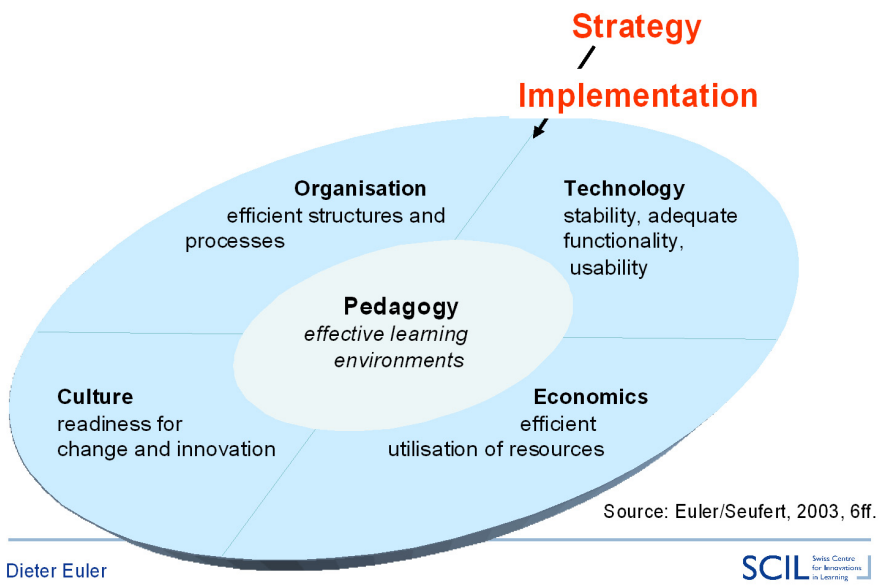
The organisational dimension is focusing on the analysis of wider institutional structures and processes, which are relevant for a sustainable integration of eLearning into the university. This perspective asks for influence factors like: stakeholder management; the coordination and phasing of technology-related projects; and evaluation schemes or communication policies for eLearning as well as its quality management within the university.

The economic dimension takes into account internal and external economic factors, which influence the eLearning integration within a university. The economic perspective asks for factors like: the competitive situation of a university; its business models; its networks and cooperation activities; and its available internal resources. In the end these factors combine to the overall question on the strategic added value of eLearning for a specific university in terms of additional profits or sources of income it could generate.

Finally, the technological dimension deals with all ICT-related influence factors, which are relevant for the sustainable use and application of eLearning within the university. This includes factors like: a stable and functional technological infrastructure; adequate support services for academic staff and students; the development of interfaces between learning management systems and administrative IT systems; and usability issues. (Euler & Seufert 2003, pp. 6-21; Euler & Seufert 2004, esp. p. 13-43).

This strategic objective - to initiate and to sustain a coherent and integrative change management process for technology-driven structural and educational innovation, as it is conceptualised in the SCIL model, reflects the challenge many universities currently face.

FIGURE: SCIL MODEL FOR THE SUSTAINABLE INTEGRATION OF ELEARNING



2.6. Academic Staff as Target Group

Academic staff plays a key role in education innovation. Academic teachers are the '*process owners*' or '*gate keepers*' of the research and teaching activities within universities (Kerres 2005, p. 7). In the daily business of universities, academic staff members define the (subject) curricula, they plan individual courses and study programs within the faculties, and they communicate and interact with the students in teaching and learning scenarios. Digital tools offer a wide range of options to enhance the communication and interaction between teachers and students in universities. To unleash their potential, the digital tools need to be embedded into pedagogical concepts, which reflect on the added value of technological components in specific learning environments. The pedagogical concepts frame and specify the added value of technology use in learning environments in close relation to the needs of learner groups. But, in order to design and to implement innovative teaching and learning scenarios which build on the adequate use of ICT, academic teachers need to enhance existing and to acquire new competences. Faculty members need to be aware of and to understand the innovative potential of the new technologies which are available to support and enhance their research and teaching activities. Academic teachers need to develop or to improve ICT-related competences to cope with the technological challenges in their workplace (Johnson 2003, p. 10-11; Salmon 2004, p. 3-4).

2.7. eCompetence in Universities as Subject of Investigation

The main challenge for a theoretical discussion of eCompetence is to relate the general term of competence to a specific '*eContext*' - the electronic context that is gradually evolving and changing the work culture in higher education. Electronic communication and work environments make new, innovative formats for teaching and learning activities in universities possible. eCompetence is required to transform potential technological options into real innovative teaching and learning activities. If the majority of academic staff members gains a deeper and more comprehensive understanding for the impact of new technologies on their key work processes, they can use these new technologies to extend, re-work and innovate their research and teaching contexts. (Graves 2001, p. 35-36).

2.8. Individual and Organisational Level of eCompetence

eCompetence research represents one aspect within the discussion on models for a sustainable integration of new technologies into universities. Its main interest is on the role of the human factor in this

technology-driven innovation process in higher education institutions. *eCompetence* is, at its core, dealing with the development of personal competences in the creative use of ICT - you cannot innovate an organisation without developing the competences of its workforce. Current human resource management models refer to competences of the employees as the most limited resource and most valuable asset of organisations (Barney & Wright 1998, pp. 31-32; Becker & Gerhart 1996, pp. 779-780).

Then again, the organisation as a whole has to enable and to encourage the competence development of its individual members if it wants to strategically act in the field of ICT-driven innovation. There is a strong interrelation and interdependence between the individual and organisational level of competence development (Weinert 1999, p.11; North & Reinhard 2003, pp. 1375 ff.). We have to analyse the organisational work processes and work contexts, in which specific needs and challenges on the use of ICT are defined, and in which individual competence is developed. This is the reason why we speak in this study about the level of individual and the level of organisational eCompetence.

Although eCompetence is using a technological focus, the required competences for academic staff are not limited to the 'e', the electronic component of the term. eCompetence is not primarily dealing with the expertise level of the individual teacher to handle specific software applications. The concept of eCompetence has to be interpreted in a wider perspective. In addition to technical aspects, the concept of eCompetence asks for educational competences, which are necessary to judge and efficiently apply ICT in teaching and learning activities (Stalmeier 2006, p. 37).

In this perspective, individual eCompetence deals with dispositions that enable academic teachers to design innovative teaching models, which are made possible by ICT and which systematically explore its potential in creative ways; it relates to the well-informed selection and confident use of technologies within teaching and learning; and it links to the ability to adapt to new, technology-enriched work environments. Organisational eCompetence deals with the capacity of an institution to efficiently integrate the technology needed for its own institutional development; it asks for the aptitude of the responsible university members to elaborate a consistent innovation policy and to describe the structures and processes in place that embed the use of ICT in its institutional context.

Based on these considerations, we can situate eCompetence within the SCIL model as general reference framework for this study as one aspect of a sustainable integration of new technologies into universities. One approach for specifying competence profiles could be to use all five dimensions within the model in order to define respective eCompetences of the main actors, which take responsibility for the structures and processes within these dimensions. Euler has taken this approach and generated role profiles or competence clusters for the pedagogical, the socio-cultural, the organisational, the economic, and the technological dimension (Euler 2005, p. 177).

This study would like to take a different approach and start with academic staff as our specific target group for eCompetence measures as point of departure (Schulmeister 2004, p. 227). We can ask for the place and responsibilities of this target group within the five dimensions of the SCIL framework. Academic staff is mainly responsible for the definition of influence factors in the pedagogical dimension. Academic staff is responsible to integrate eLearning into the curricula, to make use of blended learning strategies and of concepts for computer-supported collaborative learning, to fit eLearning elements into the assessment system, and to arrange learning activities in electronic learning environments. But in addition to its pedagogical responsibilities, we can assume that academic staff is also part of the socio-cultural dimension and of the organisational dimension within the SCIL framework. The socio-cultural dimension includes the change readiness of the members of the university, their interest and motivation in the innovation of the existing teaching culture, the system of individual and collective values and responsibilities in education as main tasks within the eLearning implementation; and the organisational dimension includes stakeholder management, the coordination and phasing of technology-related projects, evaluation schemes and communication policies for eLearning and its quality management as main tasks within the eLearning implementation. Academic staffs is at least partly responsible for these change processes within the socio-cultural and the organisational dimensions.

In conclusion, the place and main responsibilities of academic staff can be situated primarily within the pedagogical, and to some degree also within the socio-cultural and organisational dimensions of the SCIL framework for a sustainable integration of new technologies into universities.

2.9. Competence Development Measures in Universities

One finding in current higher education research is the insufficient impact of traditional ICT qualification schemes for academic staff in universities. Traditional training courses for academic staff in pedagogical or technological support units tend to be expensive, time-consuming and limited in scope. And these traditional ICT training courses are not directly linked to the real teaching and learning contexts in which academic staff members communicate and interact with each other and with their students (Bates 2000, pp. 98-103; Euler 2004, pp. 184-186, Hagner 2001, pp. 13-18, Kerres et al 2005, pp. 46-52, Kerres & Voß 2006, pp. 5-6; Salmon 2004, pp. 80-83).

The work context, conditions and the learning style of academic staff in universities differ significantly, when they are compared to the work context, conditions and the learning style of employees in corporate companies. In particular the readiness to learn and the degree of self-organised learning is extraordinary high in faculty, which is caused by their specific work culture in higher education. These

peculiarities of the academic sector have implications for the design of competence development measures which would fit the characteristics of academic staff as learning group.

According to these preconceptions on the specific learning profile of academic staff, studies emphasise the importance of non-formal or informal learning processes in the objective to build up eCompetence through competence development measures. The real work contexts and conditions, in which non- or informal learning processes take place, are highly relevant for the research on eCompetence development. One key assumption for the design of adequate staff training measures is that self-organised learning, which takes place on or close to the job, is one important factor in ICT-related competence development (Erpenbeck & Heyse 1999, p. 214-215; Kerres et al 2005, p. 6).

2.10 Main Areas for Investigation

This study aims to explore and to build upon these recent research findings. On the basis of a thorough analysis of competence research, this study will

- ✗ identify approaches to the concept of competence and analyse its key components;
- ✗ discuss conceptual implications for the eCompetence term and develop a conceptual framework for eCompetence of academic staff members;
- ✗ take into consideration characteristics and the work environment of academic staff as target group for eCompetence development measures;
- ✗ develop a theoretical framework that outlines elements within eCompetence development models for academic staff in universities; a specific focus is on innovative approaches go beyond traditional staff training and try to address challenges in the teaching and learning context of faculty with a mix of direct and indirect interventions;
- ✗ systematically analyse ongoing eCompetence development measures within the effective eCompetence practices database and the four case study interviews of the European eCompetence Initiative, and classify comparable key patterns, process and context factors within the data;
- ✗ and finally draw conclusions from the data analysis and interpretation for the validity of the main theoretical assumptions in this study on competence, eCompetence and types of measures for competence development of faculty in the use of ICT for teaching and learning.

3. Research Design - Key Assumptions, Questions, Methods and Work Steps

Content

3. Research Design - Key Assumptions, Questions, Methods and Work Steps

3.1. Aim of This Research

Aim of this study is the comparative analysis of organisational concepts and measures that universities implement to develop individual eCompetence of their academic staff members.

3.2. Research Idea and Context

This study carries out research on eCompetence in higher education. Its main research focus is on the conceptualisation of the eCompetence term and on appropriate competence development models and practices for academic staff. The topic of eCompetence is closely linked to discussions that have evolved in eLearning on the strategic challenge to implement new technologies in a sustainable way into universities.

3.3. Target Groups

The research and the results of this study aim to give additional insights and ideas for those actors, who are involved in the development of strategic approaches for the integration of ICT in higher education and who work on the implementation of eLearning in universities. In particular, this study is addressing actors who work in central support services for eLearning and in centres for academic staff development; and it is addressing stakeholders at the leadership level of universities who are involved in the management of technology-driven innovation, in the quality management of educational services, and in the creation of models for human resources management or competence development of academic staff.

3.4. Core Question for This Study

The central research question for this study is:
Which organisational concepts and measures do universities set up to develop and foster individual competences of their academic staff members in the use of ICT?

3.5. Key Assumptions for This Study

This study makes two key assumptions on technology-driven innovation in higher education:

Key Assumption 1
First, this study assumes that a university as organisation can only successfully steer and implement technology-driven innovation, if its individual members are aware on the need to adapt their work culture to the changing environment, and if they make persistent use of the potential of ICT.

Key Assumption 2
Second, this study assumes that the development of new competences for academic staff is not primarily achieved by training programs for individual teachers, but relies on wider organisational contexts and conditions.

These two key assumptions are the point of departure for this study and influence all other research steps and activities. Assumptions are the main source for providing the research design with a set of relevant research questions. Wengraf has formulated the following equation to demonstrate the function of assumptions in the conceptual framework of studies: *Inference = Assumptions + Evidence-handling argument against counter-arguments*. This equation means that assumptions, which are combined with arguments, lead to inferences about specific phenomena. Assumptions usually take the form of '*knowledge claims*' - putting forward hypotheses about a specific phenomenon, meanwhile arguments take the form of providing evidence for or against the assumptions or 'knowledge claims' which lead to a specific inference (Wengraf 2004, p. 12-13).

This way, the two above stated key assumptions are basis for the overall research design of this study. They are reflected in a set of research questions, they influence the selection of the research literature, and they sharpen the analytic strategy for the collection and analysis of the empirical data. The key assumptions focus the research attention on '*how*' and '*why*' questions - they ask for causal relations and conditional factors, which have a strong influence on the specific subject of investigation (Yin 2003, p. 111-112)

Evidently, both key assumptions of this study closely relate to the role of the human factor in organisational innovation. The underlying idea is the one that the human factor is one important

aspect within technology-driven innovation in higher education. When we apply this general idea to the specific research area of this study, we can specify the research focus as such: Faculty plays a decisive role in the strategy of a university to improve and to extend its educational services with help of technology, as they determine and manage most educational processes within the institution. And, in order to make efficient use of the potential of new technologies in its educational work processes, a university as institution needs to set up appropriate support measures to foster the ICT-related competence development of its faculty.

When we break down the structure of the two key assumptions in this study, we can distinguish in both assumptions a set of constitutive elements. Both assumptions include a wider field of study, a subject of investigation, and causal relations or conditional factors, which point the analytic attention towards the 'how' and 'why' questions within the subject of investigation. This subdivided structure of both assumptions is illustrated below:

TABLE: ELEMENTS OF FIRST KEY ASSUMPTION

KEY ASSUMPTION	STRUCTURE	ELEMENT
Technology-driven innovation	Wider Area of Study	ICT Innovation
can only be steered and implemented successfully within a university as organisation	Subject of Investigation	eStrategy
if its individual members are aware on the need to adapt their work culture to the changing environment	Conditional Factor A	Human factor
andif they make persistent use of the potential of ICT.	Conditional Factor B	Adaptive behaviour

TABLE: ELEMENTS OF SECOND KEY ASSUMPTION

KEY ASSUMPTION	STRUCTURE	ELEMENT
In the field of technology-driven innovation in higher education	Wider Area of Study	ICT Innovation
the development of new competences for academic staff	Subject of Investigation	eCompetence development
is not only initiated and achieved by training programs	Conditional Factor A	Formal training
but relies on wider organisational contexts and conditions.	Conditional Factor B	Additional measures

In both assumptions, the wider field of study - as the context, in which the subject of investigation is situated, is the same one. Both assumptions start with technology-driven innovation in higher education.

Specification of Assumption 1

The first key assumption sets its analytic focus on the management of technology-driven innovation within universities as organisations. Its main attention is placed on strategic approaches, which aim to steer this innovation, and which aim to implement new technologies into the organisational structure of universities - there is a need for an efficient institutional eStrategy. The individual members of the organisation are one important element in this eStrategy. They need to become aware that there is a technology-caused change in the work processes within universities; and they need to adapt to this change, to use new technologies within their personal work contexts.

In its essence, the conditional factors of the first assumption rely on implicit cognitive as well as on both intrinsic and extrinsic motivational factors which determine the change readiness of members of the organisation. To develop an awareness for change corresponds to both cognition and motivation. Adaptation to new work contexts and persistent use of new technical tools is closely connected to the readiness and the resolution to learn - which again corresponds to cognition and motivation. These key conditional factors of the first assumption are frequently included in concepts of competence, which analyse the role and relationship of different components like cognition, motivation and learning within a process of competence development.

Specification of Assumption 2

The second key assumption sets its analytic focus on concepts of competence development for academic staff. Its main attention is placed on measures which aim to stimulate and to support the development of ICT-related competences of academic staff members. These measures can be direct measures - like traditional training courses or personal consulting; or they can be indirect measures - like incentives for academic staff to use eLearning in their teaching activities or the creation of communities of practice and additional support structures.

In its essence, the conditional factors of the second assumption include both direct and indirect measures as necessary prerequisites for an institution-guided competence development of academic staff in the use of ICT. The main point of the second assumption is that direct measures for competence development alone - like formal training programs, will not be sufficient to get the majority of academic staff members within a university on board of eLearning. To reach a lasting impact on the majority of academic staff in a university, these direct measures for competence development have to be combined and extended with a set of indirect measures. The importance of creating indirect

measures closely relates to the concept of competence again - we will see later that the concept of competence contains in educational research more complexity and implications than approaches to qualification. In consequence, measures to develop competences need to take up these implications, and they need to be designed and tailored accordingly.

3.6. Structure of This Study

Chapters 1 - 2 introduce the aim of this study and situate the eCompetence topic into the wider field of research. The research design is discussed in chapter 3. Chapters 4 - 8 deliver the main work of this study. While chapters 4 - 7 present the conceptual framework, the data analysis and interpretation is carried out in chapter 8. Final conclusions for this study are drawn in chapter 9.

Main purpose of the conceptual part is to formulate a conceptual framework for this study. Wengraf defines a conceptual framework as a set of concepts in terms of which questions can be asked and answers can be given, theories hypothesised and theoretical propositions tested. The conceptual framework - when it is thought of as a set of research questions which are asked, and research answers which are elaborated, is provided by a '*theory-language*' or theoretical discourse. This means that the conceptual framework of a specific study is usually embedded into or derives from a wider theoretical discourse on the research topic, in which the study aims to investigate. The central research question is thereby couched in terms of the conceptual framework, to which a 'theory' is a hypothetical, either supported or refuted answer. Theory means in this context descriptive or explanatory statements about social phenomena, which are expressed in theoretical propositions or assumptions. The validity of these assumptions needs to be proved in research through a selection of data collection techniques - in this study by making a web-based survey, carrying out four expert interviews and collecting additional documentation on eCompetence development. The data is finally interpreted on basis of the initial research questions which are asked in the conceptual framework (Wengraf 2001, p. 53-55).

The conceptual part of this study includes the theoretical elements which relate to the construction of a concept of eCompetence in the higher education context. Based on a desktop study of relevant research literature, the conceptual part contains four main chapters:

- ✗ Chapter 4 includes a discussion of different approaches to the concept of competence, the extraction of key components for competence which are relevant for educational contexts, and the integration of these key components into a coherent concept of action competence;
- ✗ Chapter 5 proposes a concept of eCompetence for academic teachers. The eCompetence concept builds on the conceptual clarification of competence and includes a range of vari-

ables from pedagogical models and electronic tools, which determine the options of teachers to interact in their specific teaching and learning scenarios.

- ✗ Chapter 6 observes the status of faculty as target group for eCompetence development measures within universities, makes an investigation on the organisational structure of universities as a whole and on the implications which evolve from the peculiarities of the higher education context for the design of adequate training activities;
- ✗ Chapter 7 studies concepts for academic staff development, which extend their focus beyond traditional training schemes and include complementary measures for competence development. These lines of argumentation finally result in the establishment and specification of a typology of competence development measures for faculty.

Main purpose of the empirical part is to collect evidence which can be analysed and interpreted to revise the validity of the main assumptions made in the conceptual framework of this study. One point, which Wengraf stresses for social science research, is the relation between conceptual assumptions and empirical indicators in a study. No matter what kind of empirical data is available for the study, the evidence is always 'problematic'. This means that "*... the relation between theoretical concepts and their empirical indicators is always across a gap, which one always has to be prepared to argue over. .. Inferences from data-indicators to conceptual significance cannot be assumed: they must be argued for*" (Wengraf 2001, p.54). This way, the main challenge within a qualitative study like this one is to interpret the empirical data correctly in light of the theoretical assumptions, which are made in the conceptual framework.

The empirical part of the study in chapter 8 includes four main steps, which are:

- ✗ The definition and role of practice in competence development;
- ✗ The development of an interpretative framework, which contains a set of methodical tools for the analysis of eCompetence practices;
- ✗ The analysis and categorisation of eCompetence practices, with the aim to identify key patterns and processes within each practice, and to categorise them on basis of the typology of competence development measures for faculty;
- ✗ The interpretation of the main categories found within the eCompetence practices.

In a final step, the results of the empirical data analysis are used in chapter 9 to revise the two key assumptions of this study and to prove the validity of the theoretical assumptions within the conceptual framework. Additional perspectives for further research on the strategic management of eCompetence development are suggested.

TABLE: STRUCTURE OF STUDY - OVERVIEW

PART OF STUDY	CHAPTER	OUTPUT
Introduction	Chapter 1	Aim of study
	Chapter 2	State of art of relevant research
Research Design	Chapter 3	Development of research design
Conceptual Framework	Chapter 4	The concept of competence
	Chapter 5	The concept of eCompetence
	Chapter 6	The role of universities and faculty in eCompetence measures
	Chapter 7	Types of eCompetence development measures for academic staff
Empirical Part	Chapter 8.1	Role of practice in competence development
	Chapter 8.2	Set of methodical tools for data analysis of eCompetence practices
	Chapter 8.3	Analysis and categorisation of eCompetence practices
	Chapter 8.4	Interpretation of main findings from evidence
Conclusions	Chapter 9	Final results and further research perspective

3.7. Main Research Questions in This Study

According to Wengraf, the central research question in the design of the conceptual framework for a scientific study should neither be too abstract nor too complex. Main function of the central research question is to draw the attention of the reader on the research topic and to give a clear statement of the research purpose in the planned study. Therefore, the central research question itself should be formulated in a clear and simple way. To specify the underlying conceptual assumptions within the central research question and to distinguish the dimensions of the research topic, Wengraf suggests that a subset of theory questions should be developed. These theory questions derive from the central research question and represent its different aspects. Theory questions correspond to the conceptual framework of the study. By finding answers to this subset of theory questions, the researcher should get step-by-step into the position to give a well-grounded answer for the central research question of the study (Wengraf 2004, p. 65-94).

The below given list of research questions specifies the different dimensions of the concept of eCompetence, refers to a range of faculty development measures, and connects this subject of investigation to the theoretical discourse which is relevant for the research methods and steps that this study applies. The central research question focuses on organisational measures that universities set up to develop and foster individual competences of their academic staff members in the use of ICT.

The subset of research questions details this central research question in its conceptual as well as in its empirical dimensions for each chapter of this study.

TABLE: CONCEPTUAL THEORY QUESTIONS

CHAPTER	-- SUBSET OF QUESTIONS --
Chapter 4	✗ What is competence? ✗ What are the key components of the concept of competence? ✗ Which approach to competence is adequate as theoretical basis for a conceptualisation of eCompetence in higher education?
Chapter 5	✗ What is eCompetence? ✗ What are the main components and theoretical assumptions of the concept of eCompetence? ✗ How can this concept be applied to academic staff in higher education?
Chapter 6	✗ What are the main collective attributes of academic staff as target group for competence development measures? ✗ What are specific organisational structures of universities as institutional context, in which academic staff is situated? ✗ Which implications evolve from the collective attributes of academic staff and the wider contextual factors of universities as organisations for the design of adequate eCompetence development measures?
Chapter 7	✗ Which concepts go beyond traditional training courses and include additional measures for staff development? ✗ Does the theoretical discourse on competence development offer a basis for the construction of a typology of eCompetence measures?

TABLE: EMPIRICAL RESEARCH QUESTIONS

CHAPTER	-- SUBSET OF QUESTIONS --
Chapter 8.1	✗ What is a practice? ✗ How does practice relate to to competence development?
Chapter 8.2	✗ Which methodical tools are adequate to analyse eCompetence practices in light of a theory-based typology of competence development measures?
Chapter 8.3	✗ How do universities in the project consortium of the European eCompetence Initiative address the challenge to develop eCompetence? ✗ Which types of measures for competence development of academic staff are taken in their local contexts? ✗ How can patterns and processes in the eCompetence practices be consistently categorised and interpreted within a theoretical typology of competence

CHAPTER	-- SUBSET OF QUESTIONS --
	development measures for faculty?
Chapter 8.4	✗ Do the findings in the empirical evidence support or refute the theoretical assumptions on the typology of measures for competence development made in the conceptual part of this study?

TABLE: CONCLUDING QUESTIONS

CHAPTER	-- SUBSET OF QUESTIONS --
Chapter 9	✗ Does the evidence found in the eCompetence practices support the two key assumptions of this study? ✗ Which components of the conceptual framework of this study are validated by the analysed evidence? ✗ Which perspectives for further research on eCompetence emerge on basis of the findings of this study?

3.8. Preparatory Work

There has been preparatory work for this study undertaken in the project context of the *European eCompetence Initiative*. A first work definition and analytic framework for eCompetence research has been drafted in the project proposal in autumn 2003 (Schneckenberg & Wildt 2003; Schneckenberg 2004). When the project has been selected for funding by the EU and started in April 2004, we have identified and collected in a first research activity those eCompetence activities that the partner universities have carried out in their own institutions. For this reason, we have set up and distributed a standardised web questionnaire that asked our project partners to describe effective eCompetence practices which have evolved in their local contexts. Different to a theoretical model, a plan or a policy statement, a practice or solution is meant to be a pattern of activities which have been performed in reality. By the term effective eCompetence practice we understand accordingly a set of measures or activities, which influence the development of ICT - related competences of academic staff members.

The effective eCompetence practices have been submitted to the database via a web questionnaire, which contains a standardised structure of questions. All submitted practice descriptions have the same formal structure of information. This structure is used as basis for the analysis and interpretation of the data which is available for each practice. A total of 31 descriptions of measures or activities have been submitted to the effective eCompetence practice database. The web survey is still accessible at the eCompetence project website: *http://www.ecompetence.info/form/*.

A first analysis of the submitted effective eCompetence practices and a subsequent selection process for four case study interviews have taken place between September 2004 and April 2005. In detail, we have considered a set of criteria as important for the selection of these cases which indicate a certain degree of sustainability and sufficient involvement of key stakeholders in the eCompetence practice. We have focused on the following criteria:

- ✗ the eCompetence development of the university is part of a wider approach for eLearning integration into teaching and learning and/ or have defined strategic goals;
- ✗ the eCompetence development is not a temporary phenomenon, but taking place within the university over a longer period of time with access to sustainable financial resources;
- ✗ the university has implemented long-term or permanent organisational structures and defined specific responsibilities for the implementation of eCompetence development;
- ✗ the eCompetence development is combined with or shows links to the academic staff development programme of the university.

Based on the evaluation outcomes, we have selected four partner institutions for case study interviews. All four interviews have taken place in May 2005. Technically, the interviews have been realised as audio conferences that we have set up and conducted by using the Voice over Internet Protocol (VoIP) software Skype. The audio conference settings of Skype allow to connect up to five participants via internet. With the exception of Pretoria, all interviews have been conducted in a '2 on 2' mode, which means that we had 2 interviewers and 2 interviewed experts from the selected institutions taking part in the conversation. Each session lasted for around 90 minutes. The interview sessions have been digitally recorded and subsequently transcribed. The four case study interviews are used as complementary source of evidence for the eCompetence practices within the four selected universities.

TABLE: ECOMPETENCE CASE STUDY INTERVIEWS

INSTITUTION	COORDINATING UNIT	EFFECTIVE PRACTICE
K.U. Leuven, Belgium	AVNet Center - Audiovisual & New Educational Technologies in a Network	eCompetence: Guided Independent Learning, TOLEDO & Digital Chalk
University of Pretoria, South Africa	Department of Telematic Learning & Education Innovation (TLEI)	Training in WebCT, Web support & Integration of Campus Systems
University of Athens, Greece	Department of Informatics & Telecommunications	e-Class platform & using e-content to enhance classroom teaching
Helsinki University of Technology, Finland	Lifelong Learning Institute Dipoli	TieVie: a national training programme

In addition to the case studies, we have invited all project partners to submit research papers on eCompetence. Authors have been asked to discuss eCompetence related to their own experiences within their local context, to the application of an exemplary practice in a specific university, or to a theoretical discourse which is relevant for eCompetence development in higher education. This way, we have received 24 papers that surface the authors' understanding of eCompetence in one of these three perspectives. Further relevant information on the eCompetence practices has been given by participants in presentations at project symposia and in audio or video conferences. The project has generated with the effective practice database, the case studies, the collection of articles and the additional documentation a pool of empirical evidence for methodical analysis and interpretation.

3.9. Research Data, Methods and Work Steps

This study is based on a qualitative research design. A range of qualitative and interpretative research methods are used in the operationalisation of the main research questions which the study aims to investigate.

The conceptual part of this work relies on a desktop study of relevant research literature. The conceptual part starts with an investigation of the concept of competence, which refers to competence research as well as to motivational and cognitive studies in psychology, links to learning theories and models in pedagogy, and takes into account external competence standards and wider contextual factors for competence management, which are discussed in organisational and business sciences. For the conceptualisation of eCompetence, this study relies on contributions from media pedagogy and on research in the wider eLearning community. The part about academic staff as target group for competence development takes into account findings from institutional research in higher education, from motivational research in organisational psychology, and from change management models in business science. Finally, the study on measures for competence development relates to research on models for human resources management and refers to complementary research within academic staff development.

The empirical part of this study comprises a systematic analysis and interpretation of the project data. The following table summarises the sources of evidence which are available for the empirical part of this study:

TABLE: SOURCES OF EVIDENCE

SOURCE OF EVIDENCE	DESCRIPTION OF SOURCE
Database entry	The submitted eCompetence practice are basis and point of departure for the data analysis, offering a common formal structure for the categorisation and interpretation of key patterns and processes.
Interview	The four case study interviews add a considerable body of evidence to the four related eCompetence practices. For this study, the interview analysis will not follow the case study model of the project, but search for additional information on the types of competence development measures that have been identified in the categorisation of the patterns and processes in the effective practice.
Research paper	The final publication of the eCompetence project contains 24 different papers, most of which add information to the submitted eCompetence practices. Some project participants have provided additional research papers on the practices, which have been published in international journals or conference proceedings.
Strategy paper	Some internal strategy papers with relation to submitted eCompetence practices have been made available to the eCompetence project.
Report	Some, mostly internal reports have been made available to the project. In addition, two eCompetence magazines have been produced, which contain interviews and statements of trainers and participants in the practices.
Project Presentation	A number of informants have given comprehensive presentations of their local practices in the symposia of the eCompetence project.
Website	Most local eCompetence teams have created websites with a range of additional information.

The table shows that the project has generated multiple sources of evidence. The database entries serve as basis and point of departure for the analysis of the eCompetence practices. But most informants have delivered additional sources of evidence, which complement the database entry of the practice by sending related papers, making presentations, giving interviews and so forth. This allows for most reported eCompetence cases to carry out a triangulation of data sources. Yin has characterised data triangulation as a corroboratory strategy to collect and analyse information from multiple sources in order to stronger support interpretations of a specific phenomenon. The analysis of multiple sources helps to create a convergence of evidence, to establish a common and more reliable ground for a concise understanding of the observed phenomenon (Yin 2003, p. 99-100).

The initial research task within the empirical part of this study is the development of adequate methodical tools for the analysis of eCompetence practices. The eCompetence practice descriptions

in the database have a standardised structure, which provides a common ground for analysing and interpreting the contained data. The data analysis aims to categorise eCompetence practices with help of a typology of competence development measures. But how are the analysis tools developed and how is this typology of measures established? The definition of a typology, which is close to the empirical data, but which also refers to the theoretical assumptions of a study, is seen in literature on qualitative research methods as a delicate process (Mayring & Gläser-Zikuda 2003, p. 10 ff.). Two different research models are possible at this point of the study to develop the methodical tools for data analysis and interpretation.

The first model is an inductive categorisation of the eCompetence practices into a typology, which is suggested by the given data and contains different types of competence development measures. This inductive approach is rooted in the grounded theory tradition - the researcher first collects all relevant facts, and in a second step the theory emerges from the data. The second model is the analysis and categorisation of eCompetence practices in a deduced typology, which has been constructed on basis of a prior investigation of the theoretical discourse and the formulation of specific assumptions. In the deductive model, the collected evidence mainly serves the objective to prove the validity and reliability of the formulated theoretical assumptions (Wengraf, 2001, pp. 3-4).

The set of methodical tools, which are used for the analysis and categorisation of the eCompetence practices, will be based on a deductive research model. The conceptual framework, which is developed in chapters 4-7, works its analysis of the theoretical discourse all the way down towards the establishment of a theoretically grounded typology of competence development measures. All sources of evidence will be analysed and categorised in an interpretative framework, which is based on this typology of measures that has been deduced from the theory discussion. The different types of measures serve as a blueprint, by which the key patterns and processes of eCompetence practices are categorised. The interpretative framework contains a set of word tables, which combine the categories of the theory-based typology with additional data classes, which are part of the structure of the eCompetence practice database.

This way, the categorisation of competence development measures in the empirical evidence takes place on basis of a typology according to theoretically relevant criteria. An essential feature of the methodical tool of a typology is the one that the boundaries between different types are not clear-cut, but fluent. Categories in a typology are based on nominal scales, which allow to categorise the empirical evidence with a higher degree of flexibility than for example the methodical tool of ideal types would allow for. To speak in the metaphor of the *analytic knife*, ideal types have strictly defined boundaries. Ideal types clearly separate phenomenon A from phenomenon B in the analysis of empirical evidence. Any phenomenon, which is part of one ideal type, can therefore not contain elements of any other ideal type. Typologies have more fluent boundaries to categorise empirical evidence. A phenomenon, which is part of one type, can nonetheless contain elements of another type. We will

see in the empirical part of this study that most eCompetence practices combine elements of different types of competence development measures.

The analysis and categorisation of patterns and processes in the eCompetence practices relies mainly on the analytic technique of pattern matching. Pattern matching is based on a thorough identification of dominant patterns within an observed particular phenomenon. These empirical patterns found within the evidence can be compared with predicted ones in the key assumptions of a study (Yin 2003, p. 116 ff.; see also McLuhan 2000, in chapter 2.2 of this study on the relevance of pattern recognition in cognitive processes). The key patterns and processes within each eCompetence practice are displayed in the interpretative framework within a set of tables.

For example, the eCompetence web survey contains one field on the benefits of the practice. The table of the interpretative framework displays the main patterns of a particular practice which are given in the benefit field; in a second row, the table assigns these patterns to the theory-based type of measure, which fits best as adequate category to the kind of reported benefit of the particular practice. This way, the set of tables allows a systematic analysis of each practice and at the same time a categorisation of its patterns in light with the theory-based typology of measures.

The results of the empirical data analysis are applied in the conclusions to revise the two key assumptions of this study, and to prove the theoretical assumptions on the concept of eCompetence and on the typology of competence development measures for academic staff in the use of ICT.

For example, this study considers in its second key assumption that the combination of direct and indirect competence development measures is a critical factor for the successful implementation of institutional endeavours within universities to foster eCompetence of its academic staff, and to increase the use of ICT in routine educational practice. This assumption predicts that the combined impact of two conditional factors - direct and indirect measures for competence development, lead to the overall pattern of enhanced eCompetence of academic staff and subsequently to an increased level of the use of eLearning within their educational work processes. If, however, the evidence in the practices shows that the eCompetence of faculty staff and the use of ICT in teaching and learning activities has not increased despite the existence of both conditional factors, the validity and reliability of this initial key assumption needs to be questioned.

4. The Concept of Competence

Content

4. The Concept of Competence

4.1. Work Definition of Competence for Specific Research Context

The conceptualisation of eCompetence starts necessarily with a clarification of the competence term. We focus in this study on a work definition which relates the competence concept to the specific eLearning research context. eCompetence is analysed as one core element of innovation strategies that universities develop to integrate ICT in a sustainable way into their work processes. This study investigates organisational concepts and measures for eCompetence, which universities have set up as part of wider strategic decisions to innovate their educational portfolio. These concepts and measures aim to develop individual competences of academic teachers, which relate to the application of new technologies in teaching and learning processes. The field of investigation is situated in the educational environment of higher education.

The process of ICT-related competence development of academic teachers takes place in this environment of higher education. This process contains variables of the individual teacher - such as cognitive and mental dispositions, as well as variables of the organisational context, in which the teacher designs and carries out a range of ICT-supported teaching and learning activities - such as support structures, technological infrastructure, financial resources, ICT-related training, and incentives to use new technologies.

eCompetence, when analysed closely, is a verbal specification of competence. It is a sub-class of the competence term, related to an electronic context, or eContext. We do not yet know how competence evolves and which components it includes. In the below given section, we therefore try to identify and to understand the main components or constituents of competence, as they are discussed within the relevant scientific literature. This work is not primarily meant to give new insights on the competence concept itself, but to prepare the ground for a theoretical conceptualisation of the eCompetence term.

4.2. Popularity and Relevance of the Concept of Competence

The competence term has become popular. Nowadays, it is in its use no longer restricted to research - as theoretical concept, and to legislation - as personal authority to judge or to take legal decisions. To an increasing degree, the competence term can be found in situations of everyday life. Competence is

often cited as a 'fashionable' and 'modern' term in political programs; it is a decorative style element for a growing number of 'competence centers'; and it can be found in marketing slogans that aim to persuade consumers to buy products like the 'competent flat panel PC monitor' or a kitchen stove named 'competence'. One might start to wonder what the specific competence of a flat panel monitor or a kitchen stove could be. In particular its loose definition and inflated use show that 'competence' has become a buzzword of our time.

FIGURE: IMAGE OF COMPETENCE

One reason for the growing importance of competence is the increasing complexity that we face in our lives. In the globalised world of the 21st century, societies are confronted with a challenging economic and societal competition. Citizens need to be equipped with new competences to adapt to constantly changing work and live conditions in knowledge-based economies and societies. Knowledge has become a key production factor. When we agree on the main assumptions made in studies of Gibbons et al, new modes of knowledge production evolve in science and research; and these new production modes of knowledge influence not only the societal, but also the corporate sector in modern society (Gibbons et al 1994, p. 3-16). This idea of new modes of knowledge production has progressively led to a wide recognition in policy debates that people are the most important asset for growth and employment in our societies (European Commission 2005). Within the highly competitive modern economic environment, it has in parallel been recognised in business strategies that human resources - or the human capital, as it is also frequently named, have become the single most valuable asset for companies (Samuelson & Nordhaus 1995, p. 532; Albrecht 2005).

The competence debate is closely linked to the field of continuing education and lifelong learning. Our societal and economic environment is undergoing continuous change, and we need to continuously master new situations in our work context. Accordingly, our school and higher education systems need to ensure that young people acquire a set of key competences which enable them to cope with the work and life challenges in modern society. But this formal period of education in schools and universities will not be sufficient any longer to equip learners with the necessary set of competences that they need throughout their lifetime. As consequence, the adult generation has to supplement its formal initial and higher degree education, and to continue learning in order to update existing or to acquire new competences.

4.3. Complexity of the Concept of Competence

The starting point for the rapid evolution of the competence topic in science and its application as a powerful instrument for managing and developing human resources, can be - at least in the United States, traced back to the publication of McClelland's seminal paper in 1973, which is titled "*Testing for competence rather than 'intelligence'*" (McClelland 1973). In this paper, McClelland doubts that the traditional way of testing abilities of students and employees through writing exams and measuring intelligence quotients (IQ) are adequate methods to predict their future success in jobs. As consequence of his argumentation, McClelland proposes the competence concept as alternative basis for assessing people's abilities and for predicting their performance in solving authentic job tasks. The concept of competence subsequently has become an influential component in the areas of education and human resources management across the world; in the United States its popularity is symbolised by characterising the whole field related to human resources management in public and private sectors in the accompanying scientific discussion with the term '*competency movement*' (Adams 1997, p. 18).

Nowadays, definitions of competence are as manyfold as their use in various contexts. A wide range of scientific papers deals with competence and its underlying concepts, as well as with the challenges of competence development, competence assessment, and competence management. Contributions to the concept of competence vary in the range of included competence components and characteristics, and they take place within a number of science disciplines. Therefore, Jonathan Winterton characterises the concept of competence in current research as fuzzy, when he states: "*There is such confusion and debate concerning the concept of competence that it is impossible to identify or impute a coherent theory or to arrive at a definition capable of accommodating and reconciling all the different ways that the term is used*" (Winterton 2005, p. 29). This assessment of the competence concept as being fuzzy and unprecise is shared by Erpenbeck & Heyse - they observe an abundance of contributions on the competence topic in the German research literature alone (Erpenbeck & Heyse 1999, p. 163).

A certain level of confusion and incertitude about the competence concept can be found in many related studies and discussions. As part of a study on educational systems for the Organisation for Economic Co-operation and Development (OECD), Weinert has found a wide spectrum of theoretical approaches to competence in the scientific discussion. But he has not found a common conceptual framework that could overarch the differing theoretical discussion strings. Accordingly, he writes: "*An exhaustive definition of competence would have to include all the intellectual abilities, content-specific knowledge, skills, strategies, meta-cognitions and action routines that contribute to learning, problem solving and a variety of achievements. Such a definition would mean that the concept of competence covered all of a person's cognitive resources, that is, all those mental conditions that underlie individual performance, intra-individual performance changes, and inter-individual performance differences at any given point in time. The advantage of such a broad definition is also its*

greatest disadvantage. One would be confronted with a problem not yet solved in the 100-year history of scientific psychology: a complementary classification and performance-specific integration of ability and knowledge. There is neither a theoretical nor a practical solution to this problem at this time" (Weinert 1999, p. 26). Weinert's reflections show clearly that competence is a complex research subject - the level of complexity makes it almost impossible to define a general or generic competence concept, which would represent all inherent theoretical aspects in an adequate and objective way.

We can nonetheless identify a group of key components for competence, which are mentioned and referred to in a large number of definitory approaches. These components include terms like knowledge, motivation, skills, abilities, aptitudes, values, performance, cognition, learning, proficiencies, and dispositions. Remarkably, most of these key terms within the competence concept are complex terms by themselves - they contain additional implications which need to be further clarified to understand what they represent within competence definitions. And, with reference to different approaches to competence, the nomination, the grouping, the hierarchical structure, the interrelation, and the interdependence between these key components is changing.

In the subsequent part of this study, we will systematically analyse the different approaches to competence, as well as the main key components that are frequently mentioned within the competence debate. But we start with a clarification of the range of science disciplines, which contribute to the research of competence as field of investigation.

4.4. Interdisciplinary Theoretical Background for the Concept of Competence

Since its evolution in the 1960ies, the topic of competence has spread across the boundaries of science disciplines and eventually become an object for interdisciplinary research. The specific research context of this study is the development of individual and organisational competences which relate to technological innovation in universities. For this research context, we can safely sort out from the spectrum of relevant science disciplines those definitions of competence which have evolved in jurisprudence, natural sciences and medicine - competence definitions from these disciplines are not relevant for the theoretical underpinning of eCompetence in higher education.

In his study of a range of different competence concepts, Weinert narrows the scope of definitory approaches for competence to a subset of scientific disciplines: "*Restricting our focus to the use of the word 'competence' in developmental sciences, psychology, linguistics, sociology, political science*

and economics still yields a wide variety of definitions" (Weinert 1999, page 4). Nonetheless, Weinert argues that the science disciplines in this specific subset can be reasonably connected with each other for a common interpretation of competence concepts. Weinert describes competence in this common interpretation as a roughly specialised system of individual or collective abilities, proficiencies, or skills that are necessary or sufficient to reach a specific goal. This common interpretation can be applied to two levels of competence - it can be applied to individual dispositions; and it can be applied to the distribution of such dispositions within a social group or an institution (Weinert 1999, pp. 4 ff).

North & Reinhard have developed a model of integrative competence management for organisations which act in the corporate sector. North & Reinhard underpin the conceptual framework for their model with theoretical approaches from both cognitive and organisational sciences. They refer to a range of relevant science disciplines, which can be combined in competence research without blurring the research focus too much. Although this range of science disciplines has not been specified for an educational context, but for an economic one, it is nonetheless comparable in its scope to Weinert's classification.

North & Reinhard argue that competence research, which relates to organisational strategies, is based on two broader science areas. The first area are cognitive sciences, which include contributions to the concept of competence from psychology, pedagogy, philosophy, linguistics, neuro- and computer science; and the second area are organisational sciences, which include contributions to the concept of competence from social sciences, from sociological research on organisational structures and organisational development, and from business science as well as public management science. These two broad science areas contribute to the literature which evolves on human resources management and considers competence development as one key element in organisational strategies of companies in order to cope with the growing dynamics, uncertainty, and increasing competition within their business fields (North & Reinhard 2003, p. 1372).

After having made this classification of science disciplines, North & Reinhard describe more in detail theory inputs, which the two wider science areas contribute to competence research: "*Sociological and psychological application models mostly concentrate on developing competence classifications and describing individual and collective competence types... as well as regulating learning processes among individuals... . Organizational science models on the other hand mainly answer questions about the strategic organization and aggregation of competencies... as well as their distribution and orientation toward operational processes*" (North & Reinhard 2003, p. 1373).

TABLE: SCIENCE DISCIPLINES IN COMPETENCE RESEARCH

RESEARCHER	RANGE OF SCIENCE DISCIPLINES
Weinert	Developmental sciences, psychology, linguistics, sociology, political science,

RESEARCHER	RANGE OF SCIENCE DISCIPLINES
	economics.
North & Reinhard	1. Cognitive sciences - including psychology, pedagogy, philosophy, linguistics, neuro-, and computer science. 2. Social sciences - including sociology, organisational studies, business science, public management science.

Within the work undertaken by Weinert and North & Reinhard, we have presented two classification schemes for science disciplines, which are relevant for competence research. What can we learn from these classifications for the analysis of eCompetence? The eCompetence research presented in this study refers to training measures for academic teachers; it is situated in an educational context. When we compare a university and a business company, we will find distinct organisational structures and functions in both corporations. Then again, we can see some similarities in the classification of science disciplines, which Weinert proposes for competence research in educational contexts, and in the classification, which North & Reinhard propose for competence research in corporate contexts. And we can find in the arguments of Weinert and North & Reinhard similar theoretical approaches to conceptualise competence - all three researchers assume that competence models can be applied to individuals and to organisations, and they agree that the interrelation of these two levels is a challenging task for additional research (on this topic see also Erpenbeck 2005).

This study distincts between the individual and the organisational level of eCompetence. The science discipline classifications, which have been specified by Weinert and North & Reinhard on competence research, give a first orientation for a specification of the relevant scientific literature. We can select on this basis relevant contributions on the concept of competence, which may clarify the conceptual implications for eCompetence, and which may lead to new insights for ICT-related competence development measures for academic staff in universities. The subsequent discussion of theoretical foundations for the competence term will therefore refer to contributions from disciplines which are included in both classifications. But before we start to identify key components of competence, we first analyse more in detail the levels of attribution which can be found within the concept of competence.

4.5. Attribution Levels for Competence

Weinert has discussed the theoretical foundations for the concept of competence with a particular focus on competence acquisition of individual learners. As has been already mentioned, Weinert assumes that it is not possible to construct an integrated definition for competence from the variety of conceptual approaches. The approaches are too heterogeneous and too ambiguous to be integrated

into a common theoretical framework for competence. Nonetheless, Weinert successively elaborates a distinctive set of arguments and reflections for the concept of competence, its main interpretations, its key components, and he gives some suggestions for the adequate application of competence models within specific scientific investigations and research projects.

As initial approach to the concept of competence, Weinert differentiates the levels of attribution, to which competences can be ascribed: "*Competence can be attributed to individuals, social groups or institutions, when they possess or acquire the conditions for achieving specific developmental goals and meeting important demands presented by the external environment*" (Weinert 1999, p. 3). If we follow Weinert's distinction of three levels, to which competence can be attributed, it becomes obvious that competence is not just an individual phenomenon. It is also adequate to apply the competence concept to the group level of a social collective and to the institutional level of an organisation.

Similar to Weinert, Erpenbeck & Heyse initially identify three competence levels in their competence study, which are the individual, the group, and the institutional level. Subsequently, they merge the group and the institutional level in their competence model into one and thus specify two levels of attribution for competence, which are the individual and the institutional level. Erpenbeck & Heyse define competence as self-organised types of action carried out by complex mental or organisational systems. Individual competence of a person is represented in this definition by the complex mental system, and group or institutional competence by the organisational system. This distinction between individual and institutional competence does not imply that both levels can be regarded to be independent from each other. In particular in business management strategies, the model of intellectual capital (IC) interrelates both competence levels within organisations. Referring to the IC in business development, Erpenbeck & Heyse use their competence model to represent the dispositions which integrate relevant business knowledge within a company at both individual and at organisational levels, and which potentially advance both the business company and its individual members (Erpenbeck & Heyse 1999, p. 155-156).

In their model of integrative competence management, North & Reinhard discuss the role of competence within organisational business strategies. In focus of their reflections are competence development measures as part of business innovation processes which aim to increase the competitive ability of a company. Competence management is proposed as one strategic option for companies to face business challenges in increasingly complex and unstable market conditions. North & Reinhard define competence as a relation that evolves between given requirements and skills or potentials. They distinct between two types of requirements: external requirements, which are included within an authentic performance context; and internal requirements, which they specify as self-defined individual motivation to act. These requirements and the corresponding skills or potentials can be attributed to a person or to a group of persons.

Based on these assumptions, North & Reinhard combine the levels of individual and organisational learning into their model of integrative competence management. This model specifies critical factors for the capability of a company to successfully support and foster learning within its daily business. Integrative competence management aims to model a development scheme, which initiates and controls individual and organisational learning. This learning usually takes place as response to internal or external requirements close to the action contexts of the employees, and, in case the learning activities are well designed and implemented, they may result in enhanced competences of the whole company. When individual or group knowledge is applied in concrete action, this performance and the resulting learning process lead to competence acquisition. North & Reinhard conclude that the efficiency of measures for competence development is based on the effective synchronisation and on the mutual integration of individual and organisational learning processes within a company (North & Reinhard 2003, pp. 1375 ff.).

North & Reinhard's model also identifies one critical point in strategic concepts for competence development and management. When institutional strategies for human resources development are implemented, it is a complex task to interrelate and to integrate measures at the individual and at the organisational level of competence development. North & Reinhard consider the interdisciplinary exchange of research results between cognitive and organisational sciences as problematic, as both science areas lack a homogeneous understanding of key terms. The missing 'common language' leads to blind spots in competence research, in particular at the intersection of individual and organisational competence development. North & Reinhard write on this critical point in competence research: "*For the most part, the models from the organisational sciences overlook the specific properties, classifications and transfer problems of individual competencies, while the models from psychology and sociology do not pay enough attention to business and process concerns. Existing models follow either the one or the other point of view, however, never an integrative approach*" (North & Reinhard 2003, page 1374). Beyond the concrete implementation issues in organisational practice, the two competence levels represent in their underlying theoretical implications a gap and a friction between the two different science areas and cultures.

Similar to North's point of view, Weinert remarks in his studies, that the integration of the individual and the organisational level within the concept of competence remains a big challenge. In his comparative analysis of competence approaches in institution-specific contexts, Weinert has not found any theories at intermediate level that could fill the gaps between the individual and the collective or organisational part of competence (Weinert 1999, page 11). The interrelation between individual and organisational competence development and management remains an object for further study in competence research.

As far as the levels of attribution , to which competence can be ascribed, are in focus, two essential conclusions can be drawn for the eCompetence research at this point of this study:

1. Competence can be attributed to individuals and organisations.
2. The interrelation between, and integration of individual and institutional competence development is one focus point in the analysis of eCompetence measures for academic staff in universities.

We now continue our discussion of the concept of competence with the identification and systematic analysis of a range of key components that are frequently mentioned within scientific contributions to competence research.

4.6. Key Components of Competence

4.6.1 Learning

A fundamental question in the whole competence debate is the one if competences can be learned - what is the role of learning in competence development? Related to learning, and in particular to the assessment of learning outcomes, the competence term has been introduced by McClelland in psychology as contraposition to the classical concept of intelligence. Psychological research undertaken on intelligence is, to a large extent, focused on the investigation of fundamental cognitive dispositions. In classical intelligence models, these cognitive dispositions are frequently conceptualised as given individual characteristics, which are innate and which can be applied rather independent from the context of performance. As consequence of this way of conceptualisation within classical intelligence models, the learnability of fundamental cognitive dispositions has to be considered as limited (McClelland 1973).

Another prominent approach, which implies that the learnability of competence can be questioned, is the competence - performance model from Noam Chomsky. Based on neuro-linguistic research, Chomsky describes in his competence - performance model the acquisition and application of language and its underlying cognitive dispositions. One of Chomsky's key assumptions is the idea that the majority of important properties of language and mind are innate. Accordingly, Chomsky defines competence as a limited system of basic cognitive elements, or as a stable cognitive disposition of the individual. In his competence - performance model, Chomsky interprets competences as a result of the unfolding of innate cognitive dispositions which are triggered by experiential input of the external environment (Chomsky 1980; Mandl & Krause 2001, p. 6).

In contrast to Chomsky's interpretation of cognitive dispositions for language acquisition and performance, and in opposition to the classical intelligence concept, we assume in this study that learning influences given competences and that it is the basis for acquiring new competences - a

process of continuous learning is at the core of any competence development. This is a simple statement, but it is an important one. In pedagogical psychology, educational research and sociological theories on human resources management, learning is a key constituent for the concept of competence.

The idea that competence can be developed through learning is the basis for the concept of competence, which McClelland & Boyatzis have constructed. McClelland & Boyatzis define competence as a prerequisite to master specific challenges in a concrete field of activity. At the core of their concept is the assumption that individuals and organisations can improve given and gain new competences through learning and experience. The learning, which takes place, and the experience, which is made in authentic situative challenges, is regarded to be the basis for a process of individual or collective competence acquisition. In this way, competence is a disposition to perform in a specific context - and it is considered as a learnable human trait (Adams 1998, Simonton 2003).

In line with this position taken by McClelland & Boyatzis, Weinert ascertains that competences can be learned. According to Weinert, learning is a necessary condition for the acquisition of prerequisites that enable a successful mastery of complex tasks - which is one description for competence. He further specifies that individuals, groups or institutions either possess or acquire competences (Weinert 1999, p. 7/ Weinert 2001, p. 63). The considerations taken by Weinert and by McClelland & Boyatzis support the assumption that it is basically possible to develop new competences in learning processes.

One important aspect for the role of learning in competence development is the unstable character of the learning process. Erpenbeck refers in his competence model to this unstable character of the learning process. Learning, which contributes to the acquisition of competence, cannot be seen as a stable, linear process. Individual or organisational learning is sparked and initiated through a state of irritation. This irritation is caused within action which takes place in an unstable, non-routinised and complex context. In this unfamiliar and complex context, the effect of individual or collective action is not predictable, as any experience on the effect of action is lacking. The new contextual challenges and the lack of experience lead to a labilisation of the existing value system - the acting individual or group has to learn through concrete experience about the effects of specific actions in a new and complex context. Irritation also leads to phases of frustration in learning. To overcome phases of frustration, individual or organisational perseverance is one additional important factor to maintain and to drive the ambition to learn forward. When the action has been completed, the gained experience and knowledge is incorporated into the existing value system, and thereby modifies existing attitudes of the learner (Erpenbeck 2005).

Angerhn et al specify in a recent study on organisational change management the labilisation of values as one important motivational influence factor for competence development. With reference to a classical model for organisational change, which has been created by Kurt Lewin, Angehrn et al differ three phases which characterise a modification of the internal value system within organisations, and which are caused by the influence of external conditions. A significant modification of the prevailing system of values triggers the development of new and the enhancement of existing competences, which correspond to evolving requirements that external or internal change carries into the organisation.

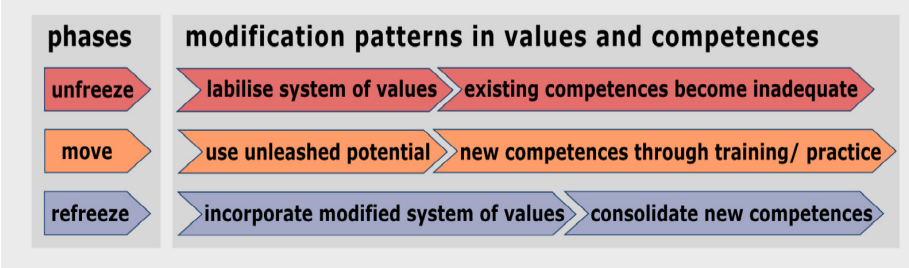
The first modification phase within the system of values is dubbed as '*unfreeze*' - which means that the existing state of goals, norms and work processes within the organisation is questioned. The given collective competences are not adequate any longer to deal with new, evolving work challenges. This gap between the inadequacy of given competences and the new requirements of evolving work challenges is causing a deep uncertainty among the members of the organisation and is leading to a substantial labilisation of their internal system of work-related values and norms.

The second modification phase within the system of values is dubbed as '*move*' - the main challenge of the organisation at this point of the change process is to use the unleashing potential, which is set free by the increasing uncertainty of its individual members, in a positive way by offering learning options and by encouraging its employees to use these learning options in order to cope with the present change. New goals, norms and work processes within the organisation have to be explained, and to be taken up by the individual members of the organisation through training and practice. When these organisational measures are efficiently implemented, new competences evolve step-by-step in this process of organisational learning.

The third modification phase within the system of values is dubbed as '*refreeze*' - which means that the individual members of the organisation internalise the new goals, norms and work processes which have been established within the organisation. They gradually adapt to their new roles and work contexts, and they incorporate the modified organisational goals, norms and work processes into their internal system of values and into their network of relationships. Finally, the set of new and enhanced competences progressively consolidates within the organisation (Angerhn et al 2005, p. 8; Lewin & Graumann, 1982).

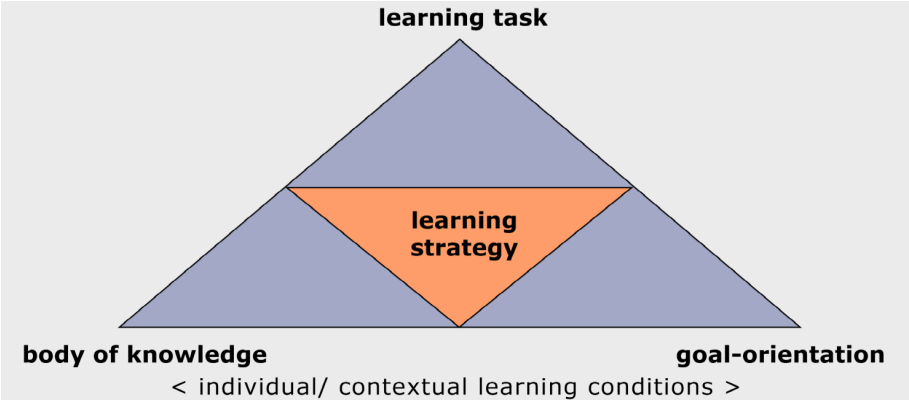
The three modification phases and patterns of this organisational process are summarised in the following figure:

FIGURE: ORGANISATIONAL CHANGE PROCESS - MODIFICATION PHASES AND PATTERNS



Friedrich & Mandl link competence development in the field of cognitive psychology to the model of active learning, which describes learning as an active reception and processing of information. The reception and assembling of information is characterised as active, self-directed and constructive process - a learner acquires knowledge, skills and abilities through active reflection on a specific learning object. The efficiency of this learning process depends to a high degree on a coherent learning strategy of the learner. Friedrich & Mandl characterise a learning strategy as a set of more or less conscious patterns or plans of a learner. This set of patterns or plans guides the combined amount of learning activities which the learner carries out to cope with a specific learning task. Apart from the learner's individual and contextual preconditions to learn, the flexibility of his or her learning strategy depends on the given learning task, the existent body of knowledge at a given point of time, and personal goal-orientation (Friedrich & Mandl 1992; Weinert 1996).

FIGURE: KEY INFLUENCE VARIABLES ON THE LEARNING STRATEGY - TRIANGLE



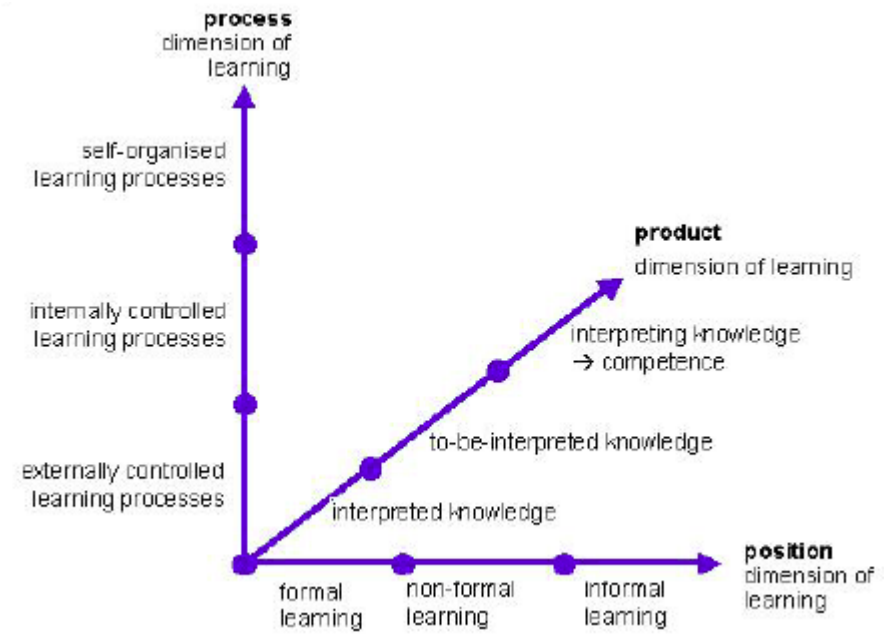
Erpenbeck & Sauer have classified the main learning dimensions, which relate to competence, within a three-dimensional descriptive learning model. These three dimensions of learning are the learning process, the learning position, and the learning product. Each of the three learning dimensions in this model are further analysed and sorted into three categories.

The dimension of the learning process splits into the categories externally controlled learning, internally controlled learning, and self-organised learning. Externally controlled learning is influenced by the external definition of educational objectives and certificates. The primarily function of the teacher in this first category of the learning process is to guide learners towards the externally defined objective or learning outcomes. Internally controlled learning also presupposes a given external objective or learning outcome, but the learner can determine his or her learning with a higher degree of autonomy. The teacher takes in this second category of the learning process a facilitating role in supporting the learning process of the learner. Finally, self-organised learning does not necessarily presume a predefined objective or goal. The learner's principal learning motivation is caused by the immediate need to improve his or her ability to act in an unstable, non-routinised performance context.

The dimension of the learning position splits into the categories formal learning, non-formal learning, and informal learning. Formal learning is the characteristic model for educational institutions like schools and universities. Learning objectives and outcomes are externally defined, tested and certified with specific degrees. The difference between non-formal and informal learning is often debated within educational research and human resources development (Winterton et al 2005, p. 5-6). Erpenbeck & Sauer define non-formal learning as learning processes, which take place within educational institutions, but which are not directly linked to externally defined educational objectives and goals. Non-formal learning is not certified, but the learners gain knowledge which can be measured. Informal learning stands for learning processes which definitely take place outside the work context of educational institutions. The learner defines him- or herself learning objectives and goals. The learning outcomes are usually not certified, and they can only be measured through the performance of the learner.

Finally, the dimension of the learning product splits into the categories interpreted knowledge, to-be-interpreted knowledge, and interpreting knowledge. Interpreted knowledge is defined as explicit knowledge, which is presented in educational settings and assessed in exams. To-be-interpreted knowledge relates to concepts of implicit, tacit knowledge. Explicit learning contents do not represent tacit knowledge, as tacit knowledge cannot be codified. Learners express and exchange tacit knowledge in interaction and in their creation of relationships. Interpreting knowledge, as it is defined by Erpenbeck & Sauer, is closely linked to competence acquisition. It stands for the learner's active reflection and interpretation of new knowledge. Interpreting knowledge includes the cognitive activity of knowledge processing; it also relates to values and attitudes as additional components, which are relevant for the process of knowledge interpretation. Finally, the existing set of values and attitudes of the learner are influenced and modified by the result of his or her cognitive process - which is to reflect upon, to interpret and to integrate new knowledge (Erpenbeck & Sauer, 2000; Hartmann 2004, p. 2-3).

FIGURE: LEARNING DIMENSIONS WITHIN COMPETENCE MODELS (ERPENBECK & SAUER, 2000)



In Erpenbeck & Heyse's work we can identify notions of adult learning, which may be important for the competence development of university teachers in the use of ICT. Terms like self-organised learning, lifelong learning, demand-driven and tailored training solutions, pervasiveness of innovative processes, and individualisation emphasise the active role and the perspective of the learner within a learning context. The design of innovative human resources development measures and learning choices, which are embedded into work contexts, depends to a large degree on the implications which are made for this type of active learner. One core aspect in the concept of active learning is the learning competence, which Erpenbeck & Heyse define as disposition, which is at the individual learner's disposal to develop self-learning competence. Learning competence includes the learner's cognition, abilities, and skills to efficiently develop his or her personality. In addition, learning competence is a prerequisite for improving the learner's work-related performance in his or her institutional context. To increase the degree of self-organised learning in educational processes, institutions need to create a learning culture which allows and encourages individual learning in a cooperative and participative work context. This new learning culture dissociates the teacher from established roles of instruction - it requests alternative teaching concepts, which place the learner and his or her learning activities in the center of the teaching and learning process (Erpenbeck & Heyse 1999, p. 96f.; 122).

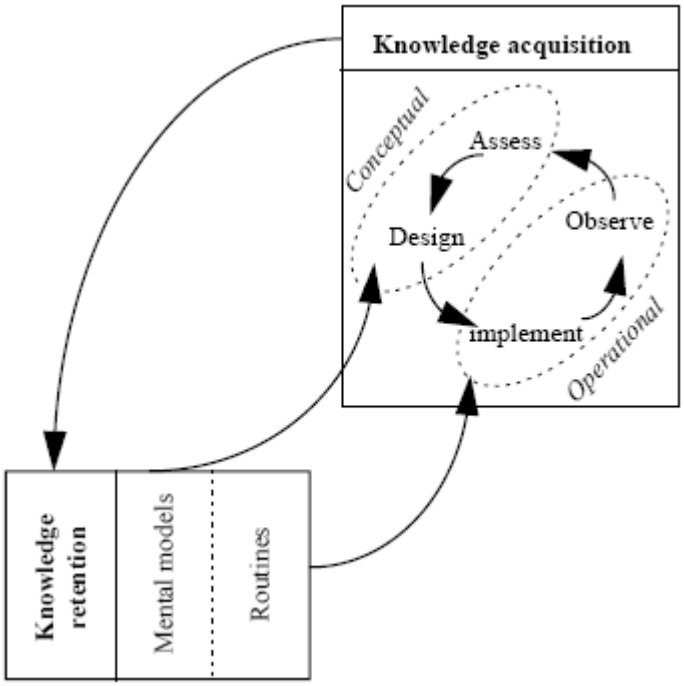
With reference to studies on learning in cognitive and pedagogical psychology, Mandl & Krause define competence to learn as the ability to successfully act in learning. Mandl & Krause characterise learning as active, self-directed, constructive, situative and social process. Learning takes place in

phases of cooperation between learning individuals. Associated attributes of the learning process are self-organisation, interaction, social exchange and cooperation. These attributes provide reference points for the pedagogical design of a learning environment, which actively encourages the learner's competence development.

Based on this characterisation of learning as an active process, Mandl & Krause propose the concept of constructivist learning as pedagogical framework for the design of a stimulating and interactive learning environment. The concept of constructivist learning takes up the idea of learning as a self-directed process, which builds on the learner's active construction of knowledge. When learners acquire new competences, their existing body of knowledge, their experiences, and their attitudes influence their learning process. The learning of an individual learner depends on his or her self-directed and active knowledge construction. This dependency of successful learning from active knowledge construction relates closely to the aspect of self-organisation, that Erpenbeck & Heyse have referred to in their argumentation and which has been presented in the previous paragraph. (Mandl & Krause 2001, p. 4f.; 15f.).

In their work on the concept of competence, Winterton & Delamare Le-Deist have taken up a cyclical learning model from Kim, and extended it into an integrated model of individual learning (Kim 1993). This model consists of two interdependent components, which structure the learning process. These components are the acquisition and the retention of knowledge by the learner. The component of knowledge acquisition splits into two elements, which are conceptual and operational learning. Conceptual learning occurs when the learner assesses new knowledge and prepares for a specific action. In the process of the operationalisation of learning, the learner carries out this specific action and reflects upon its impact. The knowledge retention component of the model stands for individual and organisational learning outcomes. The knowledge retention component combines two elements: the first element are mental models; they determine the learner's perception of reality. The mental models are influenced by conceptual learning processes, which take place in the knowledge acquisition component of the model. The second element of the knowledge retention component are routines; they determine the learner's behaviour and performance in a specific context. The routines are influenced by the operational learning processes that take place in the knowledge acquisition component of the model (Winterton et al 2005, p. 7)

FIGURE: INTEGRATED MODEL OF INDIVIDUAL LEARNING (KIM 1993; WINTERTON ET AL 2005, P. 6-7)



This model represents a cyclical process of learning in competence development. With knowledge acquisition and knowledge retention, the model includes two main components of learning. It also differs between two types of learning, when learners acquire new knowledge. These two types of learning are conceptual and operational learning. With mental models and routines, the model distinguishes between two outcomes of learning, which combine into the knowledge retention component. Next, the model assumes close interdependencies between the knowledge acquisition and the knowledge retention component and their key elements. Finally, the cyclical learning model links the individual and the organisational level of learning. This link can be found in the interplay between the conceptual and the operational part of the knowledge acquisition cycle. The conceptual part refers to cognitive learning processes of the individual learner; and the operational part refers to behavioural learning processes, which combine individual action and the impact of this action on the corresponding organisational context, in which this specific action is carried out.

The learning context is an important influence factor on the way in which learning evolves and is fostered. For example - learning, as a key component for competence development, seems to have different notions in the corporate and in the public sectors. When we compare models for learning, which takes place in companies, and models for learning, which takes place in universities, these two approaches to learning follow distinct purposes, and they are placed within distinct organisational structures.

In the corporate sector, companies usually define learning goals and learning outcomes for their employees in human resources management on the basis of market-driven success indicators, which determine the capability of the companies to remain competitive with their products in open and free corporate markets. This market-driven corporate context is dynamic; it exerts a constant pressure on the companies to adapt to innovative and competitive production processes (Samuelson & Nordhaus 1995, pp. 128 ff).

These contextual factors influence the type and structure of training courses for employees in companies. Training courses tend to be demand-driven; they need to be tailored to fit the short-term training needs and time schedules of the employees, and they are in their majority designed to improve the performance of a group of employees rather than to solely foster individual competences of a single learner.

In the educational sector, it is hard to find human resources management in universities at all. Universities do often not even define any learning goals and outcomes for their academic staff members. They are still to a large extent rated by externally defined success factors, and they act in a highly regulated public market - although this regulated market is currently changing and universities face increasing competition for resources and students. But most universities still have to build up the capability to adapt to innovative processes (Bates, pp. 7 ff; Enders 2002, pp. 15 ff).

These contextual factors influence the type and structure of academic staff development courses in universities. Many training courses are still supply-driven. They are usually not tailored to fit the self-organised learning style and the tight time schedule of university teachers. And the majority of staff development courses is designed to improve individual teaching performance rather than to induce a mode of collaboration and to improve the division of labour between and within groups of academic teachers.

In particular the self-organised learning style is important for the analysis of eCompetence development measures and activities in universities. Many academic teachers work with a high degree of autonomy. They do not acquire competences in reaction to external educational objectives or certificates. Due to this high degree of autonomy, which most faculty members enjoy in the academic culture - which is still characterised by its independent definition of research objectives within disciplines and its consensual decision-making within faculties, universities as institutions cannot oblige their academic staff to commit themselves to strategic organisational objectives - e.g., to support a sustainable implementation of eLearning and the increased use of ICT in teaching. Competence acquisition of academic staff takes usually place on a voluntary basis and relies heavily on self-organised learning. Any university that wants to set up adequate staff training and support measures in order to advance technology-based teaching and learning, has to be aware on these internal peculiarities of the academic work culture (Kerres et al 2005, pp. 36-38).

We have argued that staff members are highly independent and active learners. They self-organise a large part of their learning based on criteria that express the values and cultures of specific academic disciplines. These patterns of the academic learning culture link back to the above illustrated conception that Erpenbeck & Sauer have made on learning. Their definition of three learning dimensions and their specification of characteristics for adult learning sharpen the analytic perspective

on learning demands and needs for academic staff in ICT - related activities; and they may help to understand and to interpret innovative elements in specific university staff training measures.

Learning - Summary and Competence Model

To summarise this section, we can state that *learning is a key component and the core of any competence development - there is no competence development without learning.* This is the basic assumption for the role of learning as key component in the concept of competence. Within this basic assumption on learning, we have discussed several implications, which detail the aspects of learning as key component in the concept of competence. These implications refer to

- the unstable character of the learning process and the irritation of the existing system of values of learners;
- the need for ambition and perseverance to overcome phases of frustration in the learning process;
- the phases and patterns of modification in the collective system of values and competences of employees, which occurs in organisational change;
- the role of a learning strategy as basis for successful learning;
- a specification of the main learning dimensions in relation to the concept of competence;
- the influence of the learning-to-learn concept and learning competence on models for competence development;
- the concept of constructivist learning and its relation to self-organised learning;
- a cyclical learning model in competence development, which includes the individual and the organisational levels of learning;
- distinct learning objectives and structures in human resources management models within the corporate and the educational sectors;
- and finally the role of self-organised learning within the academic learning culture and its implications for adequate academic staff training measures.

When we try to illustrate the key components of competence in a model, we can start by placing the process of learning as first component at the core of the following figure:

FIGURE: KEY COMPONENTS OF COMPETENCE - THE LEARNING CORE (CIRCLE I)

4.6.2. System of Dispositions

We have already seen above that Weinert extracts in his OECD study a common basis for interpreting competence from its wide spectrum of definitions in a number of scientific disciplines (see chapter 4.3 - Complexity). This common basis constitutes competence as the abilities, the proficiencies, or the skills which form a specialised system for adequate action and goal fulfilment. The specialised system for action itself is based on individual or on collective dispositions, which are distributed within a social group or within an institution. And these dispositional components of competence are specified by their relation to a specific goal. This goal orientation - the individual or collective volition '*to reach a specific goal*', defines the main functions or requirements of the dispositional competence components. Finally, competence reveals itself in an act of performance. If no act of performance occurs, any competence will remain a hypothetical option, an unfulfilled potentiality of an individual, a group, or an institution (Weinert 1999, p. 4).

We can conclude from Weinert's comparative analysis of competence concepts that the system of dispositions is a key component of competence. And we have seen that competences - at least in the perspective of pedagogical psychology and educational research, can be acquired or enhanced through learning. This has led us to the assumption that specific learning processes influence the dispositional side of competence, and we have discussed these learning processes in the previous section. The first question is now, if we can characterise the system of dispositions within competence more in detail within the relevant scientific literature. And secondly, which implications does the system of dispositions have for the task of universities to design specific measures in order to develop ICT - related competences for faculty?

Mandl & Krause analyse in their work cognitive dispositions within competence on the basis of an expertise model. An expert distinguishes him- or herself by definition from the collective by excellent performance in a domain. With reference to expertise research in cognitive psychology, a domain is defined here as a specific field of study or work. One cognitive component, which Mandl & Krause specify as relevant for learning and competence development, is existing basic knowledge of the individual in a particular field. Learning is described as a cumulative process, by which a learner acquires and integrates new knowledge. This new knowledge correlates with existent, previously developed knowledge resources of the learner. Mandl & Krause illustrate this correlation with the biblical parable of the so-called Matthew Principle, which says: "*For whosoever hath, to him shall be given, and he shall have more abundance*" (Matthew 13:12). This means, that we can assume a positive correlation between the given body of knowledge, which a learner has already acquired in a specific domain, and the rate of adding new knowledge to this given body of knowledge - the more you know in a specific domain, the easier you add to your knowledge through learning. This way, the level of a learner's existing knowledge in his or her specific domain has a big influence on his or her efficient acquisition and interpretation of new knowledge.

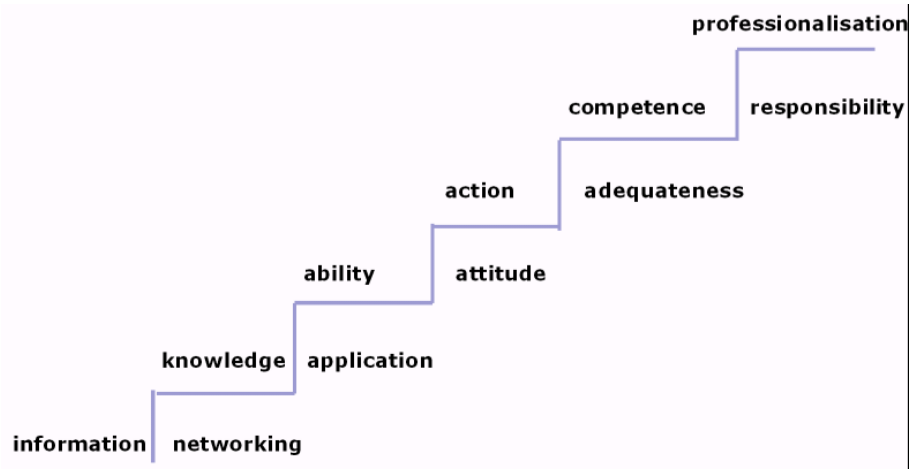
The development of expertise requires that an individual expert has gained and can resort to a given level of cognitive dispositions, which determine his or her performance in the specific field of study or work. Only if the level of the learner's cognitive dispositions is above the required threshold, which separates average from excellent performers, a continuous learning process elevates the competence level of the learner above average and leads subsequently to the pursuit of expertise. Next to knowledge in a specific domain, Mandl & Krause relate specific skills and work routines to cognitive dispositions which, in their sum, form the basis for individual expertise. Accordingly, the competence of an expert is rooted in a mental network of specialised knowledge, specific skills, and work routines, which are implicit dispositions and whose acquisition through learning requires long-term practice and proficiency (Mandl & Krause 2001, p. 6-9).

Similar to Mandl & Krause, Proctor & Dutta identify in their expertise research continuous learning and long-term practice as key influence factors to develop outstanding individual competence in a specific field of study or work. At one point, Proctor & Dutta write: "*Expertise typically is acquired through many years of intensive, deliberate practice in a particular domain, with 10 years typically given as the minimum time for expert levels of performance to be achieved*" (Proctor & Dutta 1995, p. 262). As they subsequently detail this definition of expertise, Proctor & Dutta distinguish three cognitive dispositions which enable an expert to carry out outstanding performance in a domain. The first cognitive disposition are mental knowledge structures of an expert, which encode and process a large amount of meaningful information in a specific knowledge domain. The second cognitive disposition are task-solving strategies of an expert, which help him or her to efficiently coordinate relevant process components of a task-related performance; and the third cognitive disposition are meta-cognitive abilities of an expert which are necessary for him- or herself to self-evaluate the progress made within the performance.

Wildt has structured a group of key components, which experts integrate in their competence development, within a stairway model. This stairway model has been originally developed by North to specify the evolution of professional expertise in the corporate sector. Wildt has modified North's model and applies it to the higher education sector. This stairway model describes the cumulative process of professionalisation, which academic experts go through when they acquire competence in their specific science domain. The different competence components interrelate with each other, and they cumulatively build upon each other. Competence development is triggered, when the learner identifies and acquires new information. The learner reflects on this new information and connects it to his or her existing body of knowledge, which is rooted in a mental network of meaning. This reflection process of the learner results in new knowledge. If the learner integrates new knowledge within his or her specific science domain, this leads to an increased ability of the learner in this domain. In the next step, this increased ability needs to coincide with a specific attitude of the learner, which is the willingness or volition to perform, in order to result in an act of performance - the attitudinal component in this model includes the learner's system of values and his or her motivation. If, in the fourth step, the action of the learner is consistent with given, external standards of adequateness, this adequate action

results in increased competence in the specified domain. In a final step the competence, which is combined with a certain social responsibility in the educational system, leads to an increased professionalisation of the learner in his or her specific science domain (North 2005; Schneckenberg & Wildt 2006, p. 30-31).

FIGURE: STAIRWAY OF PROFESSIONALISATION

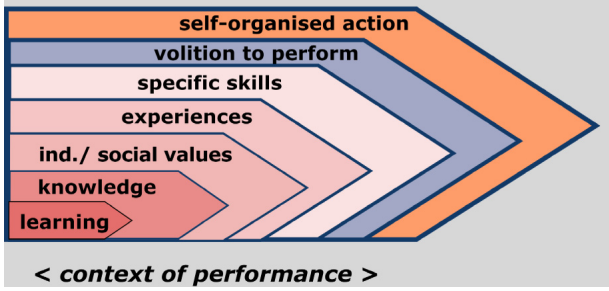


Similar to the point of view, which Weinert takes on the research basis for the dispositional components of competence, Erpenbeck & Heyse assume that the spectrum of scientific studies and contributions on competence refers to a common conceptual basis. They specify in their work this common conceptual basis for the dispositional components in line with the concept of action competence. According to Erpenbeck & Heyse, a system of dispositional correlations is basis for the ability of individuals to act in a self-organised way - a set of specific dispositional preconditions determines self-organised performance. These dispositional preconditions for competent action include knowledge, values, experiences, skills, and volition.

Subsequently, Erpenbeck & Heyse define knowledge as the combined amount of mental results of learning. Knowledge, as it is based on mental structures, can be detached from the context of values and performance. Values result from the cognitive process of attributing acquired knowledge to an existing system of values. Within the value system itself, Erpenbeck & Heyse distinct between individual and social values. At individual level, values subsume implicit needs, attitudes, emotions, and motivation. Within a social context, values represent explicit social norms. In the next stage of this dispositional system, experience is defined as a complex of knowledge and values, which the acting individual has proved in past performance situations. This way, experiences are available as dispositional basis for potential future performance in a similar context. One step further in the dispositional system, skills are defined as a complex of performance dispositions, which an acting individual has acquired in past performance dispositions - skills integrate knowledge, values and experiences.

Finally, Erpenbeck & Heyse define volition as mental ability of an acting individual to self-organise his or her action in a specific context (Erpenbeck & Heyse, p. 161f.).

FIGURE: IND. COMPETENCE - DISPOSITIONAL PRECONDITIONS FOR SELF-ORGANISED ACTION



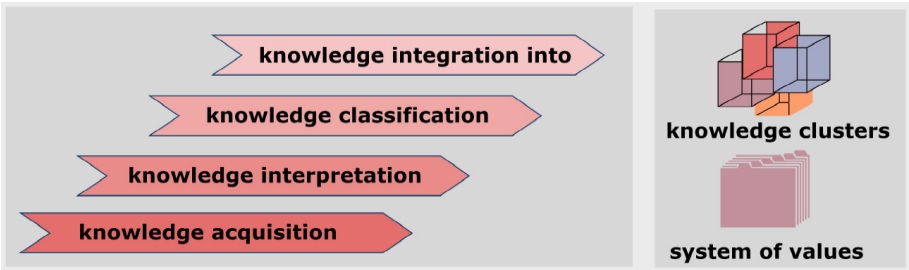
These five dispositional preconditions, which Erpenbeck & Heyse have identified for competence, closely correlate with each other. In their sum, they determine the performance of the acting individual. Knowledge, values and experiences build upon each other in a cumulative process - values include knowledge, and experiences include values and knowledge. Skills are characterised as past performance dispositions, which include all three preceding dispositional components - experiences, values and knowledge. Volition is regarded the single dispositional component of competence, which is not directly interrelated with, but rather independent from the other components. The role of volition as dispositional component for competent action, as Erpenbeck & Heyse interpret it, is comparable to the role that Weinert assumes for motivation in his considerations on competence. In the works of Erpenbeck & Heyse and Weinert both dispositional components, volition and motivation, are treated as independent influence factors on competence, which have a decisive impetus on performance. In their model, Erpenbeck & Heyse subsume motivation as a subcomponent of values. Volition is seen as an important, but independent dispositional component that determines the relation between competence and performance.

To conclude this string of argumentation on dispositional competence components, Erpenbeck & Heyse construct an integrative definition for knowledge, values, experiences, skills, and volition. This definition assumes that the five dispositional influence factors for competence development are interrelated in a complex structure, and that they build upon and integrate each other: "*Competences are originated in knowledge, constituted by values, made disposable as skills, consolidated by experiences, realised by volition*" (Erpenbeck & Heyse 1999, p. 162).

Erpenbeck & Heyse also describe in detail the process of developing competence through learning. Individual competence development of the learner starts with the acquisition of accessible and available knowledge, which has to be operationalised within competent action. In the process of learning, this new knowledge needs to be interpreted, classified and integrated into existing know-

ledge clusters and into the value system of the learner. Next, the learner progressively develops a strategy for adequate action in a specific context. This performance strategy bundles knowledge, values, skills and experiences as dispositional competence components of the learner. The one condition for carrying out an action, which is independent from the other dispositional competence components, is volition. Only when the volition to act adds to the other dispositional competence components, the performance strategy of the individual learner will realise in a specific action. In this way, the learner's performance strategy results in action competence, which Erpenbeck & Heyse define as self-organised, dispositional ability to act, while integrating knowledge, values, experiences and skills (Erpenbeck & Heyse 1999, p. 163 ff).

FIGURE: KNOWLEDGE PROCESSING IN COMPETENCE DEVELOPMENT



Bloom's taxonomy is a model related to learning dispositions, which has become influential in education and training contexts. Bloom's taxonomy is a reference model for the classification of learning goals which teachers can define for learning activities of their students. The learning performance of students is assessed in different levels with an increasing degree of complexity. Bloom's taxonomy differentiates between three domains, in which educational activities take place and into which they can be classified - these are the cognitive, the psycho-motor and the affective domain. In the cognitive domain, learning closely interrelates with knowledge. In the psycho-motor domain, learning connects to the acquisition and enhancement of manual or physical skills. And in the affective domain, learning influences the evolution and stabilisation of individual attitudes. Bloom's taxonomy of learning is frequently cited in the training literature and in competence research as the KSA (knowledge, skills, attitudes) model. One additional notion of the KSA model is its orientation towards learning outcomes. The KSA model defines for each of the three educational domains what learners should have acquired in terms of knowledge, skills or attitudes, after they have finished a specific learning activity. Bloom's taxonomy intends to support teachers in developing a more holistic approach towards education. It offers a framework for teachers which integrates all three domains into specific pedagogical settings and learning activities. (Bloom 1976; Winterton & Delamare Le-Deist 2005, p. 18).

Delamare Le-Deist & Winterton refer in their comparative analysis of competence concepts to holistic competence approaches, which have emerged in particular in the German (Erpenbeck & Heyse 1999; Arnold 2005) and French research discussion (Cazal & Deitrich 2003). In these holistic

competence approaches, knowledge, skills and attitudes are seen as interrelated competence components. In the French approach, the KSA model is quite commonly used to represent the dispositional components of competence (Delamare Le-Deist & Winterton 2005, p. 36 ff.). Dejoux reports that a consensus definition of competence is widely used in France, which includes three dispositional key components: the first component is based on knowledge - *savoir et connaissance*; the second component relates to skill-based experience - *savoir faire*; and the third component evolves around the ability for self-reflection and to show adequate behaviour in a social context, while respecting explicit norms and values - *savoir être où la faculté de s'adapter*. These three dispositional key components of competence have been named '*tripytique*' in French. According to Dejoux, the dispositional key components of the 'tripytique' are frequently integrated in France as conceptual basis in human resources development programs in the public as well as in the corporate sectors (Dejoux 1996).

Winterton et al construct their own theoretical framework of dispositional components for competence with close reference to the KSA model. Winterton et al define within their theoretical approach a typology of knowledge, skills and competence. The typology of knowledge, skills and competence sets a focus on the assessment of learning outcomes and aims to categorise the competences which a learner has acquired - irrespective of his or her mode of acquisition. The focus on learning outcomes also implies that the underlying pedagogical concept, on which this typology is based, is learner-centered learning. The typology combines four competence dimensions: these are cognitive, functional, and social competences, to which an additional meta-competence is added. In their explication, Winterton el al argue that cognitive, functional and social competences are consistent with the KSA (knowledge, skills and attitudes) model which has derived from Bloom's taxonomy of learning. Accordingly, they relate knowledge to cognitive competence, skills to functional competence, and attitudes to social competence.

The dimension of meta-competence is quite distinct from the cognitive, the functional, and the social component of competence. Meta-competence includes those mental processes which stimulate the enhancement of the other three substantial competence dimensions. Meta-competence has a 'vertical', pervasive function, it influences the evolution of the three other competence dimensions of a learner. In this way, the dimension of meta-competence which Winterton et al refer to, can be compared to the concept of learning competence, as it has been outlined in similar ways by Mandl & Krause and by Erpenbeck & Heyse (see chapter 4.6.1 Learning).

Finally, Winterton et al emphasise that the four dispositional competence dimensions can only be interpreted within theoretical models as analytically separated parts. In real practice, the four competence dimensions merge to one interrelated dispositional complex to enable the acting individual to adequately perform in a specific context (Winterton et al 2005, pp. 40-41).

FIGURE: UNIFIED TYPOLOGY OF KNOWLEDGE, SKILLS AND COMPETENCE (WINTERTON ET AL, P. 40)

	occupational	*personal*
conceptual	Cognitive competence (knowledge)	meta-competence (facilitating learning)
operational	Functional competence (skills)	social competence (attitudes and behaviours)

The topic of competence development has also made its way into the educational policy goals of the European Commission. The ongoing educational policy debate includes competence development as one strategic element within the concept of lifelong learning. And the shift from qualification to the development of competence is currently stressed as one key topic for the innovation of educational systems in order to face the increasing competition and complexity in our work and life contexts. This challenging societal and economic environment is demanding changes in the dispositional structure of the citizens' competences - each individual member of society needs to acquire new knowledge, to learn new skills, and to incorporate new attitudes to cope with the complexities of modern world.

With the aim to stimulate this policy-driven debate on the reform of educational systems, the European Commission has authorised a work group of scientific experts to discuss and to draft a reference framework for key competences for lifelong learning. This expert group has identified and specified general dispositional components of competence. On the basis of this specification, competence is defined in the EU framework paper as "*... a combination of knowledge, skills and attitudes appropriate to a particular situation*" (COM 2005 548 final, p. 3). Within this debate on policy measures for educational reforms and its implicit conceptual assumptions of competence, the authors of the European framework for key competences specify knowledge, skills and attitudes as the three main dispositional components that determine the ability of the individual citizen to participate adequately and actively in the emerging knowledge society. In this way, the EU expert group underlines the role of the KSA model as adequate representation of dispositional components of competence in its reference framework for key competences.

Kerres et al refer to the dispositional triad of knowledge, skill and attitudes in a recent study on eTeaching competence in higher education. With reference on previous work from Euler & Hahn on the competence topic, Kerres et al define competence in a general way as disposition for stable and continuous performance of human beings in specific types of situations (Euler & Hahn 2004, p. 214). This competence definition is specified by Kerres et al with reference to competence-related attributes. They identify personal traits - e.g. subject-orientation, integrity and individual potential for self-organisation, as essential attributes for competence. As next step in their considerations, Kerres et al present knowledge, skills and attitudes as dispositional basis for those performance dimensions, in which individual action competence is operationalised. Knowledge evolves in cognitive processes. Skills enable an individual actor to carry out creative and constructive activities - in this function, skills are one condition for individual capability or proficiency. In addition, skills serve as basis for individual

work routines. This potential of skills evolves in performance contexts, where individual action is presumably carried out with a high degree of automatisation. Attitudes enable individuals to assess and to value objects according to given criteria of morality, aesthetics or efficiency (Kerres et al. 2005, 12-13).

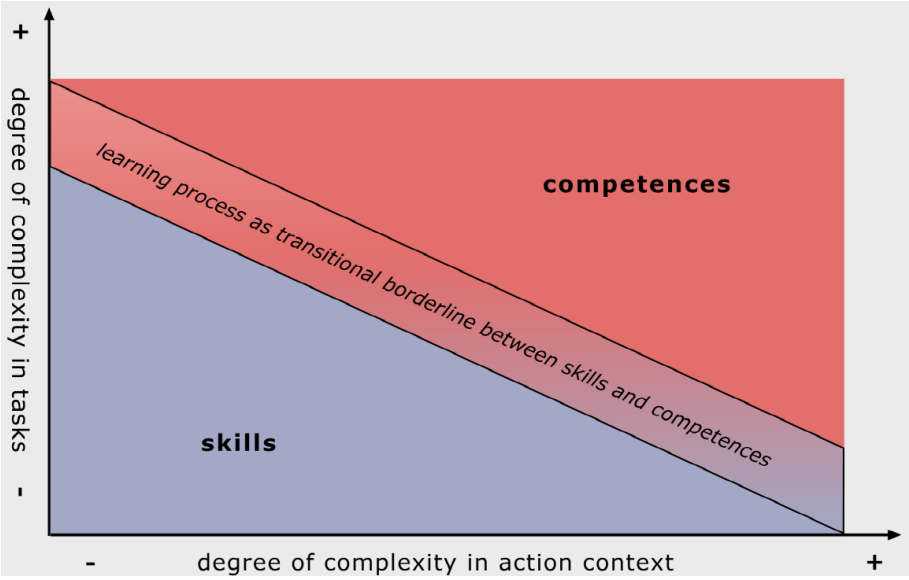
A final reference to the system of dispositions within competence in this section of the study is the competence definition which Van der Blij presents within a Dutch paper on competence assessment and competence-based teaching. Van der Blij also refers to the KSA triad as dispositional key components of competence. She defines competence as "*... the ability to act within a given context in a responsible and adequate way, while integrating complex knowledge, skills and attitudes* (Van der Blij 2002, translation from Dutch by author). This definition is quite compact and coherent. The dispositional components of competence consist of the already well-known triad of knowledge, skills and attitudes. When an individual actor carries out a specific action, in order to show competent behaviour in the context of performance, the dispositional components of knowledge, skills and attitudes need to be combined and to be interrelated with each other in a process of integration.

In addition to this integrative moment related to the act of performance, van der Blij characterises the dispositional KSA component of competence as complex. Complexity is an important criteria for competence, because complexity '*makes a difference*' - it draws a line between skills and competences. The degree of complexity is included in the task and in the context of performance. Simple tasks, which an individual actor can process in a highly routinised way, mainly require skills. In contrast to this routinised task-solving the more complex tasks, which an individual actor is facing in an unstable and challenging context, require competences for adequate action.

Related to the notion of complexity within the concept of competence, Weinert takes a similar standpoint on how to distinguish skills and competences. Weinert notes that, in general, the research literature tends to be unprecise on the distinction between skills and competences. According to his thoughts, the concept of competence always implies that a sufficient degree of complexity is required in the act of performance to meet given demands and tasks. Those dispositional factors, which in principle can be automatised in performance situations, are more adequately characterised as skills. Therefore, the competence term can only be adequately applied to those task-solving activities which contain a high degree of complexity (Weinert 2001, p. 62).

The following figure represents the notion of complexity and the distinction between skills and competences:

FIGURE: DEGREE OF COMPLEXITY: FROM SKILLS TO COMPETENCES



Summary - System of Dispositions and Competence Model

When we summarise this section, we can conclude that, next to learning, the system of dispositions is a second key component of the concept of competence. *The system of dispositions is the basis for goal-oriented, adequate action in a complex and authentic context - there is no competent action possible without the system of dispositions*. This is the basic assumption for the system of dispositions as key component in the concept of competence. Within this basic assumption on the system of dispositions, we have outlined several implications, which exemplify different aspects of the system of dispositions as key component in the concept of competence. These implications include

- the existing basic knowledge of the learner in a particular domain, as well as specific skills and work routines as essential mental and physical prerequisites for developing expertise;
- a network of knowledge structures, task-solving strategies, and meta-cognitive abilities as three cognitive dispositions which enable an expert to carry out outstanding performance in a specific domain;
- a range of dispositional key components for competence, which build upon each other in a cumulative process of professionalisation of academic experts;
- a process chain of mutually interrelated individual competence dispositions - including step-by-step mental reflection, knowledge, values, experience, skills and volition, which result finally in self-organised action;
- the evolution of the KSA (knowledge, skill, attitudes) model on the basis of Bloom's taxonomy and its frequent use in the current training and competence development discussion;

- the frequently used holistic French approach to competence, based on the dispositional triptyque of *savoir*, *savoir faire*, and *savoir etre*;
- examples of the specification and application of the KSA model in different contexts, such as in the KSC (knowledge, skills, competence) model, which adds meta-competence as fourth dispositional competence dimension; the use of the KSA model in the EU framework paper on key competences for lifelong learning; its use as dispositional basis for the specification of eTeaching competence; and its exemplification as complex and integrative dispositional component in the Van der Blij's Dutch competence assessment study.

Based on these implications, we can now return to our illustration of key components of competence and circle the mutually interrelated and integrated dispositional components knowledge, skills, and attitudes as one common building block in the model around the learning core.

FIGURE: KEY COMPONENTS OF COMPETENCE - THE KSA TRIAD OF DISPOSITIONAL COMPONENTS (CIRCLE II)

4.6.3. Motivation

Motivation is the one key component within the architecture of any competence concept which is frequently regarded as taking a particular position. Competent performance is closely related to motivation. But in many conceptual approaches motivation is not included as integral component of competence. For example: Van der Blij refers in her definition, which we have introduced in the preceding section, to this motivational aspect of the competence concept, when she speaks of the ability to act. Notably, this ability to act is optional. The potential action of the individual actor depends on his or her motivation to act. Only if substantial motivational drivers to trigger an adequate performance evolve in a specific situation, the ability to act - as potential, will transpose in adequate action. In this way, motivation is a conditional influence factor on competence. Boyatzis has expressed this optional character of competence - as disposition, and the role of motivation - as essential trigger for action, in a concrete example: "*A lot of times, people don't use their competencies. Take consultants. For years, I've watched them with clients – they are very charismatic, sensitive, empathetic – then, they'd come back to the office and behave like jerks*" (Adams 1998, p. 43). Obviously, although in this example the consultants are competent to behave in a charismatic, sensitive, and empathetic

way, they are seemingly not motivated to use these competences in their familiar, 'remote' work environment.

White has published a paper in 1959 on the relationship between competence and motivation, which has become influential in the competence debate. In this paper, White defines competence as effective interaction of an acting individual with his or her environment, and he observes a close relationship between cognitive dispositions, motivational action tendencies and competent behaviour.

In this relationship, motivational action tendencies serve as a bridge, which connects cognitive dispositions - as the ability to act in an effective way, and competent behaviour - as the observable manifestation of the cognitive dispositions within a context of performance. If we remove the motivational action tendencies in this relationship, the cognitive dispositions have no path or channel to turn into a performance - without the motivational bridge, there will be no action, even if the required cognitive dispositions for adequate action are in place.

FIGURE: MOTIVATION AS BRIDGE BETWEEN COGNITIVE DISPOSITIONS AND COMPETENT BEHAVIOUR

Accordingly, White assumes that motivation is a key factor for competence acquisition and development. He concludes, that "*... it is necessary to make competence a motivational concept, that there is a competence motivation as well as competence in its more familiar sense of achieved capacity*" (White 1959, p. 317f).

Weinert has analysed the interrelation between competence, performance and motivation. In Weinert's position, motivation is the essential condition for adequate performance: one can be competent, but not motivated, so there will be no adequate performance - or no performance at all. Next, Weinert specifies a set of motivational attitudes which influence the relation between competence and performance. These motivational attitudes include, amongst others, self-confidence in specific personal competencies, personal attribution style for success and failure outcomes, self-efficacy feelings, test anxiety, goal orientation and personal expectancies.

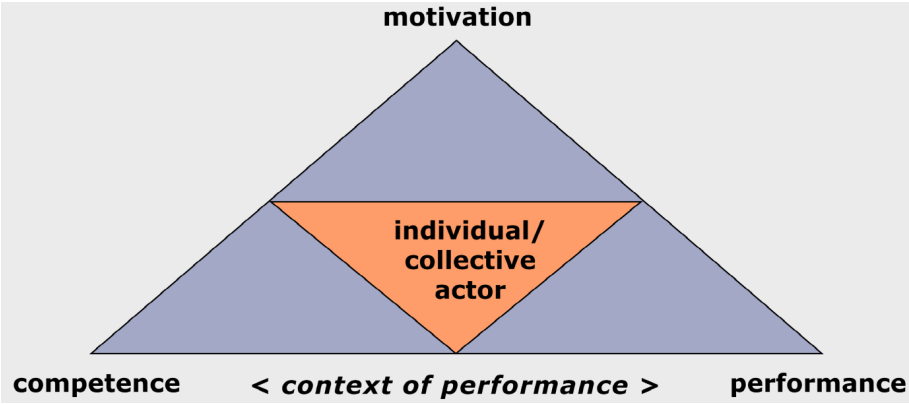
LIST: MOTIVATIONAL ATTITUDES WHICH INFLUENCE THE RELATION BETWEEN COMPETENCE AND PERFORMANCE (BASED ON WEINERT 1999)

- Self-confidence in specific personal competencies

- ✗ Personal attribution style for success and failure outcomes
- ✗ Self-efficacy feelings
- ✗ Test anxiety
- ✗ Goal orientation
- ✗ Personal expectancies

Weinert concludes that motivation is not an integral component of competence; it is rather to be seen as independent condition for competence-based performance: "*Empirical findings have shown reciprocal effects between motivational attitudes and the development of competencies. Thus, motivation should not be taken as a component of the competence concept, but rather an important condition for specifying the relation between competencies and performance*" (Weinert 1999, p. 25).

FIGURE: MUTUAL DEPENDENCY OF COMPETENCE, MOTIVATION AND PERFORMANCE



In their study on competence, Winterton et al underpin White's and Weinert's position that motivation should not be considered an integral part within the concept of competence. According to Winterton et al, the evolution of a specific action motivation depends on a wide subset of motivational variables, which, in their sum, are too heterogeneous to be included in competence models: "*A person is said to be 'competent' if they have the requisite KSC [knowledge, skills and competence], but whether or not they are motivated is a function of a whole range of external and internal factors*" (Winterton et al 2005, p. 27). As consequence, Winterton et al assume that motivation is an independent influence factor in the concept of competence which affects both the dispositional competence components and performance.

Reiserer & Mandl analyse the relation between motivation and competence with a focus on learning motivation. They discuss the influence of motivation on learning, and further on they inquire about the influence of learning motivation on the development of competence in the wider educational scenario of lifelong learning. Reiserer & Mandl assume that personal motivation to learn depends on a large set of variables. Amongst others, it depends on goal orientation of a learner, on his or her interest in the specific learning object and field, and on his or her self-efficacy beliefs. Next,

they interpret goal orientation as habitual or dispositional attributes of a learner. These habitual or dispositional attributes can be intrinsic - at the individual level of motivational orientation; or they can be extrinsic - at the contextual (organisational) level of motivational orientation. Interest is defined as interrelation between a learner and his or her object of learning. This interrelation contains value-related, attitudinal, and emotional components. And finally, Reiserer & Mandl assume that self-efficacy beliefs of a learner rely on related cognitive assessment processes - learners as acting individual ask themselves, if they can reach the envisaged goal at a particular time with their given abilities. Reiserer & Mandl conclude that the variables goal orientation, interest and self-efficacy beliefs strongly influence personal motivation to learn (Reiserer & Mandl 2002).

Motivation, and its influence on learning and competence development, is not restricted to the individual level of learners, but can also be analysed at organisational level of companies and institutions. Euler has discussed the role of motivation as factor within organisational change (Euler & Hahn 2004). In this context, Euler relates motivation to the concept of innovation readiness in higher education institutions. He lists a number of motivational factors, which influence the readiness of an organisation and the readiness of its individual members to support or to actively take part in strategic change. These motivational factors for innovation readiness include, amongst others: openness and trust in the communication between members of the organisation; a high degree of cooperation between members of the organisation; a willingness to exchange experiences; a place for dialogue; leadership commitment; individual competence, which can be brought into mutual cooperation; and interest, as well as a curiosity of members of the organisation to build upon and to extend a cooperative basis for driving forward the change process. Euler points out that these motivational influence factors for innovation readiness are often mentioned in studies on organisational learning, and he rates them to be appropriate characteristics to describe underlying motivational tendencies for innovation readiness.

Next, Euler allocates the influence factors for innovation readiness to two motivational categories. These motivational categories are capability and volition. They can be applied to individual members of the organisation, and to the organisation as a whole. In addition, Euler argues that these two categories also interrelate with each other - innovation can only be successfully implemented if both capability and volition evolve within the organisational context. Euler concludes that motivational processes bridge the gap between the intention to perform and the realisation of performance. In this way, motivation is one important element in the concept of innovation readiness in organisations (Euler 2004, p. 567).

The following figure summarises the function of the motivational factors as link between intentions to perform and the realisation of performance:

FIGURE: FROM INTENTION TO REALISATION OF ORGANISATIONAL PERFORMANCE

With reference to studies from motivation research, Euler argues that two cumulative motivational variables contribute to a stable performance of individual actors in innovative scenarios: the first variable for stable performance is initial motivation, which triggers a specific action tendency; and the second variable for stable performance is the subsequent evolution of a process- or realisation motivation, which stabilises and continuously improves actions and behaviour. Next to initial motivation of the individual to act, persistence is a second important motivational influence factor, which relates to the development of new competences in an innovative scenario. As a motivational variable for stable performance, persistence refers to the continuation of individual action in spite of present or emerging obstacles. Organisational innovation frequently starts with a high level of initial enthusiasm that group members, which are affected by the change process, develop for new ideas. But, once the change processes has started and its implementation reveals to be more challenging as expected, this initial enthusiasm of individual actors tends to decrease. At this critical stage of the innovation process, many individual actors lack the motivational persistence to uphold their initial engagement (Kuhl 1983; Euler 2004, p. 568).

To sum up this point of view on the role of motivation in organisational innovation, we can conclude that motivation is a critical component in organisational change. Organisational innovation is obviously changing the work context of the individual members of the organisation - they have to adapt to new, unfamiliar work tasks, and they have to develop new or to enhance existing competences to comply with upcoming challenges in their changing work context. Euler has referred to a set of motivational factors which influence innovation readiness, introduced capability and volition as two central motivational categories for organisational innovation, and considered initial motivation and process- or realisation motivation as key variables for building up a persistent change readiness. When we relate these findings to the conceptual analysis of competence, we can safely assume that motivation is essential to start and to uphold a continuous learning process, which progressively leads to the acquisition of new individual and group or collective competences.

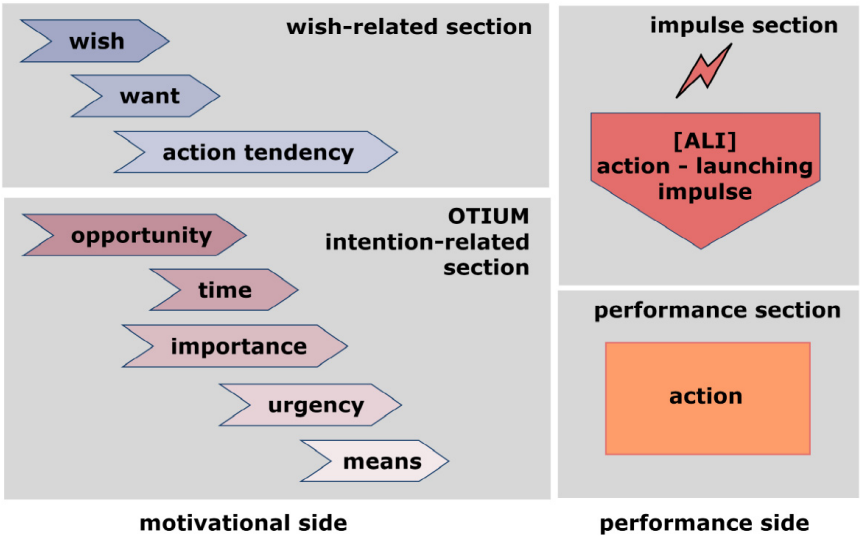
With a similar perspective on motivational factors and its influence on competence development within institutional innovation processes, Heckhausen & Kuhl have developed the OTIUM model, which can be applied to identify intentional motivation factors for individual participation in organisa-

tional change. The OTIUM model analyses the emergence of intentional action tendencies on the basis of action theory assumptions. The field of psychological action theory analyses and interprets motivational factors such as wishes, wants and intentions which precede and cause individual action (Schaper 2004, p. 195). Accordingly, the OTIUM model illustrates wish-related and intentional motivation factors which precede and condition the evolution of individual action.

Heckhausen & Kuhl assume that a motivational process is precondition for any action. This motivational process for action is split into two sections - a wish-related section, and a intention-related section. The wish-related section of the motivational process for action includes the components '*wishes*' and '*wants*'. If both components evolve to a sufficient degree, the motivational process for action is passing from the wish-related section into the intention-related section.

This intention-related section of the motivational process includes opportunity, time, importance, urgency, and means as main subcomponents of the OTIUM model. Opportunity stands for the chance or the option of an individual actor to achieve a specific goal in a specific situation. There needs to be a sufficient amount of time available to achieve a specific goal. This aspired goal has to be or to become important for the individual to cause an action. A sense of real urgency needs to be related to the aspired goal. And finally, the individual actor has to dispose of adequate means - in terms of own resources and additional support from his or her social context, to reach the specific goal. If all wish-related and intention-related subcomponents emerge in the motivational process to a sufficient degree, they combine to an intentional action tendency or action launching impulse (ALI) which initiates individual action (Heckhausen & Kuhl, 1985).

FIGURE: OTIUM - INTENTIONAL MOTIVATION FACTORS WHICH PRECEDE ACTION (BASED ON HECKHAUSEN & KUHL, 1985)



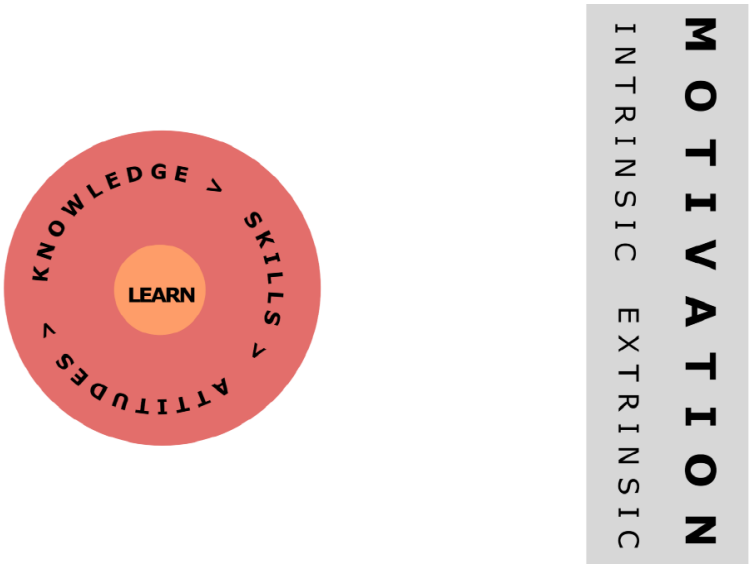
Summary - Motivation and Competence Model

In the conclusion of this section, we add motivation next to learning and the system of dispositions as a third key component to the concept of competence. *Motivation is an essential condition for competence-based performance - you can be competent, but if you are not motivated to act, there will be no action at all.* A specific quality of motivation is its place in the concept of competence - it is not an integral component of competence, but rather seen as independent influence factor, which determines the relation between the dispositional competence components and performance. This is the basic assumption for motivation as key component in the concept of competence. Within this basic assumption on motivation, we have discussed a number of implications which detail the aspect of motivation as key component in the concept of competence. These implications refer to

- the role of motivation as main trigger and essential condition for adequate or competent action;
- the function of motivation as bridge between cognitive competence dispositions and competent behaviour;
- specific motivational attitudes, which influence the relation between competence and performance;
- the particular status of motivation as independent component within the concept of competence;
- the specification of motivational variables which influence personal competence development through learning;
- the distinction between the intrinsic or individual, and the extrinsic or contextual level of motivational orientation;
- the role of motivation within organisational innovation, which includes: a specification of motivational factors which influence the innovation readiness of individuals; the identification of volition and capability as two motivational categories; and the differentiation between initial action motivation and persistence as two cumulative stages for a stable performance of individual actors in innovative scenarios;
- the presentation of five intentional motivation factors for individual action tendencies within the OTIUM model.

Based on these implications, we add motivation to the illustration of key components of the concept of competence. Due to its peculiar quality as independent conditional factor, which determines the relation between the dispositional competence components knowledge, skills, and attitudes on one hand and performance on the other hand, we place motivation in the model as independent block at the side of learning and the system of dispositions.

FIGURE: KEY COMPONENTS OF COMPETENCE - INTRINSIC AND EXTRINSIC MOTIVATION (CIRCLE III)



4.6.4. Performance

We have seen so far that the concept of competence includes learning and the dispositional system of KSA as integral components, to which motivation can be added as external influence factor. One more integral component of competence is performance. Performance is the visible aspect, the 'shape' of competence, which we can observe and measure - it is the manifestation of the dispositional components of competence within concrete action in a social situation. This relationship between the dispositional and the performance level of competence is one key point of Chomsky's competence - performance model. Chomsky distincts in his research on cognitive prerequisites for language learning between competence and performance as two components which complement each other. He assumes that competence cannot be examined or measured directly, but reveals itself and becomes manifest in acts of performance. Thus, competence can only be interpreted by observing and measuring external behaviour of the acting individual.

In one of his recent works on conceptual approaches for studies on competence, Chomsky outlines a research model which sets a focus on the question how persons acquire and integrate new ideas and concepts into their existing body of knowledge. At one point of this work, Chomsky states: "*One might, for example, consider the problem of how a person comes to acquire a certain concept of three-dimensional space, or an implicit 'theory of human action,' in similar terms. Such a study would begin with the attempt to characterise the implicit theory that underlies actual performance and would then turn to the question of how this theory develops under the given conditions of time and access to data that is, in what way the resulting system of beliefs is determined by the interplay of*

available data, 'heuristic procedures', and the innate schematism that restricts and conditions the form of the acquired system" (Chomsky 1998).

According to this research model that Chomsky describes, the only key we find to access the cognitive level of acquiring and integrating new knowledge and its subsequent competence development is to observe a person's real performance. This observation of performance behaviour has to be underpinned by an interpretative system of conceptual implications. In this conceptual framework the researchers need to propose theoretical assumptions and interpretations on the dispositional components of competence, which trace back to the explicit and visible performance patterns - as we cannot measure the cognitive dispositions of competence directly, we need to interpret them in the behaviour patterns of visible performance. Chomsky's competence - performance model, in particular the relationship between the dispositional component and the performance component of competence, has become an influential contribution for the scientific discussion in competence research.

McClelland & Boyatzis have carried out studies on effective or superior management performance in the corporate sector and discussed methods to identify and to measure cognitive dispositions of competence, which are the basis for the managerial competence of these outperformers. McClelland & Boyatzis understand competence as a behavioural concept - a specific competence becomes manifest in a specific behaviour. Accordingly, their approach to competence is based on the analysis of performance patterns in authentic and complex work contexts. They define effective performance as "*... the attainment of specific results (outcomes) through specific actions while maintaining policies, procedures and conditions of the organisational environment.*" This definition includes an important notion on the role of performance as component of competence: in order to be competent actions, those actions, which are taken, have to be in accordance with the norms and regulations of the organisation - they have to be responsible and adequate actions. Continuing their argumentation, McClelland & Boyatzis emphasise that adequate actions within a given organisational environment rely on specific competences of an individual actor: "*Competence is the underlying characteristic of an individual, which is causally related to effective or superior performance in a job* (Adams 1997, p. 20)."

Based on these conceptual assumptions, McClelland & Boyatzis have developed a methodology for assessing work-related competence in the corporate sector, which could be applied in our study to diagnose eCompetence of academic teachers in universities. This methodology is called the behavioural event interview - which is based again on the critical incident interview. The critical incident interview asks interviewees to reflect on their behaviour in critical situations they encountered in their workplace. In the behavioural event interview, researchers first select two sample groups within the organisation, where the study is carried out: the first group are outstanding, and the second group are average job performers in a specific work context. Next, the researchers take in-depth interviews with the actors from both sample groups: the interview questions focus on the way the interviewees do their work.

The clue within the behavioural event interview is thereby to emphasise the whole enquiry on critical situations: a specific research focus is on those decisions and those actions which the interviewees have taken in critical situations, when the work processes have been developing exceptionally well or bad for them. After having taken and recorded the interviews, the transcripts are analysed and specific behavioural indicators, which can be identified and extracted from the reflections of the actors, are notated. These indicators are then clustered into a set of competences for both sample groups of the study. The contrasting selection of the two sample groups helps to identify more clearly those competences of the outstanding performers which make a difference and which are the foundation for their superior performance and success in the work context (Boyatzis 1982).

Kerres el al refer in their study on ICT - related teaching competence development measures for academic staff in universities to a competence definition which underlines the role of performance as visible part of the concept of competence. Competence is not merely restricted to the acquisition of knowledge, but it is demonstrated and becomes manifest in specific action. Accordingly, Kerres et al define competence as ability of an individual actor to cope with situative challenges in actions. It is the real actions of an individual performer, by which we can solely gain access to his or her underlying competences and try to interpret the implicit dispositional competence components (Kerres et al 2005, p. 12).

Summary - Performance and Competence Model

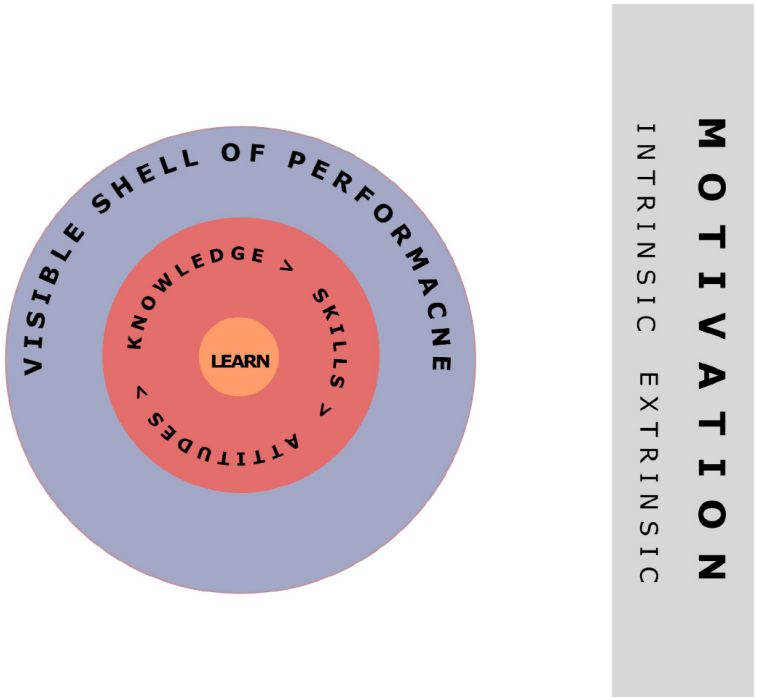
To summarise this section, we can add performance as fourth key component of the concept of competence to learning, the system of dispositions, and motivation. *Performance is the visible manifestation of the 'hidden' dispositional competence components in a specific social context - as competence cannot be measured or examined directly, theoretical assumptions on the implicit dispositional competence components have to be validated and interpreted by the observation of real performance*. This is the basic assumption for performance as key component in the concept of competence. Within this basic assumption on performance, we have outlined several implications, which detail the role of performance as key component in the concept of competence. These implications include

- the research methodology for constructing competence models by defining a set of theoretical implications on the implicit characteristics of specific competences, and by validating the theoretical construct through the assessment of observable performance in real contexts;
- the approach to understand competence as a behavioural concept;
- the definition of competent performance as adequate action, which is conform to external contextual norms and regulations;
- the competence diagnosis model of the behavioural event interview and its implicit methodology and assumptions;

- the essential role of performance as visible manifestation of competence in specific actions and as sole measurable indicator for a diagnosis of the dispositional competence components.

Based on these implications, we add performance to our illustration of key components of the concept of competence and circle it in the model as visible shell of competence around the learning core and around the dispositional system of knowledge, skills and attitudes.

FIGURE: KEY COMPONENTS OF COMPETENCE - PERFORMANCE (CIRCLE IV)



4.6.5. Context

A final key component of competence, which we would like to discuss in this study, is the context. A number of references have already been made to the context in the above presented analysis of competence components. We have in particular argued that the context contains the notions of authenticity and complexity as essentials characteristic for the concept of competence. Meanwhile an individual actor can handle tasks with a low degree of complexity by applying mainly existing skills, the more the degree of complexity within the context of performance increases, the more the individual actor depends on his or her competences to adequately handle the given tasks. In this way the context functions as differentiator between skills and competences (see chapter 4.6.2. System of

Dispositions - figure: from skills to competences). This function of the context as differentiator and as denominator for specific competences is closely interrelated in the concept of competence with the component of performance. The context is the space, in which a specific action is carried out. The attributes of the context of performance specify in their sum those competences that are required for adequate individual or collective action.

This basic relevance of the context as a key component of competence is stressed in a study, which has been carried out by Fischer et al. The authors question the validity of competence definitions, which define competence as a generalised or generic performance disposition, without relating these dispositions to the context of action. Accordingly, they clearly state in their paper that "*...people do not have competencies independent of context*" (Fischer et al. 1993, p. 113). The context includes specific situative requirements for adequate action, which is based on the dispositional competence components. A diagnosis of context-specific performance patterns is the basis for the validation of theoretical assumptions which are made in a specific concept of competence. This means that the context-specific situative challenges for adequate action need to be thoroughly analysed and described in order to understand and to specify a specific competence. If we follow the perspective of Fischer and his colleagues, a specific competence can simply not be discussed without any reference to the context of performance.

Until now we have roughly conceptualise the context as a confining frameset, in which all other key components of the competence concept are embedded. Can we further specify the main function of the context and its main attributes - as being a differentiator and denominator for specific competences? Weinert notes in his OECD study that most definitions of competence are centered on the individual, and fail to consider the social, physical and task-specific contexts, in which performance occurs (Weinert 1999, p. 17). The context of competence-based performance is thus multidimensional. The four dimensions, which Weinert specifies, add up to a large number of variables, which set in their sum the requirements for achieving a specific goal through adequate action. In this perspective, competence relates to specific achievement conditions. These achievement conditions consist of distinct internal and external sets of variables, which influence the action. One set of variables in the social dimension of the context are, for example, relevant standards (goals, demands) which are externally defined; these standards are incorporated into the context as the social environment, in which the acting individual or group is situated. Within the four contextual dimensions, which Weinert proposes for a specification of achievement conditions, we can thus assume a number of additional variables as influence factors which affect competent action. These variables are listed in the following table:

TABLE: DIMENSIONS OF THE CONTEXT OF PERFORMANCE AND RELATED VARIABLES (BASED ON WEINERT 1999)

DIMENSION	VARIABLES FOR ADEQUATE ACTION
Individual dimension	Group position; goal-orientation; external and internal motivational

DIMENSION	VARIABLES FOR ADEQUATE ACTION
	factors.
Social dimension	Standards; organisational and individual norms and habits; work culture.
Physical dimension	Spacial situation; work exposure; constitution; motor ability; degree of fitness; fatigue.
Task-specific dimension	Task setting; task definition; task type; degree of complexity.

According to Erpenbeck, one approach to understand the role of the context as definitory element for specific competences is based on the assumption that individual or collective actors rely on a set of basic or fundamental core competences when they carry out a performance. Erpenbeck suggests that we could list for example self-organisation, critical reflection, communication, problem-solving, and team orientation as five basic core competences, which are important for adequately using ICT. Then again, we could list more or less the same core competences to be important for actions in an intercultural setting. When we assume though, that the required basic core competences are more or less the same for both situations, what is then the difference between ICT-related and intercultural competences? The difference is included in the context of performance. It is the key attributes within the situative context of performance which determine as sets of variables the specific competences that are needed for adequate action of the individual or the collective actors. And the key attributes of an ICT-based action context certainly differ, when we compare them to the key attributes of an intercultural action context (Erpenbeck 2006, interview).

An initial perspective on the key characteristics or attributes of the context is also included in Van der Blij's definition, which we have introduced in chapter 4.6.2 on competence dispositions. When we take up this definition again, Van der Blij argues that the context of performance is given; and the competence-based ability to act within this context is described with the attributes 'responsible' and 'adequate'. According to this competence definition, the individual actor cannot freely choose his or her performance context, but has to act in a given situation. This contextual condition and the implied attributes refer to the aspect of external standards for adequate and responsible behaviour. External standards are usually defined by social consensus of decision-makers in specific organisational or systemic structures. This implies that the context of performance includes and represents a set of social norms and regulations within the concept of competence.

Wildt presents a more detailed view on the key attributes of the context as one component within the concept of competence. With close reference to Van der Blij's competence definition, Wildt extracts a core structure of definitory competence elements. This core structure defines competence as individual dispositions to act in context-bound situations according to consensual standards. The core structure of competence is based on three key components. The first key component of the competence structure is 'individual dispositions', the second key component of the competence struc-

ture is 'to act in context-bound situations', and the third key component of the competence structure is 'according to consensual standards'.

Next, Wildt separates the three key components into three distinct levels of observation, and he assigns a range of characteristics or attributes to the three components. The first level of observation is focusing on competence dispositions, which enable an individual actor to carry out an adequate performance. The second level of observation analyses the immediate situational context of an individual actor. This situational context is the frameset, in which an individual actor interacts with his or her immediate environment. And the third level of observation investigates the wider organisational or systemic environment, in which an individual actor is situated. This wider organisational or systemic environment contains a set of standards for adequate behaviour, which are implicitly or explicitly defined within the organisation or the social system.

Finally, Wildt adds specific science disciplines to the three levels of observation. For each of the three competence levels, the large majority of scientific contributions derives from three distinctable science disciplines. Accordingly, Wildt states a predominance of cognitive psychological theory approaches to competence on the individual level of cognitive dispositions, of sociological theory approaches on the organisational or systemic level of relevant standards, and of the merging of both science disciplines on the intermediate level of the situational context, The intermediate level can be analysed with action theory approaches, which interpret goal-directed behaviour in organisational settings on its implicit intentions (Heckhausen & Kuhl 1985).

The characteristics or attributes of the situational context as intermediate level of observation give a more detailed idea on the kind of immediate context of performance, which requires individual competence for adequate action. This context of performance, where individual interaction with the immediate environment takes place, is characterised as 'authentic', 'complex', 'undefined', 'not routinised', and 'dynamic'. One could add attributes like 'unfamiliar' and 'challenging' to the characterisation of the competence-specific context. In their sum, these attributes stand for the assumption that competence-based individual action does not take place in a simple and familiar context of performance, but that it is carried out in a highly complex and unfamiliar context of performance (Schneckenberg & Wildt 2006, p. 30).

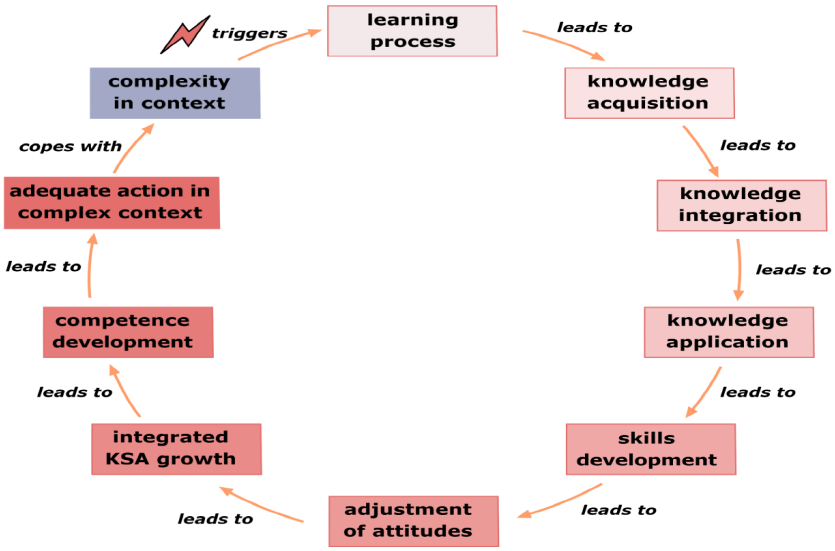
The following figure shows the key components, characteristics, and attributes of the context of performance:

FIGURE: ATTRIBUTES OF CONTEXT OF PERFORMANCE (BASED ON WILDT 2005)

COMPONENTS	CHARACTERISTICS	LEVELS OF OBSERVATION
individual dispositions ⇩ to act in	abilities, aptitudes, motivations attitudes , values	psychological theory
⇩ context-bound situations ⇩ according to	complex, undefined, not routinised dynamic	action theory
⇩ consensual standards	appropriateness, responsibility	sociological theory

Finally, the notion of complexity, which is interwoven in the concept of competence with the context of performance, has a strong influence on learning. The specified characteristics of a complex context are closely connected to a learning process, which is again the nucleus for developing and for enhancing competences. We assume that the complexity and challenges, which are enclosed within the context of performance, serve as a trigger for learning. To cope with this complexity, individual actors have to acquire and to integrate new knowledge, to apply this knowledge within a specific action, and to assess and to value the results of the action within their set of attitudes. This way, learners acquire competences in confrontation with their immediate environment. Accordingly, the development of competence through a process of learning is always related to a challenging and complex social context (Kerres et al 2005, p. 12).

FIGURE: CIRCLE - COMPLEX CONTEXT OF PERFORMANCE AS TRIGGER FOR LEARNING AND COMPETENCE DEVELOPMENT



Summary - Complex Context and Competence Model

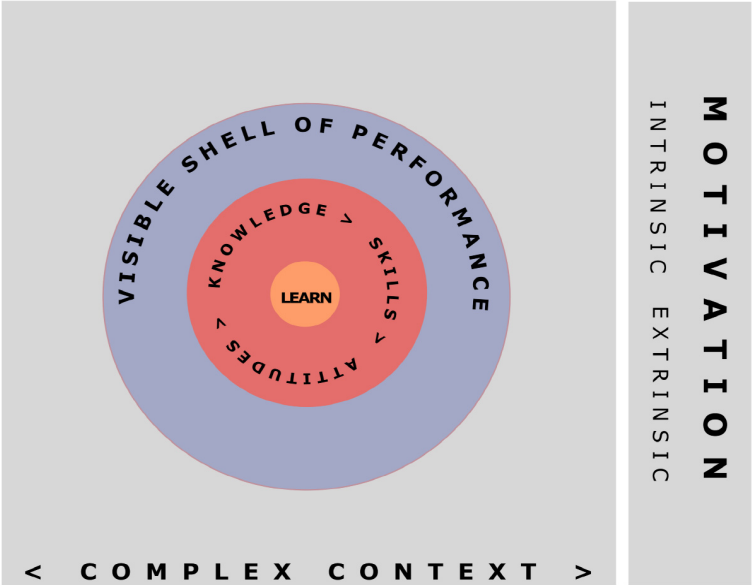
To conclude this section, we can add the complex context as fifth key component of the concept of competence to learning, the system of dispositions, performance and motivation. *First, the particular context of performance defines and specifies those competences, which are necessary to adequately act in a given situation - it is not possible to specify competences without a thorough analysis of the specific requirements which are included in the context. And second, the degree of complexity within the context of performance, which contains attributes of authentic, unstable, undefined, challenging, non-routinised tasks, is a trigger for a learning process in which individuals or groups develop and enhance their competences.* This way, the context of performance is an important component for understanding the concept of competence and for attributing competences to specific individuals or groups. A thorough context analysis is the key to specify particular competence needs and profiles within organisations. This is the basic assumption for the complex context of performance as key component in the concept of competence. Within this basic assumption on the context, we have outlined several implications, which detail the role of the complex context as key component in the concept of competence. These implications relate to

- the function of the context as differentiator and as denominator for specific competences;
- the immediate dependency of the diagnosis of context-specific performance patterns from the analysis of context-specific situative requirements for adequate action;
- the distinction between an individual, a social, a physical and a task-specific dimension of the context of performance;
- a set of key attributes within the situative context of performance, which determine specific competences needed for adequate action;
- the aspect of external standards for adequate and responsible behaviour within the context;
- the distinction between an immediate situational action context and a wider organisational or systemic environment, which determine the competence requirements of the acting individual;
- the role of the complex context of performance as trigger for learning and competence development.

Based on these implications, we add the complex context to the illustration of key components of the concept of competence and position it in the model as the confining frameset for adequate action behind the learning core, the dispositional system of knowledge, skills and attitudes, and the performance shell.

This function of the context in the concept of competence as confining frameset for adequate action is shown in the following figure:

FIGURE: KEY COMPONENTS OF COMPETENCE - COMPLEX CONTEXT (CIRCLE V)



4.7. Concept of Action Competence

We have discussed until this point of the study key components of competence, which are frequently mentioned and described within competence research. These key components are: a continuous process of learning; a system of dispositions, which integrates the three components knowledge, skills, and attitudes; intrinsic and extrinsic motivation; the act of performance; and finally the context of performance. The key components and their main attributes have been identified and specified within a desktop study of relevant research on the conceptualisation of competence. Where does that lead us to now? Can we integrate the single components into a consistent competence model? And would that model fit into one of the main strings of discussion in competence research?

It has already become clear in this study that various approaches to competence can be found in the scientific debate. Weinert differentiates at least nine ways in which competence is defined or interpreted. These categories of competence definition and interpretation are: general cognitive ability; specialised cognitive skills; the competence - performance model; the modified competence - performance model; objective and subjective self-concepts; motivated action tendencies; action competence; the model of key competencies; and meta-competencies. These approaches can be regarded as being mutually exclusive. Any attempt to integrate different competence approaches into a generic concept of competence would lead to a 'hyper-definition', which would lack specificity and precision (Weinert 1999, p. 6; p. 15).

For a further discussion and integration of the conceptual key components of competence into a coherent theoretical model, on which the main assumptions of eCompetence will be based, we first focus on the concept of action competence. Weinert characterises action competence as a holistic approach to competence, when he states: "*Action competence includes all those cognitive, motivational and social prerequisites necessary and/ or available for successful learning and action*" (Weinert 1999, p. 10). The concept of action competence combines cognitive and motivational components into a coherent dispositional system; it assumes a learning process at the core of competence development; and it puts obviously an emphasises on action, on performed behaviour - as the single visible component, by which the underlying dispositional competence factors can be assessed and interpreted.

Weinert notes that the concept of action competence is quite commonly used, due to its holistic quality, to analyse conditions for successful actions in professional, institutional or social contexts. The concept of action competence includes not only cognitive dispositions and motivational factors; it also combines individual, role-specific and collective conditions for the successful development of competences within a social group or within an institution. The combination of these conditional factors implies that

- ✗ competences for successful action can be distributed within institutions in a social network of individual actors;
- ✗ institutional human resources management strategies rely on a normative definition of institutional key competences, which summarise and specify the required individual competences in a social network of individual actors;
- ✗ the complementary development of competence for specific areas of action within a social network of individual actors needs to be framed by a wider institutional strategy (Weinert 1999, p. 10).

These three implications in the concept of action competence can be further detailed:

1. Competences can be distributed in a social network of individual actors, who are involved in the implementation of specific institutional goals and strategies. This first implication states that competences can be fostered within an institution at individual level of the single actor or at group level of the collective, that forms, as a whole, the responsible team for a specific task.

2. At institutional level, the concept of action competence is useful to analyse the development and management of institution-specific competences within a social network. The second implication focuses on the main challenges, that an institution is facing in its organisational competence development: the institution has to set up a portfolio of measures to develop competences of its individual members; and the institution has to find effective instruments to

manage and to make use of the distributed competences which are available in specific groups for specific tasks. From these reflections we can also infer the selective, segregative function of the context in the concept of action competence. Each single institution has different needs and reacts in a different way to contextual innovation challenges - what fits one institution, does not necessarily fit the other. Accordingly, we can presume for our own research topic that a universal, 'one size fits all' - portfolio of measures for eCompetence development seems to be an unlikely conceptual or analytic result of this study.

3. In organisational perspective, integrative competence development of human resources is one constituent of institutional change strategies and innovation models. What does that mean? The main institutional task in human resources management (or human capital management, as it is frequently dubbed in the corporate sector) is to initialise and to define a training strategy, which sets up a support structure and which includes measures for framing the competence development of its individual members. The planning and implementation of such a training strategy requires strong leadership, flexible competence management models, and the identification and description of team skills and individual action competences, which are defined for and assessed within different group levels, and which are combined for institutional action in the core business processes of the organisation.

Weinert observes that five dispositional core components are frequently mentioned in conceptual approaches to action competence. These core components of action competence are general problem-solving competence, critical thinking skills, domain-general and domain-specific knowledge, realistic, positive self-confidence and social competencies (Weinert 1999, p. 10). This category of components is comparable to the key competence model, which is frequently used in the German research context and which assumes that action competence can be subdivided into four key competences. These key competences are subject matter, methodical, social and personal competences. This way, in a comparison of both models, domain-general and domain-specific knowledge is comparable to subject matter competence; general problem-solving competence is comparable to methodical competence; social competencies equals social competence; and finally realistic, positive self-confidence is comparable to personal competence. Remain solely the critical thinking skills in Weinert's conceptual approach, which are more a sort of transversal competence that interrelates to all four other core components of the concept of action competence.

Finally, we shortly discuss the perspective which Erpenbeck & Heyse take within their work on the concept of action competence. Erpenbeck & Heyse have created a detailed reference framework for individual competences, which is based on the analysis of self-organised action. With reference to implications, which are made in action theory, Erpenbeck & Heyse assume that individual competence is interpreted in action which is not, or not completely predictable. The degree of complexity within the situational context, the given dispositions of the acting individual and the process of action are key variables within the analysis model for action competence. Subsequently, Erpenbeck & Heyse define competence as individual dispositions for self-organisation. They define four basic types of self-organ-

ised actions, which are mental, instrumental, social and communicative, and (self-) reflective actions. On the basis of these action types, the underlying competences can be interpreted and classified.

Based on a performance analysis and a classification of four types of action, Erpenbeck & Heyse relate these four action types to their underlying competence dispositions. The range of competence dispositions are clustered within a typology of four key competences, which are subject-matter, methodical, social and personal competence. Erpenbeck & Heyse remark that the classification of groups of dispositions into these four individual competence types is caused by conceptional reasons - the theoretical classification of dispositions allows distinct analytic perspectives on the process of performance. In real practice, the four competence types do not function as separated dispositional components of competence - quite to the contrary, they interrelate closely with each other in performed action. Within a process of performance, any mental or cognitive activity, which is related to a specific subject, always implies methodical, social and self-reflective activities and vice versa.

Subsequently, Erpenbeck & Heyse characterise the four competence types more in detail. Subject-matter competences are defined as dispositions to act self-organised in cognitive and mental task-solving. This includes the ability to solve problems with subject-matter skills, and to classify as well as to value knowledge in a meaningful way. Methodical competences are dispositions to act self-organised in reflective processes. This includes the creative design and application of methods in tasks and solutions, and the ability to structure cognitive procedures. Social competences are dispositions to act self-organised in communication and cooperation processes. This includes the ability to interact within a group, and to behave according to collective orientations. And personal competences are dispositions to act self-organised in (self-)reflective processes. This includes the ability to self-assess oneself, to develop productive and positive attitudes, value-orientation, motifs and self-perception, to unfold personal talent, motivation and ambition, and to learn as well as to develop within and beyond work contexts.

TABLE: CLASSIFICATION OF FOUR KEY COMPETENCES (BASED ON ERPENBECK & HEYSE 1999)

COMPETENCE TYPE	-- COMPETENCE ATTRIBUTES --
Subject Matter	✗ Problem-solving in subject area ✗ Classify knowledge ✗ Value knowledge
Methodical	✗ Creative design of methods in tasks and solutions ✗ Efficient application of methods in tasks and solutions ✗ Coherent structuring of cognitive procedures
Social	✗ Effective communication, cooperation and interaction within group ✗ Adequate behaviour according to collective orientations

COMPETENCE TYPE	-- COMPETENCE ATTRIBUTES --
Personal	✗ Critical self-assessment ✗ Develop productive and positive attitudes, value-orientation, motifs and self-perception ✗ Unfold personal talent, motivation and ambition ✗ Learn and develop within and beyond work contexts

Building on this classification, Erpenbeck & Heyse combine the four individual competence types within an integrative model of action competence. When they define action competence as dispositions to act self-organised in a coherent way, this includes the ability to integrate a set of subject-specific, methodical, social, and personal competences within a process of individual performance. Erpenbeck & Heyse describe action competence in a more extensive definition as dispositions to efficiently apply and to implement values, perceptions and behaviour patterns, which have been acquired in actions within personal and vocational contexts and which are specified within the four individual competence categories (Erpenbeck & Heyse 1999, pp.156 ff).

One important assumption within the model of action competence, which Erpenbeck & Heyse provide, is the process of self-organised learning. This relates to the question if learning fosters the ability for self-organisation in a specific vocational or professional context. Erpenbeck & Heyse assume that learning has a positive effect on the four key competences and that it is ultimately enhancing competence.

We have already argued in chapter 4.6.1, which has focused on learning, that competence can be developed through a continuous process of learning. One important notion in the learning dimension is thereby the pedagogical principle of learner-centered learning. Competence development requires as basis an active, self-organised process of learning - competence can be learned, but it cannot be taught. The idea of a learning-to-learn competence seems to be implicitly embedded within the concept of action competence. To summarise these reflections, we can define action competence in line with Erpenbeck & Heyse as a system of prerequisites for successful, self-organised performance, which is influenced by practice and by a continuous process of learning.

When we try to combine the key components of competence, that we have discussed so far, into an integrative model, which is consistent with the implications of the concept of action competence, we can sketch two building blocks and add one linking bracket between these blocks:

The first building block of the integrative model of action competence is the dispositional side of competence. This dispositional side includes several components: it is based on the KSA complex - knowledge, skills and attitudes, which combine the cognitive (knowledge), physical (skills) and mental

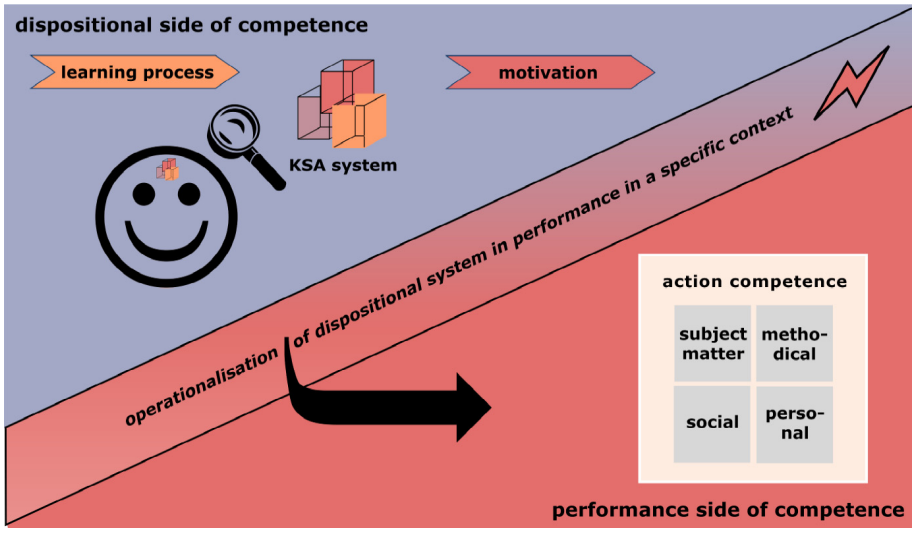
(attitudes) dispositions of competence; closely connected to this KSA complex is the process of learning, which is a key influence factor on knowledge, skills and attitudes; and finally, motivation is part of the dispositional side of competence, as it is a key influence factor on the volition to perform, to transpose competence dispositions into action.

The second building block of the model is the performance side of competence. The performance side includes the action itself, and the interpretation of this action within a typology of four underlying key competences, which are subject-matter, methodical, social, and personal competence.

The linking bracket, or the glue between the dispositional and the performance side of competence is the moment or instance of operationalisation. In precisely this instance, the dispositional components of competence are operationalised in an act of performance, which is carried out in a specific situation or context. In the concept of action competence, the instance of operationalisation interrelates the competence dispositions on the hidden or invisible side of competence to individual or collective action on the exposed or visible side of competence.

These two building blocks of action competence and the linking bracket are illustrated in the following figure:

FIGURE: FROM COMPETENCE DISPOSITIONS TO PERFORMANCE



Summary - Key Competences and Competence Model

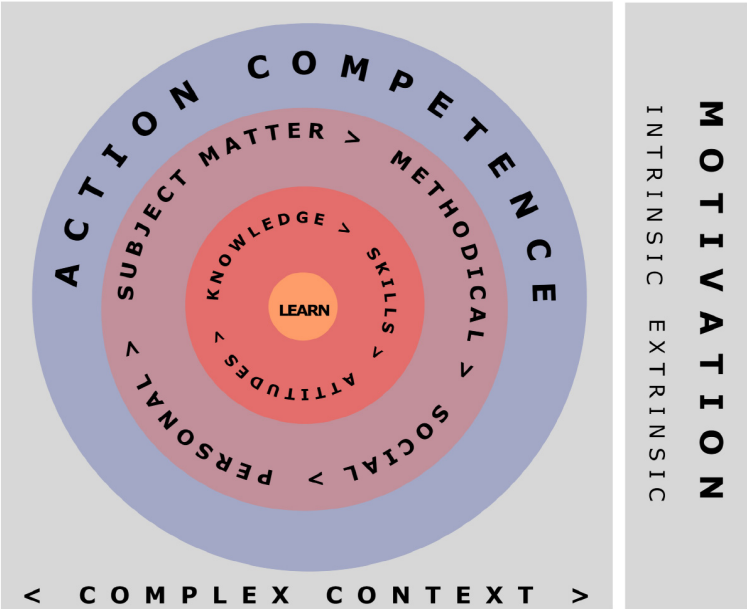
To summarise this section, we add the typology of four key competences as sixth key component of the concept of competence to learning, the system of dispositions, performance, motivation and the complex context. *The typology of subject matter, methodical, social and personal competence specifies the visible shell of performance and assigns this specific model for our research, which we have so far constructed, to the conceptual approach of action competence.* This is the basic assumption for the typology of four key competences as key component in the concept of competence. The typology of four key competences provides a conceptual substructure for the component of performance and the combined key competences integrate in the model into action competence. Within this basic assumption on the typology of four key competences, which integrate into action competence, we have outlined several implications. These implications relate to

- the holistic quality of the concept of action competence, which combines cognitive and motivational components into a coherent dispositional system, places learning at the core of competence development, and tries to measure competence through the assessment of performed behaviour;
- the inclusion of individual, role-specific and collective conditions for competence development within the concept of action competence;
- the distribution of competence in a network of individual actors;
- the combination of individual and institutional competence in organisations and its implications for human resources development measures;
- the concept of self-organised action, which can be subdivided into mental, instrumental, social and communicative, and (self-) reflective actions as four basic types of action;
- the deduced typology of four basic underlying action competence dispositions, which are subject-matter, methodical, social, and personal competences;
- the specific role of learner-centered learning as essential pedagogical paradigm in the concept of action competence;
- and finally, the dispositional and the performance side as two main building blocks of action competence, which interrelate in the instance of operationalisation.

Based on these implications, we add the typology of four basic competence dispositions and action competence as a specification of the component of performance in this research model to our illustration of key components and position both as perceivable competence shell around the dispositional system of knowledge, skills and attitudes.

The following figure shows a coherent model of action competence; this model includes all key components, which have been discussed in chapter 4.

FIGURE: KEY COMPONENTS OF COMPETENCE - THE FOUR KEY COMPETENCES AND ACTION COMPETENCE (CIRCLE VI)



4.8. Conclusions

We have thoroughly analysed in chapter 4 key components of the concept of competence, which are discussed in the scientific research literature. This analysis has started with a clarification of the specific research topic and context in this study, which is the investigation of eCompetence development measures for academic staff in higher education institutions. Faculty need to cope with new requirements in technology-enriched learning environments. Before we approach the new competences, which academic staff need for eLearning, we have intended to understand the main implications within the concept of competence.

We have seen in the literature analysis that an abundant corpus of contributions exists on the topic of competence. Obviously, competence and competence development have become popular and relevant topics in educational policy, research and practice. The main reasons for this high relevance of the competence topic can be found in knowledge-intense production modes and the fundamental changes which technology is causing in our contemporary societies. Educational research and policy have shifted towards competence-oriented learning outcomes, and the competence topic is closely linked to the field of continuing education and lifelong learning.

It has become clear that competence is a complex theoretical concept, as it aims to integrate a set of components, which are complex by themselves again. This high degree of complexity has led to a certain level of confusion and incertitude within the scientific landscape what competence is really about. As consequence, the concept of competence has been characterised to be a fuzzy and ambiguous research subject. It has been stated that a wide spectrum of theoretical approaches to competence exists, but that a universal conceptual framework for competence is at present not a likely or realistic research outcome.

One more characteristic, which has emerged in the literature analysis, is the interdisciplinary nature of competence research. Contributions to competence research have spread across the boundaries of science disciplines. Two main fields have been analysed with the cognitive and social sciences. These two wider discipline fields represent the two levels, on which competence is being investigated.

We have learned that competence can be attributed to individuals and organisations, and that both levels of attribution interrelate with each other in competence development. Based on these assumptions, we have concluded that the interrelation between, and integration of individual and institutional competence development is one focus point in the analysis of eCompetence measures for academic staff in universities.

The main part of this chapter has been a thorough analysis of key components of competence within the research literature. Subsequently, we have identified and analysed learning, knowledge, skills and attitudes as system of dispositions, motivation, performance, context of performance and key competences as main competence components. Step-by-step, a competence model has emerged within this analysis process, which has been finally classified as an action competence approach.

For each key component of the competence model, we have made key assumptions and a set of subsequent implications. The table below lists again the key competences of the constructed competence model and their related key assumptions.

TABLE: KEY COMPONENTS AND BASIC ASSUMPTIONS IN THE COMPETENCE MODEL

KEY COMPONENT	BASIC ASSUMPTION
Learning	Is at the core of any competence development - there is no competence development without learning.
System of Dispositions	Is the basis for goal-oriented, adequate action in a complex and authentic context - there is no competent action possible without the system of dispositions.

KEY COMPONENT	BASIC ASSUMPTION
Motivation	Is the essential condition for competence-based performance - you can be competent, but if you are not motivated to act, there will be no action at all. Not an integral component of competence, but independent influence factor.
Performance	Is the visible manifestation of 'hidden' dispositional competence components in specific social context - assumptions on implicit competences have to be validated and interpreted by observation of real performance.
Context	First, particular context of performance defines and specifies competences, which are necessary to adequately act in given situation - it is not possible to specify competences without an analysis of specific requirements which are included in the context. Second, degree of complexity within context of performance is trigger for learning process.
Key Competences	The typology of subject matter, methodical, social and personal competence specifies the visible shell of performance. Typology provides a conceptual substructure for the component of performance; combined key competences integrate into action competence.

These key components of the competence model, as well as their key assumptions and further implications serve as theoretical basis for the subsequent conceptualisation of eCompetence for academic teachers in higher education institutions. We reflect the further findings on eCompetence and related competence development measures for academic staff in universities on the basis of the key components of this constructed competence model.

5. The Concept of eCompetence

Content

5. The Concept of eCompetence for Academic Staff

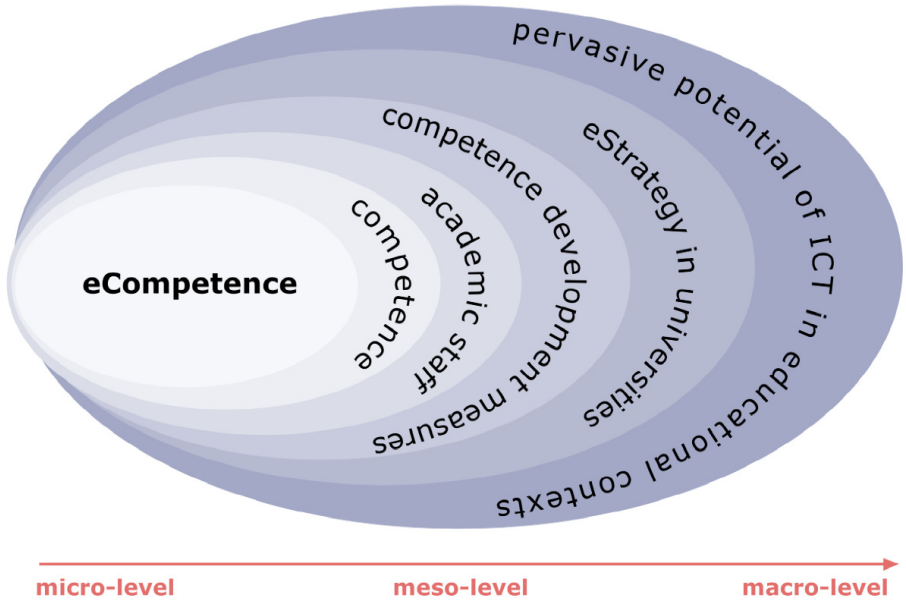
5.1. Introduction

This chapter moves forward from the discussion of concepts of competence to the conceptualisation of eCompetence. This conceptual work is done on basis of the competence model and its inherent key components, which has been constructed in chapter 4. The analytic focus is placed on the main components and theoretical assumptions which a coherent concept of eCompetence for academic teachers in higher education needs to include.

In a short retrospect on the position of eCompetence research in eLearning, we can say that it represents one aspect within the current discussion about models for a sustainable integration of new technologies into universities (see chapter 2.4 - eStrategy). eCompetence research deals with the role of the human factor in technology-driven innovation in higher education institutions. The scope of research can be illustrated in a model, which represents the main layers into which the eCompetence topic is embedded. This model includes a range of layers which start at the micro-level of eCompetence, where it is part of the general action competence of an individual academic staff member in a university. The individual academic staff member is part of the group of faculty staff at the meso-level of a university. The collective eCompetences of academic staff members are influenced by a portfolio of direct competence development measures that the university might have set up in its human resources management; and they are influenced by the wider eLearning-related contexts and conditions, which motivate academic staff members to reflect upon the potential of new technologies for teaching and learning. Of main interest are in our case direct and indirect competence development measures and factors, which are connected at macro-level of the organisation to the implementation of an eStrategy within a university. The eStrategy of universities is finally coping with the wider pervasive potential of ICT, which has evolved in the educational contexts of society.

The following figure illustrates the layers, which this study includes for its research on the topic of eCompetence:

FIGURE: MODEL OF ECOMPETENCE LAYERS



We observe in this study academic staff as a specific group, who face the challenge to successfully use ICT in teaching and learning within universities. How can eCompetence of academic teachers be specified? Chapter 4.6.5 has focused on the role of the context and its main functions in the concept of competence. The immediate context of the individual actor includes situative requirements for adequate action. These requirements, which are context-specific situative challenges for adequate action, need to be analysed and described in order to understand and to specify a specific competence, which is in case of this study the eCompetence of academic teachers in technology-enriched work environments.

The main challenge for a theoretical discussion of eCompetence is to relate the general concept of competence to a specific 'eContext' - the electronic context that is gradually evolving and changing the work environment of academic staff in higher education.

5.2. The Concept of eCompetence - A Clarification

eCompetence, when analysed closely, is a verbal specification of competence. It is a sub-class of the competence term, related to an electronic context, or eContext. As we can see in the model of layers,

Chapter 5 - The concept of eCompetence

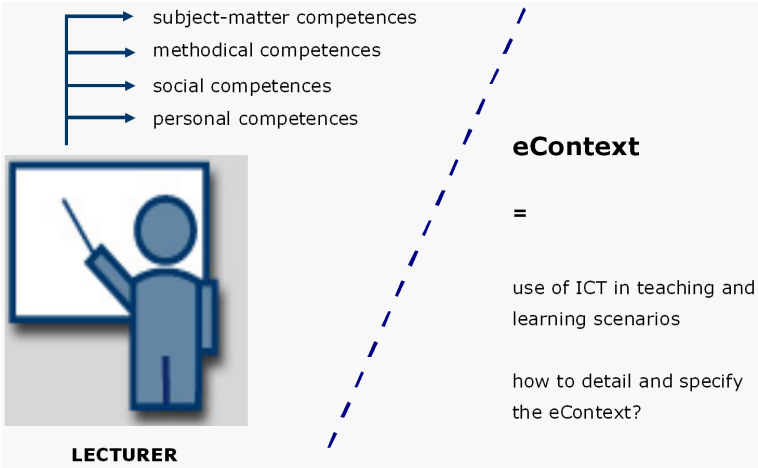
eCompetence is at its core dealing with the development of personal competences in the creative use of ICT. We have inferred in this perspective a work definition as basis for a conceptualisation of eCompetence in higher education. eCompetence is understood in this general mode as the ability to use ICT in teaching and learning in a meaningful way. The definition of eCompetence subsequently differs between personal and institutional eCompetence. The personal eCompetence of academic staff describes their ability to use ICT in teaching and course delivery. Institutional eCompetence describes the structures, processes and policies in place, by which a university integrates the use of ICT into its core tasks research and education. However, eCompetence describes at both levels the ability to successfully use e-Learning technologies in routine educational practice.

Based on this argumentation, we will subsequently focus on the development of a concept of eCompetence for academic teachers in universities. Objective is to build a generic model for eCompetence, which takes into account the potential performance options of academic teachers in digital learning environments. Considering closer a potential structure for the concept of individual eCompetence, one can identify the following key components: university teachers, who have competences as their general cognitive disposition to act; and teaching and learning scenarios, which embed or rely on the use of ICT as particular context in which the performance of university teachers is situated. Let us observe more in detail the key components and the implications they include for the construction of a theoretical concept for individual eCompetence.

The first key component is the competence of the individual university teacher. We have deduced in the above given observation a specific approach to define competence, that sets its focus on the performance dimension of the academic teacher. This approach combines two subcomponents: the dispositional dimension, which are individual prerequisites of a teacher to act in an adequate way; and the performance dimension, which the combination of key components of the competence of the teacher in observable action. We have analysed in chapter 4 a set of competence components and gradually constructed a model that defines and integrates personal, social and communicative, methodical and subject-specific competences into an overarching action competence (see chapter 4 - concept of competence). In the construction of the concept of eCompetence, we apply this action competence model and its inherent implications to individual teachers.

The second key component are teaching and learning scenarios, which embed or rely on the use of ICT as the particular context in which the performance of the university teacher is situated. We apply the term 'eContext' to this use of ICT in teaching and learning scenarios of the university teacher. This eContext is not yet specified. Nonetheless, we assume that the eCompetence construct can only be inferred in a meaningful way, if the situative context as dimension, in which performance occurs, is specified. The eContext determines as contextual environment the options of lecturers to perform in a given situation. When we want to identify the competences, which teachers require to adequately act, we need to analyse the variables which are included in this eContext.

FIGURE: INDIVIDUAL ECOMPETENCE



The approach, which we have chosen to specify the eContext, combines two contextual key influence factors. The first key influence factor is the pedagogical design of the learning environment, in which teachers and learners interact and communicate with each other; and the second key influence factor is the technological design of the learning environment. Both key influence factors determine in their combination the potential action patters of academic teachers in the learning environment. The pedagogical design of the learning environment can vary according to the pedagogical model that teachers apply. A range of distinct pedagogical models have emerged in educational sciences for the design of lectures and courses in universities. We assume that university teachers will think in design options and apply coherent methods and instruments of specific pedagogical models for specific learning environments that they need to organise. This way, teachers select from a spectrum of pedagogical models for teaching and learning the one that seems most appropriate for the specific learning environment, in which they interact with students (Wildt 2006, pp. 205-209; Viebahn 2004, pp. 29-30; Prosser).

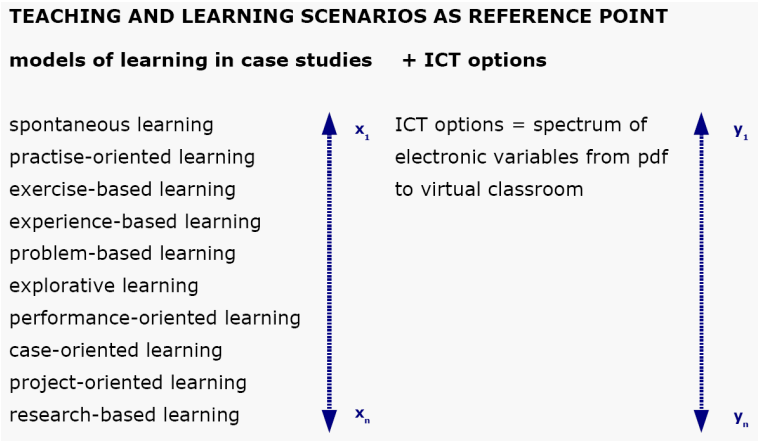
Next to the selection of an appropriate pedagogical model, a selection of the ICT tools needs to take place which are adequate for use in the pedagogical scenario. The ICT options, which a teacher can apply, are combined in a spectrum of electronic variables. The ICT options range in their complexity from the manipulation of simple digital documents, like the storage of pdf files on a website for download, to the use of highly complex electronic learning environments, like the setup and use of a virtual classroom which includes complex applications for interaction and communication. The university teacher would select in an ideal pedagogical design scenario ICT options for the learning environment only after he or she made an decision on a pedagogical model for the specific teaching performance. It is likely that an economic science teacher, who needs to cope with a mass lecture in front of a thousand students, will have different pedagogical concepts and ICT options in mind as a philosophy teacher, who plans a course with a small work group. In practice, the selection

process of academic teachers probably takes place in a more pragmatic way, combining simultaneously both pedagogical models and ICT options which are available within universities.

To sum up this argumentation string, we assume that two key influence factors determine the eContext: these are the pedagogical and the technological design options for learning environments. Both key influence factors are illustrated in form of a spectrum. The two spectra array the choices teachers make on pedagogical and technological design options.

The pedagogical design options are represented in a spectrum of pedagogical models for the learning environment; and the technological design options are represented in a spectrum of electronic variables for the learning environment.

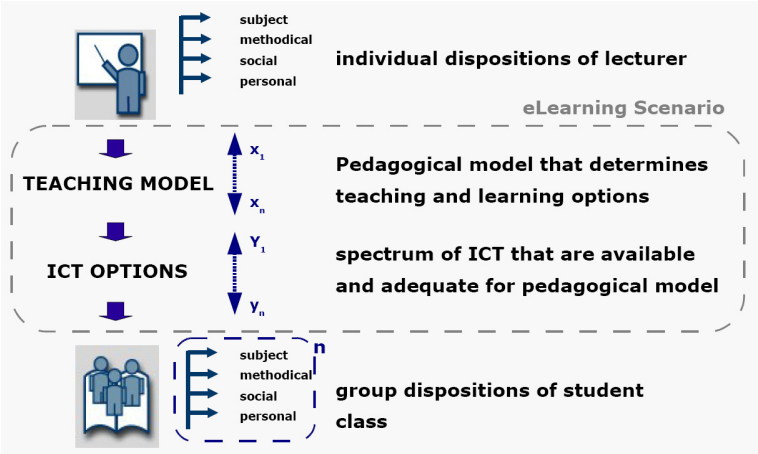
FIGURE: TWO SPECTRA OF VARIABLES



When we combine these two spectra in a generic model for individual eCompetence, there is nonetheless one additional key component to be added to make the model consistent: this is the eCompetence of students, who interact with the teacher or with each other in teaching and learning scenarios. Students possesses a specific eCompetence on their own, which can be conceptualised in a similar way as the eCompetence of academic teachers. The main difference between teachers and students does not lie in the dispositional dimension, but in the performance dimension of competence, and it is determined by the context. The primarily goal of teachers is to teach, the primarily goal of students is to learn. One important aspect in this relation is the efficiency of a specific course setting, which largely depends on the degree in which competences of teachers and of students fit each other in teaching and learning processes.

This way, the roles in the interaction between teachers and students are situated at opposite sites of the teaching and learning process. Nonetheless, they need to complement each other. The personal eCompetence of individual students describes their ability to use ICT in their learning activities. And the combined individual eCompetences of students in a particular course sum up to the group dispositions of the class to adequately use ICT in their learning.

FIGURE: SYNERGY MODEL FOR ECOMPETENCE

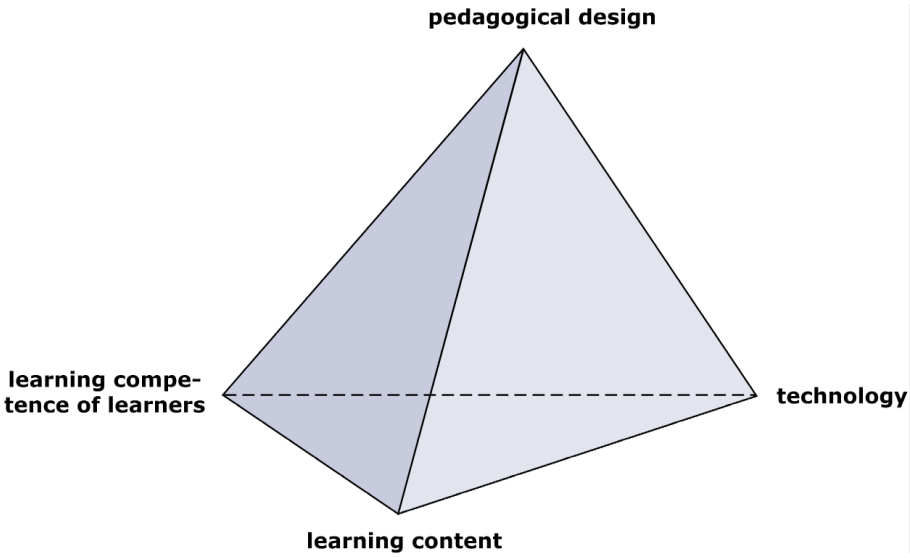


This conceptualisation of the eContext of academic teachers is similar to the approach, which Kerres et al have made to specify eLearning scenarios. Each scenario requires a specific eTeaching profile (Kerres et al 2005, p.21 - see next chapter 5.3 for details). The eContext also relates to reflections, which Hesse has made on technology-enhanced knowledge distribution and transmission in higher education and its consequences for the culture of learning. Hesse sees ICT as a driver and accelerator of a changing learning culture in universities, when two conditions are met: the potential of technology needs to be coherently identified for specific teaching and learning scenarios; and ICT needs to add pedagogical value to these scenarios.

According to Hesse, ICT-enhanced teaching and learning takes place in a socio-technical environment, which is determined by a set of influence dimensions. These influence dimensions are: the technology itself; the way technology is used and integrated into the learning environment (the design); the learning ability, readiness and competences of the learner or the group of learners; and the learning content.

The following illustration shows main influence dimensions on the learning environment, as they are described by Hesse:

FIGURE: TRIANGLE: INFLUENCE DIMENSIONS ON THE LEARNING ENVIRONMENT (BASED ON HESSE 2004)



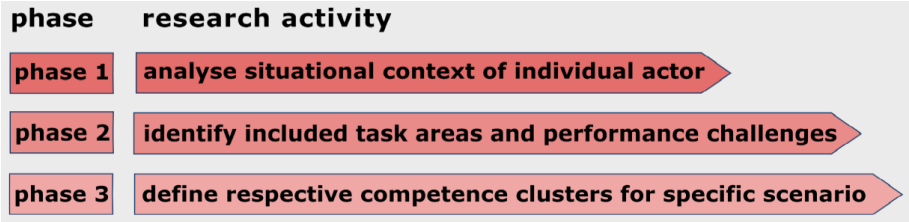
All four influence dimensions in the socio-technical learning environment closely interrelate with each other. A diagnosis of the learning ability, readiness and competences of the learner or the group of learners is an essential prerequisite for the adequate application of technology in the design of learning environments. Learning environments, which offer a high degree of technology integration, are not *per se* adequate for learners. Decisive is rather the point that the design of learning environments exploits the potential of ICT to add value to teaching and learning activities - technological choices have to be made to foster sequences of active learning within learning environments (Hesse 2004, pp. 15-16).

5.3. Conceptual Approach for Individual eCompetence

ICT- related competences for academic staff can be specified more in detail, when we analyse different teaching and learning environments at the level of concrete action in specific *eLearning scenarios*. A differentiation of eCompetence at the level of cognitive and mental dispositions for actions is based on a context analysis, which investigates contextual requirements for adequate performance that academic teachers face in specific eLearning scenarios. For a definition of eCompetence profiles, these specified contextual requirements take the function of behavioural indicators for adequate teaching and learning activities. We can describe a range of adequate behaviour patterns by clustering these indicators into detailed task descriptions, and subsequently model competence profiles for academic teachers in specific eLearning scenarios.

Euler summarises the main steps, which are taken in a context-based approach to define competence profiles for specific eLearning scenarios. The point of departure for a definition of competences, which enable individual actors to adequately deal with specific tasks and challenges in their work practice, is the question which competences need to be acquired by which target groups. This way, a definition of competence profiles for specific scenarios starts with an analysis of the context of performance, for which specific competences need to be developed. The challenges, which are included in this context for adequate action or task-fulfilment, need to be identified and described. These specified task descriptions are basis for a deduced definition of competence profiles, which actors have to bring along to adequately deal with contextual challenges and to efficiently solve given tasks in specific scenarios (Euler 2004, pp. 172-173; see also chapter 4.6.5. Context).

FIGURE: PHASES IN DEFINITION OF COMPETENCE PROFILES



As the specification of eCompetence profiles for academic teachers is done within hypothetical ideal types of eLearning scenarios, it is useful to first clarify what the term 'scenario' means. A scenario is a description of a future event or context, in which an individual actor or an organisation will eventually be situated. Scenario planning is a strategic tool, which is widely used in corporate management for planning and decision-making within uncertain contexts. Scenario planning explores potential developments, which could evolve within specific context of an individual actor or an organisation. The main objective of scenario planning is to get a closer idea on the impact of potential future developments within the context on potential performance options of an individual actor or of an organisation, and to find a coherent strategy which enables an efficient action within the emerging contextual conditions. This can be done by adapting individual competences and organisational structures and processes to the main contextual conditions of the predicted scenario. In its essence, scenario planning builds on the above described method of context analysis for defining competence profiles - with the difference that the context is not a real one, but a potential future one (Schoemaker 1995, pp. 26-27; Erasmus 2006).

Kerres et al have applied a scenario-based context analysis method in recent report on eTeaching competences for academic staff. They define ICT - related competence profiles for academic teachers within an exemplary spectrum of ten different eLearning scenarios. Each of the ten eLearning scenarios within the presented spectrum contains a specific pedagogical model on one hand, and a specific combination of ICT tools within the learning environment on the other hand. The degree, in which ICT tools are applied within each learning environment of the spectrum, is augmenting within

the spectrum from top to bottom. The contextual task areas and performance conditions within each scenario ask for specific competences of academic teachers in order to efficiently teach in technology-enriched learning environments (Kerres et al 2005, pp. 21-34). This exemplary spectrum of potential eLearning scenarios in universities is listed in the following table:

FIGURE: SPECTRUM OF RELEVANT ELEARNING SCENARIOS (BASED ON KERRES ET AL 2005, P. 21)

Digitale Medien **...in** Präsenzveranstaltungen	1 Lehrerzentrierter Unterricht mit eMedien
	2 Kooperatives Lernen mit digitalen Lernressourcen und -werkzeugen
	3 Lernerfolgsprüfung mit eAssessment
...als **Ergänzung** von Präsenzveranstaltungen ...als wesentliche **Erweiterung** von Präsenzveranstaltungen	4 Selbstgesteuertes Lernen mit e-tutorieller Begleitung
	5 Reflexives Lernen mit Diskussionsforen
	6 Fallbasiertes Lernen mit Webressourcen
	7 Entdeckendes Lernen mit computerbasierten Simulationen
...als **Ersatz** von Präsenzveranstaltungen	8 Projektorientiertes Lernen mit CSCW-Werkzeugen
	9 Telelernen mit Videokonferenzsystemen
	10 Dialogbasiertes Lernen mit Virtuellem Klassenzimmer

Tabelle 9: Spektrum relevanter eLearning-Szenarien

We discuss in this study two approaches to specify the concept of eCompetence at individual level of academic teachers and at organisational level of universities, which have been presented by Gilly Salmon and Dieter Euler at the final eCompetence symposium in March 2006.

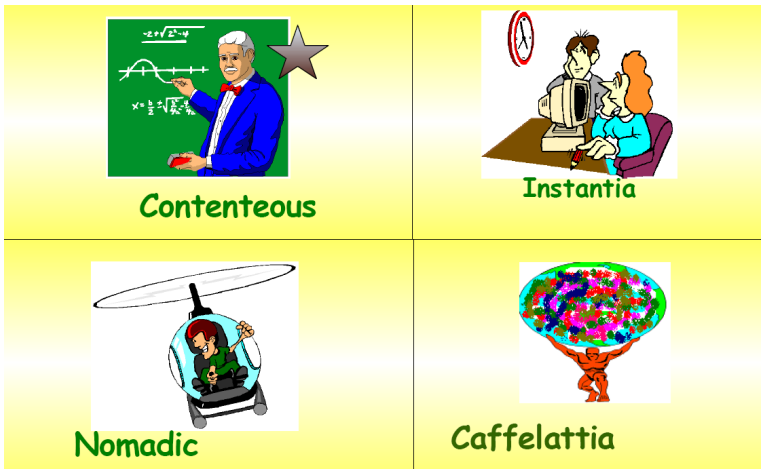
Salmon has proposed a method to conceptualise *individual eCompetence* of academic teachers through a context analysis of performance requirements within eLearning scenarios. Salmon's definition of specific eCompetence profiles starts with the introduction and characterisation of four different eLearning scenarios. Salmon has used the analogy of four ePlanets for a depiction of these scenarios. These four ePlanets are the 'planet of contenteous', 'the planet of instantia', 'the planet of nomadic', and 'the planet of caffélattia'. In real practice, these different eLearning scenarios merge with each other, but Salmon has separated them to be able to think about the main technologies applied in each scenario, and their impact on teaching, learning and the creation of knowledge sharing.

These ePlanets enable us to take four different perspectives on the relationship between teaching and technology in educational scenarios. The abstract separation of ideal types of eLearning scenarios also allows us to reflect upon the main pedagogical concepts behind each scenario, and to derive the main competences, which are required by academic teachers to steer teaching and learning activities in an adequate way.

We will subsequently analyse a set of key elements within these four ePlanets. These key elements are: the principle idea, which determines the evolution of learning environments on each planet; the main role of technology within this evolutionary process; the underlying pedagogical model and the

main teaching and learning activities which evolve within the learning environments; the key features of learning assessment and its adequateness to the predominant model of teaching; and the ideal competence profile for teachers within each of the four eLearning scenarios.

FIGURE: FOUR EPLANETS AS ELEARNING SCENARIOS (BASED ON SALMON 2006A)



5.3.1. Content Transmission Scenario

The first planet is the '*planet of contenteous*'. The principle idea on the 'planet of contenteous' is the one that '*content is king*' - the whole evolution of the learning environment corresponds closely to the production and delivery of digital learning content.

The main role of technology on the 'planet of contenteous' is to give access to digital content and to deliver it to learners. The learning environment is structured with help of applications such as VLE (virtual learning environments), LMS (learning management systems) and CMS (content management systems), digital radio and TV. This way, the learning landscape is usually characterised through hierarchical navigation structures, the integration of multi-media elements and simulations, automatic tracking and testing tools and a schematic scheduling of learning events. High-capability bandwidth access allows large chunks of content to be delivered to learners through the web.

The underlying pedagogical model for the 'planet of contenteous' is the efficient transmission of learning content. Information is transferred as digital content from teachers to learners. Direct interaction between teachers and learners in the digital learning environment is taking place on a lower scale than in the traditional 'analogue' model of knowledge transmission within real lectures and courses on campus, where students can ask direct questions and debate with their teachers on the spot. To

ensure a demand for the content, it has to be high-quality content, which is produced by the best researchers in the field and professionally transferred into digital content by use of the latest learning technologies.

The key features of assessment for the 'planet of contenteous' rely on the reproduction of learning content by the learner. The learning needs of learners are assessed with diagnostic tests, which help them to decide on specific choices about the digital content and about pathways within the learning environment. Testing proves the degree in which learners comprehend and critically reflect upon learning content. Automated testing is frequently embedded in the learning environment in form of multiple-choice questions and model-building tasks in interactive simulations. The results of these tests can be used in feedback and recommendations to learners on their next learning directions and activities.

The required competence profile for teachers in the eLearning scenario of the 'planet of contenteous' includes first of all an outstanding expertise on the learning subject. The transmission model builds its economy of scales on a potentially high demand for the offered learning content. Teachers, who produce and transmit the learning content, have to be distinguished experts in their science domains to assure a high quality of the courses or study programs in the digital learning environment. In addition to being outstanding subject experts, teachers need to be good communicators, and they need to have a good understanding of the pedagogical potential of digital design and transmission technologies for the production and distribution of learning content. Media presentation and communication skills of teachers assure an efficient transmission of learning content to the audience. Teachers need to know the structure of electronic libraries and learning resources, and they need to be able to integrate these digital content repositories into their curricula. Teachers need to have team ability to work together with media designers and IT technologists, who transform the analogue lectures and scripts into digital learning content (Hanley 2001, pp. 58-59; Salmon 2004, pp. 137-138).

5.3.2. Flexible Learning Scenario

The second planet is the '*planet of instantia*'. The principle idea on the 'planet of instantia' is dealing with *flexible learning*, which is tailored to the learner's immediate needs and directly applied within his or her work context.

The main role of technology on the 'planet of instantia' relates to the design of devices which are connected to the web. Connected devices surround learners with a kind of 'ambient intelligence' that allows them to instantly start some learning activity. This way, connected devices deliver tailored learning chunks to learners at their home, at their workplace or within learning labs on campus. Digital learning chunks or learning objects are usually stored in meta-tagged databases, and they need to be

reliable, scalable and customisable for collection and manipulation of learners within their learning activities.

The underlying pedagogical model for the 'planet of instantia' is based on flexible and integrated learning activities, which rely on learning objects to immediately respond to specific learning needs or requirements of learners. These learning objects are embedded in computer-based courses, but they are also available in the web - if learners don't find a reasonable answer to their questions within the course environment, they google the web for additional resources which they can bring into and assemble in their learning process. Learners learn in an autonomous and self-directed way. Learning and work is carried out simultaneously. Speed of mind and speed of technology combine to a high pace of learning.

The key features of assessment for the 'planet of instantia' relate to the authenticity of learning outcomes. The evaluation of learning outcomes is done by checking their relevance and applicability within specific tasks in challenging contexts. In organisations, this is usually done by assessing the extent to which the organisational performance improves after a specific learning provision has been offered to its employees (Stalmeier 2006, pp. 42-43). In educational contexts, learning outcomes need to be measured in interactive or collaborative test situations, which simulate to a high degree the applied, real-life work contexts and usually include some project work or hands-on activity. Learning activities and outcomes in digital learning environments can be tracked and reported to the assessor.

The required competence profile for teachers in the eLearning scenario of the 'planet of instantia' includes primarily the ability to support autonomous and self-directed learning activities of learners. Teachers need to be efficient moderators and counsellors, they need to be flexible to react to a wide range of different learning activities, and they need to be available as much as possible, as learners expect a quick reaction on their questions. The ability to be a good communicator in both synchronous and asynchronous dialogue with learners is an important competence of teachers. And they need to understand methods for assessing task-related competence development of learners. This is in particular relevant for educational institutions, as competence assessment is not widespread in traditional testing modes (Huba & Freed 2000, pp. 9-13; Salmon 2004, pp. 139-140).

5.3.3. Mobile Learning Scenario

The third planet is the '*planet of nomadic*'. The principle idea on the 'planet of nomadic' is about total *mobility of individual learning* independent from place and time, which is made possible by ubiquitous access to the web and by the use of embedded learning devices.

The main role of technology on the 'planet of nomadic' is to foster a high mobility of the learner through the development of portable and adaptable devices. Mobile technologies tend to decrease in size and to increase in functionality, and as portable devices they can be easily embedded into the immediate environment of learners. Technology allows the identification, tracking and mapping of each electronic device, thereby offering learners a range of different learning opportunities on the spot and connecting them in a network of learning communities independent of their current physical location. Access to learning resources is assured by ubiquitous internet nodes. Portable learning devices are geared towards specific traits of the individual learner, and they are adaptable to his or her individual learning behaviour and pace. This way, learners can decide to learn at work, in universities, in the train, or wherever they might be situated in a specific moment - a scenario, which equals the 'old' 24 hours a day /7 days a week, 52 weeks a year 'anytime, anywhere' paradigm of eLearning.

The underlying pedagogical model for the 'planet of nomadic' is based on tailored, customised learning, which is independent from time and place and which adapts to the learning style and pace of individual learners. Learners access small-sized, tagged learning objects and carry out several phases of learning during the course of the day, which fit into their work and life schedules. Learning activities are directly applied to real-life contexts and learning outcomes are documented in portfolios.

The key features of assessment for the 'planet of nomadic' relate to a shift from learning and memorising theoretical concepts in written tests towards their application in real-life performances. The evaluation of project and learning outcomes is done by assessing collaborative efforts of learning groups which are documented and accessible in the web. Assessment results update individual learning profiles by suggesting the next learning steps, and they are stored as transferable credits in individual learning portfolios. Authenticity of individual learning outcomes is assured by peer networks and biometric identification technologies. Online assessment is used for evaluating the degree of interaction of individual learners in collective learning activities and their contribution to learning outcomes in common projects (Jokinen et al 2006, p. 132-133).

The required competence profile for teachers in the eLearning scenario of the 'planet of nomadic' is rooted in the predominant flexible and mobile learning culture. Teachers need be flexible and mobile themselves, they need to understand and to foster the model of active, self-motivated, autonomous learning, and they need to know and to be able to apply portfolio-oriented teaching concepts. They have to be highly aware on individual learning needs and collective learning cultures. Excellent communication skills and cross-disciplinary thinking and expertise help teachers to 'get the main message' across technological channels and disciplinary borders. Teachers have the ability to define micro-size learning phases and activities, they are firm in online assessment techniques, in which they apply methods to prove authenticity of learning outcomes, and they strongly support as

facilitators the idea of student ownership of the learning process (Barrett & Wilkerson 2004; Salmon 2004, pp. 140-143).

5.3.4. Collaborative Learning Scenario

The fourth and final planet is the '*planet of cafélattia*'. The principle idea for the 'planet of cafélattia' is based on global *collaborative learning activities*, which are made possible and amplified by networked computers.

The main role of technology on the 'planet of cafélattia' is to enable sharing of data and knowledge within peer-to-peer networks. Communication is heavily based on instant messaging applications, and collaboration of learning activities between learners is merging with their work schedules. Access to the web allows learners to interact with each other through synchronous and asynchronous information and communication tools. The communication activities are complemented by groupware, peer-to-peer applications and additional data repositories in the web. High-capacity bandwidth systems ensure an efficient flow of data within peer-to-peer networking and learning activities.

The underlying pedagogical model for the 'planet of cafélattia' is focusing on constructive, social, creative and collaborative learning activities in networked learning communities. Interaction and collective knowledge construction is at the core of the pedagogical model, directing learning activities of learners towards open dialogue, exchange of ideas and digital information alike. As a matter, learning is more a surrounding environment which augments interaction and dialogue rather than a specific content or object. Learning communities set the frame for the context of learning and assure the authenticity of learning outcomes through critical peer review. To be able to efficiently interact with like-minded peers in the networked learning model, learners are required to have the ability to self-reflect, the willingness to continuously improve their professional development and the readiness to share explicit and tacit knowledge.

The key features for assessment on the 'planet of cafélattia' focus on a learner-driven evaluation of learning outcomes, which is primarily based on peer reviews in learning communities. Knowledge construction and complex problem-solving are critical skills within the peer evaluation of learning outcomes. The degree of individual interaction within specific group learning activities and the efficient application of theoretical knowledge in real-life tasks are key indicators for assessing learning success.

The required competence profile for teachers in the eLearning scenario of the 'planet of cafélattia' is strongly determined by collaborative and interactive learning processes between teachers and

learners. Teachers need to be responsible moderators, facilitators and mentors within learning communities, and they need to be group managers and to steer interaction between learners at specific points of the learning process. The ability to balance their interventions as teachers within group learning scenarios and to motivate and include all learners in a group are critical teaching competences. Also teachers need to self-reflect and to be able to change roles to understand specific behaviour patterns of learners. Finally, teachers need to be able to take a responsible leadership role and they need to be efficient networkers, who understand and steer processes of knowledge construction within learning communities (Huba & Freed 2000, pp. 53-56; Salmon 2004, pp. 143-145).

TABLE: ELEARNING SCENARIOS AND ECOMPETENCE PROFILES (BASED ON SALMON 2006A)

eLEARNING SCENARIO	-- eCOMPETENCE PROFILE OF TEACHER --
Planet of Contentious - Content Transmission	✗ have outstanding expertise on the learning subject ✗ be good communicator and eLecturer ✗ understand pedagogical potential of digital content and transmission technologies ✗ have media presentation and communication skills ✗ know and integrate electronic learning resources into curricula ✗ have team ability
Planet of Instantia - Flexible Learning	✗ be able to support autonomous, self-directed learning ✗ be efficient moderator and counsellor ✗ be flexible to react to different learning activities ✗ be highly available for feedback ✗ be good communicator in synchronous and asynchronous dialogue ✗ understand methods for assessing task-related competence development
Planet of Nomadic - Mobile Learning	✗ be flexible and mobile ✗ understand and foster active, self-motivated, autonomous learning ✗ integrate and support formal and informal learning ✗ be used to portfolio-oriented teaching ✗ be aware on individual learning needs and collective learning cultures ✗ have excellent communication skills ✗ carry out cross-disciplinary thinking and expertise ✗ be able to define micro-size learning phases and activities ✗ be firm in online assessment techniques ✗ be able to facilitate student ownership of learning process

eLEARNING SCENARIO	-- eCOMPETENCE PROFILE OF TEACHER --
Planet of Cafélattia - Collaborative Learning	✗ understand collaborative and interactive learning processes ✗ moderate, facilitate, mediate and mentor learning within communities ✗ foster peer-to-peer support ✗ manage group and steer interaction between learners ✗ be self-reflective and able to change roles ✗ take a leadership role ✗ be an efficient networker

5.4. Conceptual Approach for Organisational eCompetence

Euler has presented a conceptual approach for organisational eCompetence at the final eCompetence symposium. He started his presentation with an initial definition of organisational eCompetence. For educational contexts, organisational eCompetence means to build up capabilities of organisations like universities to introduce and implement technology-driven educational innovations (Euler 2006).

Euler's conceptual thoughts on organisational eCompetence rely as point of reference on the SCIL framework for a sustainable implementation of ICT in universities. Each of the five key dimensions of the SCIL reference framework can be used to define the main challenges, to describe related task areas, and to deduce respective profiles of required competences for the main actors involved in the technology-driven organisational innovation. The allocation of emerging tasks in the ICT-driven change process within a university thereby depends on given competences of the main actors involved and on existing organisational structures. This allocation of tasks or the division of labour for the eLearning implementation within a university poses two key challenges on its human resources management unit: the responsible unit members need to identify key competence profiles, which are required for the foreseen change process; and they need to integrate these competence profiles into a wider organisational human resources concept, which combines a pool of competent employees for a sustainable implementation of eLearning into the university (Stalmeier 2006, pp. 38-42).

Euler's conceptual approach to organisational eCompetence basically builds on the wider role of eLearning in higher education. A key focus for the integration of eLearning in universities is the potential of ICT within teaching and learning scenarios. In a first step the contextual challenges, which are given in specific eLearning scenarios at universities, have to be identified. This analysis of context-related tasks serves as basis for a subsequent deduction of eLearning-related competence profiles of the main actors, who are involved in the organisational innovation (Euler 2006).

The context analysis of these wider structures and decision-making processes at macro-level of the university are the initial task for identifying organisational eCompetence profiles. Normative objectives within a wider education innovation strategy influence specific eLearning scenarios in universities and subsequently also influence the deduced concept of organisational eCompetence. Strategic decisions, which a university takes at macro-level of the organisation as a whole, determine or enframe to a high degree the choices which academic teachers make at micro-level on the pedagogical design of technology-based courses or study programs. If a university has decided to use Blackboard as central learning management platform and does not support the technical maintenance of alternative platforms, this does restrict the choices academic teachers are able make for the setup of digital learning environments. The same applies to the range of digital learning tools which the university favours and funds as organisation for use in eLearning scenarios.

As consequence of this interrelation between macro-level strategy decisions of the university management on eLearning platforms, tools and support structures, and micro-level pedagogical design options of academic teachers within their specific teaching and learning scenarios, eCompetence profiles need to be deduced not only within the pedagogical eLearning dimension, in which teaching and learning takes place; a wider concept of organisational eCompetence has to take into account competence profiles for each of the five dimensions within the SCIL framework. This analysis of institutional conditions for a sustainable ICT implementation allows a holistic view on the wider change management process at organisational level - an approach to organisational eCompetence of universities.

When we restrict in this study the definition of competence profiles to academic staff as target group for our research, we need in addition to the pedagogical dimension to take into account two of the four other eLearning dimensions in the SCIL framework, which are the socio-cultural and the organisational dimensions. The core responsibilities of academic staff lie with research and education in the pedagogical dimension, but they are also involved into socio-cultural processes and organisational decisions of universities. The economic and technical dimensions do not so deeply involve academic staff. The economic dimension primarily deals with the management of financial resources and projects; and the technical dimension is focusing on the development of a technical infrastructure for the implementation of eLearning into universities (Euler 2004, p. 177). We will discuss the socio-cultural and organisational dimensions later and start with the eCompetence profiles of academic teachers in the pedagogical dimension.

5.4.1. Pedagogical Dimension

The SCIL framework places the pedagogical dimension in the center of the endeavours of universities to sustainably integrate eLearning. Main objective of technology-driven organisational innovation is to

generate added value in the use of ICT in pedagogical structures and work processes and to increase the efficiency of new concepts for teaching and learning, which rely on educational technologies.

Euler proposes the pedagogical dimension of the SCIL framework as main reference point for a deduction of eCompetence profiles of academic teachers in universities. He distinguishes three key areas within the pedagogical dimension of the SCIL framework, which serve as basis for the deduced competence profiles for academic teachers in eLearning. These key areas are

1. the design of digital learning environments;
2. the design of learning phases by applying ICT tools for communication, interaction and digital representation of learning content;
3. the overall design of courses or study programs, which rely on digital learning environments and integrate ICT tools (Euler 2004, p. 175).

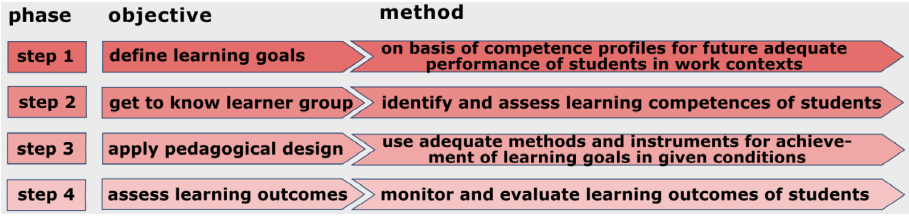
All three key areas of the pedagogical dimension deal at its core with the wider pedagogical design of teaching and learning in universities. Academic teachers, who are involved in eLearning, primarily need an underlying basic pedagogical or didactical competence to adequately shape these three key areas within the pedagogical dimension. Euler specifies in addition to this cross-sectional pedagogical competence a number of profiles for academic teachers in each of the three key areas. These competence profiles are detailed below.

5.4.1.1. Design of Digital Learning Environments

eLearning is one specific methodical framework amongst other options for the pedagogical design of learning environments in universities. For a sound pedagogical design of digital learning environments, the use of ICT needs to be consistent with given dispositions of the learner group - their learning competences, in order to reach the foreseen learning goals. Therefore, academic teachers need to be able to asses the learning competences of the learner group, and they need to know how to apply new technologies and other pedagogical instruments adequately in relation to the learning competences of the learner group and the learning goals. This pedagogical design competence can be used for the creation of face-to-face or digital learning environments alike (Dondi et al 2006, p. 21; Euler 2004, p. 175; see also chapter 5.2).

The following figure summarises the key components of the pedagogical design competence of academic teachers:

FIGURE: PEDAGOGICAL DESIGN COMPETENCE OF ACADEMIC TEACHERS



Academic teachers also need a coherent understanding of wider pedagogical principles and correlations for a sound pedagogical design of digital learning environments. Therefore, they need to

- understand and apply pedagogical paradigms - such as constructivism, behaviourism etc., and principles - such as problem-based learning, project-based learning etc., to digital learning environments;
- understand and foster modes of autonomous, self-directed learning;
- reflect upon peculiarities as well as upon potentials and limits of ICT for the overall pedagogical design;
- reflect upon the peculiarities, as well as upon potentials and limits of technology-based communication and interaction;
- reflect upon the efficiency of electronic learning environments in relation to given learning dispositions, or learning competences of the student group and the aspired learning goals (Euler 2004, p. 178).

5.4.1.2. Design of Learning Phases by Applying ICT Tools

The next specification of eCompetence profiles for academic teachers in the pedagogical dimension of the SCIL framework relates to the pedagogical design and implementation of teaching activities at micro-level of a specific course or within a specific learning environment. The pedagogical design of a learning environment depends to a high degree on teaching actions of academic teachers. They can choose from a set of different actions in learning environments - such as for example to give a lecture, to steer a discussion, to moderate a group work, or to supervise students in learning activities.

Compared to face-to-face teaching and learning scenarios, technology-based communication and interaction in virtual learning environments show some peculiarities, which require new teaching competences of academic teachers. This does not mean that the nature of teaching in eLearning scenarios is completely different to teaching in face-to-face courses. The new technologies in the digital learning environment rather extend and augment given teaching faculties and options of academic teachers in physical learning environments and therefore require specific eTeaching competences (Kerres et al 2005, p. 16; Dondi et al 2006, p. 23; see also McLuhan 2003, pp. 26 ff.).

What are now the main characteristics of online communication and interaction in digital learning environments? Salmon assumes that teaching and learning in online environments requires much more than mere computer skills. Learning is a complex process of interaction, which involves neural, cognitive, motivational, attitudinal, and social components. And learning is not a continuous, but a disruptive process, which includes intense and encouraging learning phases as well as disillusioning moments of frustration and irritation (see also chapter 4.6.1. The Concept of Competence - Learning). Salmon assumes in contrast to the mainstream standpoint in relevant research that learning in digital learning environments integrates the acquisition of subject matter knowledge and the acquisition of ICT skills. The design of learning phases and the interaction and communication patterns of the academic teacher in the digital learning environment have to take into account these complex learning processes in order to efficiently support a learning group (Salmon 2004, p. 28).

The influence of technology on interaction and communication in digital learning environments is somewhat ambiguous and two-sided. On one hand, technology veils the transparency of social interaction in the virtual classroom and limits the control mechanisms for academic teachers on communication and interaction processes, which are more explicit in physical learning environments. In particular online communication and interaction in the web, which is based on instant messaging technologies, occurs at a higher level of speed and dynamics than in the face-to-face situation of a classroom. Due to a missing physical presence in the digital learning environment, there is a lower awareness of the learning group. Non-verbal, physical communication signs are not represented. In the absence of physical presence there is less pressure on individual learners to stick to conformity and to social norms within the group. The digital learning environment, when it applies instant messaging tools, lowers psychological barriers to participate in interaction and communication and increases readiness of learners for direct participation in online discussions (Euler 2004, p. 179).

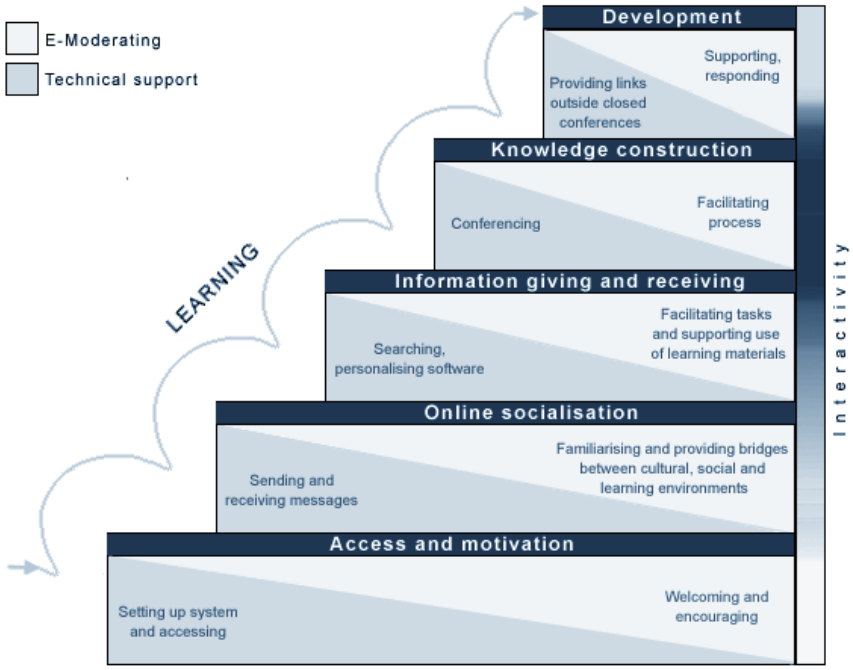
On the other hand, technology increases the transparency of social interaction in the digital classroom and enhances the control mechanisms for academic teachers on communication and interaction processes, which are less explicit in physical learning environments. Technological options to record and store each activity of learners within digital learning platforms are more abundant than in physical learning environments. Tracking systems allow teachers to assess learning pathways of learners in the digital learning environment, to reconstruct which website has been accessed and which learning object has been used at a specific time. Data storing systems and data evaluation techniques enable the automatic assessment of specific learning profiles in the digital learning environment. Contributions, which have been submitted by learners to discussion forums, can be retrieved and analysed by teachers. These peculiarities of online communication and interaction ask for specific teaching activities and therefore require respective teaching competences.

Salmon has developed a a five-stage model of teaching and learning online, which can be used for a detailed specification of the main interaction and communication tasks and the deduced eCompe-

tence profiles of academic teachers in digital learning environments. Salmon's model distinguishes five different learning phases and outlines the main teaching activities which are required within each single phase.

The five-stage model of teaching and learning online contains 'access and motivation', 'online socialisation', 'information exchange', 'knowledge construction', and 'development' as the five main learning phases which usually evolve in educational processes within digital learning environments. Each single phase requires specific competences of the academic teacher, which correspond to a description of specific tasks. Main task of the teacher in phase one of the model is to welcome and to encourage the learner group within the learning environment. Main task of the teacher in phase two is to make learners familiar with each other in the learning group, as well as with the learning model and culture, and with the given learning environment. Phase three includes as main responsibilities of the teacher a facilitation of learning tasks and the support of learners in the use of learning contents. In phase four, the teacher mainly takes the role of a facilitator in the knowledge construction of learners. In the final phase of the model, the teacher supports and responds to the next learning activities of learners beyond the direct learning goals in the specific course (Salmon 2004, pp. 28-30; Salmon 2006b, pp. 146-149).

FIGURE: MODEL OF TEACHING AND LEARNING ONLINE (BASED ON SALMON 2004, P. 29)



When we agree with Salmon's description of roles and tasks that the teacher has to take within the five phases of the model, competence requirements for online teaching rely much more on a distinguished communication and interaction expertise than on the mere mastery of digital tools. The eCompetence of academic teachers in the task areas of ICT-based interaction and communication is much more determined by teaching requirements than by technology requirements, as teaching, and not the application of digital tools is the predominant role the academic teacher has to fulfil in the digital learning environment. If we assume that the key function of teaching in digital learning environments is to give support to a self-directed and autonomous learning process of learners, then learners need much more a teacher who is motivator, facilitator, moderator, supervisor, and counsellor than a technology expert to help them to get along with their learning.

The main learning phases and coherent teaching tasks, which Salmon details for teachers in digital learning environments, are quite similar to a description of evolution stages for online communities, which Kess sketches in an analysis of social interaction in the Finnish virtual university. Kess states that online communities are social networks, which are characterised by trust, shared interests, shared responsibilities, and shared norms and values. The competence of online community members to efficiently interact with each other relies on a neat definition of the main target of the network. Accordingly, online communities experience five evolution stages, which are: the network target setting; to build the trust within the network; to build competence for mutual interaction; to gradually build the infrastructure of a shared workspace; and finally to secure sustainability of the community. Main task of the network coordinator is to foster a competence development of the community members in each of the five evolution stages. This way, in a similar ICT context the main task area of the network coordinator is once again much more situated in communication and interaction processes than in mere technological expertise (Kess 2003).

A final task area of academic teachers in the design of learning phases in digital learning environments relates to the pedagogical use of learning content, the representation of learning content in digital form. The type of electronic media determines the options of the academic teacher for representing learning content in digital form. Static media types like pdf or power-point files, which mainly represent explicit information, rely on an efficient visualisation of the learning content. More dynamic media types - like animations or movies, which deliver a wide range of facts around the main learning subject, require a coherent string of narration to transmit the main ideas within the presented learning content to learners. Interactive media types like simulations, games, and communication tools need efficient moderation and feedback mechanisms to keep the focus of learners on the learning content. This way, each medium has a unique quality to represent learning content.

The required eCompetence of the academic teacher in relation to the pedagogical use of digital learning content is the ability to understand the unique quality of different media types for representing knowledge and to make informed choices on the use of content production tools and media

types in the design phase of a specific learning environment. This does not mean that the academic teacher has to be a technology expert for media and digital content production tools and modes. The transmission of learning content into digital form is usually not done by the teacher him- or herself, but by a team of media designers and computer specialists. To guide the production process, academic teachers need as content experts to be able to work with and to manage this kind of interdisciplinary team (Hanley 2004, pp. 58-59).

5.4.1.3. Overall Design of ICT-based Courses or Study Programs

A last specification of eCompetence profiles for academic teachers in the pedagogical dimension of the SCIL framework relates to the overall design of courses or study programs, which rely on digital learning environments and integrate ICT tools. This wider task area for academic teachers in the pedagogical dimension of the SCIL framework extends beyond the planning of teaching activities at micro-level of a specific digital course environment. It deals with the integration of single digital course units, specific sets of interaction and communication tools, and digital learning contents into wider learning environments of universities. This may be a range of blended learning courses or even a whole study program of a faculty. The overall pedagogical design of a set of courses or study programs, which rely on digital learning environments and integrate ICT tools, asks for a set of competences of the involved academic staff, which includes step-by-step in the whole design process the abilities

- ✗ to define learning goals for large student groups;
- ✗ to define learning prerequisites and to assess levels of expertise of the learner groups;
- ✗ to make an informed selection of a specific pedagogical paradigm and to apply the coherent teaching and learning principles and methods;
- ✗ to integrate digital learning tools and contents into the learning environment;
- ✗ to select adequate learning tasks, which fit the learning competence of the learner group;
- ✗ and to select assessment types which correspond to the teaching model which is used in the learning environment (Euler 2004, p. 181).

5.4.2. Socio-Cultural and Organisational Dimensions

We have further above assumed that academic staff is at least partially involved into socio-cultural processes and organisational decisions of universities. Therefore, we come back to the socio-cultural and organisational dimensions of the SCIL reference framework.

The socio-cultural dimension is basis for the definition of competence profiles which are required for the implementation of a wider change management process for a sustainable integration of ICT into universities. The work context of academic teachers is insofar included in the socio-cultural

dimension, as new concepts for teaching and learning, which evolve along technology-driven change, confront longstanding traditional teaching models and practices in universities. Zemsky & Massy speak about the dominant design of these traditional teaching models and practices in higher education, which are firmly rooted and hard to overcome with innovative pedagogical eLearning approaches that specifically lack this dominant design (Zemsky & Massy 2004, pp. 3-4). Teachers need to become aware on the potential of new technologies for pedagogical use, and they need to actively take part in the current changes, which the implementation of technology-driven education innovation is causing in the teaching and learning culture. The socio-cultural dimension contains a combination of motivational, cognitive and mental factors which relate to the change readiness of academic staff members in universities and their increased use of eLearning in teaching and learning activities (see also chapters 3.5 - key assumptions and 4.6.3. The concept of competence - motivation).

The eCompetence profile of academic teachers in the socio-cultural dimension of the SCIL framework assembles competences, which relate to the abilities

- ✗ to learn about and to deal with new eLearning contexts;
- ✗ to understand and to cope with technological innovation in educational work processes;
- ✗ to understand the potential and experiment with, make use of new technological tools;
- ✗ to exchange eLearning-related knowledge and experience, and to communicate in peer networks and communities (Euler 2004, p. 183).

The organisational dimension of the SCIL framework is basis for a definition of competence profiles, which are required to define and implement the wider structures and processes of ICT-driven change at institutional level. Strategic planning for the setup of additional eLearning support units, a definition of transparent work flows, the introduction of adequate staff development schemes, and the launch of an effective ICT communication policy certainly depend on active leadership involvement. But, beyond the level of university management, academic staff is the most important target group for institutional change management strategies (Bates 2000, pp. 95-96). One essential success factor within the organisational dimension is active involvement of academic teachers in the main decisions and change implementation processes related to eLearning. Academic staff needs to be involved in collective decision-making in terms of sharing process ownership and co-determination on the wider ICT strategy, and they need to actively participate in the discrete implementation steps which are carried out in the university.

Therefore, the eCompetence profile of academic teachers in the organisational dimension of the SCIL framework assembles competences, which relate to the abilities

- ✗ to engage in strategic decision-making on the ICT integration within the university;
- ✗ to communicate and network in the organisation on eLearning-specific concepts and tasks;

- ✗ to work in interdisciplinary teams and to solve problems, which emerge through the complexity of an institution-wide eLearning integration;
- ✗ and to manage eLearning projects in their faculties, which are part of the wider eStrategy of the university.

The table below summarises the eCompetence profiles for the three SCIL framework dimensions:

TABLE: SCIL DIMENSIONS AND ECOMPETENCE PROFILES (BASED ON EULER 2004)

SCIL DIMENSION	-- eCOMPETENCE PROFILE OF TEACHER --
Pedagogical Dimension	✗ cross-sectional pedagogical competence as general ability to design teaching and learning activities
a. Design of VLE's	✗ pedagogical design competence - define learning goals - assess learning competences of students - use adequate methods and instruments for achievement of learning goals in given conditions ✗ understand and apply pedagogical paradigms ✗ understand and foster modes of autonomous learning ✗ reflect upon peculiarities, potentials and limits of ICT ✗ reflect upon peculiarities, potentials and limits of technology-based communication and interaction ✗ reflect upon efficiency of eLearning in relation to students' learning competences and learning goals
b. Design of Learning Phases	✗ encourage and motivate learner group ✗ familiarise learners with each other in learning group ✗ familiarise learners with learning model and culture and with given learning environment ✗ facilitate learning tasks and support learners in use of learning contents ✗ facilitate knowledge construction of learners ✗ support and respond to learning activities of learners beyond direct learning goals ✗ understand unique quality of different media types for representing knowledge ✗ make informed choices on pedagogical use of content production tools and media types ✗ work with and manage interdisciplinary eLearning production teams
c. Overall Design of Courses or Study	✗ define learning goals for large student groups ✗ define learning prerequisites and assess levels of expertise of

SCIL DIMENSION	-- eCOMPETENCE PROFILE OF TEACHER --
Programs	learner group ✗ make informed selection of pedagogical paradigms and apply coherent principles and methods ✗ integrate digital learning tools and contents into learning environment ✗ select adequate learning tasks, which fit learning competence of learner group ✗ select assessment types which correspond to teaching model used in learning environment
Socio-Cultural Dimension	✗ readiness to learn about eLearning ✗ apply technological innovation to own work context ✗ reflect upon ICT potential ✗ self-reflect upon the teacher role in innovative learning environments ✗ readiness to experiment with ICT tools ✗ communicate and exchange knowledge in peer networks
Organisational Dimension	✗ engage in strategic decision-making ✗ communicate and network in organisation ✗ work in interdisciplinary teams ✗ solve complex problems at organisational level ✗ manage eLearning projects at faculty level

5.5. Classification of Competence Profiles in Competence Matrix

We relate in a final step of chapter 5 the identified competence descriptors in the four eLearning scenarios and in the three dimensions of the SCIL reference framework to the competence model, which has been elaborated in chapter 4 (see chapter 4.8 - Conclusions). Therefore, we *classify the competence descriptors* within in a two-stage process. In a first stage, we classify competence descriptors within subject matter, methodical, social and personal competences. This is done with reference to competence attributes of the four key competences, which Erpenbeck & Heyse describe in their action competence model (see table 'classification of four key competences' in chapter 4.7 - action competence) . In a second stage, we assign competence descriptors to knowledge, skills and attitudes (KSA), the three key components of the system of dispositions within the competence model as it has been constructed in chapter 4. This two-stage process results in the assignment of identified competence descriptors within a 3x4 field competence matrix, which is shown below (see also Kerres et al 2005, p. 13):

TABLE: 3X4 FIELD COMPETENCE MATRIX

		DISPOSITIONS		
		KNOWLEDGE	SKILLS	ATTITUDES
COMPETENCES	SUBJECT MATTER			
	METHODICAL			
	SOCIAL			
	PERSONAL			

The unequivocal classification of single competence descriptors within the competence matrix is not easy. Many competence descriptors can be assigned to several fields. In particular the distinction between subject matter and methodical competences as well as the distinction between knowledge and skills is neither clear, nor evident. The three dispositional competence components knowledge, skills and attitudes, as well as the four key competences merge in real practice with each other in performed action (see Winterton & Le Deist in chapter 4.6.2 on the system of dispositions and Erpenbeck & Heyse in chapter 4.7 on the four key competences). The below given tables propose an approximation to separate and classify competence descriptors into the 3x4 field competence matrix for further analysis and interpretation.

5.5.1. Matrix of Individual eCompetence Profiles

The four tables below provide one eCompetence matrix for each of the four eLearning scenarios - content transmission, flexible learning, mobile learning and collaborative learning.

TABLE A: ECOMPETENCE MATRIX FOR THE EPLANET OF CONTENTEOUS

-- CONTENTEOUS - CONTENT TRANSMISSION --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	- have outstanding expertise on learning subject; - understand pedagogical potential of digital content and transmission technologies	--	--
METHODI-CAL	- know electronic learning resources	- integrate electronic learning resources	--

-- CONTENTEOUS - CONTENT TRANSMISSION --			
		into curricula	
SOCIAL	- be good communicator and eLecturer	- have media presentation and communication skills; - have team ability	--
PERSONAL	--	--	--

TABLE B: ECOMPETENCE MATRIX FOR THE EPLANET OF INSTANTIA

-- INSTANTIA - FLEXIBLE LEARNING --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	- assess task-related competence development	--	--
METHODICAL		--	- support autonomous, self-directed learning
SOCIAL	- be good communicator in synchronous and asynchronous dialogue	--	--
PERSONAL	--	- be flexible to react to different learning activities	- be highly available for feedback

TABLE C: ECOMPETENCE MATRIX FOR THE EPLANET OF MOBILE

-- NOMADIC - MOBILE LEARNING --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	--	carry out cross--disciplinary thinking and expertise	--
METHODICAL	- understand active, self-motivated, autonomous learning	- be firm in online assessment techniques; - integrate formal and informal learning	- foster active, self-motivated, autonomous learning; - get used to portfolio-oriented teaching facilitate student ownership of learning process;

-- NOMADIC - MOBILE LEARNING --			
			- support formal and informal learning
SOCIAL	- define micro-size learning phases and activities	have excellent communication skills	- be aware on individual learning needs and collective learning cultures
PERSONAL	--	--	- be flexible and mobile

TABLE D: ECOMPETENCE MATRIX FOR THE EPLANET OF CAFÉLATTIA

-- CAFÉLATTIA - COLLABORATIVE LEARNING --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	- understand collaborative and interactive learning processes	--	--
METHODICAL	--	- moderate, facilitate, mediate and mentor learning within communities	--
SOCIAL	- be an efficient networker	- manage group; take leadership role	- foster peer-to-peer support; - steer interaction between learners
PERSONAL	--	- be able to change roles	- be self-reflective

In table A, we see a cluster of competence descriptors in the subject matter/ knowledge field, meanwhile there is no single descriptor in the attitudes column. There is also no competence descriptor in the personal competence row. In comparison to this first, teacher-centered and content-based eLearning scenario, we see a gradually changing dispersion pattern of competence descriptors in the more learner-centered and flexible, collaborative eLearning scenarios. The frequency of descriptors moves from the subject matter and methodical knowledge fields towards the social and personal skills and attitudes fields. Skills appear rather consistently in all four eLearning scenarios with a focal point in methodical and social competences.

This diagnosis is consistent with theoretical assumptions on the shift from teaching to learning in educational structures and on the changing role of the teacher from 'sage on the stage to guide on

the side'. As technologies emphasise and amplify these general change processes in educational structures, this general shift towards learner-centered learning and the role change of the teacher is expressed in the shifting distribution of patterns of competence descriptors in the competence matrices of the four eLearning scenarios.

5.5.2. Matrix of Organisational eCompetence Profiles

The three tables below show the dispersion of eCompetence descriptors in the competence matrix for the three dimensions of the SCIL reference framework pedagogy, socio-culture and organisation.

TABLE A: ECOMPETENCE MATRIX FOR THE PEDAGOGICAL DIMENSION

-- ORGANISATIONAL eCOMPETENCE MATRIX: PEDAGOGICAL DIMENSION --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	- Define learning goals assess learning competences of students; - understand unique quality of different media types for representing knowledge; - define learning goals for large student groups; - define learning prerequisites; - assess levels of expertise of learner group	- Facilitate learning tasks; - support learners in use of learning contents - integrate digital learning tools and contents into learning environment; - select adequate learning tasks, which fit learning competence of learner group	- facilitate knowledge construction of learners support and respond to learning activities of learners beyond direct learning goals
METHODICAL	- understand pedagogical paradigma; - understand modes of autonomous learning; make informed choices on pedagogical use of content production tools and media types; - make informed selection of pedagogical	- use adequate methods and instruments for achievement of learning goals in given conditions; - apply pedagogical paradigma; foster modes of autonomous	--

-- ORGANISATIONAL eCOMPETENCE MATRIX: PEDAGOGICAL DIMENSION --			
	paradigma and apply coherent principles and methods; - select assessment types which correspond to teaching model used in learning environment	learning; - apply coherent pedagogical principles and methods	
SOCIAL	- work with and manage interdisciplinary eLearning production teams	- familiarise learners with each other in learning group; - familiarise learners with learning model and culture and with given learning environment	- encourage and motivate learner group
PERSONAL	- reflect upon efficiency of eLearning in relation to students' learning competences and learning goals	- apply technological innovation to own work context	- reflect upon peculiarities, potentials and limits of ICT; - reflect upon peculiarities, potentials and limits of technology-based communication and interaction; - readiness to learn about eLearning; reflect upon ICT potential; - self-reflect upon the teacher role in innovative learning environments; - readiness to experiment with ICT tools

TABLE B: ECOMPETENCE MATRIX FOR THE SOCIO-CULTURAL DIMENSION

-- ORGANISATIONAL eCOMPETENCE MATRIX: SOCIO-CULTURAL DIMENSION --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	--	--	--
METHODI-CAL	--	--	--
SOCIAL	- communicate and exchange knowledge in peer networks	--	--
PERSONAL	--	- apply technolog-ical innovation to own work context	- readiness to learn about eLearning; reflect upon ICT poten-tial; - self-reflect upon the teacher role in innova-tive learning environ-ments; - readiness to experi-ment with ICT tools

TABLE C: ECOMPETENCE MATRIX FOR THE ORGANISATIONAL DIMENSION

-- ORGANISATIONAL eCOMPETENCE MATRIX: ORGANISATIONAL DIMENSION --			
	KNOWLEDGE	SKILLS	ATTITUDES
SUBJECT MATTER	- manage eLearning projects at faculty level	--	--
METHODI-CAL	- solve complex prob-lems at organisational level	--	--
SOCIAL	--	- communicate and network in organi-sation; - work in interdisci-plinary teams	- engage in strategic decision-making
PERSONAL	--	--	--

Table A contains the greatest amount of eCompetence descriptors, as the pedagogical dimension is at the core of activities and tasks of academic teachers in a universities. Within the matrix itself, we see again a predominance of the subject matter and methodical knowledge and skills fields, which contain the majority of eCompetence descriptors. A second focal point is the personal attitudes field, which contains a comparably great number of descriptors, meanwhile no single descriptor has been ascribed to the methodical attitudes field.

The most striking pattern in table B is the complete absence of eCompetence descriptors in the subject matter and methodical columns, meanwhile a focal point can be found in the personal attitudes field. This dispersion pattern makes sense, as the main challenge for academic teachers in the socio-cultural dimension of the eLearning implementation process is to develop a change awareness and readiness at motivational level. The dispersion of eCompetence descriptors in table C indicates the requirement of subject matter and methodical knowledge for the implementation of eLearning components at faculty level and of social skills and attitudes to exchange eLearning-related information within the organisation and to engage in the change process.

5.6. Conclusions

The clarification of the eCompetence concept has started with its location in the wider discussion of current eLearning research. In strategic perspective, eCompetence is one aspect within the current discussion on models for a sustainable integration of new technologies into universities; in competence research perspective, it is a part of the individual or collective action competence of academic staff in universities. Next, we have made a distinction between individual eCompetence - as personal competences in the creative use of ICT, and organisational eCompetence - as the structures, processes and policies in place, by which a university aims to embed the ICT use into its core tasks research and education.

We have assumed with reference to chapter 4.6.5 that a thorough context analysis is the appropriate methodical approach to define eCompetence profiles for academic teachers in technology-enhanced learning environments. Main challenge of this analysis process is to relate the dispositional key components within the general competence model of chapter 4 to the specific 'eContext' of academic teachers in their teaching and learning processes.

Subsequently, we have introduced a generic concept of individual eCompetence, considering its inherent key components - the individual teacher, the pedagogical model, the ICT options and the student group, and we have merged these components into a holistic model. This generic concept represents the key components which have to be taken into account in the construction of eCompe-

tence for academic staff; it does, nonetheless, not specify competence profiles of academic teachers in specific eLearning scenarios.

Next, we have extracted individual eCompetence profiles for academic teachers within four specific ideal types of eLearning scenarios - the four ePlanets, which have been sketched by Salmon. It has become clear that the required individual eCompetence profiles for the academic teacher in each eLearning scenario do not place their main focus on technical, but rather on cross-sectional methodical, social, communicative and reflective competences. The organisational eCompetence has been based on the SCIL framework for a sustainable implementation of ICT in universities and specified for academic staff within the three dimensions pedagogy, culture and organisation. At the level of organisational eCompetence, the main focus of competence profiles for academic teachers has likewise been placed on cross-sectional methodical, social, communicative and reflective competences rather than on an advanced expertise in technologies and software applications.

The results of the context-based analysis of eCompetence profiles for academic teachers, which is based on specific individual eLearning scenarios and organisational change management dimensions, are coherent with a central assumption on the role of eLearning in formal education processes in universities: new technologies enhance or extend existing learning environments, but they do not replace them or make them obsolete. Required competence types for academic teachers rather extend existing teaching competences than to replace them with completely new ones.

A next step in the categorisation of the eCompetence profiles has been to reflect identified competence clusters against dispositional key components, which have been included in the competence model in chapter 4. This has been done by further assembling the competence profiles and by breaking them down into single competence descriptors within a 3x4 field competence matrix, which includes the four key competence categories subject matter, methodical, social and personal competences on its vertical axis, and the three dispositional key components knowledge, skills, and attitudes on its horizontal axis.

What has become clear in this analytic process in chapter 5 is the point that eCompetence for the target group of academic staff in higher education is not a concept that we can define independent from the context of performance - and that this context of performance is distinct within different universities, different disciplines, different courses of the same study program, and even within different eLearning scenarios which vary in the degree of technology use. Accordingly, a unified, scalable macro-level approach for the concept of eCompetence in society and education is highly improbable.

We can conclude for this study that we primarily need to think about a deduction of strategic human resources measures for academic staff in universities in terms of *modularised eCompetence approaches* that fit the specific meso- and micro-contexts in which they are required. From a theoretical point of view, the most concise way to design eCompetence development measures for

academic teachers would be to identify in a first step contextual requirements for efficient teaching behaviour within those eLearning scenarios, which are realised in a specific university. When the eCompetence profiles have been analysed, they can serve as a blueprint for a portfolio of competence development measures. Aim of the portfolio should be to strengthen those specific knowledge, skills and attitudes, which enable academic staff to teach in eLearning scenarios in a competent way.

Main challenge for universities is to decide upon a set eLearning scenarios, which best fit their educational needs and purposes, and to develop competence development measures for their academic staff on basis of specified eCompetence profiles for those institutionally favoured eLearning scenarios. This approach is feasible when we think in terms of wider eLearning scenarios like the ePlanets that Salmon has sketched; they could serve as institution-wide strategy decisions for the use of ICT to meet specific target groups. This approach is probably not feasible at level of individual teachers and courses, where each single eLearning scenario includes a different set of variables. Scenario planning is in practice rather applied as a tool for critical reflection on teaching competences in eLearning scenarios and for the subsequent creation of coherent competence development measures.

6. The Role of Universities and Faculty in eCompetence Measures

Content

6. The Role of Universities and Faculty in eCompetence Measures

6.1 Introduction

This chapter sets its focus on two research areas, which relate the concept of eCompetence to its macro-context. The first part of this chapter refers to wider *contextual and institutional factors* within universities as complex organisations which influence the success of eCompetence development measures. The second part of this chapter debates the *role of academic staff* as target group for eCompetence measures through a summative analysis of their main habitual and motivational traits.

We have argued in chapters 2.5. and 2.6. that eCompetence measures can be regarded in macro-level perspective of universities as organisations as a part of wider ICT-driven institutional innovation strategies. It has become clear that a variety of strategic approaches for technology-driven institutional innovation are debated and realised in the relevant eLearning research and practice. Universities have to develop specific eLearning innovation strategy approaches on basis of a needs analysis within their own local contexts. A central question in this area is: how are prepared universities to manage technology-driven institutional change?

From institutional perspective, the objective to foster eCompetence of its faculty can be understood as one component of the human resources management within a university. The general capability of a university to develop its human resources determines to a high degree its potential to sustainably implement eLearning as well as its success in specific eCompetence development measures for academic staff. We refer with the terms individual and organisational learning to these two competence areas. The organisational capability to stimulate eCompetence development and the individual learning process of academic teachers in the use of ICT interdepend on each other. The interrelation between the organisational capability of a university (to steer its institutional innovation processes) and the impact of eCompetence measures (as part of human resources management) on the ability of academic staff to use ICT in teaching and learning can be theoretically grounded. This important relationship between individual and organisational learning has been discussed in detail in chapters 2.8 and 4.5.

We assume that the interrelation between individual and organisational learning is a critical success factor for strategic competence development and competence management in universities. The institutional challenge is to build up and to manage this interrelation between the individual and organisational level of competence development. The motivation of academic teachers to reflect on eLearning

and to acquire eCompetence for an efficient use of ICT depends partially on institutional incentives and learning environments that universities offer.

This chapter will start with a brief analysis of general innovation processes in higher education and a view on typical organisational structures, which are found within universities. These organisational structures influence the capability of universities to initiate efficient eCompetence development measures for their faculties.

A second key influence factor for the success of institutional competence development measures is faculty itself. The status of academic staff within the university, the motivation of academic teachers to take part in eCompetence trainings and eLearning activities, and the distinct levels of expertise within academic staff as target group for competence development influence in their combination the design and potential success of adequate institutional training measures.

Finally, we draw some conclusions, which evolve from the analysis of structural characteristics of universities and from the analysis of group characteristics of academic staff for the adequate design of eCompetence development activities.

6.2. A Systemic Macro-Level Perspective on Universities

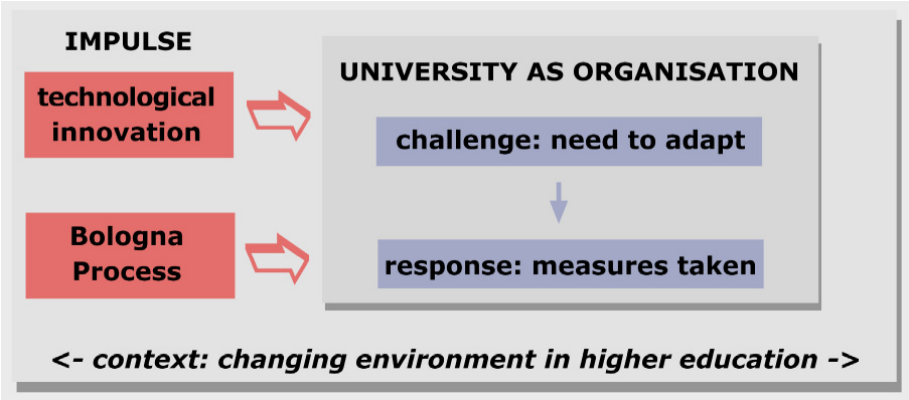
6.2.1. Current Innovation Trends in Higher Education

Traditionally, the European *higher education sector* tended to be a sheltered institutional environment. Universities in Europe have neither been highly cooperative nor bitter rivals; they have often cultivated a mutual exchange of information and knowledge, as well as of students and staff. These cooperative structures used to take place in a highly regulated and sheltered public market, where competition did not play a decisive role as success factor. The weak competition between universities, which mainly concentrated on scholarly reputation, was further reduced by substantial state-funded investments in higher education institutions.

This traditional higher education landscape has fundamentally changed in the last two decades. Nowadays, universities have to react to the challenges that globalisation and technological innovation cause in the higher education sector. And they need to generate new sources of funding to counterbalance a continuous decrease of public investment in higher education. Universities face these chal-

lenges with an increase in both competition between each other and at the same time with enforced mutual cooperation. The implementation of the *Bologna Process* in the European higher education sector accelerates and amplifies through its two-cycle structure and its comparable degrees the complementary evolution of competition and cooperation between universities. These distinctive characteristics of the higher education sector are clearly evolving (Sporn 1999, pp. 6 ff.; Communication COM 548 final 2005, p. 25; see also chapter 2.3).

FIGURE: CHALLENGES FOR UNIVERSITY CHANGE



Universities focus as institutional players at inter-organisational level on the establishment of strategic coalitions within consortia in order to strengthen mutual interests and to better compete in joint research project proposals for third-party funding. This complex inter-organisational interaction of universities in national and international networks is complemented by public-private partnerships, which aim to foster the knowledge transfer from science to business. This is often realised through the foundation of technology centers and the initial funding of commercial spin-offs which use research results, that have been generated within universities, as key production factors for their business processes.

At organisational level, universities work on the definition of coherent institutional profiles to gain a stronger competitiveness in the emerging global educational markets. Nowadays, we experience a growing rivalry for resources and prestige among universities. Adding to this competition are corporate education providers, which have begun to offer commercial study courses in the higher education sector. This new phenomenon urges universities to face competition, to find niches in emerging international markets, and to develop new management models in order to steer and to justify their core work processes. The innovation strategies of universities, which aim to adapt the organisation to the impact of ever more competitive markets, usually include a number of different components. These components are, amongst others: an ongoing definition and measurement of educational quality; a new perspective on students as customers of educational services; an increasing demand for teaching quality; and the efficient use of new technologies for learning and research.

6.2.2. Organisational Structures and Change in Universities

The above described change factors in the higher education sector have led in institutional research to the emergence of *concepts for adaptive or entrepreneurial universities*. Main idea in these organisational concepts is that universities gain an active role in defining their institutional goals and in structuring their own social and economic environments. On one hand, this role implies a higher degree of financial and structural autonomy of universities from governmental regulations of education ministries. On the other hand, this higher degree of autonomy requires universities at the same time to be more responsible for their strategic decisions and their performance as educational institutions. Universities increasingly face the challenge to autonomously plan their main fields of activities and to be accountable for their work results in terms of measurable, quantitative success indicators (Birnbaum 2001, Boezerooij 2006, pp. 33 ff.; Collis & Van der Wende 2001, pp. 67 ff; Sporn 1999, pp. 24 ff.).

What seems to be in theory a mandatory objective in policy goals - to transform universities from traditional, state-controlled educational institutions to entrepreneurial actors which compete in global markets, faces in reality a set of serious constraints. These constrains are grounded in specific structural and cultural features which can be found in the analysis of organisational structures of universities. A number of significant concepts and theories in organisational studies and institutional research describe universities as 'loosely-coupled' systems. This concept of a university as a loosely-coupled system implies that the formal structures within a university as organisational unit are only loosely connected to its core functions and activities. A high degree of autonomy of the faculties as substructures of the university leads to a kind of garbage can decision-making within the institution. Sometimes, the internal structures of universities are even characterised in institutional research studies as coming close to a kind of organisational anarchy, or the mere specification of boundaries which can be drawn between universities as complex organisations and their wider environment is seriously questioned (Birnbaum 2001, pp 3-4; Miles & Snow 2003, pp 252-255; Pellert 2000, pp. 39-41).

Enders has detailed a set of unique organisational characteristics of European public universities. He observes in his analysis of the current state of higher education, that universities are normative at their core, that they are being weighed down by many, often contradictory goals, that they still lack real organisational autonomy, and that they are deeply institutionalised and possess a conservative administrative culture. As consequence of these unique organisational characteristics, European public universities tend to be bottom-heavy institutions with comparably low potential for collective actions and strong organisational leadership (Enders 2002, p. 19).

Organisational change in universities depends to a high degree on their capability to motivate their professorate to actively engage into institutional innovation. From organisational perspective, faculty members are part of the human resources within a university. Human resources are a key area for structural innovation which universities mainly influence through three different governance instru-

ments: universities influence the selection of junior faculty members in recruiting procedures, and they can try to transmit organisational norms and standards in socialisation processes and in training activities. But, due to the specific career development mode of scientists which we will outline in the next chapter, universities play only a limited role in the continuous development of their faculty members. A strategic human resources development plan, although it seems indispensable for the innovation of organisations, is a new phenomenon in most universities and needs to cope with these structural constraints.

In addition to these points, the wider changes that emerge in the macro-level institutional environment often bear little relation to the work which is done within universities themselves. There is a danger that the adaptation of innovation strategies within universities tends to be more of a ritualistic or symbolic nature than to be a real willingness and commitment of its workforce to drive change forward. As consequence, the validity of the main implications on organisational rationality, which are discussed in new public management models for corporate governance, has to be critically questioned for the higher education sector (Levine 1980; Birnbaum 2000).

This has been a short overview on general trends in the higher education sector and on organisational structures of universities in theory and in reality. We can draw from this outline at least two central conclusions for the subject of this study. First, the higher education sector is in a period of fundamental change. These change processes exert an increasing pressure on universities to adapt to new normative value systems and to regulation frameworks, which emphasise an institutional performance measurement on the basis of quantitative output indicators. And second, this environmental pressure is forcing universities to gradually re-structure themselves from sheltered state institutions to more entrepreneurial institutions, which are able to act as autonomous organisations in competitive educational markets. Part of the efforts of universities to innovate their organisational structures is an increasing awareness to efficiently invest into the human resources development of their academic staff. And part of the human resources development is the eCompetence development of academic teachers, which may be fostered within a university as component of its eStrategy through the design and implementation of appropriate training measures.

To summarise these points, we assume that universities are complex organisations, and that the impact of strategies for organisational innovation is threatened to be seriously constrained by structural and functional peculiarities of the higher education system. Given the complex systemic structures of universities and the manyfold external as well as internal interest groups and influence factors, which have to be balanced to draw a coherent organisational innovation strategy, it is reasonable to conclude that, while in theory we might argue for a clear-sighted human resources management and deduce coherent competence development measures for academic staff, to implement these conceptual frameworks in practice presents a big challenge. In this perspective, it is an interesting question to

which degree universities are really capable to implement a strategic management models for their human resources, and in particular for their faculty members.

Next to the macro-level structures of the higher education sector and the university as organisation, a short analysis at meso-level of academic staff as key group for the educational activities within the organisation might give us some hints about their learning needs and priorities, as well as to clarify their motivational attitudes to get involved in eLearning activities and to participate in eCompetence development measures.

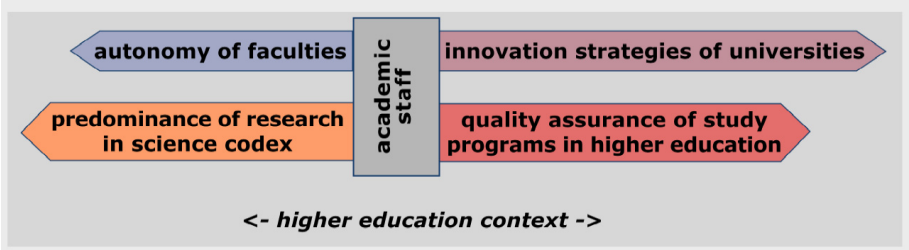
6.3. Faculty Members as Target Group for eCompetence Development

6.3.1. Status, Interests and eLearning Commitment of Faculty

In order to assess more in detail the relevance and the degree of importance of eLearning and eCompetence as topics for academic staff, we have to first understand their *general needs and interests* as collective group within the higher education system. After all, the best eCompetence staff training courses will have been set up in vain by a university, if its faculty is not interested or motivated to be involved in eLearning. We need to know which influence factors determine the priorities and drive the behaviour of faculty. We can discuss the core interests and motivational factors of faculty from two perspectives. The first perspective inquires on the position of academic staff as a group within the university. The tension, which exists between the high degree of autonomy of faculties and centralised institutional innovation plans of a university as a whole, defines the main baseline in this first perspective. The second perspective focuses on career development paths of academic staff members in higher education; these are strongly influenced by the norms and regulations which are defined in the codex of science. The tension, which exists between the predominant importance of research in the science codex and the increasing importance of strategic planning and quality assurance of study programs and teaching portfolios within universities, sets the main baseline in this second perspective.

The following figure illustrates these two tension areas, which have an influence on academic staff as collective group:

FIGURE: TWO PERSPECTIVES ON ACADEMIC STAFF



Let us begin with the first perspective on the main interests and general motivational factors of faculty and observe their position within the organisational structure of universities. As has been outlined in the previous chapter, universities can be understood in various institutional research models as organisations or conglomerates of highly specialised subject experts. Formally, professorate and research assistants are employees of those universities in which they work. But these host universities are usually not the main focal point of academic staff. This is caused by a combination of normative and habitual factors which characterise the higher education system. A common concept in organisational science is the image of scientists as professional entrepreneurs in their subject fields and of universities as a more or less aggregated consortium of researchers, who are only loosely bound to the organisation as a whole.

A high degree of formal autonomy of the professorate is one characteristic, which significantly determines the internal structure of average universities. This high degree of autonomy applies to research and teaching as the main work tasks of academic staff members. Usually, academic staff define their target setting and work processes within both research and teaching independent from institutional aims. And they define their target setting and work processes within both research and teaching more in relation to the normative system of their science disciplines than as tasks, which are embedded into and coherent with a specific institutional strategy.

Becher & Trowler observe that the professorate in universities are mainly committed and connected to their respective science disciplines and cultures. Accordingly, Becher & Trowler illustrate this internal structural fragmentation of universities and the dispersion of academic groups and respective norms and regulations across scientific disciplines as a higher education landscape, which is inhabited and dominated by academic tribes and territories. The fragmentation of organisational structures and the dispersion of the division of scientific labour between distinct academic cultures and disciplinary bodies of knowledge leads to a comparably low identification of faculty members with their own universities. Given these peculiar organisational and contextual structures in higher education, universities as institutions have only limited capacities to manage their human resources and to influence the competence development processes of their academic staff (Becher & Trowler 2001, pp. 14 ff.; Enders 1998, p. 58; Pellert 2000, pp. 41-44; Sporn 1999, pp. 28 ff.; Viebahn 2004, pp. 58-59).

The second perspective on interests and motivational factors of faculty relates to the system of career paths in science. Traditionally, academic careers are not in first place determined by institutional criteria of universities, but by quality assessment standards which emerge within science disciplines. Merton has identified these general standards in higher education in a classical sociological study and categorised them within a '*codex of science*'. This codex of science contains four implicit rules and norms, which in their sum represent quality indicators for research and define standards for academic expertise; they are the fix points for junior researchers, who like to build an academic career. These four science norms are universalism, communality, disinterestness and organised scepticism. Universalism means that the position of researchers within specific science communities should be exclusively based on the quality of their contributions to the science field. Communality means that researchers are obliged to publish their results, thereby making their research available to the wider science community. Disinterestness stands for the ethical responsibility of researchers to conduct their research independent from vested public or corporate interests. And organised scepticism exposes the key function of the critical peer review system in science by emphasising the importance of contradictory viewpoints to assure a high level of objectivity in research findings (Merton 1973; Braxton 1990, pp. 461-462).

The science codex leads to a number of consequences for the career development of academic staff members in universities. First, there is usually a strong identification of scientists with their disciplinary communities. These disciplinary communities set the standards, which are applied as criteria to define excellence in science disciplines and which serve as benchmarks to assess the work quality of individual research in a specific field. Instead of being an element of institutional measures of universities, the individual competence development of researchers mainly takes place in national and international communities of scholars. Continuous learning can safely be regarded as one key aspect of the academic work culture in universities. The daily work routines of scientists in the knowledge-intense academic environment necessarily include a high degree of competence acquisition. Researchers need to have a high degree of self-responsibility to develop and to enhance their competence in specific science domains. But the competence assessment of researchers is mainly taking place in the documentation of their scientific outputs. Scientists usually present their research success in individual competence portfolios which contain items like the main field of investigation, a list of publications, presentations in conferences, acquisition of projects, and membership in scientific communities or academic networks.

This way, the current science culture evidently favours the scope and quality of research outcomes over teaching merits of academic staff members. Research is scrutinely assessed in scientific communities, meanwhile teaching is still barely assessed at all. This imbalance between the value of research and teaching performance as criteria for career development paths of junior researchers in higher education is a direct result of the codex of science and its strong emphasis on successful research as key indicator for scientific excellence. As long as appointments to open positions are mainly based on research portfolios of junior researchers, the marginalisation of teaching in the academic culture will

continue. As a further effect, the weak position of teaching expertise in the science system significantly constraints institutional efforts of universities to foster eCompetence within their academic staff as part of a wider eStrategy.

Adding to these points, in particular structural weaknesses of the human resources dimension within the higher education system further drive a marginalisation of teaching in the academic career reward system. Average European universities experience a long period of severe underfunding, which has been taking place for almost three decades. This has unfavourable consequences for the status of faculties and for the resources which are disposable for funding schemes of academic staff in higher education institutions. In most disciplines, far more qualified junior researchers are available on academic job markets than open research positions in faculties can be financed within universities. Competition for these scarce open positions is fierce, and the main benchmark criteria for appointments focus on the research success of applicants, inquiring on their research competence portfolios. As consequence, many junior researchers can not invest a lot of time or energy into their teaching efforts, even if they wanted to (Nowotny et al 2001, pp. 82-83, Bates 2000, pp. 96-97).

This last point is a particularly regrettable systemic flaw in the academic culture, as many younger researchers are open to bring innovative teaching formats forward and to experiment with the use of ICT in study courses. Hagner & Schneebeck concisely perceive this dilemma in the eLearning adoption process in higher education. They write that junior researchers, who are most likely to bring along expertise and openness for the use of new technologies in teaching and learning, are at the same time the faculty group with the most unstable and precarious job positions. Bates asserts in his thoughts on organisational approaches, which aim to motivate faculty to take up eLearning, that in the long run the misbalance between importance of research and teaching in science system can only be countered through an inclusion of teaching merits in appointment schemes for open positions at universities, which would in consequence also strengthen the strategic efforts of universities to foster eCompetence of their academic staff (Bates 2000, p. 98; Hagner & Schneebeck 2001, p.10).

In spite of the comparably low appreciation of teaching within the current system of academic careers, universities are in need to strategically drive forward teaching and eLearning if they want to cope with policy demands for a more efficient educational performance, with enforced competition for students and with the massification of course systems, as well as to serve student demands to receive improved teaching services for their student fees. After all, the education of students is a key objective of each university, which has to be realised in an efficient way.

6.3.2. Motivational Factors for the eLearning Adoption of Faculty

When we apply a systemic approach rooted in institutional research to detail the position and main needs and interests of faculty as target group for eCompetence development, the analytic focus is on explicit norms and organisational structures, which exist as surrounding influence factors on academic staff. Alternatively, faculty can be analysed in psychological perspective from within, inquiring on their main *motivational and attitudinal characteristics* and their *level of eLearning expertise* as basis for the design of adequate institutional reward mechanisms and eCompetence development measures.

A general assumption in expertise research is the one that individual expertise in a specific knowledge domain is emerging in a multi-tier development process over an extended period of time. Experts develop an extensive body of knowledge, experience, and task-solving strategies in a specific domain in a series of consecutive steps - a learning process which counts in years rather than in months. Accordingly, one can distinct several levels in the process of expertise building: this has been prominently done by Dreyfus & Dreyfus, who differ in a five-stage typology between the levels of novices, advanced beginners, competent persons, proficient persons and finally experts (Dreyfus & Dreyfus 1986, see also chapter 4.6.2 on expertise models).

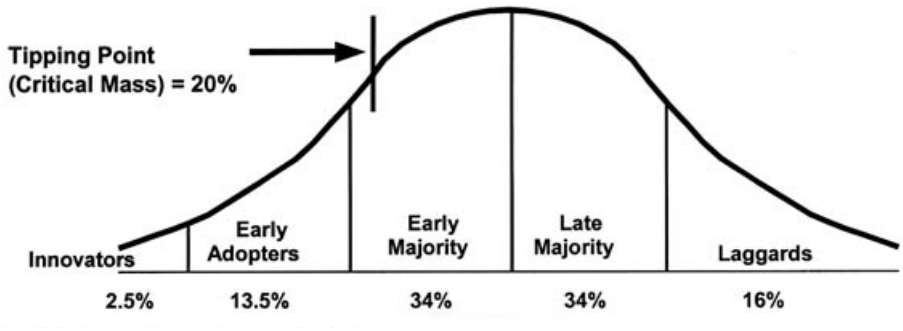
Meanwhile the development and the levels of expertise have been treated in a number of cognitive psychology studies for management leaders in the corporate sector, Kerres et al remark that so far there is no validated empirical research available that applies models for the acquisition of expertise to academic staff in the higher education sector. An external classification of levels of eLearning expertise members would need to find ways to measure distinctable expertise levels within the teaching practice of academic teachers in order to serve as conceptual basis for eCompetence development measures (Kerres et al 2006, pp. 43-44).

We can rely on motivational studies to better understand preconditions of academic staff for competence development and for their readiness to get involved into eLearning. A well-known approach for the adaptation of innovation in social systems, which is frequently cited in eLearning studies, is Rogers' theory of adopter types. In his work, Rogers identifies and makes assumptions on five distinctable social groups in innovation processes. These five groups need different periods of time, while taking up and adopting new ideas within the social system in which they are situated - a phenomenon, which Rogers characterises as 'innovativeness'. The innovativeness of individuals is measured by the time they need to adopt an innovation. Meanwhile some individuals adopt new ideas rapidly - they have a high degree of innovativeness, the majority within the social system needs considerably more time for adapting to innovation processes, and for a small group of societal members it is difficult to adapt at all to the changing environment - they have a low degree of innovativeness.

According to these thoughts on the innovativeness of a population within a social system, Rogers has defined five adopter categories, which contain different adopter types. These categories are the

'innovators', the 'early adopters', the 'early majority', the 'late majority', and the 'laggards'. On the basis of statistical calculations, which take into account the mean and the standard distribution of the total population within a social system, Rogers estimates the adopter distribution within the five categories. This ideal-type standard distribution of adopter types in a social system calculates 2.5 percent of the total population for the innovator category, 13.5 percent for the early adopter category, 34 percent for both the early majority and the late majority categories, and finally 16 percent for the laggard category. The following figure illustrates these basic assumptions of Rogers model (Rogers, pp. 279 ff.).

FIGURE: ADOPTER CATEGORISATION ON THE BASIS OF INNOVATIVENESS (BASED ON ROGERS 2003, P. 281)



How can we move forward from Rogers general assumptions on the phenomenon of innovativeness and of five different adopter types within a social system to a more empirically grounded analysis of these types for the adoption of eLearning innovation by faculties in universities? Zemsky & Massy have applied Rogers theory model in a recent study on the adoption of new technologies in US higher education institutions. For this study, Zemsky & Massy have gathered data from faculty members and from administrators in six US universities, focusing on their attitudes, expectations and uses of eLearning.

The following table classifies the main findings of this study according to the adopter typology of Rogers:

TABLE: TYPOLOGY OF ADOPTERS OF ELEARNING INNOVATION (BASED ON ZEMSKY & MASSY 2004)

TYPE	% OF POP.	ROLE	MOTIVATION		INNOVATION ACTIVITIES	SPEC. eLEARN ACTIVITIES
			intrinsic	extrinsic		
Innovators	2.5%	Pioneers	++++	+	Seek out, take risk, experiment, make sense, demonstrate	Work on complete re-design of courses
Early adopters	13.5%	Opinion	+++	++	Take responsibility,	Integrate digital

TYPE	% OF POP.	ROLE	MOTIVATION		INNOVATION ACTIVITIES	SPEC. eLEARN ACTIVITIES
			intrinsic	extrinsic		
		leaders			manage risk, test, communicate	content produced by others
Early majority	34%	Open-minded peers	++	+++	Take up, exploit potential, integrate, systematise	Rely on LMS/ CMS as communication and data exchange platform
Late majority	34%	Conservative followers	+	++++	Get aware, follow up, exploit potential	Enrich existing courses - ppt. web, newsgroup, eAssessment
Laggards	16%	Resistants			Resist, stay out	Marginal or none at all

These five different eLearning adopter types show different motivational backgrounds and competence profiles, which could be used as one source of information for the conceptual design of institutional eCompetence measures for faculties. Innovators tend to be intrinsically motivated - they use ICT in their teaching and learning activities anyway, even if there is no explicit external reward. They have generally a high level of eLearning expertise, they are informed about the latest technological trends and they possess the skills to integrate new tools into their work processes. Institutional competence development measures for innovators do not primarily focus on the transmission of factual eLearning knowledge or the enhancement of eLearning-related skills, but rather try to reinforce their positive attitudes by lowering the risk and by widening the impact of the innovative work they carry out.

Early adopters possess a high intrinsic motivation, but they are also aware on external reward factors. The level of eLearning expertise and skills of the early adopters is high; they are mainly in need of institutional measures which help them to assess the risks and rewards of specific technology integration models in educational scenarios, and to get their messages and evaluations to the wider university public. Additional institutional grants for innovative teaching and learning projects attract members of the early majority to come closer to eLearning.

The early majority is in organisational perspective the crucial adopter group for a successful implementation of eLearning innovations in universities. When the early adopters take up and start to constantly work with innovative eLearning scenarios in their teaching, it becomes unlikely that the innovation process will not subsequently disperse to the whole faculty population (Rogers 2003, p. 275). The main challenge for institutional competence development measures which target the early majority is the need to focus on a strategic systematisation of the ICT potential. The early majority

considers rationally advantages and disadvantages of eLearning as innovation in their work contexts. The university has to offer efficient information services and a comprehensive eLearning environment, in which early adopters are able to explore the use of ICT in teaching and learning and to assess the outcomes for themselves. This experimental environment should provide early adopters with advice of eLearning experts, who share their body of knowledge, and suggest ways to apply technological options in routine teaching practice. Direct consultation and training courses might increase the awareness of the early majority for the potential and added value of ICT in teaching and learning.

These structured learning options are still more important for the late majority, who are not only quite critical on the potential of eLearning, but also do not have an advanced level of knowledge on the range of available digital tools and options. Next to a portfolio of ICT courses and efficient information services, strong institutional mission statements and commitment as well as direct incentives to faculty members add to the motivation of the late majority to get on the eLearning train. Finally, the laggards have the lowest level of knowledge on eLearning and are the hardest group to be reached at all by institutional competence development measures.

Zemsky & Massy conclude in their study that universities are still in the first implementation phase of eLearning; they usually make low use of the potential of new technologies for teaching and learning. Much remains to be done to raise the interest of the larger majority of faculty for eLearning, and the reward systems and competence development measures have to be tailored in a more efficient way to the needs and motivational backgrounds of the different adopter types (Zemsky & Massy 2004, pp 7 ff.; pp. 22 ff.; Euler 2006).

A second key study on the topic of faculty engagement in eLearning innovation, which also refers to Rogers adopter model, has been carried out by Hagner in 2001. In the field of eLearning, Hagner asserts that faculties currently find themselves in a kind of 'sandwich position': they feel pressure from both their university administrations and from their students to make more and better use of new technologies in educational practice. This increasing pressure on faculty to change teaching behaviour is illustrated in the model of information-age mindset. This mindset is a new way of technology-savvy cognition, which contemporary students bring into the campus culture and which urges faculty to change their modes of teaching and interaction (Barone, 2003, p.41; Frand, 2000). Hagner has based his survey on previous research undertaken by Brown (Brown 2000), and interviewed thirty academic teachers, who are frequently using eLearning in US universities. In focus of the interviews have been contextual characteristics, which are relevant for the value system of faculty members when they adopt new technologies for teaching and learning - items like resources, incentives and reward mechanisms for the innovative behaviour of the interviewed academic teachers have been collected and discussed.

Hagner's results presents the image of a faculty, who shows varying states in the adoption of new technologies in teaching and learning. Hagner distincts four types of academic staff with respect to the adoption of eLearning innovation, which he refers to as 'entrepreneurs', 'risk-aversives', 'reward-seekers' and 'reluctants'. The group of the entrepreneurs does not need to be externally motivated to get into eLearning. They take part into eLearning mainly driven by their intrinsic motivation and in spite of frequent lack of institutional incentives and resources. But entrepreneurs are only a small fraction within the total population of faculty; they alone cannot push eLearning innovations into a wide dispersion within universities. The groups, which are critical for a successful adoption of educational technologies in a universities, are risk-aversives and reward-seekers. Hagner also refers to these two majority groups as the 'second' and the 'third wave' faculty, who have to be addressed and encouraged with a portfolio of institutional measures to take up eLearning.

The main characteristics, which Hagner has found four each of these four groups, are summarised in the table below:

TABLE: CHARACTERISTICS OF ADOPTERS OF ELEARNING INNOVATION (BASED ON HAGNER 2001)

ADOPTER TYPE	-- MAIN CHARACTERISTICS --
Entrepreneurs	✗ take risks in teaching and learning ✗ committed to quality teaching ✗ competent in educational technologies ✗ not primarily seeking reward ✗ strong interest in innovative teaching ✗ intrinsic motivation ✗ curiosity ✗ adventurous ✗ expect positive feedback ✗ idiosyncratic work style ✗ do not care about portability and scalability of work results
Risk-aversives	✗ committed to quality learning ✗ attracted by technology potential for education ✗ risk aversive ✗ lack technical expertise ✗ no solid knowledge about adoption investment costs ✗ need instructional support ✗ hesitant on self-assessment
Reward-seekers	✗ focus on career advancement ✗ seek institutional rewards ✗ aim to improve job position

ADOPTER TYPE	-- MAIN CHARACTERISTICS --
	✗ rational calculation of efforts and gains
Reluctants	✗ conservative attitudes ✗ unwillingness to change traditional teaching models ✗ do not participate in or even reject eLearning innovation process

Once again, from the distinct levels of eLearning expertise, technological skills and motivational traits of these four adopter groups it becomes clear that, what is needed to get the majority of faculty on board of eLearning innovations is not a single training unit, but rather a portfolio, which combines a set of institutional eCompetence measures. Universities, which favour a 'one size fits all solution' or intend the mere adoption of a 'best practice' from a prominent light-house case as eCompetence training model, seem doomed to fail expectations of their academic staff. To effectively address the needs and motivations of the critical groups of risk-aversives and reward-seekers, Hagner proposes five different measures that could foster faculty engagement. These measures are: training; financial grants and resources; adequate technical support services; the assessment of faculty needs and expectations; and an efficient eLearning communication strategy within the institution. Hagner demands that any strategy for eLearning support structures and eCompetence development should start with an assessment of faculty readiness, asking for both their given level of expertise and for their main concerns and priorities in eLearning (Hagner 2001, pp. 28 ff.; Hagner & Schneebeck 2001).

Kerres et al combine Roger's innovation model and Hagner's studies on faculty engagement in a table, which reflects measures for each type of faculty on basis of the given motivation, the main characteristics of faculty types, and the specific phase of eLearning diffusion in universities.

TABLE: ELEARNING DIFFUSION, FACULTY ADOPTER TYPES, MOTIVATION AND POSSIBLE MEASURES (KERRES ET AL 2004, P. 343)

PHASE	TARGET GROUP	MOTIVATION	MEASURES
Invention	Innovators	Acknowledgement in scientific eLearning community	Establishment of eLearning positions in research and administration; establishment of eLearning centers
Pioneer phase	Early adopters	Acknowledgement beyond disciplinary community/ Recognition within own university	Institutional funding of innovative eLearning projects
Diffusion	Early majority	Added value for own teaching activities	Consultation; Training courses; Marketing; Information portals; Raise awareness

PHASE	TARGET GROUP	MOTIVATION	MEASURES
Integration into practice	Late majority	Extrinsic institutional incentives from university	Agreement on objectives; Institutional incentives; Financial rewards

Kerres et al assume in line with Hagner's argumentation that innovators and early adopters are mainly intrinsically motivated to reflect upon the potential of new technologies for teaching and learning in universities. The institutional measures, which they propose, accordingly support these two adopter groups in their experimental use of ICT by offering them improved contextual integration into university structures and favourable funding options. Kerres et al see the early majority as critical faculty adopter group for a sustainable diffusion of eLearning innovation in universities. They state that the early majority will primarily focus on the added value of eLearning for their teaching and learning activities; and they propose a combination of information, training and consultation services which would be crucial for getting the early majority on board of eLearning. The main institutional challenge of universities is to set up this combination of measures in order to raise awareness in the critical group of early majority, and to enable them to make use of eLearning. As the late majority is mainly extrinsically motivated, institutional measures for this adopter group emphasise reward mechanisms like the introduction of financial incentives and an institutional commitment for eLearning through top-down driven, strategic objectives for the use of ICT (Kerres et al 2004, p. 343 ff).

Kerres et al discuss a combination of institutional measures with reference to Hagner's study on interesting practices and proposals, which aim to engage the faculty group of early adopters for eLearning (Hagner 2001, pp. 28 ff, see above). These courses need to be complemented with additional consultation and support activities to facilitate the integration of ICT into teaching and learning. Financial grants and resources should primarily be invested into the realisation of innovative teaching and learning concepts and pay for the manpower within these projects. A central structure, which strategically defines and coordinates institutional eLearning activities, should combine adequate technical support services with de-central eLearning units within faculties; this assures a just-in-time support. Evaluation is not just seen as crucial for the assessment of faculty needs and expectations, it is also indispensable for a continuous improvement of ongoing eLearning activities within the institution. A wider change management concept for the integration of ICT into the institution needs to efficiently combine an eLearning communication strategy and a portfolio of competence development measures for staff within universities (Kerres et al 2004, pp. 346 ff.).

6.4. Conclusions

We have broadened the research perspective in Chapter 6 from eCompetence profiles and measures towards the status of faculty within the university, and investigated the capability of universities to

cope with current innovation trends in higher education. Main idea behind this extension of the research perspective has been the assumption that new technologies only unleash their potential, if universities accomplish a turn in their eLearning endeavours towards institutional change management strategies. They need to face the complex mix of pedagogical, technological, economic and cultural challenges in the adoption of eLearning innovations with a holistic approach, which takes into account more than just one-dimensional change processes.

The topic of eCompetence development measures for academic staff is not an isolated, one-dimensional change process, but one part of this wider ICT-driven change which currently takes place in universities. This chapter has summarised the main influence factors, which derive from both the status, priorities and commitment of faculties at meso-level of universities, as well as from the organisational structures and human resources development challenges at macro-level of the higher education sector. The macro-level perspective on current innovation processes in higher education and on general university structures has referred to institutional research studies, meanwhile the meso-level perspective on faculty has relied on sociological science system studies and psychological motivation studies for academic staff.

In macro-level perspective, we have seen that a combination of factors have triggered a deep change process in the European higher education sector. The changing higher education environment leads to an increase of both competition between and mutual cooperation among universities; it is pushing universities to re-structure themselves as organisations and to develop clear institutional profiles; and it is forcing universities to justify their teaching and research performance through the documentation and evaluation of measurable results in quality management systems. Even though the feasability of new public management models for universities has been critically questioned in institutional research, many universities have incorporated these models to increase their adaptability to external changes in higher education. These reflections on the wider innovation processes in higher education emphasise the complexity of the context in which eLearning integration, as reaction to technological innovation pressures, and eCompetence development, as one part of a strategic human resources management of universities, are situated. Given those contextual challenges, it is not at all assured that universities - even if they have developed concepts for eCompetence measures, are capable to fully realise these concepts in their institutional innovation.

In meso-level perspective, we have from sociological point of view focused on the status of faculty, which can be located within two tension areas. The first tension area relates to the autonomy of faculties within universities and their traditional form of organisation in academic tribes and territories, which stands against institution-wide objectives in centralised strategies of universities to face current innovation challenges. The second tension area relates to the predominance of research in the science system, which stands against the increasing pressure on universities to set up a quality assurance of their study programs and to improve their output indicators. Both tension areas, in combina-

tion with a severe underfunding of universities, have unfavourable consequences for efforts to push eCompetence development of academic teachers as strategic institutional objective.

The studies with psychological perspective on the eLearning readiness and motivational traits of faculty have shown that we can distinct different groups of adopter types. These faculty adopter types have different motivational attitudes towards adopting eLearning as innovation in their teaching practice; they bring along different levels of eLearning expertise; and they take up technological innovation at a different pace. Given the great variety of interests, competences, and innovation readiness within faculties, it seems unlikely that universities can efficiently rely on 'one size fits all' training solutions for developing eCompetence of academic teachers. Supply-driven training courses, which many traditional staff development centers currently offer, do not seem fit for purpose to serve various competence levels and to address various learning needs of distinct faculty adopter types. The challenges, which universities face at meso-level with the design of appropriate eCompetence development schemes for faculties, are in a similar way not one-, but multi-dimensional, as the macro-level change processes are multi-dimensional and require more complex solutions.

Which conclusions can we draw from the main findings of this chapter for the design of eCompetence development measures in universities? The measures, which are taken, have to be tailored to serve the real learning needs and interests of faculties; and they have to consider specific institutional goals and contexts within different universities. The *format of staff development measures* needs to expand from rather static, supply-driven courses, which are limited in scope, to flexible, demand-driven competence development activities; and the format needs to change from off-the-job training to near-the-job or-on-the job learning. This change of format requires several steps to be taken. The institutional stakeholders involved in the design of eCompetence development programs need to identify levels of expertise in eLearning and learning needs within faculty. The assessment of expertise could for example be done for different eLearning scenarios on the basis of the eCompetence matrix, which has been described in chapter 5.5.

In addition to the different expertise levels, any portfolio of institutional competence development measures needs to take into account motivational backgrounds of faculty adopter types - trying not solely to transmit factual eLearning knowledge, but to actively involve and engage academic staff in the eLearning innovation process. This implies steps like: a shift from formal to more informal competence development measures for academic staff; an approach to combine direct training courses with self-organised and self-directed learning activities of academic teachers in eLearning scenarios; and an effort to complement staff development with additional institutional innovation incentives and support structures.

7. Types of Competence Development Measures for Academic Staff

Content

7. Types of Competence Development Measures for Academic Staff

7.1. Introduction

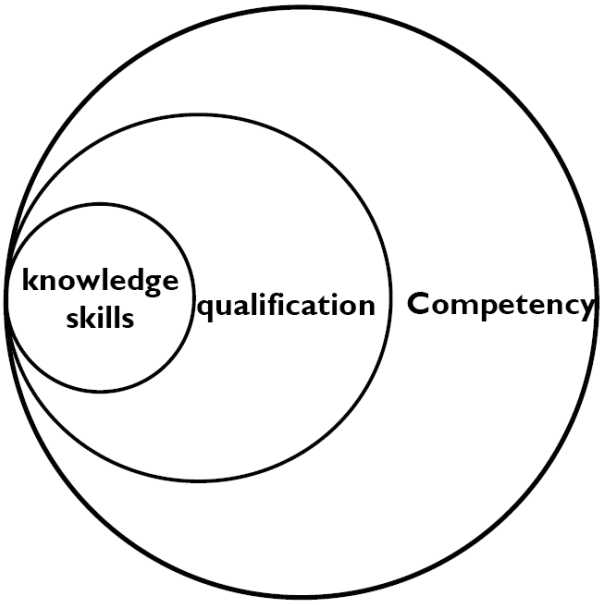
The first part of this chapter debates the distinctions, which are made in current educational and vocational research between *traditional training* courses and *innovative competence development*. What is the main idea behind the new rise of competence development in the educational discourse? And can we really make such a sharp distinction between these two modes of learning? Building on this comparative analysis, the second part of this chapter asks for innovative competence development measures, which complement or go beyond direct and formal training. This analysis investigates trends for competence development of staff in both the higher education (academic staff development) and the corporate (human resources management) sectors. In a final step, a theory-based typology of measures for eCompetence development of faculty in teaching and learning scenarios is discussed. This typology serves as methodical tool for the analysis of the effective practice database in the empirical part of this study.

7.2. Training vs. Competence Development

We have discussed in chapters 2.9 and 6 of this study the assumption in higher education research that traditional training courses in universities are not the most efficient way to develop staff competences. This insufficiency is frequently highlighted by the diagnosis of weak points in traditional training schemes, like their demand-driven curricula design, their limited scope, their lacking economies of scale, and their missing direct links to the work contexts of learners. Three short examples from the current research discussion illustrate the recent *trend towards competence development models*.

Erpenbeck draws a distinction between training and competence development by outlining the differences between the terms 'qualification' and 'competence'. He states that qualifications are one integrative element of competence, but that they do not include the moment of performance - the self-organised dispositions to act in an adequate way. Meanwhile we can talk about a qualification without having to include a competence, we do need to include a qualification when we talk about a competence.

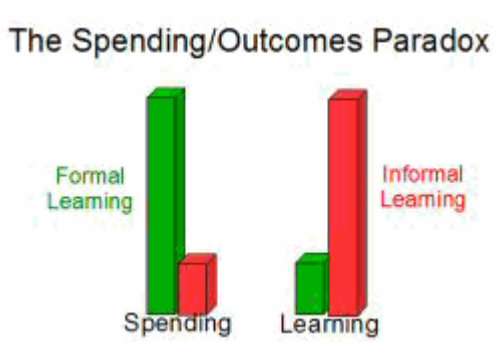
FIGURE: RELATION BETWEEN KNOWLEDGE, SKILLS, QUALIFICATION AND COMPETENCE (BASED ON ERPENBECK 2005)



Qualifications represent descriptive educational learning objectives, which are taught in traditional pedagogical settings like training courses. Acquired qualifications are directly measured through knowledge and skills tests and certified by formal educational institutions. Competences include in contrast to qualifications the dispositional ability to efficiently act in complex situations; they can not be taught in traditional educational settings, but require pedagogical approaches to teaching and learning, which are based on active learning and experience-making of learners. Dispositions for adequate behaviour can also not be directly measured, but need to be interpreted through an analysis of concrete actions, the performance of individuals in authentic and relevant contexts (Erpenbeck 2005; see also chapter 4).

Albrecht observes that the traditional approach to professional training in the corporate sector is mainly based on input-oriented curricula designs. Training is realised in course format, the impact of training is evaluated by self-assessment of learners' satisfaction, and direct links between training and job performance are seldom made (Albrecht 2005). Cross confirms Albrecht's position and amplifies the critical standpoint on traditional training schemes in the corporate sector. Cross develops with reference to the *Pareto principle* the so-called spending-outcomes paradox in corporate learning. The paradox says that, although 80 percent of corporate spending for human resources development goes to formal learning, it adds only 20 percent to the total amount of learning outcomes of employees at their workplaces. On the other side of that ratio, 80 percent of learning in organisations takes place in informal learning contexts, using only 20 percent of the total financial resources for corporate human resources development (Cross 2006, p. 17).

FIGURE: THE SPENDING/ OUTCOMES PARADOX (BASED ON CROSS 2006)



These three short examples are part of a phenomenon, which is discussed in cognitive and pedagogical psychology as the transfer dilemma in organisational training. Saks ascertains that the transfer dilemma in training has recently received increased research attention. Although the concept of transfer is controversially discussed, it indicates in our research context the main problem, which traditional training schemes in staff development face. When we follow a classic definition given by Detterman, we can define transfer as the degree to which a learned or trained behaviour will be repeated in a new situation (Detterman 1993, p. 4). Detterman writes about studies, which analyse the impact of trained behaviour on effective performance in real-life situations: "*Most studies fail to find transfer … and those studies claiming transfer can only be said to have found transfer by the most generous of criteria and would not meet the classical definition of transfer*" (Detterman 1993, p. 15). The transfer dilemma debate in training research thus represents unfavourable assessments of the extent, to which knowledge and skills, which have been taught in traditional corporate trainings, really transfer to the authentic work context of course participants. (Schwartz et al 2005 pp. 2 ff.; Saks 1997, pp. 365-366; Carraher & Schliemann 2002).

Given the above presented studies, one could reasonably ask why organisations should invest into formal trainings, if the outcome ratio is as low as indicated in the spending-outcomes paradox, or as uncertain as discussed in the training transfer dilemma debate. Applied to our research subject, we could ask the question: does it make sense for universities to set up eCompetence development measures for faculty at all? The answer is partly given in the chapter 6, where the conclusion has been that in strategic perspective of organisational change management it is indeed necessary to strategically foster faculty competence in the use of ICT with a portfolio of measures. Both the format of staff development measures has to expand from rather static, supply-driven courses to flexible, demand-driven competence development activities, from off-the-job training to near-the-job or on-the-job learning.

If we follow the somewhat oversimplified but illustrative *dichotomy*, that (traditional) training serves qualification, and (innovative) competence development measures serve the ability to show adequate

behaviour, then we have to investigate the main differences which can be found in these two formats of learning. The previous chapters of this study have discussed this topic. The main conclusion has been that competence development does not occur in lecture-based knowledge transmission, but requires an experience-based pedagogical approach to teaching and learning. One key assumption on the role of learning in chapter 4.6.1. has been that learning stimulates competence development through active experience and initiative of learners in the learning environment. This active and engaging, learner-centered learning environment can be designed with reference to the concept of constructivist learning. The experiential learning theory of Kolb & Kolb is one prominent learning theory, which is using a holistic approach. The theory emphasises that learning is a holistic process of active creation of knowledge; learning needs to engage learners; learning needs to be facilitated; learning needs to combine phases of action and reflection; and learning is heavily based on interaction (Kolb & Kolb 2005, p. 2).

What do academic teacher really need to learn to use ICT in an adequate way? How do they acquire eCompetence most efficiently? Exemplary learning needs for faculty in the use of ICT have been specified in the competence profiles for specific eLearning scenarios, which are illustrated in chapter 5 of this study. But this specification of competence profiles for eLearning scenarios is probably too narrow, too much based on the analysis of micro-level contextual requirements for adequate teaching performance to be transmitted into operationalisable institutional competence development measures. Twigg has summarised in a recent article the following advice for faculty to keep up with technology change:

1. Faculty need to collaborate with each other - they need to share preparation, share material, share resources, and share experience;
2. Faculty need to know which technological trend is sustainable - but there is generally no need to be a technology expert. It will be more advisable to keep up to date with new technology developments by consulting the IT staff in university support centers;
3. Faculty are experts in subject matter, but usually not in learning pedagogy - this is why they need to collaborate with each other and to give assignments away;
4. Faculty need to use technology to empower learners - they need to collaborate to foster a learning-centered mode of education (Twigg et al 2004, pp 52 ff.)

There is a strong emphasis in Twigg's recommendations for faculty development on collaboration, exchange of experience, and networking as activities, which make academic teachers more proficient in eLearning and more able to assess the potential of ICT for their own teaching and learning. Which competence development measures have evolved, or can at least be conceptualised to serve these learning needs of faculty? We discuss this question with reference to recent competence development trends in both academic staff development in the higher education sector, and in human resources management in the corporate sector.

7.3. Trends in Innovative Competence Development Measures

7.3.1. Academic Staff Development - HE Sector

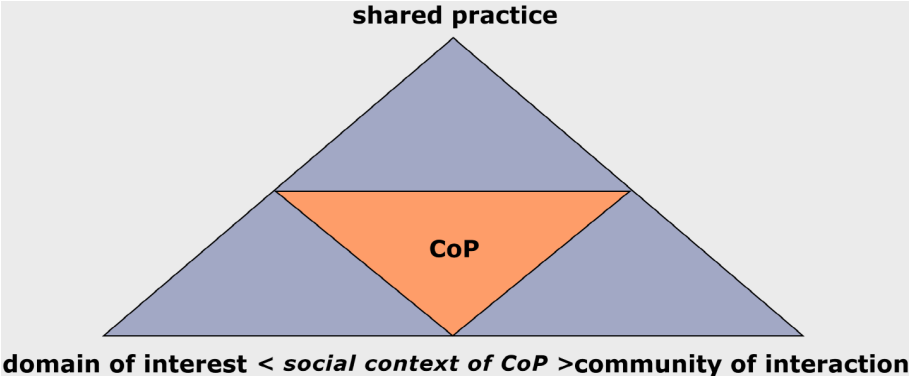
McLabhrainn has conducted a survey on the current international academic staff development landscape and on evolving trends in staff development modes. He found in his survey evidence for a *renewed professionalism* in the area of teaching practice. This new professionalism is documented with reference to reflective writing and teaching portfolios as two staff development methods, which have become popular in universities. Thereby Schön's concept of reflective practice is interpreted as underlying theoretical framework for both methods (Schön 1987). McLabrhainn found teaching portfolios a well established approach in US colleges and universities, where it serves as a means of faculty to present their teaching practice as personal asset within tenure-track competitions and to self-reflect upon their teaching models. This finding is strongly supported by a comparative US survey on faculty roles and rewards, which has been conducted in more than 460 higher education institutions of the Consortium for the Advancement of Private Higher Education. The teaching portfolio is assessed in this study as both an efficient tool for documentation of teaching activities, and at the same time as a measure to stimulate teachers' self-reflection on their teaching styles (Zahorski & Cognard 1999, pp. 29 ff).

McLabhrainn has observed in the British context in addition to the teaching portfolio approach a trend towards the provision of accredited qualification programs for faculty at post-graduate level. Accredited staff qualification programs have evolved as predominant UK and Irish approach to formalise the continuing professional development of faculty. The accreditation of acquired qualifications also gains importance in competitions for open university positions. Nonetheless, McLabhrainn found both the acceptance of teaching portfolios and the accredited qualifications highly dependent from the institutional commitment of universities to consider professional teaching as a strategic asset in the competition for students (McLabhrainn 2005).

A strong focus in recent faculty development has evolved for the concept of communities of practice (CoP) as a means to professionalise higher education teaching. The basic idea of the CoP relates to the creation of knowledge as a social process, which builds on collegiality and a sense of belonging between the members in a community. The concept of the CoP is theoretically grounded in studies on reflective practice (Laudrillard 1979, Schön 1987), in studies on the learning organisation (Senge 1990), and in studies on situated learning and on the foundations for communities of practice (Lave & Wenger 1991; Wenger et al 2002).

According to Wenger, a CoP has three main characteristics, which are the domain of interest, the community, and the practice. The domain of interest, which the community members share with each other, gives the CoP a specific identity. Members of a CoP are usually committed to the domain of interest; they own a shared competence in the domain that distinguishes them from other people. The community evolves through interaction amongst community members, while they pursue the interests in their domain. Community members engage in joint activities and discussions, they help each other, and they share relevant information. In the long term, community members build relationships which enable them to learn from each others' expertise in the domain. The practice represents a set of activities, where community members engage with each other. Community members develop and a share as active practitioners a set of resources like experiences, discussions, tools, and methods (Wenger 2006).

FIGURE: MAIN CHARACTERISTICS OF A COMMUNITY OF PRACTICE (BASED ON WENGER 2006)



Based on this theoretical framework, the application of the CoP concept is vividly discussed as a potential method for faculty development. Examples include Eib & Miller, who propose CoP's as a means to facilitate change in the academic teaching culture. They regard CoP's as appropriate approach to break the isolation of academic teachers, to connect faculty with each other, to create a sense of collegiality, and to collaboratively construct teaching expertise (Eib & Miller 2006). Sherer et al discuss CoP's as a coherent model for facilitating technology-based peer learning of academic teachers through the creation of an online portal for faculty development (Sherer et al 2003).

Seufert presents a comprehensive overview for staff development measures, which can be applied to improve the quality of academic teaching. She sorts the spectrum of possible measures into three categories, which are on-the-job, near-the-job, and off-the-job learning activities. These categories are well established in the domain of human resources development, where they represent the relation of a specific learning activity to the work context of learners. Adding to this categorisation, Seufert relates the faculty adopter types, which Hagner has identified for eLearning innovation processes in

universities (see chapter 6.3.2.), to the measures which best fit the learning needs of each adopter type. The following table summarises Seufert's categorisation of faculty development measures:

TABLE: DIFFERENTIATED ELABORATION OF ACADEMIC STAFF DEVELOPMENT (BASED ON SEUFERT 2004, P. 291)

RELATION LEARNING/ WORK	-- TYPE OF STAFF DEVELOPMENT MEASURE --	FACULTY ADOPTER TYPE
OFF THE JOB *commercial programs*	✗ master study courses ✗ research-based professionalisation ✗ post-graduate courses ✗ continuous professional study course	Reward-seekers *including external target groups, eLearning experts and generalists*
OFF THE JOB *institutional programs*	✗ modularised certificates ✗ classroom-type specific courses: courses for the design of tutorials, self-study courses, face-to-face courses etc.	Reward-seekers *including internal target groups and generalists*
	✗ role-specific courses: eTutoring, media design, content design etc.	Reward-seekers *including internal target groups and eLearning experts*
NEAR THE JOB	✗ coaching and support through facilitators ✗ accompanying support of project work ✗ 'small steps', test environment	Risk-aversives
NEAR THE JOB	✗ support in formative evaluation, feedback and assessment of classroom courses ✗ workshops for exchange of experience ✗ presentation of good practice ✗ information on the added value of eLearning, evaluation reports, lighthouse presentation etc.	Reluctants *constructive reluctants*
ON THE JOB	✗ offer just in time support ✗ create flexible and open learning options ✗ reward and promote engagement	Entrepreneurs

Seufert specifies the types of staff development measures for each of the three learning/ work relation categories. Off-the-job measures include traditional qualification schemes for faculty. These training courses offer specified knowledge in various teaching and learning dimensions. They focus on ICT topics like content design, ICT tools, pedagogy; and they include general knowledge in teaching and learning like presentation and communication skills, assessment methods and so on. A recent

trend is to cluster and certify single training courses into modular study programs or master programs for higher education, which makes them more interesting for the faculty group of reward-seekers (see also McLabhrainn above). Near-the-job measures aim to increase the motivation of risk-aversives and constructive reluctants to become engaged into eLearning with a set of encouraging and informing support steps. They present the added value of the use of ICT in teaching and learning activities. Next to coaching and community-building, Seufert specifies workshops, project support, lighthouse presentations and test opportunities among possible types of measures in the second category. On-the-job measures offer direct support for entrepreneurs, who are already deeply involved into eLearning. They need less additional subject-specific knowledge on eLearning; they need additional resources in terms of time, financial budgets, additional manpower and institutional recognition to drive forward their high level of engagement (Seufert 2004, pp. 290 ff.).

7.3.2. HRM - Corporate Sector

Concepts and models for *human resources management* in the corporate sector are generally more advanced than staff development models in higher education. This is caused by the fact that professional development of faculty in universities is a highly autonomous and institution-independent, self-organised learning process of individual researchers in a specific science domain, meanwhile for-profit companies, which act in competitive markets, necessarily need to strategically think about strategies and tools to update and continuously improve the collective competences of their workforce in their core business fields. Current developments in the human resources management of companies might add some ideas to the way, in which universities establish competence development measures for faculty.

What are current trends for competence development of employees and adult learners in the corporate sector? Erpenbeck has identified seven trends of professional learning in further education and vocational training, which are presented in the following list:

LIST: SEVEN TRENDS OF PROFESSIONAL LEARNING (BASED ON ERPENBECK 2005)

1. From qualification to competence;
2. From further education to competence development;
3. From further education to further learning;
4. From the service model to the self-supply model;
5. From qualification audit to competence evidence;
6. From single competences to basic competences;
7. From the informalisation of formal learning to the formalisation of informal learning.

Erpenbeck sees in the first two trends a rising focus in educational research on those knowledge, skills and attitudes, which have been acquired outside formal learning contexts, like school or university courses. The third trend stands for the increasing relevance and importance of competences in vocational practice, which have been acquired outside vocational training scenarios. Trend number four means that contemporary learners do not rely in first place on educational services any more, but become more and more self-suppliers in the acquisition of knowledge, skills, and attitudes. There is a significant shift from supply-driven learning services to demand-driven autonomous learning contexts. This assumption is in line with the recent evolution of a wide range of social software and web 2.0 community building. Trend number five represents the need to find in both formal educational institutions and in the corporate sector appropriate methods, which assess and certify competences instead of continuing to test qualifications. More holistic assessment methods are required to make competences visible, which individuals bring into or acquire in the organisational contexts of educational institutions or a companies. Trend number six is placing the focus in current competence research on a better understanding of basic competences, which enable individuals to adequately act self-organised in challenging situations. Trend number seven emphasises the importance to find efficient modes of moderation and support of individual learning processes, which take place near-the-job or on-the-job, and which include experience-based learning (Erpenbeck 2005).

Albrecht reports about experiences, which have been made with the application of new trends in corporate training at Volkswagen. The most important overall trend, which Albrecht identifies in the corporate sector, is that nowadays the topic of competence development has been recognised as a core task at leadership management level. A second key trend, which Albrecht reports, is a significant shift from the traditional corporate training framework, where learning and work takes place in separated processes, to a new framework of corporate learning, where learning and work take place in integrated processes. This observation of a significant shift from formal training to informal learning is in line with Cross' statements on the spending-outcomes paradox in corporate human resources development (see above, chapter 7.2).

Albrecht relates his report on experiences made in corporate practice to the concept of human capital management (HCM) in the corporate sector, whose underlying idea is to value the collective competences of employees as the intellectual capital of a company, and to manage this capital in a professional way. Main objective of the HCM concept at operational level is to align the individual competence development of employees with the overall corporate strategy. To fulfil this objective, current HCM approaches try to combine input-oriented (defining curricula from learning contents) and output-oriented (defining curricula from learning outcomes) competence development measures in an effective way (see also North & Reinhard, chapter 4.6).

The concept of HCM consists of three main components, which are models, methods, and systems for competence management in companies. While considerable research progress has been made in

all three components, it is unlikely that a successful combination of these components into an integrative HCM has already been accomplished in corporate practice. When it comes to the delivery of conceptual HCM elements, the key problem in practice is that these holistic approaches are often too complex to be realised in an efficient way - key challenge is to transfer HCM models and methods into operationalisable systems.

Human capital management approaches try to build an integrative system that operates in three activity areas of the company. The first area is the human resources, where HCM approaches aim to foster intellectual capital of the company through the development of individual competences of employees. The second area is the capital investment into human resources development. Aim of HCM approaches in this area is to control and to measure the impact of competence development measures by linking training activities and costs to performance improvement targets in strategic core units of the company. And the third area is the management challenge of competence development. In this area HCM approaches aim to increase leadership awareness of and commitment for human resources development in the company by making it a strategic top management task.

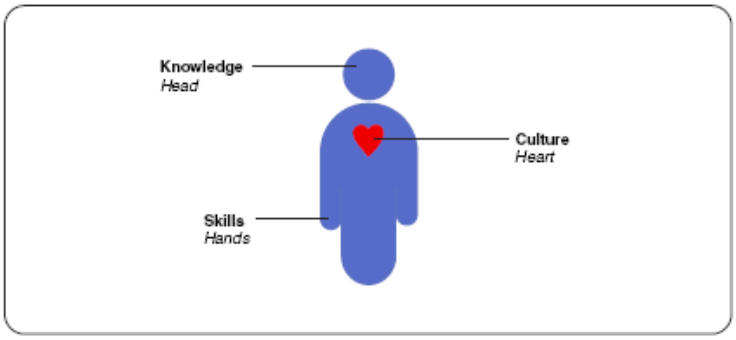
The strategy chosen at Volkswagen is oriented towards the core competences of the company to cope with the challenges, which occur in the implementation of complex HCM approaches in corporate practice. Key element in the HCM strategy is the establishment of an organisational competency matrix, which assesses the actual inventory of employees' individual competence profiles against the requirements of potential future core competencies (see also chapter 5.3. - scenario planning). The operationalisation of learning objectives in the human resources development builds on this comparative analysis of available and required competences within the organisation. The individual competence profiles are clustered into collective competence profiles of groups of employees, who are responsible for specific value chains within the company. The analysis of learning needs within these so-called 'job families' are basis for the design of appropriate competence development measures. These job families can be interpreted by their characteristics as one concrete example of the concept of community of practice in a corporate context (on CoP's see above, chapter 7.3.1). The training costs are controlled by knowledge balance sheets for each employee. These sheets document learning needs and delivered training units for each employee, and they account the total training costs, which have been invested.

Albrecht states a number of topics as relevant for research on the future development of HCM. Amongst these are training methods, which use job roles as basis for competence profiles; organisational models, which allow more flexible, multi-dimensional career paths; systems, which link more efficiently organisational competency management and individual competence profiles; diagnosis tools, which assess learning outcomes rather than control training inputs; and new approaches, which efficiently complement formal qualification with informal learning (Albrecht 2005).

The authors of a recent executive paper of the IBM Learning Solutions unit debate the role of learning as a vital ingredient in organisational change processes of corporations. The authors take the perspective of human resources development as a strategic management component, which guides the competence development of employees in organisational transformation processes of a corporation. One key assumption of the authors is that - despite variations from case to case, any transformation process of corporations can always be sorted into one of three possible categories for organisational change. Whereas an enterprise transformation affects the whole organisation, a process transformation affects mainly specific core business processes within the organisation; and an operational transformation affects solely specific product and infrastructure innovations within the organisation. These three categories build upon each other, adding complexity in the organisational change process from the operational to the enterprise transformation. The three categories also represent transformation contexts, which include specific requirements for employees to adapt to change through learning. And the learning requirements evolve within different levels and areas, depending on the kind of organisational transformation that is taking place.

The IBM authors distinct between cultural change, acquisition of new knowledge, and development of new skills as three areas of learning. Cultural change requires learners to learn new paradigms; the acquisition of new knowledge requires learners to understand new processes; and the development of new skills requires learners to apply new tools and techniques. Subsequently, the authors develop a metaphor of learning as a holistic '*whole-body*' process, which aims to support employees to be able to actively participate in a holistic organisational transformation. The cultural dimension of learning, which affects the heart of the whole-body process, aims to enhance the readiness of learners to embrace cultural changes within the organisation; the knowledge dimension of learning, which affects the head of the whole-body process, aims to add new knowledge to the learners existing expertise in a specific domain; and the skills dimension of learning, which affects the hands of the whole-body process, aims to equip learners with new tools and techniques in a specific workplace.

FIGURE: LEARNING KNOWLEDGE, CULTURE AND SKILLS TO SUPPORT ORGANISATIONAL TRANSFORMATIONS (BASED ON IBM LEARNING SOLUTIONS 2005)



Based on these three learning dimensions in the holistic model, the IBM authors identify a range of appropriate learning methods and tools, which aim to serve learners' needs in the organisational change process. These learning methods and tools are illustrated below:

FIGURE: LEARNING METHODS & MEASURES AND COHERENT TRANSFORMATION CATEGORIES (BASED ON IBM LEARNING SOLUTIONS 2005)

Area of focus	Nature of learning	Common learning methods — traditional and e-learning	Greatest emphasis
Culture (Heart)	• Beliefs • Soft skills • Values	• Executive communications • Small group interaction • Post-training "alumni network" • Appreciative inquiry	Enterprise transformation
Knowledge (Head)	• Processes • Understanding	• Communities of practice • Informal learning/peers • Knowledge management • Simulation	Process transformation
Skills (Hands)	• Procedures • Hard skills • Factual	• Formal instruction • Drill and practice • Experimentation • Performance support	Operational transformation

Learning methods and measures in the skills area mainly serve operational transformations by enhancing work routines and procedures, and hard as well as factual skills. Accordingly, the proposed learning methods are centered around hands-on, experience-based activities for learners. Learning methods and measures in the knowledge area foster primarily process transformations. Here, the proposed learning methods focus on formal and informal knowledge exchange activities between communities of practice in specific domains. Finally, learning methods and measures in the culture area facilitate enterprise transformations. The coherent proposed learning methods emphasise attitude-building activities which foster the change readiness of learners (IBM Learning Solutions 2005).

With regard to its main dimensions, we can trace back the presented IBM model to the competence model developed in chapter 4. If we replace culture with attitudes, the categories for organisational learning in the IBM approach equal the KSA model in the competence debate (see chapter 4.6.2). The attribution of the KSA model is situated in the IBM model at organisational level of a corporation, where it serves as categorical structure for human resources management activities which support transformation processes.

7.4. Types of Measures for eTeaching Competence Development

We have seen in the analysis for staff and human resources development that the trends in both the higher education and the corporate sectors emphasise a shift towards holistic competence development approaches. A range of measures, which add to or go beyond traditional training courses, are discussed and are implemented in organisational practice, whereby the implementation of innovative human resources development measures is more sophisticated and advanced in the corporate sector. We refer in a final step of this chapter the variety of competence development approaches, which we have discussed so far, to a spectrum of measures which influence the competence development of faculty in the use of ICT. Purpose of this step is to introduce a theory-based *typology of measures for eCompetence development* of faculty in teaching and learning scenarios, which can be applied as methodical tool for an analysis of the effective practice database in the empirical part of this study. We rely for this endeavour on a typology of competence development measures, which has been constructed in the SCIL report on eTeaching by Kerres et al, and discuss the main conceptual thoughts and features of this typology (Kerres et al 2005, pp. 46 ff.; Hasanbegovic & Kerres 2006).

The basic assumption of Kerres et al is that an efficient eCompetence development of faculty requires more than a single training or support measure. Kerres et al refer with their assumption to the above discussed trends for competence development in staff development of universities and in human resources management of companies. This general trend from qualification - or the supply-driven creation of training units, to competence - or demand-driven holistic competence development measures, implies that universities need to set up a portfolio of balanced competence development measures, if they want to manage the implementation of eLearning innovations into their core business fields.

Kerres et al describe the portfolio model as a combination of direct training and additional competence development measures, which in their sum increase the impact of organisational investments of universities into its human resources development area. To remain effective, the portfolio of measures needs to be regularly revised in a process of continuous organisational improvement, and the modified learning needs of faculty need to be evalutated. This way, the portfolio of competence development measures can be considered as part of a wider eStrategy of universities. Organisational condition for the implementation of the portfolio model is a close collaboration between the different support units, which traditionally have been established as separate institutes within universities. One strategic solution of universities could also be to merge their decentralised support units - like the media center, the staff development center, the IT department or computer center, and the library, into a centralised, joint support center for the whole institution (Kerres & Voß 2006, pp. 7 ff.; Kerres et al 2005, pp. 46 ff.).

We can relate the wider institutional framework for the portfolio approach, which Kerres et al propose for eCompetence development of faculty in universities, to key concepts of corporate management ideas, like the continuous improvement or '*kaizen*', and the employee empowerment within organisations. When we think about strategic business management approaches in the corporate sector, the balanced scorecard is a concept of strategic organisational management, which might be considered as a theoretical basis for defining eStrategies and competence development measures in universities. The balanced scorecard, which has first been developed by Kaplan & Norton in 1992, is a business management system, which helps organisations to define a corporate strategy and to implement this strategy into practice. The balanced scorecard combines four different strategic perspectives on the organisation, which build on the definition of relevant metrics and on the collection and interpretation of data in each of these four key areas. These strategic areas and related perspectives are the financial perspective, the business process perspective, the learning and growth perspective, and the customer perspective.

Main purpose of the learning and growth perspective in the balanced scorecard is to achieve strategic goals through sustaining the organisational ability to cope with continuous change and improvement. Kaplan & Norton introduce a holistic understanding of learning as basis for the learning and growth perspective of organisations in the balanced scorecard. Learning needs to go beyond direct training and should be facilitated by mentoring and tutoring. Organisations are required to create a culture of learning, which enables an ease of communication between employees when they face concrete problems at their workplace and search advice from their colleagues. This creation of learning communities within an open and supportive culture should be complemented with technological tools and learning environments, starting with an efficient intranet, but integrating additional features for communication and interaction. Transferred to the higher education context, an eCompetence portfolio would be defined as part of the learning and growth perspective of universities, focusing on the organisational need to develop the ability of their human resources according to their ICT-driven changes and business process improvements in research and teaching. (Arveson 1998; Kaplan & Norton 1992).

Kerres et al refer to this tension area, which spans from direct training towards more informal learning, as underlying phenomenon in their typology of competence development measures. Kerres et al emphasise a high importance of informal learning for the design of innovative competence development measures, although they concede that it is problematic to clearly define and separate formal and informal learning (see also chapter 4.6.1. of this study). They suggest in consequence that a pragmatic approach towards informal learning might be more useful to think about types of competence development measures than a fundamental reflection on its precise definition (Kerres et al 2005, pp. 47-48). This suggestion is supported by Cross, who ascertains that the design of learning choices in an organisation should not be based on dichotomies like yes or no, on or off, formal or informal, but rather blend both a continuum of formal and informal learning elements into an integrative approach: "*Formal learning and informal learning are both-and, not either-or... when you assess what will work*

for your organisation, consider how informal learning might supplement what you are doing now rather than replace it" (Cross 2006, p. 16).

FIGURE: A CONTINUUM OF YES AND NO (BASED ON CROSS 2006)

When we agree to this model of learning as a continuum or spectrum, in which both formal and informal learning have important roles to play, we can subsequently derive a spectrum of measures for competence development, which supplements formal learning options with informal learning options rather than replacing one with the other. This way of conceptualisation is applied in the typology of competence development measures that Kerres et al have drafted. They widen the perspective in faculty development from direct knowledge transfer to indirect support and facilitation of informal learning processes. They subsequently underline the potential of indirect measures for an establishment of affirmative learning contexts and cultures for faculty within universities. In this wider perspective, competence development is not any longer considered as an individual learning process, but evolves as an organisational challenge - an approach towards a holistic institutional development, which is much in line with the theory of the learning organisation (Senge 1990).

What is the distinction between direct and indirect measures for competence development of faculty in universities, which is made in the typology of competence development measures? Kerres et al distinct direct, indirect, and a third category of measures, which are 'in-between' the first two; we distinct subsequently these categories by specifying their main feature, their focus, and their main structural elements.

The main feature of direct measures is that they focus on the competence development of individual learners. Accordingly, direct measures include traditional, formal types of competence development. These types of measures are defined as direct learning activities, whose main objective is to transmit knowledge in a specific domain. Learning content is made explicit, and learning results can be tested and certified. The most usual type of direct measure is a training course for a specific learning topic.

The main feature of indirect measures is that they focus on organisational preconditions for learning. Organisational preconditions are norms and structures, which influence the behaviour of persons; they also affect their learning readiness and preferences. When organisations establish institutional incentives for specific strategic priorities in terms of financial grants, awards or career rewards,

they indirectly influence the behaviour of persons and their learning priorities and processes. Kerres et al acknowledge that the transfer of conceptual approaches for indirect measures into organisational practice is a complex management challenge. But indirect measures affect the motivational level of learners to engage themselves for strategically important organisational topics. In particular motivational incentives promise to have a considerable impact on the learning priorities and change readiness of faculty in universities (see chapter 6.3.2 motivational factors).

In addition to direct and indirect, 'in-between' (mittelbar) measures are the third category within the typology. This category combines elements or rather constitutes an intersection of direct and indirect measures. The main feature of these in-between measures is the aim to create a conditional framework which stimulates learning activities of faculty members in universities. The focus of in-between measures is on the establishment of learning contexts, in which faculty interact and communicate with each other on specific organisational topics which have been identified as strategically important. The learners, who interact in these engaging contexts, do not necessarily even have to be aware that they are actually learning within the interaction process. A representing type of in-between measure is the community of practice (Kerres et al 2005, pp. 49-50).

The following figure illustrates this categorisation of direct, in-between, and indirect measures, and their relation to the areas of individual and organisational competence development. The figure includes the different levels of communication and interaction in the range of competence development measures. The micro-level relies on 1:1 learning activities, which occur in individual coaching sessions. The levels increase in size and impact to the macro-level with 1:N learning activities, which address the whole population within an organisation as greatest possible target group.

FIGURE: RELATION OF DIRECT, IN-BETWEEN AND INDIRECT MEASURES TO INDIVIDUAL AND ORGANISATIONAL COMPETENCE DEVELOPMENT (BASED ON KERRES ET AL 2005, P. 50)

Kerres et al distinct on basis of this categorisation eight different types of competence development measures, which they identify as relevant within the discussion about human resources management as strategic factor for the competitiveness of universities. The systemic analysis of these eight different types of measures refers to topics within competence research; these are: the dispositional competence components, which are influenced by learning processes (see the competence grid, as it has been presented and discussed in chapter 5.5); the categorisation of direct, indirect, and in-between measures; the different levels of communication and interaction in these measures; and the relation of specific learning activities to the work contexts of learners by the on-, near-, and off-the-job categories. These topics within the competence research debate have been presented and discussed at several points of this study (Kerres et al 2005, p. 51).

The following table presents the eight types of measures, which Kerres et al have specified, as well as their objective, main characteristics and concrete activities for each type in organisational practice:

TABLE: TYPES OF DIRECT MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT (BASED ON KERRES ET AL 2005, PP. 51-52)

DIRECT MEASURES	OBJECTIVE	CHARACTERISTICS	CONCRETE ACTIVITIES
Provide information	Presentation and transfer of factual knowledge to enhance individual action competence.	Includes all measures that communicate relevant information on eLearning within whole organisation.	Dissemination of information via web portal, newsletter, guidelines, manuals, flyer, FAQ, blogs etc.
Foster positive attitudes	Raise awareness on eLearning innovation and create change readiness in faculty.	Includes all measures that affect the attitudinal level of faculty through motivational factors.	Design of internal eLearning communication strategy, which includes tailored messages on added value of eLearning - like events, lotteries, presentation of good practices etc.
Organise educational supplies	Acquisition or enhancement of eLearning specific competences for faculty members.	Intensive off the job trainings and learning activities which are tailored to the transfer of knowledge in specific eLearning areas.	Training courses and workshops on eLearning platforms, CSCL, CMS, WIKIS, blogs, office and learning software skills etc.
Offer consulting support	Direct support and coaching for	On or near the job support which directly	Consulting in blended curricula design, support in implementation

DIRECT MEASURES	OBJECTIVE	CHARACTERISTICS	CONCRETE ACTIVITIES
	academic teachers in design and implementation of eLearning scenarios to enhance their eCompetence.	relates to teaching and learning activities of faculty.	of blended or eLearning scenarios in study courses.

TABLE: TYPES OF INDIRECT MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT (BASED ON KERRES ET AL 2005, PP. 51-52)

INDIRECT MEASURES	OBJECTIVE	CHARACTERISTICS	CONCRETE ACTIVITIES
Increase action readiness	Increase active engagement of faculty in eLearning - related work processes of university.	Establishment of motivational incentives in wider organisational context to attract faculty to engage in eLearning.	Call for proposals and funding schemes for eLearning projects, eLearning awards, institutional career opportunities for eLearning entrepreneurs etc.
Establish learner-activating quality development	Interlink competence development and measures for quality management through active participation of faculty in quality assurance (see kaizen).	Transform format of quality management in curricula and study courses from centralised to integrative system, which involves faculty.	Active participation and reflection of faculty peer groups on quality assurance processes like accreditation and certification systems.
Foster dialogue and collaboration	Exchange of experience in faculty peer groups to raise awareness and add eLearning - related knowledge	Includes all measures that enable communities of faculty members to communicate and exchange ideas and practices in eLearning.	Knowledge cafés, informal meetings and networks between faculty peers, all group settings that build mainly on the community of practice model.

INDIRECT MEASURES	OBJECTIVE	CHARACTERISTICS	CONCRETE ACTIVITIES
Make innovation mandatory	Create active process-ownership of faculty in eLearning projects and processes within university.	Transfer of responsibilities in implementation of innovations to faculty through inclusion in eLearning strategy decisions and teams.	Commitment of university management to foster eLearning is complemented with participative transfer of decisions into daily work practice of faculty. Active engagement of faculty as integrative element in strategy decisions of organisation.

Kerres et al acknowledge that concrete measures, which we analyse in practice, usually combine different types of measures, which have been specified in this typology. Nonetheless, the typology is useful for a systematic analysis of eLearning-related competence development measures for faculty, which are implemented within universities.

We apply the typology in the empirical part of this study as a tool for the analysis of the effective practices, which have been collected in the eCompetence project. Main objective of the data analysis is to detail and categorise on basis of the given typology the key patterns and processes within each empirical measure.

7.5. Conclusion

This chapter has started with a discussion of one key assumption in this study, which implies that current staff development needs to go beyond traditional training to efficiently develop eCompetence in faculties. We have substantiated this assumption with reference to a dichotomy between training and competence development, and considered the main implications for both terms to understand the current emphasis (or revived trend) on competence in educational research and practice. Next, we have referred to Erpenbeck's model, in which competence includes qualification, and where competence development and assessment is tied to actions in complex situations. We have discussed Albrecht's standpoint on training inadequacies in corporate practice, and introduced Cross' spending-outcomes paradox, which highlights the inefficiency of formal learning when it is compared to the efficiency of informal learning - even though this position is questionable and needs further empirical evidence for a clearer picture. The inefficiency of formal training is, however, supported by current research on the phenomenon of the training transfer dilemma, whose findings show an insufficient impact of formal training on the effective performance of learners in work contexts.

In the next section of this chapter, we have summarised trends in innovative competence development, which are discussed in faculty development as well as in human resources development models. For the university context, we have found teaching portfolios, accreditation schemes for programs, and the establishment of communities of practice as prominent trends in faculty development. This discussion of trends in the higher education sector has concluded with a summative analysis of different types of competence development for faculty. We have complemented the faculty development analysis with a view on measures in the corporate sector. Main motivation behind this step has been the assumption that human resources management models in the corporate sector contain more sophisticated measures than staff development measures in higher education. This disparity is caused by the more competitive markets and the vital importance of humans resources as asset of companies in knowledge-based economies. We have started this analysis with a presentation of general trends in professional learning, and have subsequently explored two concrete experiences for human resources management made at Volkswagen and at IBM.

The experiences reported at Volkswagen emphasise the increasing importance of informal learning and construct adequate competence development measures around this finding. Items within the holistic approach to human capital management include: an inventory of collective competences; the establishment of communities of practice; and the use of individual competence profiles and knowledge balance sheets for corporate learners. The IBM experiences in competence development are illustrated in organisational perspective, which combines three different levels of corporate transformation in innovation processes. These levels serve as basis for the definition of learning areas. With reference to the KSA model, a holistic whole-body process of organisational transformation has been constructed, which specifies appropriate competence development measures for each learning area. These measures include again supplemental items to direct training, like communities of practice, and wider motivational incentives for learners to invest time and energy into organisational goals.

Finally, we have introduced a typology of measures, which Kerres et al have constructed in a report on eTeaching development in universities. The main assumptions for this portfolio approach have been presented and a reference to the balanced scorecard model has been made, as this model relates to a number of assumptions in the portfolio approach. Next, we have referred to the continuum of direct and indirect measures, which a balanced portfolio needs to include, and discussed characteristics the three main categories formal, non-formal, and 'in-between' measures. Finally, the eight different types of measures in the typology of Kerres et al have been detailed and selected as analysis tool for the empirical part of this study.

We can assess the *current trend towards a holistic concept of competence and models for competence development* as indicator to understand the art of fostering learning less in the category of one-dimensional training courses, and more as essential part of complex organisational challenges. Individual learning can be interpreted in this perspective as one strategic element in the wider organisa-

tional capacity of corporations to cope with continuous change and innovation processes. Continuous external change and innovation processes provide the background for the concept of the learning organisation, in which the increasing importance of individual learning is highlighted with reference to management models for human resources development, like the portfolio approach or the balanced scorecard. These innovative models, which are adapted from business sciences, stand for a new professionalism, which has evolved for the management of learning activities in organisations.

It remains to be seen if the promises, which accompany these trends to holistic competence management approaches, deliver in institutional or corporate practice. The danger, that these sophisticated approaches fail in corporate practice, seems to be higher in universities, as the tradition of organisational competence development is less incorporated into the higher education sector. Then again, the culture of learning is so tightly connected to universities that innovative faculty development approaches might deliver surprisingly good returns on investment in organisational performance. For the time being, we can conclude that there is a growing awareness in university management that a strategic planning of competence development of faculty is an important issue. The theory discourse offers a range of concepts for developing eCompetence of academic teachers; but they need to find a sufficient degree of change readiness and eLearning commitment within university leadership to be put into practice.

8. Analysis and Interpretation of eCompetence Practices

Content

8. Analysis and Interpretation of Empirical Evidence

8.1. Introduction

The *empirical evidence* has been collected in the project context of the eCompetence Initiative. The project consortium has brought together eLearning experts from 23 European and International higher education and research institutions, who have submitted data on eCompetence activities in their local contexts.

TABLE: WORKPLACE OF INFORMANTS

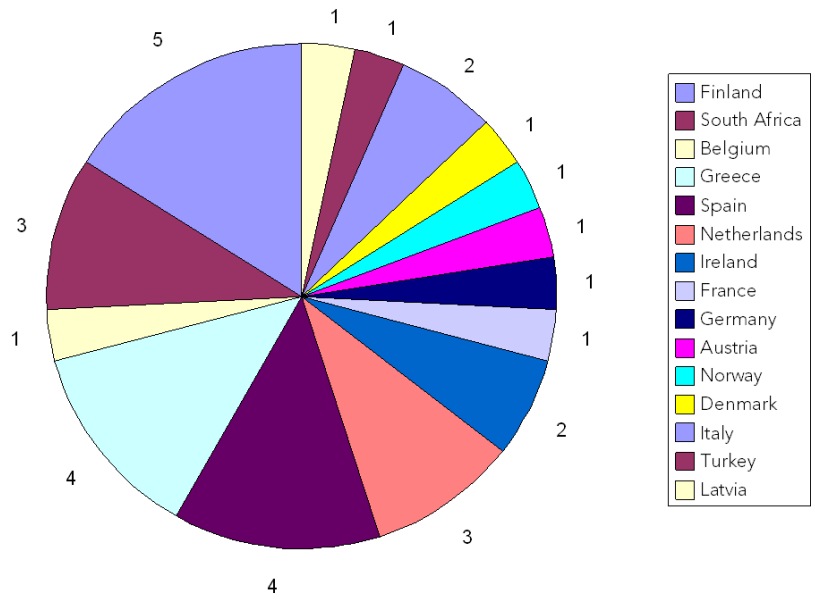
WORKPLACE OF INFORMANT	-- INSTITUTION --
FACULTY	✗ Aalborg University, Department for Education and Learning ✗ Universitat Autònoma de Barcelona, Departmamento de Pedagogia Aplicada ✗ University of Joensuu, Department of Computer Science ✗ University of Athens, Department of Informatics and Telecommunications ✗ Universitetet i Oslo, Nettpedagogen Det teologiske fakultet ✗ Universidad Nacional de Educación a Distancia, DIEEC - Departamento de Métodos de Investigación y Diagnóstico en Educación ✗ Univeristy of Twente, Faculty of Behavioral Sciences and Communication Studies ✗ University of Rome La Sapienza, European Ph.D on S.R. & C. Research Centre and Multimedia Lab ✗ Isik University, Informatics Research and Development Center ✗ Riga Technical University Distance, Education Study Centre
RESEARCH UNIT	✗ University of Helsinki, Lifelong Learning Institute Dipoli ✗ University of Pretoria, Department of Telematic Learning and Education Innovation ✗ Open University of the Netherlands, OTEC - Educational Technology Expertise Centre ✗ University of St. Gallen

WORKPLACE OF INFORMANT	-- INSTITUTION --
	✗ Universität Klagenfurt, IFF - Faculty of Interdisciplinary Research and Advanced Education ✗ Bologna Research Institute Scienter ✗ Altran Research and Development Unit
eLEARNING SUPPORT UNIT	✗ National University of Ireland, CELT - Centre for Excellence in Learning & Teaching ✗ University of Leuven, AVNet center - Audiovisual and New Educational Technologies in a Network ✗ University of Technology of Compiègne, LIP - Laboratory of Pedagogical Engineering
STAFF DEVELOPMENT UNIT	✗ University of Dortmund, Center for Research on Higher Education and Faculty Development
IT SUPPORT UNIT	✗ University of Athens
MEDIA CENTER	✗ University of Tor Vergata, MIFAV e ISIM Lab

The table shows that the experts, who have participated and submitted data to the project, work in a range of different university units and contribute a wide spectrum of expertise. The biggest group are faculty members, who cover a range of disciplines like educational science, computer science, behavioural sciences, psychology, and business science. The second group consists of eLearning experts in research-oriented university units. These experts mostly have pedagogical, psychological, social and business sciences as scientific background. The next group represents members of eLearning or staff development support units, who share a strong expertise in new and emerging ICT, combined with knowledge in media pedagogy.

Main sources of evidence for this study are: the submitted eCompetence practices; four case study interviews; research and strategy papers; reports; project presentations; and websites. The research design chapter gives a detailed description of these sources of evidence (see chapter 3.9). A total of 31 descriptions have been submitted to the eCompetence practice database. The *regional distribution* of the informants of the practices is shown in the following chart:

CHART: REGIONAL DISTRIBUTION OF INFORMANTS



Before we start the analysis of the eCompetence practices, we need to clarify the *definition and role of practice* in competence development. A number of references have been made to the theory discourse on the role of practice in competence development in chapter 4 of the conceptual part of this study A basic assumption is that competence development is fostered through practice. Angehrn et al state that training and practice are combined means for individuals to gradually adapt to their new roles and work contexts in organisational innovation (Angehrn et al 2005). Mandl & Krause describe long-term practice and proficiency as necessary requirements to attain expert competence (Mandl & Krause 2001). Proctor & Dutta understand long-term deliberate practice as basis to achieve the level of a subject expert in a particular domain (1995). Erpenbeck & Heyse assert a continuous process of learning and practice as foundation for the development of action competence (Erpenbeck & Heyse 1999).

McCluskey defines a practice as an organised way in which individuals or groups carry out a particular pattern of activities. Main characteristic of a practice is that the activities have been carried out several times in a similar way, and that they are likely to evolve in more or less the same way in the future. A practice depends on a specific context and relies on tacit knowledge, which has been acquired in experiences made by individuals or groups. If a practice is too formalised, it will lose its potential to create new experiences for the involved group members and to have an innovative impact on the organisation. If a practice is not formalised enough, it remains a unique experience; it is not transferable and cannot be shared with other groups or organisations. (McCluskey 2006).

Practice plays an important role in the development of competences. The term '*effective practice*' has been used in the eCompetence web survey. We have defined an effective practice in the introducing section of the web questionnaire as a pattern of activities which has been performed in reality. We understand accordingly the term effective eCompetence practice as a set of measures or activities, which corresponds to the development of ICT - related competences of academic staff members. An effective practice implies that the activities undertaken have a positive impact on the involved practitioners and their organisations; it serves to transfer specific knowledge, which the practitioners need in a particular domain, and to increase their work performance when they apply the shared knowledge; and it combines formal regulations, which arrange the context of action and frame the exchange of informal, tacit knowledge amongst practitioners.

8.2. Interpretative Framework for eCompetence Practices

The methodology for the *design of the interpretative framework* for the eCompetence practices has been laid down in chapter 3.9 - research data, methods and work steps. Main idea for the design of the interpretative framework is to combine, to merge the typology of competence development measures, which has been deduced from the theory discourse analysis, and the structure of the eCompetence practices database. The typology of measures is applied in this empirical part as main instrument for an analysis and interpretation of the collected eCompetence practices within universities. Nonetheless, none of these eight ideal types of measures will appear in reality as a single-standing, exclusive activity - empirical eCompetence development practices usually contain a mix of distinct types of measures (Kerres & Voss 2006, pp. 6-7). A brief version of the types of measures for eTeaching competence development summarises the detailed specification, which has been made in chapter 7.4.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ provide information	✗ increase action readiness
✗ foster positive attitudes	✗ establish learner-activating quality development
✗ organise educational supplies	✗ foster dialogue and collaboration
✗ offer consulting support	✗ make innovation mandatory

The structure of the web survey is applied to categorise the empirical evidence in each eCompetence practice. The other sources of evidence, like case study interviews, reports, papers, presentation and so forth are screened for relevant information, which is added to the categorisation of each practice. The structure of the eCompetence practice questionnaire is shown in the table below.

TABLE: STRUCTURE OF ECOMPETENCE PRACTICE WEB SURVEY

FIELD	DESCRIPTION
Background/ Challenge	Asks for a description of the wider context and conditions in which the specific practice is embedded, and for the challenge which led to the design and implementation of the practice.
Practice/Solution	Describes aims, target groups, and the main patterns and processes within the practice.
Benefits	Presents success factors and main strengths of the practice.
Shortcomings	Presents critical points and main weaknesses of the practice.
Future Plans	Inquires on modification patterns - like a re-focus or extension of the practice, and gives some clues on its sustainability.
Other References/ URL	These two fields detail the complementary sources of evidence - like a theoretical reflection of the applied practice in research papers, or a documentation of the practice in internal strategy papers and handbooks. Links to the web presentation of the practice give additional hints on its relevance and importance within the institution.
Costs	Gives an assessment made by the informant on the funding scope for the practice. The numbers given in the costs field are problematic, because internal cost controlling of the practices in the budgetary systems of universities is usually not made. This means that cost calculation is estimated by informants themselves, if indicated at all.
Replicability/ Effectiveness	These two fields present a subjective assessment of the informants on the transferability and the scale of impact of the practice on the eCompetence development of faculty.
Notes	The information in the field, if given at all, mostly adds information on the practice which does not fit into any of the other fields.
Contact	The final field of the web survey indicates the contact address of informants and their workplaces.

Both structures - the typology of measures and the database fields, serve for the design of a comprehensive set of tables, by which the key patterns and processes of each eCompetence practice are systematically analysed, categorised and interpreted. The interpretative framework for the eCompetence practices contains eleven tables. Each table has a specific analytic objective, which is specified below.

TABLE: LEVEL AND CONTEXT OF ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The first table intends to categorise the practice as a whole, as a phenomenon which is embedded into and part of a wider societal or institutional reality (Yin 2003, p. 13). The categorisation of each practice is made on basis of an investigation of the level of context, in which the practice is situated.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The second table formulates a set of five criteria, which have to be met in order to assess the relevance of each collected practice for the subject of investigation of this study, and to include it in the further analytic process. In some cases, one or more of the above set criteria are not met; those practices will not be further analysed, as they do not relate to the eCompetence development of faculty in higher education.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ Provide information	✗ Increase action readiness
✗ Foster positive attitudes	✗ Establish learner-activating quality development
✗ Organise educational supplies	✗ Foster dialogue and collaboration
✗ Offer consulting support	✗ Make innovation mandatory

The third table identifies the types of competence development measures, which each analysed practice contains. Only the relevant types of measures will be displayed in this overview table.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE

The fourth table specifies and substantiates the first identification of types of measures, which is shown in the previous table. The table displays a detailed analysis of the key patterns and processes, which can be identified in each practice. The identified patterns are categorised in the first row within the types of competence development measures.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)

Table number five refers to the main benefits, which are reported in each practice. The second row relates these key patterns in the benefits to the most adequate type of competence development measure.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)

Table number six shows the key patterns in the shortcomings of each practice and their fit in the types of competence development measures.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Continuation of Practice	
Extension of Practice	
Modification of Practice	
Termination of Practice	

Table number seven details the future plans of the practice. Only the relevant category will be displayed in each single practice analysis. Basically, a practice can be either continued, extended, modified, or terminated. The future plans evidence of each practice contains valuable information on its degree of sustainability.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Table number eight specifies on basis of the collected evidence if the practice can be categorised as a long-term, medium-term or short-term phenomenon. The category short-term represents a practice life-time of 1 year or less, medium-term a practice life-time from 1 to 3 years, and long-term a practice life-time of 3 years and above.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	
Strategy paper	
Report	
Project Presentation	
Website	
Case Study Interview	

The additional sources of evidence for each practice are specified and described in table eight, which delivers a documentation of the sources taken into account for this study.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The absolute cost numbers - if they have been reported, are problematic (see structure of web survey above). What is taken from most practice descriptions is the main source of funding. This table indicates, if the practice within a university is covered by its institutional budget - internal cost application, or if it is funded by a regional or national project grant - external cost application. If a practice is internally funded, some conclusions can be drawn from the cost model for its relevance within a university.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	
Effectiveness	

Both replicability and effectiveness of the practice are assessed in a scale, which ranges from values 1 to 5. Value 1 means that the practice is considered to be not at all effective for eCompetence development of faculty or replicable in similar contexts, value 5 means that it is considered to be highly replicable/ effective.

8.3. Analysis and Categorisation of eCompetence Practices

From the *31 eCompetence practices*, which have been submitted in total to the database, 17 practices have been analysed in the interpretative framework of this study. A number of database entries describe several aspects of the same phenomenon and have been subsumed into one practice. Based on the selection criteria for the further analysis of a practice (see table above), 5 database entries have been assigned as not relevant for the subject of investigation of this study. The first table below gives an overview on the 17 practices, which are analysed in-depth.

TABLE: INDEX OF ECOMPETENCE PRACTICES

NR	TITLE OF PRACTICE	WORKPLACE OF INFORMANT
1	TIEVIE - A National Staff Training Programme for ICT Skills in Finland	University of Helsinki, Lifelong Learning Institute Dipoli
2	eCompetence in Katholieke Universiteit Leuven (KU Leuven)	University of Leuven, AVNet - Audio-Visual Services Net
3	eLearning Training for Academic Staff at University of Pretoria (UoP)	University of Pretoria, Department of Telematic Learning and Education Innovation
4	E-Class: Implementing a National Learning Platform at the University of Athens (UoA)	University of Athens, Department of Informatics and Telecommunications
5	Mouse-based tutoring at Open University Netherlands (OUNL)	Open University of the Netherlands, OTEC - Educational Technology Expertise Centre
6	Competence Profiles: An instrument for eCompetence Management	Open University of the Netherlands, OTEC - Educational Technology Expertise Centre
7	Innovatic: Integration of ICT tools in Teaching at Universitat Autònoma de Barcelona (UAB)	Universitat Autònoma de Barcelona, Departmamento de Pedagogia Aplicada
8	BREVIA - Library of Virtual Resources for Self-Study at UAB	Universitat Autònoma de Barcelona, IDES - Unitat d' Innovació Docent en Educació

NR	TITLE OF PRACTICE	WORKPLACE OF INFORMANT
		Superior
9	E-Moderating: The Key to Effective Online Learning at National University of Ireland (NUI)	National University of Ireland, CELT - Centre for Excellence in Learning & Teaching
10	Training the Trainers - Government Funding Scheme in Ireland	National University of Ireland, CELT - Centre for Excellence in Learning & Teaching
11	Portal for Online Pedagogy at Universitetet i Oslo (UiO)	Universitetet i Oslo, Nettpedagogen Det teologiske fakultet
12	Day of New Media at Universität Graz	Universität Klagenfurt, IFF - Faculty of Interdisciplinary Research and Advanced Education
13	eCompetence Initiative Universität Dortmund: A Qualification Network for Academic Staff	Universität Dortmund, Center for Research on Higher Education and Faculty Development
14	Strategy tool-box at Aalborg Universitet	Aalborg University, Department for Education and Learning
15	Ped-Care/ Applying CRM Techniques in eLearning Solutions	Universidad Nacional de Educación a Distancia, DIEEC - Departamento de Métodos de Investigación y Diagnóstico en Educación; Altran Research and Development Unit
16	XML transposition for course material at Université de Technologie de Compiègne (UTC)	University of Technology of Compiègne, LIP - Laboratory of Pedagogical Engineering
17	eTeaching Roles and Responsibilites in VISCOS	University of Joensuu, Department of Computer Science

The 5 practices, which have not met the criteria of relevance for this study, are shown in the table below. The selection process is detailed for each practice, which has been sorted out.

TABLE: PRACTICES WITHOUT FURTHER RELEVANCE FOR STUDY

NR	TITLE OF PRACTICE	WORKPLACE OF INFORMANT
18	E-learning environment, Master and short courses	University of Tor Vergata, MIFAV e ISIM Lab
19	Rinc: Knowledge network in networked communica-	Univeristy of Twente, Faculty of Behav-

NR	TITLE OF PRACTICE	WORKPLACE OF INFORMANT
	tion	ioral Sciences and Communication Studies
20	Course ONLINE: Integrated Course Homepages Management	Isik University, Informatics Research and Development Center
21	European PhD on Social Representations and Communication	University of Rome La Sapienza, European Ph.D on S.R. & C. Research Centre and Multimedia Lab
22	E-learning for Regional Development in the Latvian Transfer to Knowledge Society	Riga Technical University Distance, Education Study Centre

8.3.1. TIEVIE - A National Staff Training Programme for ICT Skills in Finland

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

Due to the rapid development of web and communication technologies in the 1990ies, and to new demands from students, the *National Education Advisory Board of Finland* has formulated a national strategy for education, training and research in the information society. One crucial component of this national education innovation strategy is the objective of the *Ministry of Education* to improve the skills and understanding of academic staff for the use of ICT in Finnish universities. ICT are understood in this policy strategy as an essential part of an innovative higher education system, which embeds new technologies into its core work processes teaching, research, and administration of study programs and students services.

The staff development goals have been defined as one special policy focus, and they have been included for funding in a nation-wide grant for the cooperation of higher education institutions in the area of ICT. The Ministry of Education has set the quantitative target that by 2007 at least 75% of academic teachers in all Finnish universities have acquired adequate knowledge and skills to use ICT in teaching (Ministry of Education 2004 policy statement, see below). Due to its scope, the subsequently created training programme TieVie is classified as a national approach at macro-level of the Finnish higher education sector.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The Ministry of Education has started funding for the *Finnish Virtual University* (FVU) in 2000. FVU is a national network organisation to promote collaboration, exchange and experience on eLearning in all Finnish universities. One of FVU's projects is named TieVie - the Finnish acronym for *Tieto ja viestintäteknikkan opestukäyttö*, which means literally translated the use of information and communication technology in teaching and learning. TieVie is a nation-wide faculty training programme for the use of ICT in teaching and learning, which has started with a considerable initial funding grant from the government. This centralised programme funding has been gradually decreased in the last years and reallocated to the budget of each single Finnish university.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ establish learner-activating quality development ✗ foster dialogue and collaboration ✗ make innovation mandatory

The TieVie programme is an extensive faculty development approach, which contains elements of several types of measures. As a training programme for faculty in all Finnish universities, TieVie is a nation-wide organisation of educational supplies. Local TieVie experts offer in the role of mentors and tutors direct support to academic teachers in each university. The problem-based learning model of TieVie starts with concrete challenges that academic teachers face in their teaching activities, it develops solutions which can be integrated in these teaching activities; and it includes self-reflection, which is part of the ePortfolio assignment. These activities are classified within the types of establishment of learner-activating quality development and making innovation mandatory. TieVie also fits through its organisation as a network, which heavily relies on exchange of experience and peer assessment, into the type of fostering dialogue and collaboration.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Organise educational supplies	TieVie as a national network for ICT-related faculty training	TieVie is a staff training programme, which is formally a support service project in the framework of the FVU. The concept and organisation of TieVie is mainly developed and provided by five universities, which form the planning group of the network. The *Helsinki University of Technology* (HUT), which has submitted the effective practice, is a member of the TieVie planning group and it is also responsible for one module in the programme. All 21 Finnish higher education institutions participate in the networked faculty training programme of TieVie.
Organise educational supplies	Efficient use of ICT in teaching and learning as main objective	Main objective of the TieVie programme is to help university teachers to apply ICT in their own teaching activities and contexts in a pedagogically sound manner. TieVie aims to increase the readiness of faculty members to use ICT in teaching and learning in a more efficient way.
Organise educational supplies, foster dialogue and collaboration	Cross-disciplinary and inter-institutional scope of TieVie	The TieVie training groups include staff members from every Finnish university. The programme is taking place at national level and brings together participants from all science disciplines. Between 2001 and 2006, more than 1000 staff members have passed TieVie courses. There are no strict criteria for applying to the programme.
Offer consulting support, foster dialogue and collaboration	Collaborative, project-based learning model as basis for TieVie course modules	The organisation of courses is realised partly in national workshops, which are called mega conferences, partly in local group meetings of participants at each university, and partly in virtual study modules. The TieVie courses include a high level of interaction and collaboration, as well as both individual and group work of participants. The learning methods used build on the real problems teachers face in their work contexts and emphasise interactive and collaborative sessions in the courses. TieVie is applying a project-based approach to the learning processes of participants. Teachers are encouraged to set up and continuously develop electronic

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		teaching portfolios, in which they document the assignments they have been given. They work on their assignment usually between two local TieVie meetings or national conferences.
Organise educational supplies, offer consulting support	Two basic TieVie programmes for different faculty learning needs	In the initial phase of TieVie two different programmes have been offered to faculties. The *TieVie teacher training programme* provides a training package of 5 ECTS - European Credit Transfer and Accumulation System, whereby one credit requires 30 work hours by the student. Participants work on a personal eLearning production project. The *TieVie Expert Training Programme*, which until 2005 consisted of 10 ECTS and has now been extended to 15 ECTS, is designed for faculty members who are willing to act as trainer/mentor for other teachers, or as specialist in a more administrative function of their home university (see also Ruotsalainen et al 2005). In the TieVie Expert Training (10 credits), one should be in position to be able to act as tutor, mentor or developer in his or her working community and organisation.
Organise educational supplies, offer consulting support	Move towards expertise level of eCompetence in TieVie programme	In the current TieVie training the focus has shifted to the expert module. The initial training has been discontinued in 2006, mainly on the assumption that more and more faculty members have passed the beginners stage in ICT competence and directly head for the expert level. The graduate shift in emphasis of TieVie from a national network service to the creation of local expert nodes in each university implies that more and more local trainers and experts take over initial training of unexperienced staff.

The organisation of TieVie relies on mutual collaboration and interaction between all Finnish universities. Although it is a centralised programme, the learning methods and contents of TieVie are defined within the network by the planning team. This requires a high amount of dialogue and mutual agreements between the involved training staff of the five planning team university members. The dialogue format of training organisation continues at level of the courses themselves, where faculty

members are offered project-based training units which start with their individual learning needs. The level of impact of the TieVie programme is increased by the establishment of local multipliers in each university, which act as local training agents for faculties. The focus in the learning objectives has gradually moved towards the needs of advanced ICT knowledge of faculty.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Collaborative model as basis of TieVie training network As a faculty development programme, which is offered nation-wide, TieVie is explicitly based on the intense collaboration and co-operation between Finnish universities, both among all participants and among people in the coordination group.	Foster dialogue and collaboration
Wide impact of TieVie as faculty training at national level TieVie is reported to be a success in its scope and impact on faculty in universities. No other ICT training programme in Finland has reached a comparable number of university teachers.	Organise educational supplies
Competence orientation for definition of learning objectives Main objective of TieVie is to improve the competencies of the individual academic teachers in the course. Learning is organised in national networks of faculty members. This acquisition of a coherent understanding and a set of ICT skills within a large community seems to have a positive impact for organisational development of the involved universities as well.	Foster dialogue and collaboration
Creation of common understanding through network approach Due to their network structure and group orientation, the TieVie courses promote the development of a shared teaching culture; they create a common understanding of basic pedagogic principles and teaching roles in technology-based learning environments.	Foster dialogue and collaboration
Portfolio of learning methods and tools The TieVie courses provide a set of methods and electronic tools, which range from concrete course planning	Organise educational supplies

BENEFIT	RELATED MEASURE(S)
of individual academic teachers to organisational ICT strategy work and policy making in universities.	
ePortfolio as basis for continuing learning of faculty When teachers have finished the TieVie programme, they usually have developed a pilot electronic teaching portfolio, which they can use in their further career; and they have acquired the knowledge and skills to select and use technical tools for the extension of their electronic portfolio, to produce digital learning material and to reflect on their own teaching practice.	Establish learner-activating quality development
ePortfolio as tool for presenting competitive profile The development of electronic teaching portfolios provides added value to both faculty members and the university as a whole, as the presentation of teaching competences might gain importance in the future competition for students.	Establish learner-activating quality development

The network model is the basis for the perceived success of the TieVie programme. This strong emphasis of mutual collaboration and interaction is encouraged at each level of TieVie, starting with the definition of the central training framework and learning contents in the planning group, and extending to the level of each individual participant, who negotiates the training focus on basis of his or her personal learning needs. The programme offers a range of different learning methods and tools and creates a high level of flexibility for different learning needs of participants. The learning outcomes of the TieVie courses are real products in form of basic course units and ePortfolios of academic teachers, which they can directly apply in their work contexts and use as basis for a continuous improvement of their eCompetence.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
High planning workload in network structure of TieVie The collaboration effort of a national network, which offers training services to all faculties across disciplines, is a challenging task. The joint definition of a common understanding and of learning objectives and contents in course units has often been a laborious process of the planning group members.	Organise educational supplies

SHORTCOMING	RELATED MEASURE(S)
Gradual shift of financial responsibility for training expenses The existence of the TieVie training programme depends on funding from the Ministry of Education. The transfer of this national training service into local training units in universities is currently realised, but has not been completely implemented yet.	Organise educational supplies
Relevance of learning outcomes for work context of faculty The connection between attending the training programme and participants' day-to-day work in their work context is not obvious in every case. The TieVie training programme lacks information and feedback about the real impact and practical application of the acquired competences in the individual teaching contexts of the participants.	Make innovation mandatory

The network model of TieVie requires a high amount of communication and collaboration activities. As members of a network are regarded as equal partners, a common understanding of the main objectives of the network activities has to be grounded on collective dialogue and discussion. The group dynamic process takes a lot of coordination effort and can be both an exhausting and a slow process. The reported lack of information on the real impact of the acquired competences in the faculty's work context is partly tied to the continuing challenge within educational and psychological research on the diagnosis and assessment of competences which have been acquired in the related measures.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Modification of Practice	The main modification, which has taken place in the learning objectives of TieVie, is the gradual shift in focus of the target group from a beginners level towards more professional level of ICT knowledge and skills. This shift has resulted in the decision to stop the beginner module in 2006 and to extend the expert programme for faculty. The future of TieVie also depends on the gradual transfer of financial responsibility for the programme from state budget to university budgets, and on the success of the multiplier component, which aims to extend the base of local ICT training experts in each Finnish university.

With the progressive transfer of responsibility from governmental to local university level, the TieVie programme is undergoing organisational modification. Still, the programme itself seems to be settled in terms of the learning objectives and methods and demand for courses continues to be high. The transfer of responsibility to university level is a logical process, if the programme as a whole wants to be sustainable as a training measure without remaining a long-term state subsidiary project.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

The TieVie project has started course delivery in 2001 and faculty demand remains stable until now. The transfer of budgetary responsibility to university level is ongoing, assuring financial sustainability of the programme for the future. Based on these developments, it seems likely that the programme will be continued for a longer term.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Interview	*Case study interview* with Karaimo, A.-K. and Rissanen R. from HUT on TieVie practice. Recorded 25 May 2005 and transcribed for analysis. Dortmund: European eCompetence Initiative.
Research paper	Ruotsalainen, M., Tenhula, T., Vaskuri, P. (2005). *TieVie - Nationwide Training in educational ICT Use for University Staff*. In Szücs & Bo (Eds.), Lifelong E-Learning (pp. 388-394). Budapest: European Distance and E- Learning Network.
Research paper	Jokinen, T., Kairamo, A. K. & Rissanen, R. (2006). *The Portfolio as a Documentation Tool of eCompetence in the TieVie Training Programme*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 131-136). Galway: CELT, NUI.
Report	McDonald Legg, C. (2006). *Tie Vie Programme at Helsinki University of Technology*. The eCompetence Bulletin (2). Galway: CELT, NUI.
Presentation	Kairamo, A. K, & Rissanen, R. (2006). *Case study on eCompetence: TieVie network*. Presented at Fourth eCompetence Symposium 2006. Dortmund: University of Dortmund, Germany.
Strategy Paper	Finnish Ministry of Education (1999). *Education, Training and Research in the Information Society - A National Strategy for 2000 - 2004*. Retrieved 24 May 2005 from: http://www.minedu.fi/julkaisut/information/englishU/1/1.html

On side of the HUT, Anna-Kaarina Kairamo and Riikka Rissanen from the Institute for Lifelong Learning have participated in the interview. The interview results emphasise that teachers actually pointed out the network structure as main added value of TieVie. To meet subject experts from other Finnish universities and to discuss and apply ICT in a group work setting has proved to be the main added value from teacher perspective. Future competence development measures should build on the network structure and add a more tailored integration of ICT into the teaching processes of faculty.

The article of Ruotsalainen et al is a vital source for the concept, structure and implementation of the TieVie training programme. It presents detailed information for every aspect of the TieVie programme, from its start in 2001 as part of the FVU, during its early planning and development stages, until its full implementation at national level and the recent modifications that have been made within the course modules. The roles and responsibilities of planning group members, trainers, course participants and local multiplies are illustrated. The learning objectives and contents of the teacher and expert training courses are presented, and a comprehensive analysis of the experiences made in the TieVie programme as well as on its main strengths and weaknesses is given.

The article by Jokinen et al first outlines the main objective and functionalities of electronic portfolios as an assessment tool for learning outcomes, before they describe the use of ePortfolios as one key learning activity of participants within the TieVie training modules. The participating teachers develop a sample portfolio, which is assessed by peer evaluation, and continue with the improved portfolio version, which is one compulsory learning outcome at the end of the TieVie training course. Next to the individual benefit of academic teachers to have created an electronic documentation of their teaching activities, the paper emphasises the institutional benefit of universities, which gain a competitive profile by presenting teaching competence of faculty within these portfolios.

The article of McDonald Legg is a small case presentation of TieVie as one model to train faculty in the use of ICT. Next to the structure and scope of the programme, it contains a number of interview experts and individual experiences with participants of the courses.

The presentation of Kairamo & Rissanen summarises the information which is presented in the article of Ruotsalainen et al, before it details the local TieVie activities which are taking place at HUT Helsinki. Main feature of these local activities is the effort of TieVie participants to add a pedagogical perspective to the ICT integration processes within study programs and courses. The final part of the presentation outlines the use of electronic portfolios within the TieVie courses.

The policy paper of the Finnish Ministry of Education, which has been published in 1999, presents a concise macro-level analysis on the potential of ICT and the challenges they create for the educational sector of the Finnish society. On basis of this analysis, the paper defines concrete measures to be taken at national as well as at institutional levels of schools and universities.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The cost model has gradually shifted from a governmental grant to the internal funding of TieVie course expenses at each Finnish university. When the transfer process is successfully completed, the programme is considered an integral part of each university's internal budget for staff development measures, although it remains a network model.

Personnel costs occur for 11 staff members, who are involved in the coordination: this comprises their total hours of TieVie-related working time, approx. 5 planning meetings per year, preparation of and training in face-to-face seminars, which takes place 3-6 times per year. The opportunity costs for participants include their total hours of work time in TieVie virtual courses, adding two to four face-to-face 2 days seminars in different cities in Finland per course, which also includes their travel, accommodation and subsistence costs.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	4

Both replicability and effectiveness of the TieVie programme are rated high. The transfer of TieVie as a Finnish national ICT training network approach for faculty to the context of other national education sectors might be difficult. Finland is in terms of its population both a rather small and a very homogeneous country, where strong policy measures can be implemented within the educational sector without many competing governmental subunits. The structural conditions of Finland do not exist in most other national education systems.

8.3.2. eCompetence in Katholieke Universiteit Leuven

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

K.U. Leuven is a comprehensive research university with 14 faculties and 50 departments, counting 30.000 students, 1.500 professors, and 3.000 researchers in 2005. K.U. Leuven has traditionally emphasised the excellence of its educational services as asset for its institutional profile. This goal to offer a recognised quality of teaching and learning is included in the mission statement of K.U. Leuven and has been actively nourished by the rectorate of the university. In 1978, K.U. Leuven has established *DUO - Dienst Universitair Onderwijs*, a central educational support unit which is responsible for the staff development programme. All newly appointed faculty members at K.U. Leuven have been offered an initial teacher training in this staff development scheme. This traditional staff development programme has mainly focused on lecturing and evaluation skills of the new academic teachers.

In the late 1990ies, there has been an increasing recognition within K.U.Leuven on the potential of ICT for the delivery of study courses and the enhancement of teaching and learning. This recognition has subsequently led to the institution-wide implementation of a new educational concept for K.U.Leuven's education in 1999 and to the acquisition of a commercial eLearning platform in 2001, in which this concept could be realised. The most important university unit in the eLearning-related decision process at leadership level is the *ICTO (Adviesraad Informatie- en Communicatie Technologie voor het Onderwijs)* advisory council.

GIL - Guided Independent Learning is the main educational concept and comprehensive pedagogical approach for learning scenarios at K.U. Leuven, which centers the role and work processes of the academic teacher around autonomous learning activities of the students. As a learner-centered pedagogical model, GIL affects both traditional formats of teaching and independent learning of students, which is in part web-based or technology-supported.

The eLearning platform of K.U. Leuven is named TOLEDO - a Dutch acronym for *Toetsen en Leren Doeltreffend Ondersteunen* (Effective support of Assessment and Learning). TOLEDO is a learning management system which integrates the commercial eLearning tools *Blackboard(TM)* and *Question Mark(TM)* and the knowledge pool repository system ARIADNE, which has been developed at K.U. Leuven. A TOLEDO team has been established to develop and extend the platform and several

support initiatives have been taken to foster the use of the platform by both faculty and students at K.U. Leuven. In order to advance the use of eLearning and to establish TOLEDO as central learning management platform of the university, a number of measures have been taken, which target the motivation and capability of faculty to make use of these new tools. Based on the background information given for the set of measures at K.U. Leuven to foster the use of ICT in its educational portfolio, the here described practice is classified as one element in the institutional approach to eLearning at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The effective practice description on eCompetence at K.U. Leuven sets its focus on the introduction of the GIL concept and on the creation of the Digital Chalk training scheme in 2001, which is a staff development course on specific eLearning knowledge in the local university context. Main target group for the *Digital Chalk training* modules are new faculty members, who start their professorate career at the university.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ make innovation mandatory

Several organisation-wide measures have been set up to encourage faculty to make use of ICT in their courses - such as an decisive leadership support for excellence in teaching and the integration of new technologies into the educational portfolio of K.U. Leuven; the establishment of central and embedded eLearning support units, which offer on-the-job support to teachers; the funding of considerable institutional grants for innovative educational projects in teaching and learning at faculty level (up to 60.000 EUR per year for 14 funded projects per year); and ICT-related institutional incentives for the career development of junior researchers. In their combination, this portfolio of measures represents the outcome of the institutional eLearning strategy, which K.U. Leuven has defined. This set of measures fits to the type of measure of making innovation mandatory.

The focus of the effective practice description is largely placed on the GIL concept and the Digital Chalk modules as part of the direct staff development programme offered at K.U. Leuven. This eLearning module of the staff training best fits to the direct types of measures of organising educational supplies and offering consulting support.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Organise educational supplies	Extension of staff development programme with eLearning modules	The described practice is focusing on direct staff development. The implementation of the GIL concept and of the TOLEDO platform have demand a re-thinking as well as an extension of the traditional staff development programme. In particular for the topic of eLearning a staff training course has been set up by DUO, the central university education support service, which is called '*The Digital Chalk*'. This course aims to help faculty to acquire those competences which are necessary to integrate TOLEDO, the main electronic platform of K.U. Leuven, in their study courses and teaching practice, and to support students in their self-directed learning process, which should relate to the GIL concept.
Organise educational supplies	Combination of pedagogical concepts and technical training for faculty	The first Digital Chalk training scheme has consisted of four elective modules: an introductory module with a focus on the technical features of TOLEDO; a module for course design within the TOLEDO environment; a module on information delivery, which is based on the GIL concept; and a module the efficient use of communication facilities in TOLEDO. Each module has lasted 3 hours. The complete training has been offered over a period of about 8 months. The modules combine a demonstration of technical tools and work routines within TOLEDO and self-reflection of the teaching practice on basis of the GIL model in 2001.
Organise educational supplies	Faculty demand for work context-related training modules	Faculty demand for the initial Digital Chalk modules has been far higher than places could be offered - one module offers no more than 15-20 places maximum for participants. So it has been decided to

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		extend the training measure. The first Digital Chalk version has been evaluated and a number of recommendations for improvement of the training have been made; these point mainly into the direction of a better understanding of the GIL concept as underlying pedagogical approach and of adapting the web-based course components in TOLEDO to the learning needs of different student groups in different disciplines.
Offer consulting support	Tailored on-the-job consultation for teachers	The participating faculty members have been asked to work out assignments in TOLEDO in between the Digital Chalk training sessions. Direct technical consulting and support in the use of the platform elements are offered through a separate series of information and hands-on training sessions, which address the whole faculty at K.U. Leuven. The TOLEDO team as well as the University Education Support Office have provided individual support for Digital Chalk participants in order to elaborate their assignments; this should finally result in useful instructional materials that is used in the study courses of the staff members.
Offer consulting support	Central and de-central eLearning support units for faculty	Additional technical support for academic teachers can be found in the central TOLEDO help desk unit and from faculty-based TOLEDO advisers. The Digital Chalk trainer team has also published the book '*Muizen in het auditorium*' (Mouses in the lecture hall), which provides additional background information on various aspects of learning, such as instructional design, use of educational media, and organisation of education within the specific TOLEDO/ GIL environment at K.U. Leuven.

The Digital Chalk training is one element in the set of measures, which have been implemented at K.U. Leuven to foster the use of ICT in teaching and learning. Digital Chalk courses are offered as direct training option to faculty members and contain both pedagogical principles of the GIL concept and technical aspects of the TOLEDO platform. As they refer directly to the local pedagogical model and platform, the training courses offer directly applicable knowledge to participants. The training

spans over a period of eight months and is delivered in modules, which fits the scarce time schedule of academic staff. Faculty demand for direct consulting and support services is high. Consulting is realised in the course modules and is offered in addition by central and faculty-based TOLEDO support experts. The Digital Chalk training is a traditional staff training scheme which is complemented by a set of additional measures to foster eLearning at K.U. Leuven.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Response to immediate learning needs of faculty The evaluation of the Digital Chalk training shows that most participants have found the training modules helpful for their own teaching practice. In particular the method to use participants' problems and questions as starting point for exercises and discussion has been positively rated, as this training process responds to their immediate needs.	Organise educational supplies
Raise awareness of ICT potential for teaching activities The instrumental use of the TOLEDO platform in the staff training to solve educational problems through assignments has confronted participants with the potential as well as consequences of the university's pedagogical concept of GIL and the TOLEDO environment.	Make innovation mandatory
Demand for support in particular by new eLearning users in faculty Extensive support is available and used by faculty to work on the Digital Chalk assignments, which is for many participants their first experience with the development of eLearning materials in general and with the TOLEDO platform in particular.	Offer consulting support

Main strength of the Digital Chalk training is its responsiveness to actual learning needs of participants. The course inquires at the beginning of the training on challenges, which faculty members face in their teaching practice, and works from there to applicable solutions for the TOLEDO environment. As it presents the GIL concept, the course offers participants an insight into pedagogical principles for learner-centred learning, which is a necessary basis for their understanding of the ICT potential in teaching and learning scenarios as they are foreseen in the TOLEDO environment. And the course

seems to function as an initial contact place for faculty, which has not actively reflected on the use of eLearning before.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Dominant design of traditional teaching model After the training the courses, which Digital Chalk participants have set up or enhanced with TOLEDO components, have been evaluated. The evaluation has revealed that most participants still design their teaching activities from teacher perspective.	Organise educational supplies
Slow uptake of eLearning technologies in faculty The integration of the TOLEDO platform into courses and the regular teaching practice of the Digital Chalk participants has remained at a low level.	Organise educational supplies

The restrictions of Digital Chalk as a classical training approach are recognisable despite its overall positive evaluation outcomes. The impact of the training on the behaviour of faculty remains low, which is a common phenomenon for this kind of traditional trainings. Knowledge acquired in training sessions is often not transferred to the real work context of participants. In addition to this reported training transfer dilemma, the Digital Chalk course alone is not a sufficient measure to motivate a larger part of faculty or just its participants to use the learning management platform. Taking into account the additional measures, which K.U. Leuven has set up to foster eLearning, it is informative to see how great the motivational hurdle seems to be that needs to be overcome until a more significant part of faculty decides to start to use eLearning.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Extension of Practice	The Digital Chalk training course is constantly updated, repeated and evaluated since 2001, and involves a growing number of staff. The training has been extended with additional modules, and in its total scope. More hands-on experience is scheduled in a more extensive way. Models and concrete examples for the use of ICT in teaching and learning are provided to participants, which is preferably done in the TOLEDO platform itself. Where possible, faculty support by TOLEDO experts is provided "just-in-time" during the implementation of course units. The training scheme of each module is as much as possible adapted to the learning stages that

FUTURE PLANS	DESCRIPTION OF PLANS
	teachers go through while they create their courses in TOLEDO, instead of forcing them to pay attention to abstract technical aspects on basis of a purely external training scheme. One further objective for the current modifications of the Digital Chalk course is to provide participants not only with central support services, but also with additional support staff at faculty or departmental level. The DUO unit currently considers a model to use the former Digital Chalk participants as mentors for future participants and faculty colleagues.

The Digital Chalk programme has been extended as faculty demand has been higher than places available, and additional modules have been integrated to offer more choices to participants. The Digital Chalk team has also organised a week-long summer school for new faculty members at K.U. Leuven, which has started in 2004 and takes place every two years, as costs for a yearly summer school have been too high.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Given the role of the Digital Chalk programme as one crucial element within K.U. Leuven's effort to foster a model of learner-centred learning in its study courses, which is strongly supported by a technological component, and the high faculty demand for the Digital Chalk modules, it is likely that the practice will be continued for a longer term.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Interview	*Case study interview* with Van Petegem, W. and Van Den Branden, J. from K.U. Leuven on the eCompetence development practice. Recorded 25 May 2005 and transcribed for analysis. Dortmund: European eCompetence Initiative.
Research paper	Van den Branden, J. & Van Petegem, W. (2006). *KU Leuven and eCompetence*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 61-71). Galway: CELT, NUI.
Presentation	Van den Branden, J. & Van Petegem, W. (2006). *KU Leuven and eCompetence*. Presented at the Third eCompetence Symposium

REFERENCE TYPE	TITLE OF REFERENCE
	2006. Galway: CELT, NUI, Ireland.
Presentation	Elen, J. (2006). I*ndividual eCompetence Development - The approach of the K.U.Leuven*. Presented at the Fourth eCompetence Symposium 2006. Dortmund: University of Dortmund, Germany.
Presentation	Van Petegem, W. (2006). *Organisational eCompetence Development - Case AVNet@ K.U.Leuven*. Presented at the Fourth eCompetence Symposium 2006. Dortmund: University of Dortmund, Germany.

On side of the KU Leuven, Wim Van Petegem and Jef Van Den Branden from the Audiovisual and New Educational Technologies in a Network Center (AVNet) of K.U. Leuven have participated in the interview. The interview has focused on KU Leuven's approach to eLearning as an asset in its endeavour to provide excellent teaching and education services to its students.

The paper outlines the integration of ICT in the teaching and learning processes at K.U. Leuven as an evolutionary process, which is closely connected to the ambition of the university to gain a competitive profile by offering excellence in its educational services. The iterative integration of eLearning has taken place in various phases. Each eLearning integration phase is characterised by a specific institutional emphasis: it has started with the establishment of ICTO, the central ICT advisory board at leadership level; it has continued with the development of the digital learning environment TOLEDO; and subsequently it has complemented the technological development with information resources, training and motivational incentives for faculty and students to adopt the GIL concept of learning and to make use of the platform. However, the authors conclude that even though a number of measures have been taken at K.U. Leuven to adopt the GIL concept and to foster the use of ICT, the adaptation of both faculty and students to the conceptual change continues to be a slow and challenging process.

The presentation of Van den Branden & Van Petegem presents and summarises the content of the paper. The presentation of Elen introduces the main principles of the GIL concept as well as the main components of TOLEDO and its implications for the teaching model of academic teachers at K.U. Leuven. The presentation of Van Petegem illustrates the ICT integration process at K.U. Leuven from the perspective of the AVNet center.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

There is no indication given on direct or indirect costs of the Digital chalk programme, but the total expenses of personnel costs for trainers and technical advisers and the opportunity costs of participating faculty amount to a substantial investment the university has decided to spend for this specific measure. The whole training is funded by K.U. Leuven's internal budget.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	3
Effectiveness	3

Both replicability and effectiveness are rated as average. The learning materials are in Dutch and tailored to the GIL concept and the functionalities of the TOLEDO environment. The informants assume that the Digital Chalk training and its format might be transferable to other contexts.

8.3.3. eLearning Training for Academic Staff at University of Pretoria

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level		Meso-Level		Micro-Level
CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The *University of Pretoria* (UP) is the largest residential university in South Africa. UP is a comprehensive research university, whose study courses are organised in nine faculties. The university has offered in 2005 a total of 2.022 modules (or courses), including 463 undergraduate and 1.574 post graduate modules to approximately 55.000 students. Of these, about 16.000 students are traditional, paper-based distance education students. On a broad scale, UP is a contact institution, which uses eLearning to support and to enhance face-to-face sessions.

Due to the fast rise of ICT in the 1990ies, the customary model of contact education at UP has been significantly expanded and new learning environments have been created. The *TLEI - Telematic Learning and Education Innovation Center* of UP has been established in 1997 with the main objective to realise a centrally defined technology plan for the whole university. Since then, TLEI is the main institutional agent for technology integration and the efficient use of eLearning at UP's educational services. TLEI has developed a model for 'telematic learning', which combines a range of learner-centered teaching and learning activities.

One of the key tasks of TLEI is to assist lecturers to embrace the institutional vision of technology-enhanced education innovation, which includes an understanding of the telematic learning model and the efficient use of its electronic learning environments. The university has a campus-wide licence for the commercial learning management platform WebCT, which is currently in use at UP. The acquisition of eCompetence has been identified as one crucial challenge for the sustainable use of ICT at UP and a number of direct training modules as well as additional support services have been established. The eLearning-related training courses for faculty are part in its endeavour to implement a leadership-driven, institution-wide technology innovation and integration strategy, which is taking place at macro-level of the whole university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

UP has reacted to the fast technological development with the definition of an education innovation strategy, which understands the role of ICT as a tool to foster the pedagogical model of flexible learning. The faculty training measures are one important component of UP's strategy implementation. The staff training courses mostly focus on the functionalities of the learning management platform that is used at UP, with the exception of the eLearning facilitation course. The formal training courses are complemented with additional eLearning support services and motivational incentives like the accreditation of teaching merits in career paths of junior researchers to encourage faculty to actively use ICT in their teaching and learning activities.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ make innovation mandatory

The eLearning training and faculty support, which is offered at UP, is part of this wider institutional education innovation strategy. The staff training measures and the complementary eLearning support services to faculty are in focus of the practice and fit the types of organising educational supplies and offering consulting support. The offspring of TLEI itself, the major financial, the continued conceptual, and the policy-level leadership commitment, which UP has made within its education innovation strategy, are classified within the measure of making innovation mandatory.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Make innovation mandatory	Major institutional investment in TLEI as central eLearning unit	The TLEI is the main eLearning unit at UP. Several central services have been merged into this center, which has been established in 1997 with the mission to organise and administrate all work processes and activities related to the e-Campus of UP. Two units have been formed at TLEI which are involved in the implementation of eLearning at UP: the e-Education team designs and delivers the faculty development programme; and the e-Support team complements the direct staff training measures with additional ICT services to faculty members.
Organise educational supplies	Establishment of a set of direct staff trainings for WebCT	TLEI has developed five direct eLearning staff training courses with the aim to increase the competence of UP's academic staff to use the local virtual learning environment. These eLearning courses address faculty learning needs at different levels of ICT expertise. Four courses are closely focused on the central platform WebCT. The high impact course takes 1 day and presents basic tools and how to manage a WebCT course; the web page design course takes 1 day and is a customised Front Page course specifically designed to upload material into WebCT and to optimise graphics in courses; the intermediate course takes 1 day and builds on the two initial courses; and the designer course takes 2 days and includes advanced tools and functionalities of WebCT.
Organise educational supplies, offer consulting support	Establishment of a special-ised course on facilitation in eLearning	Next to the four platform-related courses, TLEI offers a course for facilitation in eLearning. This course takes 2 days and adds pre- and post-course online learning periods. Main focus of this course is the role of academic teachers in the facilitation of student learning processes in eLearning environments. The theory and methodology of this course is based on Salmon's books e-moderating and e-tivities. TLEI instructional designers attend this course to build up experience for the facilitation of eLearning, so that

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		they are able to act as facilitators for academic staff in future courses.
Organise educational supplies	General staff development programme	In addition to the direct eLearning courses, TLEI offers an extensive education induction programme for newly appointed faculty members, which equips them with pedagogical competences on teaching and learning models and activities. These courses complement the direct eLearning training with wider pedagogical models and practices for academic teachers.
Offer consulting support, make innovation mandatory	Self-responsibility of faculty for eLearning course elements	The TLEI team is responsible for the overall instructional design and development of study courses in WebCT. Nonetheless, lecturers are actively encouraged not only to manage and facilitate their WebCT courses, but also to become more self-sufficient in the general use of ICT tools in teaching and learning.

The main feature of UP's approach to implement eLearning is the leadership decision to establish TLEI as central support service for all e-Campus services and to integrate existing services like the IT support or student counselling into this new unit. Faculty training is developed and carried out by eLearning experts of the e-Education team, and additional support measures are offered to faculty by technical experts of the e-Support team. The eLearning courses, which focus on the use of WebCT as central platform, mainly address new faculty members, who start a position at UP. The whole eLearning training of UP is strongly oriented towards the transfer of specific knowledge and technical skills in the use of the institutional platform. More general pedagogical methods and eLearning tools are included in the facilitation course and partly in the general staff development courses.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Large participation of faculty in courses From 2000-2006, more than 900 faculty members have attended the eLearning-related training courses of TLEI. The big majority is counted in the basic course of the four WebCT-related courses, while only 53 faculty members have attended the more extensive and demanding eFacilitation course.	Organise educational supplies

BENEFIT	RELATED MEASURE(S)
Raising awareness of faculty on ICT potential As one overall learning outcome of the faculty eLearning training, academic teachers become aware of the possibilities offered by online learning and learn to manage and facilitate their own WebCT courses.	Organise educational supplies
Efficiency of tailored faculty training and support The TLEI offers a customised version of the basic eLearning courses to groups of lecturers in specific departments. These tailored training courses are well received by faculty, since their specific needs within a department are addressed.	Organise educational supplies, offer consulting support

In general perspective, faculty demand for TLEI's staff training courses is high. A more detailed view on the attending faculty reveals that mainly new faculty members participate in the courses and that most of them attend the basic WebCT course (high impact course). Many teachers obviously decide to stop training attendance after a first introduction into the eLearning topic. Although the overall number of attending faculty is impressive, it remains a challenge for TLEI to encourage a continuous development of academic teachers in the use of WebCT and in the more general use of ICT in teaching and learning. The tailored support, which is offered to groups of lectures in specific departments, is one option TLEI has taken to bring its training services closer to the real work context of faculty.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Lack of continued eLearning training attendance of faculty The majority of participants, which is 580 out of 907 total participants from 2000 to 2006, have only attended the basic eLearning course.	Organise educational supplies
Low impact of training on eLearning process acquisition of faculty The uptake for lecturers to become their own WebCT developers has been far less than the TLEI has hoped. The load of course development and maintenance mainly rests with TLEI's central instructional design team.	Organise educational supplies, offer consulting support
Decrease in institutional staff training investment	Organise educational supplies,

SHORTCOMING	RELATED MEASURE(S)
The budget for staff training has been reduced in 2004 and TLEI has had to cancel several courses. This financial constraint restricts TLEI's ability to promote the adoption of eLearning among additional academic staff at UP.	offer consulting support

The main reported weakness of the staff training courses is the lack of faculty motivation to continue participation in eLearning courses after they have taken the basic WebCT course. Although the basic course (high impact) includes the telematic model for flexible learning, its focus is on the use of basic WebCT tools for course management. Maybe the high impact course contents are too restricted to WebCT to motivate faculty to continue attendance in the follow-up eLearning courses of TLEI. The resistance of faculty members to take over a more active role in the course design and production process might be interpreted in the way that the course contents are too much focused on the WebCT platform.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Modification of Practice	With reference to the innovation adopter life cycle of Rogers, UP's eLearning courses target the early majority of faculty. The plan of TLEI is to cross the following marks by 2010: 45% of faculty should have acquired basic ICT competences for their teaching and learning activities; 35% of faculty should have reached an intermediate competence level; and 20% of faculty should have attained an advanced competence level. While the basic ICT competence level for faculty in this future plan of TLEI is focusing on the development of study material and instructional design skills; the intermediate level adds interaction, communication and moderation skills, and the advanced level adds group communication skills of faculty members, which work on virtual study course components for a whole department. Concrete steps, which are foreseen to be taken in the direct eLearning training services of TLEI, are: the assurance of continued institutional funding for the provision of staff training in eLearning; the delivery of more customised training courses in academic departments; the creation of on-demand, just-in-time sessions, for small groups at the lecturers' desks; and the offer of quick 'lunch-time sessions' focusing on one particular tool in WebCT.

The future plan for training measures and TLEI's efforts to implement eLearning into UP's educational processes is focusing on two key objectives. One key objective is the quantitative target of TLEI to develop the ICT competence of the early majority of faculty by 2010. This is an ambitious task, given the recognition of the weakness of the existing training scheme, where most faculty members do not continue participation after the initial course. The major modification foreseen at TLEI is to tailor its training and support services closer to specific learning needs. The risk of this tailored support model might be that the scope of the support is decreasing, while costs for these intense training sessions are increasing.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

As long as the leadership strategy on education innovation and the model of flexible learning remains high on UP's institutional agenda, TLEI should stay in a position to continue its eLearning services on a sustainable basis. The eLearning-related target setting of TLEI is currently defined until 2010.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Interview	*Case study interview* with Fresen, J. from the TLEI of UP on 17 May 2005 on the eLearning training practice. Recorded 20 May 2005 and transcribed for analysis. Dortmund: European eCompetence Initiative.
Research paper	Fresen, J., Steyn, D. & Marx, A. (2006). *The Quest for Ecompetenct Academic Staff: The University of Pretoria as a Case Study*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 91-97). Galway: CELT, NUI.
Strategy paper	Strategy Paper of the University of Pretoria (2002). I*nspiration for the Innovation Generation. 2002-2005 Strategic Challenges*. Pretoria: University of Pretoria.
Presentation	Boon, J. A. (2006). *Education Innovation - E-Competence*. Presented at Fourth eCompetence Symposium 2006. Dortmund: University of Dortmund, Germany.
Website	Department of Telematic Learning and Education Innovation http://www.up.ac.za/telematic/index.htm

On side of UP, Jil Fresen from the TLEI has participated in the interview. The interview has emphasised the strong role of the university leadership in the development and implementation of an institutional eLearning strategy for UoP.

The research paper by Fresen et al presents the broad picture of the education innovation and eLearning strategy at UP, which aims to establish technology-enhanced flexible learning as central pedagogical model for all educational services. The TLEI is introduced by detailing the subunits, which are responsible for eLearning. Amongst them are educational consultants, who offer direct personal support to faculty members, as well as e-Education and e-Support teams, which are responsible for the formal eLearning faculty training courses and the course development in WebCT. Academic staff training is presented in detail, pointing out the weakness that most faculty members only attain the basic eLearning course, and that the smallest number of participants is found in the advanced eLearning facilitation course. E-Support is offered on-demand to faculty in specific departments and is based on a mutual agreement about expectations and responsibilities of both trainers and faculty members.

The presentation of Boon gives a comprehensive overview of UP's education innovation strategy and its specific eCompetence endeavours in faculty development schemes. The strategy approach of UP is presented in chronological order, starting with the leadership decision to establish TLEI as central service unit for all eLearning issues. Key education innovation decisions of the leadership are documented in internal strategy papers and the learner-centered telematic learning model is illustrated, before finally details on faculty development goals in eLearning are given and different levels of ICT-related competences defined.

The strategy paper of UP outlines the concept of education innovation, which is defined as a multidimensional process and aims to be implemented at all levels and areas of the university's educational practice. Key objectives of UP's education innovation strategy are the promotion of the effectiveness and efficiency as well as the quality of all its educational activities. The adequate use of ICT plays a decisive role in the support and optimisation of the existing educational processes, the enhancement of teaching and learning environments and the design of new opportunities at UP. The role of faculty is explicitly highlighted in this education innovation strategy. With reference to Rogers' adopter type model, the aim in UP's faculty development area is to expand the education innovation process from innovators and early adopters to the early and late majority by means of change and innovation management.

The TLEI website presents the vision of the center, which is to establish excellence in education at the UP, and its mission; this is to take the lead, to facilitate and to actively participate in all institutional actions which aim to establish a technology-enhanced and flexible learning environment.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

Neither direct, nor indirect costs are detailed in the practice or any of the additional documents of TLEI. Due to the scope of the eLearning efforts undertaken at UP, the establishment of TLEI as central e-Campus support service and the development of the eLearning staff courses amount to a considerable internal investment UP has taken.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	4

Both replicability and effectiveness of the TLEI eLearning training scheme are rated high. Meanwhile the transfer of the training concept to other universities might be rather easily undertaken, it remains a challenge to measure the effectiveness of narrowly focused technical platform trainings on the teaching behaviour of faculty. The reported shortcomings of the practice give at least an indication that the effect of direct trainings on faculty use of ICT in study courses seems to be lower than expected.

8.3.4. E-Class: Implementing a National Learning Platform at the University of Athens

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

This practice combines the database entries, which have been submitted by the Department of Informatics and Telecommunications of the *University of Athens* (UoA). In focus of the practice is the implementation of the e-Class learning platform on institutional level, and related measures to train and motivate faculty at UoA to use e-*Class* in teaching and learning. The UoA is a large university with around 3.000 teachers, 50.000 students, and 30 departments covering all major science disciplines. Currently, UoA is facing the challenge to incorporate ICT into its educational services. As UoA is a residential university, its main institutional eLearning objective is to use ICT in order to support and

extend traditional university teaching. The dominant pedagogical model at UoA is teacher-centered lecturing, and it has not been regarded useful at this point of the eLearning integration process to try to impose a new teaching paradigm on faculty. UoA has focused in a first step on the implementation of a learning management platform called *e-Class* and encouraged its use in the professorate.

Main eLearning challenge at UoA is a more efficient e-management and diffusion of its educational material and the creation of a digital culture through the use of tools like e-Class. Main rationale for the introduction of a learning management system at UoA has been the huge amount of existing educational material and the need to find a more efficient way to disseminate this material to students. The implementation of a central learning management platform has promised to save resources of the departments by using a common ICT infrastructure for teaching and learning. In addition, many departments of UoA do not have local expertise available for operating and administering electronic learning management services. Before the implementation of e-Class has started in 2001, UoA has not offered any kind of learning management system to its students. The implementation of the e-Class platform, and the measures to motivate its faculty to use the platform at UoA are classified as an institutional approach at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The e-Class practice describes the implementation of a learning management platform at UoA. This platform implementation is funded by a Greek government grant and closely tied to the national platform development project, which is presented in the second effective practice database entry of UoA. One current challenge for the e-Class experts at UoA is to encourage faculty to make use of the platform. As no direct funding is available for staff development measures, the e-Class team has initiated some information and support activities, which are subsequently analysed.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ provide information ✗ offer consulting support	✗ increase action readiness

The focus of the described practice is quite technical and only scarce information is given on the role of faculty in the platform implementation and use. The information, which can be found within the description, refers to the direct competence development measures of providing information and offering consulting support, and to the indirect competence development measure of increasing action readiness.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Offer consulting support	e-Class project background and local implementation	The e-Class platform is a modified version of the open source platform Claroline, which is developed by the national platform development project *Greek University Net* (GUnet). The e-Class platform has been selected at UoA because it is designed to support the needs of Greek higher educational institutes, it is supporting the Greek language, it is free of licence and there is a support development team available at GUnet that incorporates new functionalities in a reasonable time period. The *Network Operation Center* (NOC), the central IT support service of UoA, maintains the local e-Class platform version technically and support teachers in its use.
Offer consulting support	Teacher support in use of e-Class through the central IT support service	GUnet and NOC have different roles in the local implementation of the e-Class platform at UoA. GUnet has established a central help-desk, which is responsible for the maintenance of the source code, anf for the incorporation of new functionalities and features in UoA's e-Class platform. GUnet is also responsible for the source distribution, the technical support, the software installation and the administration management. NOC takes care for the e-Class installation, operation and maintenance at institutional level of UoA. NOC is also responsible for providing eLearning support services to different departments and for the training and technical support of faculty in the use of e-Class. Currently, three staff members at NOC are responsible for e-Class and provide technical support for teachers, who have decided to use the platform.
Provide informa-	e-Class dissemination	NOC has promoted the use of e-Class as learning

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
tion	activities by NOC	management platform for UoA with a website presentation and eMail messages to faculty.
Increase action readiness	External government grant as faculty incentive to use e-Class	The heads of departments are responsible to encourage their respective staff to use the e-Class platform and the additional eLearning services of NOC. The Greek Ministry of Education offers some additional funding to those departments which decide to use the e-Class platform for their teaching and learning activities.

The main faculty development activities of the e-Class team at UoA are small, on-demand tool trainings, technical consultations, and the provision of information about the platform, which is presented at a project website and internally distributed by frequent eMail notes to academic staff. The whole faculty development approach at UoA is closely tied to the e-Class platform and is focusing on technical issues. The educational culture at UoA is reported to be teacher-centric and there is currently no staff development programme offered.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Impact of internal e-Class promotion In terms of user statistics, the introduction of e-Class has been successful. More than 170 university professors and around 6.000 students have used the platform for teaching and learning activities in 2005. This success in numbers of registered users is reported to be partly based on the internal promotion of e-Class.	Provide information
On demand non-formal training sessions of NOC Some prototype training activities have been carried out by NOC to inform academic staff at UoA on course management options and on digital tools within e-Class. These trainings are non-formal, have a technical focus and present the tools, which are available in e-Class, for example the course environment options. NOC provides also on-demand technical trainings, when academic teachers are interested in features like videoconferencing, audiostreaming, or recording lectures for broadcasting.	Offer consulting support

The NOC e-Class team members primarily aim to increase the use of the e-Class platform through the provision and promotion of information to faculty. The scope of individual consultation sessions with faculty members on technical issues is limited. The e-Class team tries to establish a good practice case for the platform use by promoting its use in particular at the Department for Informatics and Telecommunication.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
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No shortcoming for any direct or indirect staff competence development measure has been indicated in the practice.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Extension of Practice	A more extensive and formal training module for faculty is currently (2005) planned by NOC. The training will be tailored to the main science disciplines which are taught at UoA. The promotion and training activities will not be limited to the e-Class platform of NOC, but also include the use of multimedia and video-communication services for teaching and learning.

The stakes for the development of a formal faculty training in the use of the e-Class platform or in the more general use of ICT in teaching and learning are high. There is no tradition of academic staff development at UoA, and the teaching model is reported to be conservative, favouring in most cases the traditional lecturer model. The further development of eLearning-related innovations will depend to a certain degree on the current success of the e-Class project at UoA. If the use of the platform adds value to the teaching and learning activities within UoA's study courses and teachers start to get interested in the use of electronic tools, a more comprehensive faculty development might start to evolve.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

The classification on the life-time of the practice is not feasible for on-demand technical consultation. The expenses for the technical support team and the further development of the e-Class plat-

form at UoA are covered by the Greek government grant until 2010, which assures a long-term life-time of the e-Class project and the consultation and information work of UoA's local team.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Interview	*Case study interview* with Balaouras, P. and Grigoriadou, M. from the department of informatics and telecommunications of UoA on the e-Class practice. Recorded 27 May 2005 and transcribed for analysis. Dortmund: European eCompetence Initiative.
Research paper	Balaouras, P., Tsibanis, C., Bolis, S. & Merakos, L. (2006). *On the Provision and Use of E-Learning Services at the University of Athens*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 97-107). Galway: CELT, NUI.
Strategy paper	Balaouras, P. (2005). *On the Provision and Use of E-Learning Services at UoA*. Presentation given at the Third eCompetence Symposium 2006. Galway: CELT, NUI, Ireland.
Website	eClass http://eclass.uoa.gr

On side of UoA, Pantelis Balaouras and Maria Gregoriadou from the Department of Informatics and Telecommunications have participated in the interview. The interview has affirmed the strong technical perspective which is taken at UoA for the integration of eLearning and faculty development.

The paper of Balaouras et al presents the e-Class implementation process at UoA from a technical point of view. The information provided for direct or indirect competence development measures for academic staff in the use of the e-Class platform or other ICT tools is scarce. Some information is given on the promotion of e-Class and on future plans for a more formal faculty training scheme, which is currently developed by the NOC.

The presentation of Balaouras summarises the contents of the above cited paper. The website of the e-Class platform at UoA contains additional documentation and project reports, which are nonetheless published in Greek language only.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The e-Class platform itself is free of charge. For the faculty support and the informal technical consultation sessions occur personnel costs of the e-Class experts at UoA. The e-Class development of UoA is currently subsidised by the Greek government.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	5
Effectiveness	4

Both replicability and effectiveness are rated high, but this rating rather refers to the implementation of the e-Class platform than to its complementing faculty development activities.

8.3.5. E-Moderating: The Key to Effective Online Learning at National University of Ireland

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level		Meso-Level		Micro-Level
CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The *National University of Ireland* (NUI) Galway is increasingly using e-Learning, mainly to support its portfolio of distance learning courses. Main eLearning integration challenge is that Galway's faculty often perceives the web as being a source of information or means of content delivery, but finds it difficult to adapt to new teaching and learning approaches and lacks confidence in their ability to encourage efficient learning amongst their students in technology-based environments.

One institutional objective of NUI is to support faculty in the acquisition of eCompetence - they should be able to engage their students for active participation in learning, and to promote critical thinking as well as to build a sense of community and support within eLearning courses. *CELT - the Center for Excellence in Learning and Teaching*, is a central support service of NUI Galway, which has been given the mandate and resources to organise staff trainings for the use of eLearning. CELT has decided in 2003 to buy in Prof. Gilly Salmon as external eLearning expert in order to set up courses for faculty on methods for eModeration. As part of NUI Galway's strategic objective to foster eLearning, the faculty training courses for eModeration are classified as institutional approach at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The eModeration course is a training measure that is tailored to present and transmit specific knowledge and methods for the role of moderators in virtual learning platforms to faculty members at NUI Galway. The eModeration course is offered as free institutional service to academic staff members of faculties and departments at NUI Galway.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ foster dialogue and collaboration

As direct training measure, the eModeration course fits to the type of measure of organising educational supplies. Course delivery has been adapted to the virtual learning environment of NUI Galway. The practice reports a considerable amount of networking and information exchange between faculty members on specific challenges in the use of the local platform within study courses. This discussion of faculty on work problems within the platform is encouraged and facilitated by course moderators. Therefore, the course is classified in the typess of measures of offering consulting support and fostering dialogue and collaboration.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Organise educational supplies	Efficient use of ICT as institutional aim	Aim of the eModeration course is to get academic teachers acquainted with the role to be an online moderator, and to inform them about suitable teaching methods and practices in virtual learning environments.
Organise educational supplies, offer consulting	Main ideas of eModeration course	The eModeration course provides academic teachers in addition with the student's perspective. Teachers have to change their roles in the eModeration course

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
support		from teacher to student for the duration of the course. They perceive this way the reality of the virtual learning environment with student's eyes, understand the main challenges for efficient learning in this environment, gain practice in the use of technology and develop moderation skills to facilitate learning in an adequate way.
Organise educational supplies	External contracting as approach	CELT has commissioned Gilly Salmon to deliver online eModeration courses to NUI Galway's academic staff. The decision to buy in a well-developed eModeration course has been taken, because local expertise has not been available at that time, and work resources of CELT have been extremely strained.
Offer consulting support, foster dialogue and collaboration	Main features of eModeration course	The whole eModeration course requires a 5 hours a week for 5 weeks schedule as minimal commitment of participants. The course content and delivery has been adapted to Blackboard as the virtual learning environment of NUI Galway. The course is completely delivered online, which allows flexible learning times and places for participating faculty members.

Institutional aim of NUI Galway is to increase the efficient use of eLearning in its study courses. The eModeration courses, which are organised by and in the responsibility of CELT, are one concrete measure of NUI Galway to realise this institutional aim. The eModeration course is integrated into the local virtual learning environment and its learning content is adapted to the work challenges, which faculty encounter within their use of the local learning platform in study courses. The complete online mode of the course delivery is both an asset and a challenge: while faculty freely decide when to work for the eModeration course, the drop-out rate is reported to be 1/3 of participants on average, mainly because of not having met personally with trainers at least once.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
New pedagogical perspectives for courses The eModeration course curriculum offers participants a range of ideas and methods on how to use tech-	Organise educational supplies

BENEFIT	RELATED MEASURE(S)
nology in online teaching to foster active learning and not just to deliver learning content. Due to the flexible and hands-on approach of the eModeration course, faculty demand for the course continues to be high.	
Hands-on approach The trainers of the eModeration course address practical problems, which NUI Galway staff is facing when they add eLearning elements to their study courses. Participants are shown the main functionalities of the learning platform and how to use them within their study courses. The main focus of the course is on the experiences made by participants, when they have been in a student position, and on the role and responsibility of the academic teacher as moderator in a virtual learning environment.	Offer consulting support
Exchange of experiences The eModeration course provides a forum for participants to exchange experiences on their use of the institutional learning platform. In addition, some eModeration course tutors are from Australia, which increases the awareness of participants on the potential of ICT to cross time and space in learning. Collaboration and dialogue between participants has been actively fostered by the course tutors.	Foster dialogue and collaboration

The main benefit reported is the high relevance of the eModeration course for the real problems of academic teachers, when they design and deliver eLearning courses in the virtual learning environment of NUI Galway. The change of perspective from teacher to student is an experience that faculty members reported to be an eye-opener and a lasting learning experience. The flexible delivery of the course, which adapts to the tight schedules of faculty, is seen as an additional strength of the eModeration course format.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Costs and course size The costs for the external contractor are reported to be above average. Staff demand for the course continues	Organise educational supplies

SHORTCOMING	RELATED MEASURE(S)
to be far higher than places are available.	
Scheduling of course units The scheduling of course units is reported to be at times difficult to harmonise with the work duties of participants.	Organise educational supplies

The weak points of the NUI Galway approach do not refer at first place to the quality of the course itself, but focus on the scarcity of resources in terms of financial constraints, time constraints and constraints in the total number of participants allowed to the course. The time constraints of all members of a course add to the lack of persistence, which is causing the above mentioned drop-out rate of participants.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Extension of Practice	A continuation and extension of the eModeration courses is foreseen with additional funding of the national government funding scheme for eLearning projects in higher education. CELT plans an integration of the eModeration training into its wider framework for professional qualifications in teaching and learning. Licensing of the course materials is planned in the near future to make them available to CELT eModeration tutors at NUI Galway.

The future plans for the eModeration course foresee its continuation, as the course is a big success. The extension plans for the course depend currently on the ability of NUI Galway to successfully apply for additional governmental funding in the national train the trainers programme (see practice: training the trainers - government funding scheme). CELT plans in the long term to build up local eLearning expertise and to train tutors in eModeration issues, which would allow for a more stable and autonomous planning of the eModeration courses.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Next to the mentioned future plans, the foreseen integration of eModeration courses into the professional qualification framework is an additional sign that a long-term continuation of the courses is probable.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Mac Labhrainn, I. (2006). *E-moderating: Teaching and Learning in the Online Classroom*. In I. Mac Labhrainn, C. McDonald Legg, D. Schneckenberg, J. Wildt (Eds.), The Challenge of eCompetence in Academic Staff Development (pp. 137-145). Galway: NUI Galway.
Book	Title: Salmon, G. (2003). *E-moderating: The Key to Teaching & Learning Online (2nd Ed.)*. Routledge: London.
Report	McDonald Legg, C. & Mac Labhrainn, I. (2006). *In at the Deep End - Teaching and Learning in the Online Classroom*. Galway: NUI Galway.
Presentation	Mac Labhrainn, I. (2005). *E-moderating Case Study*. Second eCompetence Symposium. Galway: National University of Galway, Ireland.
Website	All Things in Moderation http://www.atimod.com/

The research paper summarises the main aspects of the eModeration course, which CELT has commissioned to Gilly Salmon's training unit. The average group size is reported to be 15 participants per course, with an average dropout of 2-3 learners per cohort. The change in perspective from teacher to student is reported to be the most efficient method to enrich the learning experience of academic teachers in the course and to trigger in addition a process of self-reflection on their teaching method and style.

The eModeration book of Gilly Salmon is cited as general reference for the underlying concept and the methodology used in the courses at NUI Galway. The report of McDonald Legg gives additional insights into the eModeration courses and cites personal experiences of participants from faculty at NUI Galway. The presentation given at the eCompetence symposium states that the external provision of the eModeration courses has also been selected because the local staff development center has had to deal at that time with limited staff and limited local expertise in eLearning. The website of Gilly Salmon gives an overview on the eModeration courses offered by her team as training programme for academic teachers.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

Costs are not detailed, but it has become clear that the total costs for the external contractor are high and that the plans to extend the eModeration course depends partly from the government

funding scheme as external financial resource. Due to cost pressure from the buy-in of the external contractor, successive capacity building for the creation of in-house expertise in eModeration at CELT is foreseen to become more autonomous in the course delivery.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	-
Effectiveness	-

Neither replicability nor effectiveness of the course have been rated.

8.3.6. Training the Trainers - Government Funding Scheme in Ireland

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The Irish government has started an initiative for societal innovation in 2002. The main objectives of this governmental initiative have been presented in the *National Development Plan (NDP)*, which is also the basis for funding a high number of innovative projects in several societal sectors, among them higher education. The Irish *Higher Education Authority (HEA)* is the governmental agent for the distribution of the financial resources of the NDP for the higher education sector. As part of this mandate, the HEA has been providing funding since 2002 to support training programmes for staff (academic, administrative and technical) in higher education. One of the themes, which the HEA identified as important, was the need to develop faculty competence and confidence in the use of ICT in teaching and learning, since new technologies rapidly progress.

The government funding scheme of the Irish Higher Education Agency for academic staff trainings in the use of ICT is a macro-level activity at national level. For the purpose of this study, we have to distinct between the government funding scheme - as centralised policy action at macro-level, and the impact of the funding scheme on eLearning-related staff training activities within Irish universities. What is interesting in the practice for this study, is not in first place the way the Irish HEA has set up the funding programme, but the way in which the funding programme brings the institutional ICT staff training schemes of universities forward. Main purpose of the further analysis of this practice is thus to

understand the impact of the central funding on staff competence development measures in Irish universities.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The HEA is a key policy institution of the Irish higher education sector. The funding scheme is directly targeting the challenge to bring eLearning within universities forward and to increase the use of ICT in higher education teaching and learning. Aim of the funding scheme is to provide universities with the financial resources to implement ICT trainings for academic staff. Target group of these training measures are faculty members in Irish universities. The title 'train the trainers' might be misleading, as it suggests the training of staff developers. But the target group of these trainings are in fact academic teachers.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ provide information ✗ foster positive attitudes ✗ organise educational supplies	✗ increase action readiness

When we take into account the two levels of the practice, the funding scheme and the impact of funding relate to four different types of measures: organisation of educational supplies on the use of ICT in government-funded training courses to faculty; provision of information about and within these courses; fostering of positive attitudes within faculties to become actively engaged into eLearning; and increasing action readiness of faculty members by the call for proposals for training schemes. This call is directed towards the institutional level of the applying universities, but as a policy decision of the HEA to invest into eLearning measures the funding scheme might also increase awareness and interest of faculty members to become engaged into eLearning.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Foster positive attitudes, Increase action readiness	Government funding scheme for higher education innovation	The funding scheme of the HEA - Higher Education Agency aims to support training programmes for academic staff (as well as administrative and technical staff).
Foster positive attitudes	ICT competence development as one key area for funding	One key challenge, which has been identified in the funding scheme, is the need to develop faculty competence and confidence in the use of ICT in teaching and learning in universities.
Organise educational supplies	Training the trainers programme	A yearly call for proposals is published, where all Irish universities are invited to apply for funding of staff training courses.
Organise educational supplies, provide information	Typical format of courses	Faculty ICT training courses, which are funded out of the government grant, usually consist of a series of workshops. Government funding is typically up to 15.000-20.000 EUR per training course for each university.
Organise educational supplies, provide information	Typical learning content of courses	The eLearning staff training courses usually present knowledge on aspects like virtual learning environments, multimedia development, the pedagogy of technology, or computer-aided student assessment.

The main patterns within the government funding scheme can be related to the predicted patterns of the typology of measures in a line of argumentation that descends from macro- to meso-level of the practice. The national funding scheme itself therebycontributes to the creation of awareness and increase of action readiness of faculty to get involved into eLearning as one relevant higher education policy topic in Ireland. The 'train the trainers' programme links the policy goals to concrete implementation of academic staff development measures, assuring this way a financial framework for the institutional organisation of educational supplies on ICT use in teaching and learning in universities. The measures, which are reported to be financed by the train the trainers programme, usually take the form of a series of workshops for faculty members, which are provided by eLearning experts and consultants.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Funding as external eLearning incentive in universi-	Increase action readiness

BENEFIT	RELATED MEASURE(S)
ties High funding levels enable universities to employ professional trainers, and to cover costs for developing, printing and facilitating the workshop programmes and learning contents.	
Funding as additional investment into eLearning The government funding scheme for staff training is a regular source of funding for universities and offers an additional income to the core investments they spend for eLearning.	Increase action readiness
Sharing of knowledge and information Course trainers and participants are encouraged in the train the trainers programme to share the developed materials with additional faculty members in each university.	Foster positive attitudes
Integration into wider staff training schemes The government-funded staff training is frequently integrated in universities with other ongoing faculty development programmes.	Organise educational supplies

Main added value of a funding scheme are the additional financial resources that universities can gain to set up or extend their ICT-related staff development measures. As the train the trainers government grant is a regular source of funding, it provides a sustainable increase of awareness and action readiness on the side of academic staff members and helps universities to organise and enhance their educational supplies for faculties. The design of the courses is largely in responsibility of each single university, whereby the HEA encourages a mutual exchange of materials and experiences between universities.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Organisational flaws in funding management There are significant shifts in the deadline for applications from year to year. Government funding is often provided at a late stage in the academic year and has to be spent by the end of the financial year, so planning and organisation of the training courses is often more complex than it should or needed to be.	Organise educational supplies

SHORTCOMING	RELATED MEASURE(S)
Unclear training evaluation criteria The criteria used in the evaluation process of training programme proposals at governmental level are not transparent. This fuzzy selection process makes it difficult to anticipate within universities, which proposals will be accepted, and which ones rejected for the next funding term.	Increase action readiness Foster positive attitudes

The main shortcomings, which are reported in the practice, relate to the overall regulations and management of the funding scheme by the central authority. The mentioned inconsistencies have a negative impact on the planning of training courses within universities, affect the concrete organisation of educational supplies, and to a lesser degree might also be discouraging for the faculty readiness to get involved into eLearning activities.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Modification of Practice	The government 'train the trainers' funding scheme will continue to run for a number of years. For the next call for proposals, the government grant will be published at one time for several years, rather than the publication of grant proposals for each year be continued. Improvements of recognised funding management flaws are currently taking place. The HEA has been reviewing the evaluation process for training programme proposals in 2005. Aim of this review process has been to develop an improved funding scheme system that takes account of the organisational difficulties which have been reported by the universities.

The future plans for the practice indicate its long-term continuation, which is actually evaluated by a review process and takes into account the main recommendations for improving its impact and efficiency in the Irish universities. The funding scheme has started in 1990, and since 2000 funding is treated as a submeasure of the *Employment and Human Resources Development Operational Programme (EHRD-OP)* of the Irish National Development Plan 2000-2006 (NDP); thereby it embeds the higher education policy goals on eLearning into a national innovation strategy of the country.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

According to the main sources available for this practice. the 'train the trainers' programme continues to be a source of funding for eLearning faculty development of universities at national level.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Mac Labhrainn, I. (2006). **Emoderating: Teaching and Learning in the Online Classroom.** In I. Mac Labhrainn, C. McDonald Legg, D. Schneckenberg, J. Wildt (Eds.), The Challenge of eCompetence in Academic Staff Development (pp. 137-145). Galway: NUI Galway.
Report	Review of Training of Trainers Programme Main findings of the programme review and recommendations for the its future strategic focus.
Website	Training of Trainers Programme http://www.hea.ie/index.cfm/page/sub/id/819 The website of the HEA summarises the main strategic aims of the higher education Training of Trainers Programme.

The paper makes reference to the National Development Plan of Ireland, which includes the training the trainers programme in the higher education funding area. Average funding levels within the train the trainers programme are indicated to be approximately 100.000 - 120.000 EUR per university per year for quality, staff training and teaching-related courses.

The website of the Irish Higher Education Agency summarises the scope and the main objectives of the national funding scheme. The review report gives a comprehensive overview of the complete train the trainers programme and its main policy goals and details the methods used in the review process as well as its main outcomes.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The total costs of the national funding scheme amount to approximately 12.6 million EUR, since the programme has started in 1990. The annual cost for the programme is indicated in the HEA website as at 1.089 million EUR per year.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	1
Effectiveness	4

Since the government funding scheme is a unique Irish national project, the informant has judged it not at all replicable for different contexts. The effectiveness of the national funding programme for faculty development in eLearning is rated high.

8.3.7. Mouse-based tutoring at Open University Netherlands

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The *Mouse-Based Tutoring (MBT)* practice is an in-house training programme for academic staff at the distance education *Open University Netherlands (OUNL)*. In 1997 OUNL has established Studynet, a self-developed institutional electronic learning platform, as container for all study courses offered to distance education students. Following this launch of Studynet, two courses have been developed by OUNL to learn how to use Studynet; one course for students and one for teachers. The course for students is called Mouse-based learning (MBL), while the course for teachers is called Mouse-Based Tutoring (MBT). The MBT course has had 40 runs until the summer 2005 (period of database entry) with about 250 participants in total. With the selection of specific course elements, it is also possible to offer tailor-made courses on MBT to specific target groups of teachers at OUNL.

The MBT courses aim to increase the tutoring skills and methods of faculty in the corporate learning environment at OUNL. The course is an open and free learning choice for all staff members and is classified as institutional measure of OUNL at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	

CHARACTERISTICA OF PRACTICE	YES	NO
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The MBT practice is an in-house training programme for academic and technical staff at OUNL. It is offered to faculty at OUNL to improve the quality of online tutoring in study courses. MBT training courses are internally organised by eLearning experts and all course costs are covered by OUNL. It is a type of direct competence development measure, which includes within the option for participants and course trainers to collaborate and interact on specific problems.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ foster dialogue and collaboration

MBT courses are a direct staff training measure, which fit the types of organisation of educational supplies and fostering consulting support. The exchange of information and experience of participants within and potentially beyond the MBT course frame are classified within the type of fostering dialogue and collaboration.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Organise educational supplies	eTutoring in Studynet as main aim of course	The main course goal is teaching teachers how to practically use the two main functionalities of Studynet, i.e. giving course information and managing a discussion group. In the workshop teachers work on computer assignments and discuss the products of their work.
Organise educational supplies	Faculty of OUNL as target group	MBT is offered to the teaching staff of OUNL on 'Housenet', which is the name for the institutional intranet. Academic teachers subscribe electronically to the workshop part of the MBT course. Each course allows 6 to 7 participants in one run.
Organise educational supplies	Assessment of user proficiency and shift in perspective	Teachers should first have mastered the MBL course as prerequisite to be allowed to the MBT course. Alternatively, academic teachers can prove those

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		basic ICT skills and learning methods taught in the MBL course by passing a computer-based self-test.
Organise educational supplies	Self-study content of course	Each MBT course consists of a 2-days workshop, which is complemented with web-based self-study materials and a printed user guide.

The MBT course has been introduced by OUNL as accompanying staff training measure for the implementation of its virtual learning platform Studynet. It is free for OUNL faculty, but it is not compulsory to participate as teacher. An interesting pattern included in the course design is the obligation for staff to first participate in the MBL course which is targeting OUNL students. Teachers, who participate in the MBL course take the student's role in the learning process within Studynet. The workload for faculty includes participation in the 2-days presence course, to which the amount required to learn with the self-study materials needs to be added. The learning effort required for the self-study part of the MBT course is not specified.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Applied knowledge on eTutoring The MBT course participants consist of two groups, which are faculty members, who act as course tutors in Studynet, and course developers. MBT course participants learn how to set up and maintain a course website and how to set up and manage an electronic discussion group in Studynet.	Organise educational supplies
Exchange of ideas and experiences in course Through the exchange of experiences in the workshop, participants pick up ideas and hints on the use of Studynet in different contexts. Learning content of the MBT course refers not only to the technical features of Studynet, but also includes pedagogical methods and practices for efficient tutoring of student's learning processes. The exchange of experiences and ideas between two categories of participants, technical experts as course developers on one hand and faculty members as course tutors on the other hand, is considered an added benefit of the course.	Foster dialogue and collaboration

The learning experience within the MBT course is reported to be a hands-on approach, directly referring to the specifications of the learning platform of OUNL. The MBT course transmits primarily skills for developing course environments and carrying out tutoring activities in Studynet. Participants like the collaboration and communication options which are given within the MBT course.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Large differences in ICT proficiency of participants In some MBT courses a large variation in computer skills of the participants has been reported. The great differentiation of ICT skills between those participants has caused a negative effect on the productivity of the workshop part of the course.	Organise educational supplies
Courses focus is on technical details, not on pedagogy The informant reports that the MBT courses are more focused on basic technical aspects of Studynet and less on pedagogical issues - such as how to motivate students to participate in virtual discussions and how to e-moderate group activities.	Offer consulting support

The entry assessment for participants is rather unprecise, or the admission to the course is loosely handled, as the variation of expertise on eTutoring knowledge between participants in the same course is reported to be high. The limitation of learning contents to mainly technical aspects is seen as one critical aspect, which does not fit the expectations of faculty at OUNL.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Modification of Practice	The MBT course has been revised. The revision has resulted in the establishment of two distinct courses. An introductory course is focusing on course management basics in Studynet, and an advanced course contains pedagogical methods for eModeration within Studynet. Those academic staff members, who lack basic knowledge in computer skills, are referred to a set of courses which rely upon the European Computer Driving License (ECDL).

As outcome of the evaluation of the MBT courses a differentiation of the course structure has been realised. Faculty members at OUNL can select three course types according to their existing know-

ledge on ICT. The staff training courses remain this way a stable element in OUNL's eLearning implementation.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

The MBT course has been carried out 40 times since its beginnings until summer 2005 (which is the date of the database entry) with about 250 participants in total. A differentiation of the course offering has taken place, and the course will continued to be offered to OUNL staff members. This way, the MBT course is classified as long-term practice.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	De Volder, M. (2006). *The Dutch Digital University: Realising ECompetence via Institutional Cooperation*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 107-112). Galway: CELT, NUI.

The paper outlines the different staff development programmes which have been funded within the Dutch Digital University consortium. The MBT course is not further detailed in the paper. A reference to the Happ-e-Tutor course is included; this is a similar eLearning training course which is offered nation-wide to academic teachers in the Netherlands.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

MBT course costs are not specified in numbers, but add together according to the following cost units: direct course costs consist of the salary costs for the workshop leader and of material costs for the use of a computer room with 7 computers; indirect course costs include wage costs for participants, and opportunity costs for the time spent during face-to-face workshops and for the preparation of the course. All MBT course costs are covered as internal staff training measure by OUNL.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	1

ITEM	VALUE
Effectiveness	4

The replicability of the MBT course is rated as low by the informant. Nonetheless, this type of direct staff training measure might be transferable to similar organisational contexts of universities. The effectiveness of the MBT course has been rated high.

8.3.8. Competence Profiles: An instrument for eCompetence Management

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The '*Professionalisering op maat*' (professionalisation tailored to the organisation) project aims to addresses the challenge that an increasing number of companies and organisations nowadays face when they try to introduce competence management systems for their staff. The project has been funded in 2004-2005 within the framework of the *Dutch Digital University (DU)*, a consortium of ten universities, which have invested an annual budget of 10 million EUR for research on the effective use of ICT on higher education and on ways to increase educational quality in universities. The project has been part of the eLearning expertise funding programme of the DU, whose objective has been to disseminate expertise which has been created in the development and implementation of ICT programmes and courses.

Aim of the project has been to develop a web-based instrument which supports managers in education and human resources when they specify their competence management approach and formulate a staff training policy. The basic requirements for the project have been that the instrument should offer relevant assessment criteria for ICT-driven educational innovation in organisations; it should be feasible for the formulation of a staff training policy for ICT and educational innovation; it should be able to take into account the contextual conditions of organisational innovation; it should be is usable for assessing individual and group competences; and it should be adaptable to facilitate competence management within different organisations and contexts.

The project itself has ended in 2005, but the project product is now accessible as a web-based assessment tool and it is marketed as decision-making service to organisations in ICT change

management processes. In this study, we analyse the impact of the assessment tool on the competence development of faculty in universities. Seen from this perspective, the potential application of the web-based assessment tool in universities is most appropriate classified as a macro-level activity at institutional level of university leadership.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The competence assessment tool has been designed for use in ICT-driven innovation processes in universities. Its main objective is to be an external support tool for the human resources management of universities. Main target groups of the tool are on one hand university managers, who are responsible for eLearning innovation, and on the other hand faculty as the target group, whose competences are assessed. The results of the assessment include tailored training recommendations for individual academic teachers and faculty groups.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ make innovation mandatory

Given the potential application of the instrument in universities, the assessment of competences and training recommendations refer to the types of organising educational supplies and offering consulting support to faculty. The external provision of the tool and the wide implications for realising its recommendations in competence development activities requires a leadership decision inside the university, which is part of the type of making innovation mandatory.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Make innovation mandatory	Inventory of competences and needs analysis	The web-based instrument gives insight into both the available competences and those needed in the field of ICT and educational innovation. Often, only

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		individual competences are taken into account, but educational innovation is always shaped at a group level within teams, departments or faculties.
Organise educational supplies	Individual and group competence assessment in organisation	The instrument uses competence checklists in the fields of ICT and educational innovation. These checklists have been reviewed by educational managers, personnel managers and teachers and subsequently optimised. The instrument has been developed at three levels: first, it provides a set of tools to describe the organisational context of the innovation, in order to be able to take account of the opportunities and threats present when formulating an innovation policy. Knowledge of these opportunities and threats enables a change manager to act on them, thus increasing the chances of a successful innovation. Second, in order to enable the manager to optimally formulate the required policy of staff training, the instrument provides insight into the ICT-related competence profiles of a group. Third, the instrument provides insight into the competence profile of individual group members, which is basis for the formulation of personal development plans.
Not applicable	Accompanying research of instrument	The checklist of eCompetences is the result of an earlier project of the DU (Van der Blij, Boon, Van Lieshout, Schafer & Schrijen, 2002). The checklists of contextual characteristics, group competences and innovation competences are based on literature on innovation, success factors and organisational competences. The instrument contains in addition a manual with background information, hints and references regarding, among other things, ways to formulate policies and measures for staff training.

The assessment instrument has in fact not been applied in practice. So the patterns and processes are reported as experience made with an internal testing of the instrument within the DU project group. A more detailed version of the assessment checklists in the instrument can be found in the article which is given below. Basically, the instrument starts with the assessment of general characteristics of the organisation, continues at the individual level of group members and finally takes into

account the collective competences at group level. It is highlighted in the practice description that the individual competences of faculty include not only technical aspects, but also refer to the educational competences which are necessary to judge and integrate ICT in educational processes. The development of the instrument is reported to be the result of intense research on competence concepts which has been conducted at DU.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Assessment starts with analysis of institutional challenge Describing the innovation and its targets at an early stage provides a clear view of the eCompetences needed within the context. A policy can then be formulated to achieve the required results.	Make innovation mandatory
Assessment includes individual and organisational competences The project presumes that it is fruitful to combine both individual and group competence levels.	Organise educational supplies
Assessment embeds competence analysis into specific context The instrument provides insight into both the innovation and competences needed for an educational innovation within a university. This makes it possible to see the ICT competences in connection with the innovation competences and vice versa.	Make innovation mandatory

The assessment tool aims to combine the individual and group levels of competence and relate them to the context of the organisation. The assessment begins with a clarification of the institutional innovation strategy and its main objectives and aims to provide on this basis a clearer view of the required individual and group competences within the specific organisational context. The tool thus aims to provide insight into both the institutional innovation and the competences needed to get the educational innovation in place.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
No real application outside project context The assessment tool has not been used by any external university.	Not applicable

SHORTCOMING	RELATED MEASURE(S)
More concise checklists and recommendations In the workshops held to date the following improvements have been suggested: shorter and more coherent checklists, the possibility to add competences specific to the own situation and more support for the formulation of an activity plan.	Not applicable

Main shortcoming is that the assessment tool has not been yet been applied in any other context than the project itself. The competence assessment checklists are to extensive to be feasible for external use, and the recommendations given to the customer are too generalised.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Termination of Practice	Future developments (dependent, of course, on continued funding for the project) will be based on feedback from users and their experiences of using the instrument in practice.

The Dutch DU has officially ended as university consortium in January 2007. Its mission and main activities will continue under the directive of the SURF Foundation, which will also take up all DU projects which have been developed. The informant has stated in January 2007 that the *professionalisation* project is probably not continued.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Stalmeier, M. (2006). *eCompetence profiles: an instrument for eCompetence Management*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 37-47). Galway: CELT, NUI.
Research paper	Van der Blij, M., Boon, J., Van Lieshout, H., Schafer, H., & Schrijen, H. (2002). *Competentieprofielen: over schillen en knoppen*. [Competence profiles: educational and ICT competences]. Utrecht: Digitale Universiteit.
Abstract	Boon, J., & Van Lieshout, H. (2004). *Professional development for competent organizations*. In Online Educa Berlin 2004: Book of Abstracts (p. 420). ICWE.
Presentation	Schrijen, Hans (2005). *Professionalisering op maat - een korte*

REFERENCE TYPE	TITLE OF REFERENCE
	rondleiding. Eindhoven: Digitale Universiteit/ Fontys Hogescholen.
Website	*Professionalisering op maat van de organisatie* at the website of the DU: http://www.digiuni.nl

The research paper of Stalmeier describes more in detail the conceptual framework and the main elements of the competence assessment tool. It also outlines the potential application process of the tool within a university. The research paper of Van der Blji et al is an extensive report on studies which have been undertaken within the expertise funding scheme of the DU. Key objective of this funding scheme has been to professionalise faculty and university managers in the area of ICT use and education innovation. A specific focus of the report is the definition of competence profiles at group level.

The presentation gives an overview on the main elements of the assessment instrument; it emphasises the context of innovation as starting point of the process, which is followed by the assessment of group and individual competence profiles, before a development and activity plan is given as final result of the application of the instrument.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The project costs for research and development of the web tool have been covered by the eLearning expertise funding scheme of the DU.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	3

The indicated replicability and effectiveness rely on the self-assessment of the informant on the potential use of the competence assessment instrument in other universities, which aim to foster eLearning in their educational processes.

8.3.9. Innovatic: Integration of ICT tools in Teaching at Universitat Autònoma de Barcelona (UAB)

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	**Meso-Level**	Micro-Level

CONTEXT	International/ National	Institutional	**Faculty/** Department	Study Course	Individual

The *UAB - Universitat Autònoma de Barcelona* has in the last years taken several steps to increase the use of ICT by its teaching staff. Several central support services of the university - like the *Oficina Autònoma Interactiva Docent*, (UAB's Interactive Teaching Office), the *Computer Service* and the *Educational Applications Service* have been involved to inform faculty on the potential of ICT for teaching and to support them in the design and application of new technologies in courses. Next to the objective to motivate faculty for eLearning, students are required to build up ICT skills at UAB. All new students of the university have to pass a mandatory course on ICT use in their first study year. UAB has also invested heavily into the technical infrastructure and supplied all classrooms with computers and web access. The Innovatic project is part of the university's efforts to promote ICT and addresses the problem that to date only a minority of teachers use ICT tools as part of their teaching practice. It is situated at meso-level of the university, taking place within the *Faculty of Education*.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The Innovatic project is situated in the Faculty of Education of the UAB and aims to support teachers in the use of ICT in their study courses. The practice responds to the institutional aim of the UAB to realise a bimodal pedagogical model for its curricula, which strives to deliver study courses not only in the classroom, but to move towards a mixed mode of teaching and learning and to increase the use of the virtual campus, the online learning environment of UAB. The target group of the Innovatic project are academic teachers of the Faculty of Education of UAB.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ offer consulting support	✗ foster dialogue and collaboration

The Innovatic project is based on the regular meeting and exchange of experience of a group of academic teachers at the Faculty of Education of UAB, who are committed to improve the quality of teaching and the portfolio of study courses through an efficient use of ICT. This characterisation classifies the Innovatic project as a typical community of practice at faculty level - the Innovatic group members interact with each other and exchange practices in the specific domain of the use of ICT in teaching and learning processes (see CoP definition in chapter 7.3.1. of this study). Next to the type of measure of fostering dialogue and collaboration, the practice is classified as part of the offering of educational support, as Innovatic includes the establishment of a permanent eLearning support unit at the Faculty of Education.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Offer consulting support	Efficient use of ICT in courses as aim of practice	Aim of the Innovatic project is to support teachers to make a better use of ICT in the different courses of the faculty of education.
Foster dialogue and collaboration	CoP as format of Innovatic project	Innovatic can be seen as a community of practice, where a group of teachers of different departments are voluntarily involved in the project activities. The project has started in 2003. The group members usually meet at least once per month.
Foster dialogue and collaboration	Discussion and exchange of experiences as main activities	The project group is discussing new eLearning activities, utilities and technological applications, and ways to foster interdisciplinary teaching projects; group members share good practices on the use of ICT and develop teaching models and orientations for their professional careers.
Offer consulting support	From theory to practice - eLearning support unit to improve knowledge transfer	To support the group members in applying new teaching concepts, the project has hired two ICT experts to give technological support on demand. This support is used for technical tasks - like elaboration of web quests, internet search of web pages or information for courses of project group members, preparation of presentations etc.

The group members of the Innovatic project aim to make a better and more sustainable use of ICT within their direct work context, which are the study courses at the Faculty of Education. They participate in regular meetings on a voluntary basis, without receiving explicit external reward or a high level of institutional support. The practice is a member-driven activity, which takes place as an interactive and communicative discourse between peers within the same domain. The main discussion topics of the project focus on pedagogical issues in the use of ICT. The technical expertise is bought into the project in form of a local faculty support unit.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Exchange of experience within CoP The regular meetings of the Innovatic project are an opportunity for group members to share practices and motivations and to discuss and analyse activities. The exchange of mutual experience and the availability of the technical support unit are reported to improve the relationship between pedagogical concepts for eLearning and in the teaching practice of participants of Innovatic.	Foster dialogue and collaboration
Documentation and dissemination of innovative teaching practices The group members have documented their new teaching practices on digital "best practice cards" to their colleagues; those documentations are freely accessible in the intranet of UAB.	Foster dialogue and collaboration
Contribution to faculty engagement for eLearning The project group contributes with its work to the promotion of teaching innovation within the faculty of education. Some group members have enrolled in additional ICT training courses or decided to participate in the post-graduate degree for new technologies in education, which has been established at UAB.	Foster dialogue and collaboration

Main added value of the Innovatic project is its format as community of practice, which provides an efficient framework for collaboration and learning. The involved group members work in the same domain of educational sciences, they understand and respect each others position in the discussion, they are intrinsically motivated to get involved into eLearning issues, and they deliberately share information and exchange expertise. The group model of the community of practice seems to be a coherent approach for the mutual learning processes of faculty members.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Scarcity of resources for project The initial Innovatic project is open to only about 20 teachers within the Faculty of Education. This is a severe limitation in size.	Foster dialogue and collaboration
Limited impact of practice in whole university The informants of the practice acknowledge that more teachers need to be involved in order to improve the quality of teaching at UAB through an increased use of ICT in study courses.	Foster dialogue and collaboration

The main strength of the Innovatic projects is on the other side its main weakness. The total group size is small and the overall impact of the practice on the teaching model and activities at UAB remains marginal. Due to the location of the project within the domain of educational sciences, the scalability of Innovatic into other science domains is improbable. But the Innovatic project could serve as a blueprint for the establishment of additional eLearning CoP's in other faculties at UAB.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Continuation of Practice	The technical support staff of the Innovatic project has been hired by the Faculty of Education and is now acting as permanent eLearning support unit for the faculty. The two experts are available as eLearning support for any of the 250 teachers total in the Faculty of Education to facilitate the use of ICT in the classroom. The impact of the Innovatic project and the ICT faculty support unit on the teaching practice of teachers and the learning process of students is currently assessed by an informal evaluation.

Given the permanent integration of the support unit into the Faculty of Education and the evaluation efforts made, chances are that the practice will continue. It remains to be seen, if group members are able to uphold their personal level of engagement for the Innovatic project without further institutional support or eLearning incentives.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Assessing the circumstances of Innovatic, the practice is classified as a medium-term activity with the potential to continue as a long-term activity, given the level of motivation of participants remains high.

Table: Other References of Practice

REFERENCE TYPE	TITLE OF REFERENCE
Research Paper	Tomàs, M., Feixas, M., Armegol, C., Yabar, J.M. (2006). *ECompetence at the Universitat Autónoma de Barcelona (UAB): A Context Analysis*. In I. Mac Labhrainn, C. McDonald Legg, D. Schneckenberg, J. Wildt (Eds.), The Challenge of eCompetence in Academic Staff Development (pp. 75-89). Galway: NUI Galway.
Website	Innova TIC - The new information and communication technologies as part of the transformation of the faculty (translation by author). http://dewey.uab.es/innovatic/
Website	Oficina Autònoma Interactiva Docent http://www.oaid.uab.es/

The paper of Tomàs et al outlines the main institutional endeavours which UAB undertakes to implement technology-based teaching and learning into its work processes. With reference to the Innovatic project, the paper details the important role of the Oficina Autònoma Interactiva Docent as central eLearning support unit at management level of the university and explicates more in detail the aspired bimodal learning model as pedagogical objective within the study courses at UAB.

The website of the Innovatic project offers a range of information on the project scope, its objectives, its methodology and activities which have been undertaken. The involved faculty is presented, and the main results are described. The whole website is only available in Catalan language, as well as the website of the Oficina Autònoma Interactiva Docent, the Interactive Teaching Office of the UAB. Main objective of this central support institute is to promote the application of new information and communication technologies within the teaching of the UAB professorate. The website presents the aims of the institute and illustrates the bimodal teaching model of the UAB, which is comparable to the blended learning model in eLearning. The whole website is available in Catalan language only.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The staff costs for the two support experts of the faculty eLearning unit are calculated in the practice description as 1200 to 1500 EUR per person, which amounts to a maximum of 3000 EUR staff costs

total. These numbers do not include social security costs of the employer. No further costs items for the practice are reported.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	5

Both replicability and effectiveness of the Innovatic project have been rated high. From the informants point of view, the constitution of a faculty-based community of practice, which includes a local support unit, is a promising way to get faculty members within universities engaged in a more extensive use of ICT in teaching and learning.

8.3.10. BREVIA - Library of Virtual Resources for Self-Study at UAB

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

BREVIA is the acronym for *Biblioteca de Recursos Virtuales para el Autoaprendizaje*, which translates as library of virtual resources for self-study. The BREVIA project is part of the wider innovation strategy of UAB - *Universitat Autònoma de Barcelona*. This wider innovation strategy is planned and executed by a central organisation unit called IDES - *Unitat d' Innovació Docent en Educació Superior*, which translates as Unit for Innovative Faculty in Higher Education. The BREVIA project coordination is located in the *Departament de Pedagogia Aplicada, Area de Didàctica i d'Organització Educativa*, which translates as the Department of Applied Pedagogy, area of didactics and educational organisation.

The project aims to contribute to a high quality of learning and to support autonomous learning of UAB's students. The BREVIA project produces a web repository which stores learning materials used in the study courses at UAB. These online accessible learning materials are selected by a teacher commission for every discipline which offers study courses in the university. As BREVIA is a centralised service offered to all faculties at UAB, it is classified as an institutional measure at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

Main target group of the BREVIA project are UAB's students. They are supported in their learning activities with the web repository, where they easily access relevant learning material which is used in study courses. Faculty is actively involved in the creation of the web repository. Each department at UAB is responsible for selecting the learning material which is stored within the web repository as complementary information for the lectures given in a study course. The faculty is thus actively engaged and partly responsible for the development of the web repository.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- INDIRECT MEASURES --
✗ establish learner-activating quality development ✗ make innovation mandatory

The BREVIA project is an important element in UAB's strategy to foster a learner-centered pedagogical model. The project development demands and requires an active engagement and a process ownership of faculty in the construction of the web repository. And is is backed by the active participation and involvement of university leadership management in the steering committees of the BREVIA project. Therefore, it is classified as an indirect competence development measure, which relates to the type of making innovation mandatory. BREVIA is also part of the institutional strategy to improve the quality of learning at UAB, which includes a curricula re-design, definition of learning outcomes, and a reflection of faculty on teaching models. These processes relate to the type of measure of establishing a learner-activating quality development.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Make innovation mandatory	Concept of BREVIA as tool to support autonomy of learners	The main aims of the project relate to the institutional goal of UAB to support the learner autonomy of students and to improve the quality of the learning environment.

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
establish learner-activating quality development	BREVIA as tailored web repository for study courses	BREVIA is a dynamic web repository, which allows to store learning materials used in the study courses at UAB. It is accessible for all students via the UAB intranet.
establish learner-activating quality development	Relevance of learning material in BREVIA	The learning materials stored in BREVIA are relevant as information sources for each study course. The structure of the web repository provides the following categories for learning materials: glossaries; reference texts like manuals and dossiers; selected research articles; links to relevant web journals; case- and problem-based tasks; video- and audio files; animations; data bases; laboratory tasks; lecture notes; bibliographies; and additional thematic web links. All resources included should be actively used by academic teachers in study courses.
establish learner-activating quality development	BREVIA as trigger for reflection of faculty on teaching models	The complementary side of the learner-centered learning model and the implementation of BREVIA is the necessity of faculty to think about ways to bring the aspired model of learner-centred learning into practice. Academic teachers need to reflect on ways to support student learning; they need to specify competence profiles in different knowledge fields; they need to organise learning materials according to the BREVIA criteria of categorisation; and they need to provide working guides, problem-based learning tasks, an so on for inclusion in the web repository.
Make innovation mandatory	Involvement and responsibility of faculty	All learning resources are selected by a teacher commission for every knowledge field within the different faculties at UAB. The teacher commissions are selected within each faculty, and they are responsible for pre-selecting the learning materials, which are stored in BREVIA. The preselection of learning materials is evaluated within each faculty before these are approved to pass in the web resource.
Make innovation mandatory	Leadership involvement and support for BREVIA	The whole faculty involvement at UAB is steered by a proposing commission (*Commissió Impulsora)*, which is chaired by the Vice-Rector for Academic Affairs

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		and includes senior management people from faculties and central support units. The execution of the BREVIA project is assigned to an executive commission (*Commissió executiva*), which unites the central support units IDES, OAID - Oficina Autònoma Interactiva Docent, the library and the information service.

The most striking characteristic of the BREVIA project is that it does not include in itself any direct training for faculty on ICT knowledge. BREVIA's potential to foster competence development of involved staff is not evident at first sight. But the degree of involvement and process-ownership of faculty in the whole framework of BREVIA, combined with the strong and active leadership contribution, which is not taking place in terms of money, but in terms of giving a stimulus and steering the selection processes of learning materials, make it an interesting practice of staff competence development. BREVIA is mainly made possible by the strong institutional commitment of UAB to move towards a learner-centered model, which manifests itself in the establishment of central support units like the IDES or the OAID.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Promotion of a learner-centered learning model The BREVIA project is designed to facilitate autonomous learning and to promote a more active learning at UAB. It is one element in the institutional strategy of UAB of shift the pedagogical model towards a more learner-centered model.	Establish learner-activating quality development
Responsibility and active engagement of faculty By its inherent structure, the BREVIA web repository asks faculty to design and deliver learning materials, which support and facilitate student learning in study courses through cases, situations and problems. It also includes a definition of basic competencies within the main knowledge fields and degrees offered at UAB; these competence profiles, which define the learning outcomes of students in course units, are part of the conceptual responsibility of faculty for the project.	Make innovation mandatory

The main benefit of the BREVIA approach is the high degree of process-ownership which faculty takes in the project development. This responsibility of faculty, to decide upon and to select adequate learning resources for the web repository, is complemented with the institutional commitment to foster a learner-centered learning model.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Complexity of collective selection process of learning materials The selection of learning materials for the web repository requires an agreement among academic teachers in each knowledge field. The informant of the practice concedes that it is often difficult to achieve the necessary agreement of involved faculty for selected learning materials.	Make innovation mandatory
Lack of project evaluation As the BREVIA project has been at the time of its submission to the database in its initial phase, the informant states that no evaluation implementation has taken place at this given moment. There is a lack of experience on the project processes and impact.	Establish learner-activating quality development

The process-ownership of faculty in the project has also its dysfunctional side, which is the inertia of consensual decision-making in academic committees, when they select learning materials for the repository. This consensual process is reported to be painstaking and takes too much time.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Continuation of Practice	The BREVIA web repository is continuously enlarged to serve additional study courses of UAB. A first evaluation is planned to be carried out through surveys and interviews with students as the target group which is using learning materials in the web repository.

Judging the commitment of UAB to move forward in pedagogical innovation and to empower students as learners, chances are that BREVIA remains on the innovation agenda and becomes a long-term practice. It remains to be seen, if the complex consensual decision-making process of faculty on

the learning content for web repository can be organised in a more efficient way without diminishing the process-ownership of academic teachers.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Based on the reported commitment of UAB to invest in innovative pedagogical models and its quality of study courses and the role BREVIA is playing in these goals, the practice is classified as long-term activity.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Strategy paper	IDES (2004). *Projecte BREVIA. Biblioteca de recursos virtuals per l'auto-aprenentatge UAB*. Barcelona: UAB.
Website	BREVIA: Biblioteca de recursos virtuals per l'autoaprenentage http://magno.uab.es/ides/docencia/docencia6.htm
Website	IDES - Unitat d' Innovació Docent en Educació Superior http://magno.uab.es/ides/ides.htm

The internal strategy paper summarises the conceptual framework for BREVIA and subsequently details the main implementation steps foreseen to put the web repository of learning materials into practice. The conceptual part of the paper describes BREVIA as one instrument within the overall strategy goal of UAB to improve the quality of learning and to foster the model of self-directed learning. The new learning model is based on pedagogical policy goals for autonomous learning, which are outlined in the ECTS - European Credit Transfer System. The ECTS describes autonomous learning of students as an important activity, which should be assessed and given credits in study courses. Main goal of the BREVIA web repository is to foster this autonomous learning of students.

The website of the Unit for Innovative Faculty in Higher Education of the UAB. Mission presents the main objective of this central unit as "...millorar les possibilitats i els contextos d'aprenentatge de tot l'alumnat de la UAB, dins l'àmbit específic de la globalitat de l'acció docent, individual i d'equip", which translates as 'to improve the learning possibilities and contexts for all alumni of the UAB, within the specific context of the sum of individual and group activities of faculty'. IDES has defined four key action fields for its activities, which are: to design the curricula structure to the bachelor - master model; to offer pedagogical support to the faculty; to offer pedagogical support to the students; and to accredit the study courses of UAB. Both websites are available in Catalan language only.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The reported costs are moderate, without being detailed further. Costs are covered internally by UAB.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	5
Effectiveness	5

Both items are rated with the highest indicator. The positive judgement of the informant for the transferability of the BREVIA concept to other universities might be treated with caution, as not many universities are committed to learning quality in the same way as UAB is committed to this issue.

8.3.11. Portal for Online Pedagogy at Universitetet i Oslo

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The portal for online pedagogy of the *Universitetet i Oslo* (UiO) is a project that has started with the Bologna implementation in the Norway Higher education system. In 2003, the higher education institutions in Norway have been subject to a major reform to implement the Bologna process. Among the issues for change, the reform wanted to shift higher education from a teacher-centred to a student-centred approach by using formative assessment methods in study courses. UiO reacted to the reform challenge with the definition of an institutional strategy to introduce and foster a model of flexible learning for all faculties, in which eLearning should play a considerable part.

Looking for ways to facilitate eLearning with limited resources, the administration at UiO made some funds for projects available in 2003, which experiment with innovative pedagogical approaches in study courses. Amongst other things, the university provided funding for the establishment of an online portal to promote ICT as a means in its education innovation. The *Department for Continuing and Distance Education* at the Faculty of Theology was asked to design a *portal for online pedagogy*,

which serves faculty as an extended online tool-box for eLearning. Based on this background information, the practice is classified as an institutional approach at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The portal for online pedagogy is one means of UiO to adapt to the Bologna reform objectives, in particular to shift to a learner-centered pedagogy. The university has defined an institutional strategy to implement flexible learning in 2002. The use of ICT in teaching and learning is considered as helpful to realise the strategy plan for education innovation. The portal for online pedagogy is addressing professorate and tutors of all faculties at UiO.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ provide information ✗ offer consulting support	✗ make innovation mandatory

The portal for online pedagogy is one milestone in the efforts of UiO to establish a model of flexible learning. UIO has made a collective effort to define a common model for flexible learning, which involves the deans of all faculties, who regularly meet in a steering committee that defines specific actions to be taken. UiO has allocated 15 million kronen (around 2 mill EUR) to implement the flexible learning model at all levels of the university. Continued funding is provided for the online pedagogy portal. This institutional commitment of UiO's leadership to establish a flexible learning model and to consider eLearning as part of this goal fits into the type of measure of making innovation mandatory.

The portal can be seen as central eLearning information service for faculty at UiO. The Department for Continuing and Distance Education has extended the scope of the portal from serving primarily the Faculty of Theology in 2003 to serving all faculties in 2005. In addition to the portal service, the Department for Continuing Education offers on-demand direct eLearning consultation support to faculty. Based on these functions, the portal is classified as an institutional means to provide information on eLearning at UiO, and the additional services of the department to faculty fit into the type of measure of offering consulting support.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Make innovation mandatory	Establishment of flexible learning model at UiO	In institutional leadership perspective, the portal for online pedagogy is a means to realise the flexible learning model at UiO.
Provide information	ICT skills, eLearning resources and flexible learning as main objectives of portal	Specific challenges, which the portal for online pedagogy aims to address, are: the need of faculty to acquire new pedagogical and technical skills; the problem of a shortage of eLearning resources at that time; and the lack of motivation among faculty and students to adapt to the new learning modes in the flexible learning model of the university.
Provide information	eLearning skills and knowledge as main provision of portal	The portal provides a repository of information on eLearning to faculty members at UiO. The main parts of the portal are: introduction to e-learning, LMS tips, online discussion forums, and a tool-box for teaching online. The learning contents within the portal consist of practice-oriented information on teaching skills in online learning environments and digital literacy.
Offer consulting support	Additional direct consultation to faculty	As complementary activity the Department for Continuing and Distance Education offers personal eLearning support to faculty members. The informant of the practice reports that this kind of personal attention is an important motivational factor for faculty to experiment with eLearning tools.

One key characteristic of the online pedagogy portal is its role as a tool for the establishment of a culture of flexible learning at UiO. The university has defined an institutional approach to foster a specific learning model for its study courses. The portal offers information on eLearning to faculty at UiO. The information is structured as a tool-box, aiming to provide staff with practice-oriented information, which directly refers to the LMS of UiO. The portal is connected to additional eLearning and pedagogical projects, which are embedded into the institutional plan of UiO to establish flexible learning. The reported practice indicates that the portal by itself is not a sufficient measure to motivate academic teachers for eLearning, as they often demand a more personal support in form of direct consultation.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Online information resource The portal for online pedagogy is an approach to provide online just-in-time eLearning information for academic teachers.	Provide information
Customised support for different expertise levels The learning resources in the portal address both eLearning beginners and experts.	Provide information
Practice-oriented small learning contents increase The learning materials of the portal consist of information on topics like teaching skills for a flexible, technology-based learning model and digital literacy.	Provide information
Toolbox for LMS use is a popular learning recourse for faculty In particular the tool-box for online teaching and the section on ways to use forums in online teaching have been received well by faculty. The tool-box contains learning materials, which relate to the learning management system of the university, like a digital cookbook introducing to the LMS, tips and tricks for course management in the LMS, information on online discussion forums, eTutoring and eModeration methods, and good practices.	Provide information

As the portal is basically a self-study web repository for faculty, its 24/7 availability is a given benefit. But the informant has stated in the practice description that the provided learning materials are not used by faculty without additional motivation by the Department for Continuing Education. The learning resources are tailored to the specific eLearning context of UiO, providing simple and direct help for practical problems. The usability of the portal is reported to be high by concentrating on the eLearning information which is really relevant for UiO staff. In the experience made so far, the tool-box format has proved to be an attractive container for learning materials.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Portal solution as potential threshold for eLearning newcomers in faculty The portal is reported to be a threshold by lecturers	Provide information, offer consulting support

SHORTCOMING	RELATED MEASURE(S)
with the greatest need for digital competency. In particular those lecturers, who are starting to provide online support for their teaching, are those most in need of digital competency. It has become evident that this group highly prefers personal support to online support on eLearning issues.	

The portal in itself is reported to be not sufficient to get faculty involved into eLearning. While it may be an adequate resource for academic teachers, who have already made some experience in eLearning, the newcomers request in the case of UiO more direct and personalised support.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Extension of Practice	The portal has been expanded with new tips, methods and tutorials. The portal and the contained tools and learning resources have been extended to the whole university in early 2005. During 2006, a collection of materials for case-based teaching have been added, using mind-map technology.

The portal has made a continuous development since its production in 2003. It has evolved from a faculty-based resource in theology to a university-wide eLearning information resource for all faculties and steadily aims to widen its eLearning topics and services.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

If the portal remains to be regarded as an efficient tool in the strategy of UiO to establish a flexible learning culture, its future funding and long-term continuation seems likely.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Koch, S. (2005). *Digital Literacy and new teaching skills for university lecturers going online*. In A. Szüks & I. Bo (Eds.), Lifelong E-Learning (pp. 419-423). Helsinki: European Distance and E- Learning Network.
Strategy paper	UiO (2002). *Fleksibel Læring ved Universitetet i Oslo - Strategisk*

REFERENCE TYPE	TITLE OF REFERENCE
	Plan 2003-2007. Oslo: UiO.
Website	Prosjektet Nettpedagogisk portal http://www.tf.uio.no/nettlaering/portal.html

The strategy paper of UiO describes the model for flexible learning, which includes the use of eLearning. ICT is seen as a means which helps to establish a flexible learning culture and to bring UiO into a leading position among innovative universities in the field of educational services. The strategy paper lists the main actors, which are involved from each faculty and from the university administration in this change process, it introduces the main pedagogical policy goals of the Bologna reform and the concept of flexible learning, and it details the measures which will be funded to realise the educational shift towards flexible learning in all study courses of UiO.

The paper presents in detail the evolution and the main elements of the portal for online pedagogy at UiO. The website is the entry page of the online pedagogy portal. All information on the website is in Norwegian language only.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The informants indicated a sum of 40.000 EUR as total costs for initial funding for the project that has developed the portal, including human resources, workshops, and web design. Continued funding is foreseen from the UiO institutional funding scheme for the implementation of the flexible learning model. The maintenance and update costs of the portal are covered as an internal project by UiO's funding scheme for the flexible learning strategy.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	5

Both replicability and effectiveness of the portal approach are rated high, illustrating the informant's standpoint that an institutional portal for online pedagogy is an efficient information resource for faculty at UiO, which can be applied in other universities as well.

8.3.12. Day of New Media at Universität Graz

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The *University of Graz* is a traditional, large-size higher education institution covering all major science disciplines. Until 2001, eLearning had not been on the official agenda of the university as organisation, but remained an interest of individual faculty members. The use of ICT for educational purposes started in a number of small bottom-up eLearning projects at faculty or department levels. The number of faculty members, which had gained experience with eLearning, was unknown at that time.

In 2001, the university management realised that it needed to strategically act to increase the use of ICT in teaching and learning. A *Steering Group for New Media* (Projektgruppe Neue Medien) has been established, which includes representatives from all faculties of the university. The steering group has been chaired by the *Vice-Rector for Studies, Teaching and Personnel Development* of the university, who is also assigned as responsible actor at management level for the whole area of eLearning. The steering committee started with an inventory of eLearning activities which had so far been undertaken within the university. Main objective of the committee has been to develop an eLearning strategy for the university, taking into account the evolving disperse eLearning projects. These efforts of the committee have been subsumed within a strategy paper on the use of new media in teaching and learning, which was published in late 2002. To make the decentralised projects and eLearning activities of faculty members visible to the whole university, and to bring the topic on the internal agenda, the idea for a Day of New Media was developed. Based on this background information, the Day of New Media is classified as an institutional approach taken at macro-level of the university.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The Day of New Media is a strategic event of the Universität Graz to raise awareness of faculty on the potential of ICT for improving the quality of educational services offered to students. Although it is an open event for the general public, the Day of New Media primarily targets those faculty members who might be interested in eLearning, but have not yet taken the decision to actively apply ICT in their own teaching activities. The Day of New Media is a centralised organised event of the university and falls within the responsibility of the Vice-Rector for Studies, Teaching and Personnel Development of Universität Graz.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ provide information ✗ foster positive attitudes	✗ foster dialogue and collaboration

The Day of New Media serves mainly two functions: it is a broadcasting event, which targets the faculty group of early adopters, informs about eLearning and promotes the potential of ICT as a tool to improve the quality in teaching and learning at Universität Graz; and the event itself gives its participants an opportunity to network and collaborate with each other on eLearning. These two functions of the Day of New Media are classified within the direct types of measures of fostering positive attitudes, providing information and the indirect type of measure of fostering dialogue and collaboration.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Foster positive attitudes, provide information	Open market as format of day of new media	The Day of New Media of the Universität Graz has been launched for the first time in 2002. The Day of New Media works like a trade fair or an exhibition. It offers all eLearning actors the opportunity to present their projects and activities at the Universität Graz. The event allows a wide range of different formats for presentation and debate, like poster-sessions, workshops, expert presentations, etc.
Foster positive attitudes, foster dialogue and collaboration	Main aim is to increase use of eLearning in faculty	The general aim of the Day of New Media is to raise the interest for eLearning at the Universität Graz and in consequence to involve more faculty members in the use of ICT in educational activities. A range of networking activities have taken place at the event.
Foster positive attitudes, provide informa-	Early adopters as main faculty target group	The main target groups have been early adopters among faculty members and support units like the centre for information services, but the event was

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
tion		open for all members of the university and for colleagues from other Austrian universities.

The Day of New Media can be seen as a means of the steering committee for the use of new media in teaching to get a clearer picture on the disperse eLearning activities at Universität Graz and to make an inventory of eLearning activities and projects at faculty and department levels. At the same time, the Day of New Media targets as institutional event the attitudinal level of faculty on eLearning by emphasising the value of eLearning as strategic element in the quality improvement of study courses at Universität Graz. The efforts taken to organise the event are reported to be high and the potential success depends to a large degree on follow-up activities and networking to make the event a lasting impression for faculty.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Estabish eLearning as policy goal of university management Among the benefits of the Day of New Media have been the establishment of eLearning on the agenda of the university and the use of ICT in teaching and learning as a desirable policy goal. The public visibility of eLearning activities and the support of the university management have contributed to this evolution.	Foster positive attitudes
Inventory of ongoing eLearning projects and activities The event is described in the practice as a kind of stock-taking activity: it has become more visible for the university management how many and what kind of eLearning activities have evolved at Universität Graz.	Provide information
Community building around the topic of eLearning The event has fostered community building around the topic of eLearning; actors have been able to get to know each other, received public recognition for their work and improved their networking. Faculty members have been able to discuss with and to learn from their peers.	Foster dialogue and collaboration
Marketing event for central support services	Provide information

BENEFIT	RELATED MEASURE(S)
involved in eLearning Faculty members could gain a better knowledge about the range of services offered by support units for the implementation of eLearning projects and activities at faculty level.	

The event character of the Day of New Media makes it a lively measure to raise awareness on eLearning, if it is well planned and carried out. It is reported to have made eLearning at Universität Graz more visible, showing the commitment of the main actors involved and attracting faculty to inform themselves and to discuss with each other. It has given a platform to the current eLearning actors, and the support of university leadership raises eLearning as topic on the agenda of the university. The individual involvement of the eLearning actors in the planning and organisation of the Day of New Media are considered to have largely contributed to the success of the event.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Lack of sufficient impact on majority of faculty and students While the Day of New Media 2003 has addressed pioneers and early adopters in the field of eLearning, it has been not equally successful to attract less experienced faculty or students in general.	Foster positive attitudes, provide information

Despite the effort taken by the Universität Graz in the organisation of the Day of New Media, the reported experience with the faculty majority proves how hard it is to get eLearning on their agenda. An event like the Day of New Media alone does not provide sufficient motivational input to get the majority of faculty members on board of eLearning and needs to be flanked with additional measures, which have a more continuous character.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Extension of Practice	The Day of New Media has become an annual event at the University of Graz. At the time of the report given (in 2005), the organisers have been considering ways to gradually transform the mission of the event from a networking meeting for pioneers and specialists to an event of general interest for the majority of faculty members,

FUTURE PLANS	DESCRIPTION OF PLANS
	e.g. by setting up competitions and prices for the best eLearning projects. In addition to its internal evolution, the Day of New Media is reported to have become a blueprint for similar initiatives at other Austrian universities.

The reported extension complements the Day of New Media with additional measures that might increase the impact of the efforts the Universität Graz undertakes to promote the use of ICT in teaching and learning. The foreseen public reward for best practices and the establishment of prices for the effective use of eLearning might have an influence on the action readiness of faculty at Universität Graz to become more actively involved into eLearning.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Starting for the first time in 2002, the Day of New Media at the Universität Graz is annually repeated. Given its role as internal eLearning broadcasting event at Universität Graz and its adaption by other Austrian universities, the event is likely to be continued and is classified as a long-term practice.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Strategy paper	Projektgruppe Neue Medien in der Lehre (2002). *Policy Statement für den Einsatz Neuer Medien für die Lehre und das Lernen*. Graz: Universität Graz.
Website	Portal Neue Medien http://www.kfunigraz.ac.at/neuemedien/

The policy statement of the steering committee for the use of ICT in teaching and learning of the Universität Graz outlines the main objectives of the committee work, summarises the current conditions for eLearning within the institution in 2002, and foresights the structural innovations which are necessary to make eLearning a success. The main objectives given for the use of ICT are to improve the quality of teaching and learning, and to establish modern and connected work modes at the Universität Graz. The report states that conditions in 2002 have been a good starting position for the university, defines roles and responsibilities for eLearning between the involved actors and outlines key areas for change. The structural innovation part of the report outlines the changing role of faculty in teaching processes and discusses an incentive system for academic teachers to increase the use of ICT in the study courses of the university.

The portal site of new media at the Universität Graz contains various sections which include the policy statement of the Vice-Rector for Studies, Teaching and Personnel Development. The site presents ongoing eLearning projects and news at Universität Graz, links to the central support units and to the two central learning management systems (Web-CT and eLS), offers advice on a range of ICT tools, and informs about staff development courses on eLearning.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

An event of the size like the Day of New Media can not not be organised on a voluntary base. The Unit for Teaching Development (Stabsstelle für Lehrentwicklung), which reports to the Vice-Rector for Studies, Teaching and Personnel Development, has taken responsibility for the event and invests several weeks of work to organise it in close cooperation with the Center for Information Services. Although no detailed number for costs are given, the Day of New Media is likely to be a cost-intense event. This is due to its size and the considerable amount of work needed for preparing and organising the Day of New Media as institution-wide marketplace. Adding to the direct costs of the organisation staff are indirect costs of all faculty members and central support unit staff that attend the day-long event. All in all, the Day of New Media is a considerable internal investment of Universität Graz for eLearning.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	4

Both replicability and effectiveness are rated high, indicating the respondents assessment that the Day of New Media at Universität Graz could be a good practice which is transferable to similar higher education institutions. In fact, the practice has been taken as blueprint for similar events in other Austrian universities.

8.3.13. eCompetence Initiative Universität Dortmund: A Qualification Network for Academic Staff

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	**Faculty/ Department**	Study Course	Individual

The eLearning activities at *Universität Dortmund* have been realised in decentralised projects located at department or study course level. The majority of these decentralised projects have been externally funded by the national eLearning grant of the *German Federal Ministry of Education and Research* (BMBF). Funding for most of eLearning projects at Universistät Dortmund has ended in 2005. The projects have not initiated a major shift towards a strategic use of ICT at the Universität Dortmund.

The minor impact of these decentralised eLearning projects on the teaching culture of the Universität Dortmund is caused by a combination of unfavourable factors: funded projects were often too small in terms of manpower and resources to have a broadcast effect above the specific study course or department where they have been hosted; developed concepts and prototypes only work in the specific study course context and have not been transferred to other study courses in the whole university; cooperation and synergy activities between single projects have not occurred; the university management has not taken any active role or clear position related to eLearning; and there has been no institutional eLearning strategy for the university, no coordinated innovation and change management. Despite these unfavourable institutional conditions, the Center for Research on Higher Education and Faculty Development of Universität Dortmund has decided in 2003 to set up the *eCompetence Initiative* as network of eLearning actors. In addition, the Media Center of Universität Dortmund has provided an eLearning funding programme for faculty members, who like to test some ICT element in their study courses. As the initiative has been basically working without leadership support, the practice is classified as a meso-level activity at faculty or department level of the main involved network members.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The eCompetence Initiative of Universität Dortmund is a network which aims to connect a number of disparate eLearning projects and actors at Universität Dortmund. The initiative has been initiated to address the problem that the university has not developed an institutional strategy on eLearning, and that the projects mainly have worked and created impact within their local study courses and departments.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies	✗ increase action readiness ✗ foster dialogue and collaboration

The eCompetence Initiative is addressing two main challenges, which are: to break up the isolated status of the local eLearning projects at department or study course levels; and to initiate a number of qualification workshops for faculty at Universität Dortmund. The network function of the initiative fits into the type of measure of fostering dialogue and collaboration. The workshops of the initiative as well as their embedding into a wider faculty qualification programme of the staff development center are classified within the type of measure of organisation of educational supplies. The complementary eLearning funding programme, which targets faculty readiness to become active in eLearning, falls into the type of increasing action readiness.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Foster dialogue and collaboration	Network and qualification workshops as aim of initiative	The Center for Research on Higher Education and Faculty Development has set up the eCompetence Initiative at Universität Dortmund in 2003. Main idea has been to bring disperse eLearning actors together and to create a cooperation platform. The challenges as described above were asking for a major coordination effort between the existing micro-projects. In addition to the network idea, the initiative offers a number of workshops for faculty members, who are interested in the different eLearning projects and applications.
Organise educational supplies	Focus workgroups as format of initiative	The initiative has created work groups in 2005, where eLearning actors can exchange their project expertise. The work groups address a number of eLearning topics and invite faculty members to join. The work group topics have been: (a) potential of ICT; (b) elementaria of eLearning; (c) teaching and learning with new media; (d) computer-based communication and cooperation in teaching and learning; (e) make inquiries and publicate The topics of these work groups have been basis for a staff eLearning qualification scheme offered to faculty at

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		Universität Dortmund. The former Vice-Rector for Media and Infrastructure has invited faculty by eMail to join the workshops of the initiative.
Increase action readiness	Funding scheme for eLearning projects	The Media Center has published a call for proposals for an internal funding program called "e-learning plus". Objective of this funding scheme is to provide incentives for faculty to integrate eLearning elements in their courses. The total budget of the programme is 20.000 EUR per year.

Basic idea of the eCompetence project has been to provide a platform for the local elarning projects and to use the gained expertise in a range of training courses for faculty. The courses have been offered for different learner needs and levels of ICT knowledge. The network and the training measures have been complemented with a funding grant for eLearning projects.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Inventory of existing expertise The eCompetence initiative has bundled the expertise of many eLearning actors at the university and made this knowledge explicit by creating the eLearning workshops for academic staff.	Foster dialogue and collaboration
Increased awareness for eLearning in faculty and university management the general awareness of faculty to use new media elements in teaching and learning has increased during the workshop period of the initiative. The university management has begun to deal with the topic of eLearning in a more reflective way.	Increase action readiness

The eCompetence Initiative has fulfilled as local eLearning network a number of functions which are defined for a community of practice. The involved actors have been able to exchange information and experiences made in their respective eLearning projects, and they have tried to push the topic strategically forward within the university public. The initial enthusiasm of the initiative and its joint workshop programme have caught the attention of more faculty members.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Lack of resources for initiative Money matters and unfortunately there is no major financial effort from the university management to support the initiative or to professionalise the qualification programme.	Foster dialogue and collaboration, organise educational supplies
Lack of sustainability of network The initiative has realised its activities mainly on basis of the enthusiasm of the eLearning actors in the university. Many of these mostly junior scientists have left university or abandoned their eLearning engagement to focus on their academic careers.	Foster dialogue and collaboration
Lack of institutional eLearning policy Leadership has not made any decision or move towards an eLearning strategy for the Universität Dortmund.	Increase action readiness

The Initiative has not been sustainable, as no institutional support has been arranged. Main problem has been a continued lack of resources for the work of the initiative, which has affected its sustainability. As the project members have been in their majority junior researchers hired on temporary positions, the initiative could not function as a self-sustainable network, and the initial commitment of the network members has gradually decreased.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Termination of Practice	The eCompetence Initiative itself has terminated its activities for the time being. The establishment of an eLearning certification scheme has taken place within one module of the staff development programme at Universität Dortmund. In 2006, the university has authorised an external consulting firm to evaluate the eLearning activities at Universität Dortmund. The results of this evaluation have not been published.

The organisation of the eLearning module within the staff development programme is in responsibility of the Center for Research on Higher Education and Faculty Development of the Universität Dortmund, it is not an offspring of the network any longer. The network itself has been discontinued in 2005. It remains to be seen if the network can be revived or could be a useful brick in a potential

eLearning plan the university leadership is expected to decide upon as final result of the external evaluation.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

The eCompetence Initiative cannot sustain itself without being embedded into a wider eLearning plan of Universität Dortmund or at least without receiving some financial support. At the given point of time, the further development of the practice is in question and the initiative is classified as a medium-term practice.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Strategy paper	Doberkat, E. E., Herrmann, T. Hüvermeyer, J., Müller, H. (2002). *Neue Medien an der Uni Dortmund*. Medienzentrum Universität Dortmund: Dortmund.
Website	eCompetence - Initiative der Universität Dortmund http://www.ecompetence.uni-dortmund.de/index.php
Website	E-Learning am Medienzentrum der Universität Dortmund http://www.mz.uni-dortmund.de/e-learning/Infos/index.htm

The strategy paper of the Media Center of Universität Dortmund dates from 2002 and describes the objectives, current state and action fields for eLearning at that time. Main stated objective for the use of ICT is the quality improvement of teaching and learning at Universität Dortmund. An inventory part of the report summarises a number of externally funded eLearning projects as well as the technical infrastructure and equipment of the university. The main fields for action mentioned are the establishment of a more efficient collaboration between the central support services on multimedia and infrastructure issues and a more effective technical support to faculty. The paper has been published by the Media Center and reflects a technical perspective on eLearning. Since 2002, there has been no significant strategic eLearning development taken place at Universität Dortmund.

The website of the initiative presents the objectives and main actors involved in the network as well as the workshop programme. The current workshops are organised by the Staff Development Center of the Universität Dortmund and are part of its qualification programme. The original work groups of the project have discontinued. The website of the Media Center presents the eLearning services which is offers. The main eLearning activity of the Media Center is the development of the learning management system 'edo workspace', a proprietary platform project of Universität Dortmund. The media

center also manages the e-learning plus funding programme and provides workshops on technical and multimedia issues for faculty and students.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The total budget for the e-learning plus funding scheme is 20.000 EUR annually. The e-learning plus programme as well as indirect staff costs for the time dedicated by the network actors in workshops and other network activities have been covered as internal costs by Universität Dortmund.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	3
Effectiveness	3

Both replicability and effectiveness of the practice indicate an average value. Given the difficult institutional context of the eCompetence Initiative at Universität Dortmund with low priority for eLearning at leadership level, and its competing rather than collaborating central support units, the transfer of the network approach to other universities with a less difficult context could nonetheless lead to more successful results.

8.3.14. Strategy tool-box at Aalborg Universitet

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

In the period from 1998 to 2003, *Aalborg Universitet* has conducted a 5 year program within the use of ICT in higher education. This programme has been called *IT Innovation*. The IT innovation programme has supported more than 60 projects in its first year alone, thereby involving several hundred staff and students in all departments, study programmes and administrative units of Aalborg Universitet. A significant amount of projects have been established in the further project process.

In spite of this large-scale effort of Aalborg Universitet, a wider integration of ICT in teaching and learning of academic staff has not occurred. ICT integration has proved to be both a time-consuming and expensive challenge. The main lesson learnt, which has been reported in the practice, was the one that the use of ICT in teaching and learning needs to be a part of a wider education innovation agenda. A way of doing this at Aalborg Universitet has been to initiate a direct dialogue with faculty as main target group for the institutional eLearning policy goal. This is the reason why the university decided to launch a series of ICT consultation activities at department level, which have been named *strategy tool-box*. Meanwhile eLearning is treated at Aalborg Universitet as an institutional challenge, the tool-box practice is a meso-level activity taking place at department level within meetings of the study boards.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The strategy tool-box practice is one element in the institutional eLearning strategy of Aalborg Universitet. Its main target group are both faculty, and to a lesser degree students of all study programmes of the university. The practice takes place as a consultation activity, which is offered by eLearning experts as service of the *Department for Pedagogy* within the various study boards of each department of faculty.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ offer consulting support	✗ establish learner-activating quality development ✗ make innovation mandatory

The tool-box strategy at Universitet Aalborg includes several aspects of competence development measures. The initial input, which external eLearning consultants offer to study boards on the potential of ICT for teaching and learning, is classified as type of offering consulting support. The consultation meetings are organised as a participatory approach, which actively involves all study board members in the reflection on the added value of ICT within their specific study programmes. This active involvement is classified as a type of establishing a learner-activating quality development of the study programmes at Universitet Aalborg. And the distribution of roles and responsibilities within the study boards, once the consultation process has generated eLearning project plans, is classified as a type of making innovation mandatory, as it assigns a process-ownership to selected board members, which have been appointed to engage further in the projects.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Offer consulting support	Initial consultation of eLearning experts in study boards	The strategy tool-box practice is a participative model, which has launched a series of initial workshops and organised semi-open agendas at the study board meeting of each department or faculty. A number of eLearning experts from the Department of Education of Aalborg Universitet have been appointed to attend the study board meetings of each faculty and to take the role of eLearning consultants. Main objective of the workshops is to increase the use of ICT in the study courses, when they add value to teaching and learning in courses. The study boards are the responsible units for the teaching of each study programme in the university. The study board members are traditionally students, teachers and the administrative leader as well as a number of representatives of each faculty.
Establish learner - activating quality development	eLearning development as process of continuous improvement	The result of the discussion between study board members and consultants have usually been noted on a flip-chart plan, which contains an open agenda with a number of questions that the consultants regard as important for the specific context. The agenda and the questions are discussed, and board members note important topics on flip-charts. The charts are summarised and a follow-up meeting is arranged. In the follow-up meeting, the eLearning consultants present a catalogue of strategic activities to the board, which are based on the previous summary. A number of ideas and projects are selected, and a number of responsible persons for the further development of ideas and projects are appointed. This leads to a second summary, which again lists points for development and recommendations. This continuous discussion process finally leads to the formulation of a vision and strategy for a specific study programme.
Establish learner-acti-	Implement project responsibility within	It has been considered important to use a method, which creates a feeling of ownership for the

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
vating quality development, make innovation mandatory	study programmes	eLearning strategies that are developed in study board meetings with the eLearning consultants. The discussion involves a number of active groups, including students and teachers represented in the study boards, but also other university institutions such as for instance the university library. This has led by 2004 to the cooperation of four different study boards and the library for the development of a joint database for student reports - a project which continually has kept growing.

Main strength of the consultation method used at Aalborg Universitet to foster eLearning is the active involvement and participation of faculty in each study programme. This faculty participation from the start of the decision process is assured by initial consultation, which triggers a continuous consultation process in the study boards until a common eLearning project idea for the specific study programme has developed. Next to the creation of process-ownership at study board level, the practice evaluation and feedback enables stakeholders at Aalborg Universitet to realise the institutional eLearning policy at decentral level, and it has generated a learning process of all involved faculty members on the effective use of ICT. The practice has also generated spill-over effects across single study programmes; several study boards are currently involved in the implementation of a joint web repository for student reports.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Efficiency of targeted eLearning consultation ICT is not the first thing that comes to mind when study boards meet – but implementing an eLearning strategy discussion right at the heart of the study boards is reported to have raised the awareness of both faculty and students on the potential of ICT as integral part of teaching and learning.	Offer consulting support
Create active involvement and ownership of eLearning projects Another reported benefit of the practice is that the common discussion in the study boards on eLearning stresses the necessity to prioritise specific projects and to establish clear roles and responsibilities.	Establish learner-activating quality development, make innovation mandatory

BENEFIT	RELATED MEASURE(S)
Transferability of participatory consultation method The consultation method used has been assessed by the informants to be also applicable to more administrative strategy discussions.	Establish learner-activating quality development

The key to the success of the reported practice is the integration of eLearning decisions into the study boards of the university. Nonetheless, the success of the practice is also made possible through the serious commitment of Aalborg Universitet to promote a model of problem-based project learning for all faculties. This pedagogic model has been followed and developed at Aalborg Universitet since its foundation in the 1970ies and has generated a considerable impact on the practiced teaching and learning culture. Learning innovations and the experimentation and adaption of new pedagogical models and teaching practices for the study programmes are therefore not an unknown phenomenon at Aalborg Universitet.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Cost- and labour-intense decision model The practice has generated a number of project ideas within study boards for the integration of ICT at their study programme level. But the eLearning consultation process needs financing and continued attention from the external consultants. The practice has turned out to be cost-intense and has been on hold for some time, but is continued again since fall 2004.	Offer consulting support, Establish learner-activating quality development

The active involvement of a high number of faculty and even students in eLearning project design and implementation is a cost-intense method. Aalborg Universitet has allocated considerable resources to assure a high pedagogical quality of its study programmes. To reduce costs, it remains a challenge for the university to find a balanced way between the involvement of many institutional members in eLearning decision processes and the centralisation of these decisions.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Continuation of Practice	The practice has been taken up again after a break since fall 2004 as part of a more general service of the Department of Education to the study boards of Aalborg Universitet.

The temporary stalling of the practice indicates its main dilemma. The success of the participatory approach is cost-intense, while a real alternative to reduce costs without reducing the degree of participation has not been found.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

Given the strong commitment of Aalborg Universitet to foster educational innovation in general and eLearning innovation in particular, it is likely that the participatory approach of the practice will continue to be part of the university's further development of eLearning. The eLearning consultation method is classified as long-term practice.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Lorentsen, A. *Changing traditional univesites into universities of the new millenium*. ICTE Conference Proceedings 1999. ICTE: Tampa, Florida
Website	E-Learning Lab - Center For Userdriven Innovation, Learning and Design http://www.ell.aau.dk/Home.2.0.html
Website	Aalborg Universitet Profile http://en.aau.dk/About+Aalborg+University/University+Profile

The research paper outlines the major cultural changes within universities, which shift from a traditional to a technology-enhanced, learner-centred learning model. The final part of the paper details the implementation of the IT innovation programme at Aalborg Universitet, underlining the strengths and positive experiences that have been made with the method to send ICT experts as consultants to study board meetings.

The website of the eLearning Lab presents the main objectives of this recently founded central research unit, which now hosts all eLearning activities and projects at Aalborg Universitet. It has taken over responsibility for driving the institutional approach for eLearning forward, and has closely attached eLearning to the institutional pedagogy model of problem-oriented project learning. According to the website, Aalborg Universitet has made an considerable investment to foster eLearning as a strategic element for improving the quality of teaching and for raising the institutional profile as innovative educational institution.

The university profile website outlines the specific pedagogical approach of Aalborg Universitet, with its strong emphasis on experimental learning in interdisciplinary studies and its application of problem-centred, real-life projects of educational and research relevance within all study courses.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The consultation process of each eLearning expert to study boards is reported to take 10-15 hours. The implementation of the developed eLearning strategy at study programme level is not included and is usually significantly higher than the consultation itself, depending on the proposed eLearning project. The costs for the practice are covered internally by Aalborg Universitet. Costs for follow-up eLearning projects, which are planned as de-centralised actions, are often considerably high and are a challenge for the internal budget of Universitet Aalborg.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	5

Both replicability and effectiveness of the practice are rated high. While the reported evidence supports the effectiveness of the practice in terms of faculty involvement, the cost effectiveness is unlikely to be as positive. The transfer of the practice to other university contexts might be difficult, as the specific pedagogical culture at Aalborg Universitet has significantly contributed to the reported success of the strategy tool-box method.

8.3.15. Ped-Care/ Applying CRM Techniques in eLearning Solutions

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

This practice combines two database entries: a description of the *Ped Care* project and the experience made with the application of the electronic tools of the Ped Care project in *Universidad Nacional de Educación a Distancia* (UNED), the Spanish distance education university. The contextual background of the practice is distance education, where teachers support large groups of students, at times adding up to 50 or more students per course. Managing the communication activities in this distance education scenario is a challenge for teachers, in particular if they do not have sufficient experience in distance education methodologies.

The EU - funded project Ped Care - *Pedagogical Distributed Groups Care* has aimed to address this teaching challenge and has developed a methodology called *LRM - Learners Relationship Management*. Purpose of LRM has been to improve and optimise relationships between learners and teachers in distance education courses by using a set of specific ICT tools. The LRM is a modified version of CRM - Customer Relationship Management, a concept used in the corporate sector to manage relationships of companies with their customers. The application of CRM usually includes the collection, storage and analysis of information to gain better knowledge of customers. This concept is applied in the Ped Care approach as a modified LRM version for distance higher education.

Basically, LRM aims to help teachers to monitor learning activities of all participants in their courses, to manage the communication channels with learners, and to improve the motivation of learners. Three electronic tools have been developed to support these activity fields of the teacher: the PPEM - Pedagogical Pursuit and Evaluation Manager for monitoring learners activities; the PCM - Personalised Content Manager for managing the communication; and the IeMM - Intelligent eMail Manager for motivating learners to actively participate in courses.

Following tool development, academic teachers in distance higher education institutions needed to be trained to make use of these tools in their courses and to understand the underlying CRM and LRM concepts. Technical experts of the Ped Care project have carried out several training sessions at UNED, which is the focus of this practice. The participants of these training sessions have been individual teachers, who either participated within Ped Care or have known the project and who volun-

tarily agreed to test the efficiency of the developed toolset within their courses. This way, the practice is classified as an individual approach at micro-level of the participating distance education teachers at UNED.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The LRM concept and the prototype tools have been developed in the Ped Care project to enhance teaching in online distance learning courses. The concept and tools have been tested with individual teachers in distance higher education courses at UNED. In order to facilitate the use of the Ped Care tools, several teacher training sessions have been carried out.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support

The Ped Care training sessions include an introduction into the concept and methodology of CRM and a practical tool training for participants. The training has been carried out as individual consultation of Ped Care experts to academic teachers at UNED. The training combines specific information on the concepts of CRM/ LRM and hands-on practical application of the Ped Care tools in the work context of the participating teachers. These two main functions of the Ped Care training classify it as a type of measure of offering consulting support and of organising educational supplies.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Offer consulting support	Change of mind of academic teachers	The training has been carried out as personal consultation of technical experts for academic teachers. Main objective of the training has been to foster a change in the way teachers think about classroom management in distance education courses. The

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		idea is that teachers do not have to make critical changes in their way of work - for example, teachers should be enabled to directly incorporate the answers they provide by eMail for students to the FAQ from their eMails clients, or to get information about student activities when they receive messages.
Organise educational supplies	Specific pedagogical knowledge as background for tool training	The training sessions have started with an introduction to the concepts of CRM/ LRM. This introduction is focusing on pedagogical issues in technology-enhanced distance learning. Topics included have been: methods to ensure satisfaction and motivation techniques for learners in courses; methods to stimulate active participation in courses; and the definition of pedagogical indicators to monitor learning activities and to plan appropriate teaching actions.
Offer consulting support/ organise educational supplies	Hands-on Ped Care tool training	The second step of the training has been to install the three Ped Care tools on the computer of the participating teachers and to explain them how these tools work. This hands-on practical training is focusing on the direct application of the Ped Care tools in courses of the teachers.
Offer consulting support	Course management effectiveness as main target area of training	The Ped Care tool training aims to enable teachers to manage their communication channels with students, to offer more personalised support to each learner in large-size courses, to monitor individual learning activities and student motivation, and to automatically generate an FAQ.

Main idea of the Ped Care training sessions has been to promote the use of prototype tools within distance higher education institutions and to foster the learner-centred learning model. These two main components are reflected in the composition of the individual training sessions, which start with a presentation of the LRM concept and continue after this pedagogical methodology part with the practical tool training. The perceived added value of the Ped Care tools is based on the electronic facilitation and routinisation of teaching tasks, which is considered to leverage the pedagogical activities of the teacher in distance learning courses.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Decrease of course management workload The introduction of a learner-centred pedagogical methodology, and the use of the Ped Care tools in the direct work context of the teachers allow them to decrease the course management and communication workload. The time teachers have dedicated to edit the FAQ of the course has been reduced.	Offer consulting support
Increase of pedagogical motivation of teachers By decreasing course management workload, teachers have been able to focus their work in pedagogical aspects instead of having to deal with technical platforms.	Offer consulting support
Increase of satisfaction of learners The satisfaction of learners in the courses is reported to have increased as they have received more personalised attention of teachers - this effect has been measured through personal interviews with students in courses in which the tools have been applied, contrasting their results with courses, where none tool implementation has taken place.	Offer consulting support
Overall increase in use of eLearning platform The overall usage of the eLearning platform of UNED by those students, who have participated in Ped Care - facilitated courses, has been increased.	Offer consulting support

Main added value is the increase of efficiency of specific teaching tasks and activities through the use of Ped Care tools in distance learning courses. The Ped Care tool application results in a more efficient perception of learners needs and learning progress, to which teachers have been able to react in a more efficient way. This increase in efficiency has been evaluated in interviews with learners, asking for their satisfaction in courses where Ped Care tools have been applied. The details of this learner evaluation have not been made public.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
High reluctance of teachers to use Ped Care tools The participating teachers have shown a reluctance to	Offer consulting support/ organise educational supplies

SHORTCOMING	RELATED MEASURE(S)
use Ped Care tools and have stressed to prefer their traditional teaching and learning models.	
No implementation of LRM and tools beyond experimental testing The Ped Care tools and the training activities have not created any market benefits. The use of the tools has been limited to the prototype testing period and no wider distribution of the tools has been reached.	Offer consulting support/ organise educational supplies

The shortcomings, which are reported, add to the impression that the Ped Care prototype tool testing and the complementary training are a singular activity, which has been driven by the Ped Care project and some individual teachers, but not systematically supported by UNED or any other distance higher education institution. The high reluctance that the informants faced from faculty members to use the Ped Care tools may have various reasons, but it seems that the tools are not as adaptive to the needs of teachers as it was intended.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Termination of Practice	The Ped Care project continues to undertake efforts to implement the developed tools in additional distance higher education institutions, as well as in traditional universities, which aim to increase the use of eLearning.

Efforts are made to make use of the Ped Care tools and to train staff in distance higher education institutions, but chances are that the tool development and training will be discontinued.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

No indication is given in the practice and the additional reference documents that the developed Ped Care tools are currently used in universities. No training activity has been carried out after the project has ended in 2003. In this regard, the practice is classified as a short-term activity.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Arjona, M., Ortiz, J., Mendez, C. & Aroba, J. P. (2006). *ECompetences Introducing Customer Relationship Management (CRM) in Education Centres*. In I. MacLabhrainn, C. McDonald Legg, D. Schneckenberg & J. Wildt (Eds). The challenge of eCompetence in academic staff development (p. 123-127). Galway: CELT, NUI.
Website	Ped Care - Pedagogical Distributed Groups Care http://www.altransdb.com/sigVInternet/repositorio/nivel0/nivel1/I+D/Ped-Care/Docs/Deliverables/D3/Web/about/index.html

The paper introduces the main elements of CRM and specifies competence requirements for the application of CRM methods and techniques in educational institutions. The requirements at institutional level include: a strategic definition of core objectives; a clear definition of external and internal work processes; the establishment of a single access point for eLearning; and the provision of staff training in the use of ICT. The requirements at individual level refer to the role of the teacher as motivator and facilitator within the course and ask for the ability to communicate to students and to monitor their learning progress with help of electronic tools.

The website is a repository of the Ped Care project, which includes detailed information on the project's objectives, its main activities taken and the developed set of electronic tools for the realisation of the LRM in distance education institutions. There is no further information available on the teacher trainings or the application of the toolset in teaching practice.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The costs for the tool development and the training sessions have been covered by the project budget of Ped Care. There are no details given on costs for the training. From the point of view of UNED as the higher education institution, in which the tools have been tested and the training sessions have taken place, the training costs are covered externally.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	4

Both replicability and effectiveness of the Ped Care tools and training have been rated high. Nonetheless, no additional distribution of the Ped Care tools has taken place.

8.3.16. XML transposition for course material at Université de Technologie de Compiègne

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

The *Université de Technologie de Compiègne* (UTC) has initiated a set of projects which aim to develop the Campus Numérique, the virtual campus of the university. UTC has initiated in 2003 as part of its activities within the virtual campus a project called SCENARI - *Système de Conceptión des Enseignements Numériques Adaptables Réutilisables et Interactifs* (system for the conceptualisation of adaptable and interactive virtual education). SCENARI is an open source content management environment, which can be used to digitalise learning contents and course materials. It is based on XML - *Extensible Markup Language* technology. This assures a high degree of flexibility and interchangeability of all electronic learning contents, which are stored within the SCENARI platform, to different output applications.

Next to its use in the French corporate sector, SCENARI is applied as content management system (CMS) within a number of French universities. The main challenge with the application of SCENARI as container for learning materials in study courses is the task to structure the course properly in the CMS, according to the frame of the teaching and learning scenario and to the semantic markup that is proposed for the learning content. Academic teachers have to describe their learning contents with a pedagogical approach, which helps IT experts of the SCENARI project to digitalise these contents on basis of a general document model. The document model, which is defined, serves as a general template and all digital learning contents within a specific course are interpreted and automatically rendered by applying the document model to the raw data. The document model for study courses in universities needs to be defined in close collaboration between academic teachers - as subject experts, and IT experts. In order to facilitate this teamwork, the subject experts are offered a training course called *SCENARIsup* to gain a basic understanding of the platform technology. This faculty training is offered to all French universities which implement the SCENARI platform, and it is financed by a government grant. The SCENARIsup practice is classified as institutional approach at macro-level of universities, which use the platform and the training services of the SCENARI project.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The SCENARI project aims to develop a CMS, which is offered as learning platform to French universities. As a part of the virtual campus strategy of UTC, SCENARI is a technical basis for the storage of digital learning contents which are used in study courses of universities. The SCENARIsup project is a specific training and consultation programme offered to faculty which are directly involved at their universities in the implementation of the CMS and in the creation of digital contents.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ organise educational supplies ✗ offer consulting support	✗ establish learner-activating quality development

As specific faculty training for the SCENARI platform with a strong technical focus, SCENARIsup is classified as a type of organisation of educational supplies. The training relies on proprietary learning materials of academic teachers and creates digital content, which is directly usable in study courses of participants. Teachers are required to produce digital content on their own, which is evaluated after 3 months. During this time, the SCENARIsup trainers offer consulting support to academic staff. As the product of the training is directly applied in the study courses, the practice includes the type of measure of establishment of learner-activating quality development.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Organise educa-tional supplies	Technical staff training to complement platform development	Following the initial period of CMS development, the project team has recognised that the application of SCENARI as CMS for universities can only work when major implementation challenges are solved and when dedicated faculty members gain a basic under-standing of the SCENARI technology. UTC has set up a sub-project called SCENARIsup, an acronym

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		which stands for the application of the CMS in higher education (sup is for *educatión superieur*). Part of this sub-project is a technology training for faculty members, which are involved in the SCENARI implementation within their universities. The unit responsible for the SCENARI training at UTC is the LIP - *Laboratoire d'Ingénierie Pédagogique* (laboratory of pedagogical engineering).
Organise educational supplies	Theory and practice module as parts of staff training	The training activities within SCENARIsup address faculty members, who are appointed to digitalise the learning contents of a study course. These academic teachers participate in a SCENARI seminar, which includes one theory and one practice module. The theory module deals with three main topics: structure of XML, technical structuring of digital contents, and pedagogical use of digital contents. The practice module mainly focuses on the topic how to use the SCENARI tools as academic teacher in a study course.
Offer consulting support, establish learner-activating quality development	Digital content production period as direct application of staff training	All course participants are supposed to have adequate course material ready to be digitalised. Teachers usually deliver documents in word or power point format. Following the initial training session, which takes two days, academic teachers are supplied with a personal coaching service for a period of 3 month which allows them to work with their documents in the SCENARI environment. The training and consultation process for academic teachers is closing with one additional day of seminar which is mainly dedicated to exchange experiences made and to give feedback to the SCENARI project team.

The SCENARI staff trainings are a focused activity, which is closely tied to platform development. While the theory module of the training includes general knowledge on XML technology and pedagogical models for virtual learning environments, the practical module is characterised as a tool training, which is followed by its use in the study courses of participating teachers. In particular the content production phase requires a high level of commitment from faculty in terms of time and

continued motivation to create content for the SCENARI platform. Is is not clear in the practice report how universities support involved staff to keep their level of commitment in this work processes.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Practical hands-on training approach The training session informs participating teachers about practice-oriented challenges in the production of digital content for the SCENARI platform.	Organise educational supplies
Teamwork as main format of practice SCENARI relies on close teamwork between teachers as subject experts and IT experts. Teachers get familiar with the principles of digital structuring of learning contents and with SCENARI as digital platform. Teachers partially have to change roles as members of a team to create study courses in the CMS. The developers of SCENARI are in turn confronted with a wide range of pedagogical practices that need to be implemented in the CMS.	Offer consulting support
Direct integration of produced content in CMS The introduction of SCENARI in universities and the training and consultation services is reported to raise attention of a wider group of faculty members that eLearning becomes more important. The training and consultation is based on the proprietary learning material of study courses, increasing the relevance of the produced digital content for the work context of the teachers. In addition, the SCENARIsup project systematically tries to foster follow-up meetings of faculty members, who have participated in the training and consultation sessions.	Establish learner-activating quality development
Building of digital learning repository The universities, which make use of SCENARI as platform, gradually generate digitalised and exchangeable course materials in XML technology.	Establish learner-activating quality development

The content production process for the SCENARI platform is organised as a team activity, implying a role change for the teacher. who becomes a member of a content production team. This role change and the produced content is reported to create awareness within faculty that new technolo-

gies have an impact on teaching and learning in universities. The training and the subsequent production phase use learning contents of the academic teachers, who generate relevant digital learning materials of their study courses. If the university find a way to systematically motivate faculty to work in the production and application of digital contents, it can create digital contents at a considerable pace. The XML format of the produced is a flexible technical solution, which can be used in a wide variety of media applications.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Lack of time and motivation of faculty members A critical point reported is the challenge to continuously motivate teachers who have already produced an electronic course document and who often do not have time to transform more learning material into XML.	Establish learner-activating quality development
Weak output of produced digital learning contents The output of staff training and consultation in terms of produced digital content is often not satisfying. This probably relates to the lack of time and motivation of staff to dedicate more energy to the SCENARI implementation at their campus.	Organise educational supplies, offer consulting support
Delegation of faculty tasks to assistant level In practice, the tasks of academic teachers in the production phase of the training are frequently carried out by their assistants or PhD students. Teachers only validate or modify the produced output. A standardisation of learning contents within the SCENARI platform is seen as a critical development by staff members.	Establish learner-activating quality development

The SCENARI approach is partly based on the motivation of staff to take part in the platform implementation and content production at their universities. The technical focus of the training and the high workload, which is required to produce learning materials in the practical tool application phase, surely ask for a high level of commitment from the involved staff. The staff training is narrowly focused to the development and use of one CMS platform. This gives trained staff only a limited insight into the potential of ICT for their teaching activities.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Continuation of Practice	It is planned to increase the number of faculty members which work

FUTURE PLANS	DESCRIPTION OF PLANS
	at the different French universities on the digitisation of learning contents in the SCENARI platform. The project team tries to reach this goal by offering more coaching to faculty.

The staff training depends on the success of the SCENARI project as technical platform solution for universities. It seems likely that the training needs to increase in its scope and to widen its perspective from direct platform functions to more general eLearning knowledge.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

SCENARI is actively marketed by UTC as a platform solution for universities in France, and staff training is one vital ingredient for the success of the platform. A number of French universities have decided to implement the platform, which assures continuous demand for SCENARIsup training services. Therefore, the training and staff consultation is classified as a long-term practice.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Research paper	Crozat, S., Majada, M. & Spinelli, S. (2003) *SCENARIsup : Un projet pour la gestion des contenus pédagogiques numériques dans l'enseignement supérieur* (A project for the management of virtual pedagogical contents in higher education). Conference Paper presented at CNUR 2003. CNUR: Montpellier.
Website	Scenari platform http://www.utc.fr/scenari
Website	Laboratoire d'Ingénierie Pédagogique http://www.utc.fr/~weblip/index.html

The research paper of the SCENARI project members describes mainly the technical framework of the CMS and its application in various organisational contexts. One part of the paper outlines the objectives of the SCENARIsup project and the facilitating role of faculty trainings in the implementation of the CMS in higher education institutions.

The website of the SCENARI platform describes in detail the technical framework and the main application scenarios for the CMS. One subsection of the website is dedicated to the use of the CMS in the higher education sector. The website of LIP presents the objectives and main functions of this

institute, which combines expertise in multimedia and online pedagogy and is dedicated to bring eLearning at UTC forward.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

The SCENARIsup project and the complementary staff training scheme is funded by the eLearning department for higher education of the French Ministry of Education (MEN - *Ministère de l'Education nationale, Direction de la technologie (DT) , bureau des technologies de l'information et de la communication pour l'enseignement supérieur*). The informant lists costs in a typical production chain for digital content as 50 EUR per hour for IT experts. Wage costs for academic staff involved in the production digital content, the price of the SCENARI editing tool, as well as wage and material costs for trainers and participating staff for the 3 days seminar need to be added in the cost calculation to make it complete.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	4

Both replicability and effectiveness of the SCENARIsup practice are rated high. This represents the informant's position that the platform development and the tool training for staff offered are an efficient way to create digital learning contents for study courses in universities. It should be noted that platform development and implementation are technical aspects of the integration of eLearning, which usually is not in the prime responsibility of faculty members.

8.3.17. eTeaching Roles and Responsibilites in VISCOS

TABLE: LEVEL AND CONTEXT OF EFFECTIVE ECOMPETENCE PRACTICE

LEVEL	Macro-Level	Meso-Level	Micro-Level

CONTEXT	International/ National	Institutional	Faculty/ Department	Study Course	Individual

This practice combines the database entries submitted by the Department of Computer Science at the University of Joensuu. All database entries refer to the ViSCoS - *Virtual Studies of Computer Science* project, but none entry directly describes competence development or training measures of the faculty staff involved in the study programme. Nonetheless, the presented information allows to extract some teaching roles and responsibilities within ViSCoS, and this perspective is analysed here. The competence development taking place within the ViSCoS project is most adequately classified as a micro-level activity of individual teachers.

The Department of Computer Science at the University of Joensuu has created the eLearning programme ViSCoS to respond to learning demands for computer science in Finland's large amounts of scarcely populated rural areas. Frequently, high schools are the only educational institutions in these areas. There are students at these high schools who are interested in computer science and especially in programming, but their institutions can not offer more advanced levels of computer science studies. In ViSCoS, students study the first year university-level computer science courses via the web. For the university, the aim of ViSCoS is to improve contacts to high schools as a way to recruit new students for computer science studies. The students learn first year university-level computer science courses via the web (see the effective practice entry ViSCoS: a new type of curriculum to link high schools and universities for details).

The challenge for the Department of Computer Science has been to pedagogically support students from different institutions and different locations in the web-based learning context. Four types of learning methods are used in this study programme: (1) assignment-based work; (2) collaborative studies; (3) writing of essays; and (4) project work. The main responsibility for teaching and learning in the courses lies with the faculty of the Department of Computer Science at the University of Joensuu. Students study via the net, but each partner institution has a tutor who supports students in particular in the initial phase of the study course. Main duty of tutors is to control the exams. The tutors can arrange contact tutoring in case students ask for it, but this is not required in the courses. The main challenge in the pedagogical support of the students is that courses require a considerable workload from the computer science faculty and local tutors in all partner institutions for each learning method.

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff	x	

The curriculum of ViSCoS consists of three main areas, which are: preliminaries of ICT, basic programming with Java, and introduction to computer science. The ViSCoS programme contains eight courses, which require about 600 hours of study work; this is equal to 25 credit points in the European Credit Transfer System (ECTS). The courses are divided into three half-year semesters. Aim is to study the programme in one and a half years. The ViSCoS courses are university-level, but some high schools also give courses for the high school diploma. If students pass the programme with marks high enough (grade 2 out of 3), they are free to enter the university as computer science major. Students, who start their university studies during high school, can finish their university degree earlier. Almost all graduated students have earned a free entry to the University of Joensuu. When ViSCoS students enter university, they can continue on the second year of the studies in computer science.

ViSCoS has proved to be a flexible solution for providing first year computer science studies via the net. Courses have been developed quickly and with reasonable financial investments. The collaboration between partner institutions and university has been successful. Altogether 94 students have completed the programme in the years from 2000 to 2004. Average group size is 30-40 students for the whole programme at any given time.

TABLE: TYPES OF MEASURES FOR ETEACHING COMPETENCE DEVELOPMENT

-- DIRECT MEASURES --	-- INDIRECT MEASURES --
✗ offer consulting support	✗ make innovation mandatory

The VisCoS study programme is a comparably small distance education service in computer science. Both students as well as tutors and teachers bring along a high level of technological expertise in electronic media. Teachers in the ViSCos course do not receive any formal training on technological or pedagogical issues, but are given an initial introduction and consultation on demand. The four main learning methods used in the course form the basis for most teaching and learning processes. Teachers are directly responsible for their specific course areas and have a crucial role when they give feedback in the numerous assignments. This fits into the types of measures of making innovation mandatory and offering consulting support.

TABLE: PATTERNS AND PROCESSES OF PRACTICE

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
Make innovation mandatory	Faculty role in self-directed learning model of VisCoS	Courses are currently run with an open source Moodle learning platform. The learning content in the ViSCoS courses consists of both printed material (e.g. course books) and digital learning materials; Moodle links the printed material with an activating

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		digital learning environment on the web. The digital learning materials include theory, exercises, activating examples, visualisations and animations. Various digital learning tools have also been used to support students learning processes. As a distance eLearning programme, ViSCoS has a strongly self-directed learning approach. Students are expected to do a lot of self-study activities. One project manager is responsible for the overall organisation of ViSCoS, and the head of the Department of Computer Science is responsible for the curriculum. Student assignments and written exams are in part assessed by faculty members of the department. And faculty involved in VisCoS are responsible for the study programme parts they have been appointed for. Main role of the tutors, who are often PhD students and post-doctoral faculty assistants, is to support the learning process of the students. Main role of the faculty members at professorate level is to be responsible for the learning content of the study programme and to grade assignments.
Make innovation mandatory	Crucial role of teacher assignments in the four learning methods of VisCoS	The students are engaged in diverse, mainly individual, learning assignments. One course is normally built upon 40 to 50 assignments distributed among the learning units. The idea behind the assignments is to get the students to solve relevant, motivating, and even open problems. These assignments are tightly linked with the learning content which academic staff has to select for the study programme. Each submitted assignment of VisCoS students is evaluated by academic teachers with constructive feedback. Learning outcomes of students are finally evaluated through an exam. During the collaborative study method, students make a short study in groups of two to six. A study is a small investigation on a given subject. There are no ready-made learning materials; students use the internet and the library on their own to compose the studies. Usually, tutors slightly scaffold the group

TYPE OF MEASURE	PATTERNS IN PRACTICE	PROCESSES IN PRACTICE
		writing process. Each study is assessed by student peers and only in a final step by academic teachers. In the essay method, students write an individual essay on a given subject. For instance, in the introduction to the ethicomputer science computing course students write an essay on ethical aspects of ICT, which is assessed by academic teachers. In the project method, the students do project-work. For instance, in the programming project course, the students design, implement, test and document small applications individually or in pairs. Purpose of the programming project course is to familiarise students with small-scale software development. The group work is finally assessed by academic teachers.
Offer consulting support	Tailored consultation to faculty on demand	New staff members and tutors receive no formal training, but are given an initial introduction into their role and direct consultation of the VISCoS team members in case any questions on pedagogical or technical issues arise.

Both the description of the practice itself as well as the role description of teachers in the course do not directly refer to competence development measures. Nevertheless, the role of teachers is crucial in a distance learning course, and teachers are responsible to fulfil their assignment and counselling tasks within the course framework. The process-ownership of faculty members in the curriculum, design and implementation of the ViSCoS course is a striking feature of this practice with regard to competence development.

TABLE: BENEFITS OF PRACTICE

BENEFIT	RELATED MEASURE(S)
Faculty commitment to eLearning assignments The regular assessment of a high number of submitted small assignments has proved to be an effective way to create a student-centred atmosphere.	Make innovation mandatory
Responsiveness of teachers as part of course Students are able to receive individual counselling from faculty. Feedback has been collected from students to improve digital learning materials and tools.	Make innovation mandatory

A striking aspect of the practice is the high workload of faculty in the VISCoS courses. In particular consultation is a crucial element in the teaching responsibility of faculty for distance learning students.

TABLE: SHORTCOMINGS OF PRACTICE

SHORTCOMING	RELATED MEASURE(S)
Lack of faculty resources for high workload More faculty members need to take part in the individual student counselling and assessment. Currently, an average of two to three faculty members of the Department of Computer Science assess students assignments. If the amount of students increases, more faculty members are needed.	Make innovation mandatory
High student drop-out rate despite facilitation efforts of tutors and teachers Due to the self-study approach and the shortage of faculty resources, the drop out-rate in the program is high. Approximately one-fourth of the students who start to study in ViSCoS finish their studies - a figure not uncommon though in pure distance learning programs.	Offer consulting support

Individual workload of faculty members in VisCoS is high, which is caused by the continuous assignments of students. The fact that almost 75% of students drop out during the ViSCoS course might point towards the need to offer the academic teachers involved some more substantial pedagogical advice on eModeration and eFacilitation techniques.

TABLE: FUTURE PLANS FOR PRACTICE

FUTURE PLANS	DESCRIPTION OF PLANS
Extension of Practice	The VISCoS programme is continuously revised and improved to deepen support provided to students. Main emphasis is on group building in the course, which requests a higher level of activity from both tutors and academic teachers. New digital learning tools are developed to support students. For instance, learning community applications could be used to overcome feelings of isolation. Peer support has not yet been fully applied in ViSCoS studies. Translation of ViSCoS into English is currently realised.

The ViSCoS programme itself continues in its current scope and an extension at international level is currently on its way. The need to create some additional competence development measure for staff involved might increase with the ongoing extension of VISCoS.

TABLE: DEGREE OF SUSTAINABILITY OF PRACTICE

✗ Long-term Practice	✗ Medium-Term Practice	✗ Short-Term Practice

ViSCoS started in 2001 as project and is currently opening up to international computer science students.

TABLE: OTHER REFERENCES OF PRACTICE

REFERENCE TYPE	TITLE OF REFERENCE
Website	Virtual Studies of Computer Science http://cs.joensuu.fi/viscos/?lang=eng

The ViSCoS website is in English and presents detailed information on the project background and the course curriculum.

TABLE: COSTS OF PRACTICE

✗ Internal Cost Application	✗ External Cost Application

While no cost indications are given, the ViSCoS programme has been initially funded by a three-year governmental grant, but is now financed by student fees.

TABLE: REPLICABILITY AND EFFECTIVENESS OF PRACTICE

ITEM	VALUE
Replicability	4
Effectiveness	4

Both replicability and effectiveness of VisCoS as a distance learning study course are high. This does not give any indication on the competence development of involved staff.

8.3.18. E-learning environment, Master and short courses

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures	x	
Target group are or include academic staff		x

The Università di Roma Tor Vergata has established an interdisciplinary center called MIFAV - *Museo dell'Immagine Fotografica e delle Arti Visuali*. Part of this center is ISIM - *Interface and Multimodal Interactive System Lab*. In 2005, the ISIM Lab has developed a master course in advanced technologies of interactive communication (interaction design & architecture) for students who hold a first- or second-level degree and want to specialise in computer-based interaction. This study course is planned to be opened to interested faculty of the university to improve their knowledge and expertise in the area of interaction design.

Given all available information at this point of time, until now there has been no participation of faculty in the master course. Main target group of the master course are students. There is no indication of a direct or indirect involvement of faculty members in the course. Therefore, the practice will not be further analysed.

8.3.19. Rinc: Knowledge network in networked communication

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning		x
Aims include direct or indirect competence development measures		x
Target group are or include academic staff		x

RiNC is a pilot communication platform of the Communication Studies Department of the Faculty of Behavioural Sciences at the *University of Twente* in Netherlands. The platform offers a variety of services to public and corporate organisations. As far as the data given on RiNC can be interpreted, the platform seems to be a spin-off from a former research project of the University of Twente, which is continued as a commercial service. There is no indication of any direct or indirect competence development activity for faculty staff in the RiNC practice description. Therefore, RiNC does not meet the criteria for a further analysis of the practice.

8.3.20. Course ONLINE: Integrated Course Homepages Management

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	
Aims include direct or indirect competence development measures		x
Target group are or include academic staff		x

Course On-Line is a course homepages management system, which has been developed by the Informatics Research and Development Center at *Isik University*. The course homepages management system offers a set of functionalities to faculty members, who intend to publish parts of their courses in the web. Academic teachers can manage and edit course syllabi, upload and announce new assignments and collect assignment files, supply course materials and links to different web resources, send group eMails to course participants, and set up and moderate course-related forums. Meanwhile the introduction of the Course management system is a relevant policy decision of Isik University on eLearning, there is no indication within the practice itself nor in the website of the project about any direct or indirect competence development measures taking place for faculty members.

8.3.21. European PhD on Social Representations and Communication

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities	x	
Challenge includes enhanced use of ICT in teaching and learning	x	

Aims include direct or indirect competence development measures		x
Target group are or include academic staff		x

The *Faculty of Psychology* of the *University of Rome La Sapienza* has developed a European Ph.D study programme on social representations and communication. This study programme offers young researchers training in advanced academic and technical skills needed to conduct advanced research in the fields of psychology and social sciences. Part of the programme is offered as distance learning course modules. Meanwhile the higher education context of the Ph.D programme is a relevant subject for this study, no indication is given in the practice on any competence development measures of academic teachers involved, nor is there any description on teaching roles and responsibilities within the course.

8.3.22. E-learning for Regional Development in the Latvian Transfer to Knowledge Societ

TABLE: SELECTION CRITERIA FOR FURTHER ANALYSIS OF PRACTICE

CHARACTERISTICA OF PRACTICE	YES	NO
Context is higher education sector	x	
Background is situated in universities		x
Challenge includes enhanced use of ICT in teaching and learning		x
Aims include direct or indirect competence development measures		x
Target group are or include academic staff		x

The *Distance Education Study Centre* at *Riga Technical University* has initiated a series of continuing education programs to serve the learning needs of part of the work population in Latvia in a period of economic transfer after 1990. These programs include IT courses, which are not directed towards faculty at Latvian universities, but to the qualification needs of employees within the private sector.

8.4. Conclusions

This chapter assesses the *validity* of the eight types of competence development measures and of the action competence model with help of the empirical evidence found in the eCompetence practices. It serves to give some conclusions on the question to which degree the empirical evidence supports or

refutes the theoretical assumptions which have been made in the conceptual part of this study. In particular, it will focus on the relevance of the eight types of measures for the eCompetence development of teachers. Which significance does each type of measure have for the development of eCompetence? Which causal inference can be made for each of these measures on competence development of faculty? And which further considerations can be made for each type of competence development measure?

Next to the level of types of competence development measures, the interpretation of the data intends to make where possible a *reference to the action competence model*. Which inferences can be made from the analysed competence development measures for key components of the action competence model, which has been developed in the conceptual part of this study? The interpretations in this chapter trace back to the analysis of the effective practices; therefore the numbers in brackets below indicate in the argumentation the related data in the index of eCompetence practices, which is shown in the previous chapter.

8.4.1. Provide Information

Evidence

The empirical evidence in the effective practices data for the *provision of information* as a faculty development measure remains rather limited. There is some reference given on the provision of information as promotion measure in the Greek e-Class practice of UoA (4), where the responsible eLearning actors report to have gained a considerable increase in the use of the institutional platform by addressing faculty with eMails and a website presentation. The e-Class team is using eMail and the web as internal communication channels to promote the use of the learning platform.

The workshop series for faculty, which the Irish government funding scheme (10) promotes, has the objective to present eLearning knowledge on a variety of electronic tools and pedagogical aspects. In this workshop setting, factual knowledge is delivered personally by trainers to staff, which might increase the impact on faculty motivation to think about eLearning as innovation in teaching and learning.

A practice, which strongly emphasises the provision of information, is the Norwegian portal for online pedagogy at the University of Oslo (11). This portal is a central point of information, which provides a repository of eLearning information to faculty. The portal contents are primarily practice-oriented to increase its relevance to academic teachers, and they aim to enhance teaching skills in online learning environments and digital literacy.

The Austrian practice of the Day of New Media at the University of Graz (12) has served the objective to make all institutional eLearning projects visible and to let faculty members gain a better understanding for services offered by eLearning support units. The informant reports in this practice that the Day of New Media has mainly attracted eLearning innovators and early adopters, while the majority of faculty without advanced knowledge in eLearning did not take part in the event.

Inference on eCompetence Development

What is the inference of the provision of knowledge on the competence development of faculty? The provision of information is first of all a basic type of measure - it is in fact an *essential starting point for any learning process*. The provision and access to a specific body of information is primarily an influence factor on the learning core and the knowledge component in the dispositional triad of the action competence model.

The provision of information comes in a range of different formats: it can be delivered by electronic communication channels or direct communication, thereby taking either a broadcasting or a tailored form; and although it is not often explicitly mentioned in the data, most if not all practices include some portion of providing eLearning information to faculty, as information and knowledge provision are a basic condition for learning.

While it might be uncritical to assume that information and knowledge are the basis for any learning and knowledge acquisition process of learners, one might have to ask why it is not sufficient to create a number of eLearning portals, newsletters and guidelines and let faculty learn the contents on their own? The Austrian experience made with the Day of New Media (12) indicates why it needs more than just providing information to attract faculty to eLearning. The information by itself has be bear some importance or meaning to attract and motivate individual learners - information without any meaning in the action context of academic teachers will likely not be perceived as relevant by the majority of faculty.

The motivation to learn factual eLearning knowledge does not evolve by itself. While the intrinsic motivation is high within the faculty groups of innovators and early adopters, the majority of faculty needs additional stimuli which are able to create extrinsic motivation for eLearning. Therefore, the mere provision of information on eLearning without any additional motivating measures is not likely to have a significant impact on eCompetence development and changes in teaching behaviour of most faculty members.

When we think about the provision of information as measure for competence development, we have to consider ways to make that information meaningful to the addressees. That might be partly reached with help of marketing strategies, which efficiently use a number of communication channels to make information provision more professional and to attract the target group to the offered services. In this context the communication strategy refers to eLearning services within a university, which are provided to faculty. But it will probably need complementary measures on the motivational level of faculty to make the provision of information meaningful to individual academic teachers. Faculty members better understand the impact of new technologies for teaching, when they have the opportunity to apply provided eLearning information and knowledge within a meaningful action context, and when they assess the results of their actions. This does not mean that the measure of providing information by itself is useless; but it is likely that it requires complementary components to unfold its potential for competence development.

8.4.2. Foster Positive Attitudes

Evidence

The empirical evidence for the *creation and fostering of positive attitudes* in the effective practices is quite limited. The Irish government funding scheme of the higher education agency (10) includes some evidence which relates to the attitudinal level of faculty. One key challenge, which has been identified at national level of the agency, is the need to develop faculty competence and confidence in the use of ICT in university teaching and learning. Accordingly, the government grants aim to support staff training programmes for faculty in the use of ICT. The HEA contributes to the creation of faculty awareness on eLearning innovation, as it regards eCompetence as important and provides national funding for related faculty trainings. In addition, course trainers and participants are encouraged in the programme to share developed materials with additional faculty members in each university. On the shortcomings side of the practice, the criteria used in the evaluation process of training programme proposals at governmental level are not transparent, which makes it difficult to anticipate within universities which trainings will be accepted and which ones rejected for the next funding term. The existence of unclear rules for the distribution of incentives like the Irish government grant constraints to a certain degree the creation of positive faculty attitudes towards eLearning.

The Day of New Media at the University of Graz (12) is a second practice which includes attitudinal influence factors on faculty. The Day of New Media works like a trade fair or an exhibition. It offers eLearning actors the opportunity to present their projects and activities at the University of Graz, allowing different formats for presentation and debate - like poster-sessions, workshops, or expert presentations. Aim of the practice is to raise interest for eLearning at the university and to subsequently involve more faculty members in the use of ICT in educational activities. A range of

networking activities has taken place at the event. Main presenters have been early adopters among faculty members and support units like the centre for information services, but the event has been open for all members of the university and for colleagues from other Austrian universities. While the event has attracted pioneers and early adopters in the field of eLearning, it has not been equally successful to attract less experienced faculty or students.

Inference on eCompetence development

Which measures can be taken to positively influence the attitudes of faculty towards the use of ICT in teaching and learning? The attitudinal component of the action competence model is the one which might be the most difficult to influence and to change with measures. Attitudes correspond to value systems, which are made explicit in social contexts through cultural norms and economic regulations. The science system awards for example researchers, who have been able to publish a number of articles in international peer-reviewed journals in a certain amount of time. Certainly, teaching is - or should at least be an important part of the work of faculty, but what is the value of being an expert in eLearning in the science system?

Extrinsic values influence intrinsic attitudes, and intrinsic attitudes influence the willingness to learn new knowledge in a given domain. One would have to think about *measures that drive a change of the predominant values* in the existing academic culture to really influence the attitude of faculty towards eLearning - which in most traditional universities is a tough challenge. In the Irish example, the national agency tries to buy in a positive attitude of faculty members by offering economic incentives for eLearning measures. It provides money to all universities which are willing to submit eLearning workshops and training programme proposals for faculty. A side effect of the training provision might be that eLearning and the acquisition of competence to adequately deal with ICT is regarded more important in the value system of faculties in Irish universities. But this is only an assumption which cannot be proved in this study.

The Austrian practice represents an approach to increase the value of eLearning in an institutional context. The Day of New Media simulates a market - it creates a public space for eLearning actors to present their work to an inner-institutional audience and to gain attention and appraisal for their endeavours. Does this scenario work for the fostering of positive attitudes of more faculty groups than the ones, who are engaged in eLearning anyway? Despite the efforts taken, the practice reportedly failed to attract the faculty majority, which proves how hard it is to get eLearning on their agenda.

Neither the Irish way of providing economic incentives, nor the Austrian way of creating markets for recognition and appraisal for eLearning provide sufficient motivational input to get the majority of faculty members on board of eLearning. These kind of measures are of high importance for creating a

much needed cultural change in the teaching body of universities; but they would probably need to be flanked with additional measures, which have a more continuous character and sustain the awareness of faculty that new technologies are changing things in higher education.

8.4.3. Organise Educational Supplies

Evidence

In contrast to the two previous types of measures, an abundance of empirical evidence can be found in the data for the *organisation of educational supplies*. This is obviously the type of staff development measure which is part of most effective practices. The direct training approach is widely used in the reporting universities to foster eCompetence development of their academic staff. Nevertheless, the organisation of educational supplies for faculty comes in a variety of distinct forms.

The Finnish TieVie practice (1) contains a number of innovative elements. TieVie is a large-scale national training activity with a high internal differentiation of learning methods. TieVie is also a cross-disciplinary and inter-institutional network which delivers factual eLearning knowledge and skills in a collaborative and project-based approach. The practice relies on peer review and peer learning of faculty members in training courses. Teacher training courses are accredited with a nation-wide recognition of the certified qualifications, which participants have gained, in all Finnish universities. A personal negotiation of the training focus takes place with each participant at the start of each course, and assignments are embedded in the creation of ePortfolios which can be extended and used by faculty members after the training has ended. A high interest of faculty in all Finnish universities and overall good learning outcomes have been reported for the TieVie practice.

The Belgium practice (2) is an advanced institutional measure to develop faculty competence in eLearning, which is embedded into KU Leuven's endeavour to assure a high teaching quality as explicit part of its institutional profile. The eLearning training modules are integrated into a wider staff development programme. These modules are near-the-job training sessions, which combine pedagogical and technical components as learning contents. Similar to the Finnish approach, the Belgium practice takes participants' real problems with the integration of ICT into teaching as basis for the training sessions. Despite these efforts, the informants of the practice assume that there is only a minor impact of the eLearning training sessions on faculty behaviour, which is still very much rooted in teacher-centered education. The integration of new technologies in teaching activities at KU Leuven takes place at slow pace and the impact of the training on the teaching culture remains unclear.

The South African practice at UoP (3) resembles the Leuven case. At UoP, eLearning is considered part of the university's institutional profile. The TLEI offers a set of direct staff trainings with different skills levels which focus on technical aspects of the institutional platform, except in one course which deals with facilitation of student learning in digital learning environments. The eLearning beginners course receives since its creation a high rate of attendance, in particular from newly appointed faculty members at UoP. This contrasts with the low rate of faculty, who continues eLearning training attendance in the advanced courses. And the courses have failed to attract most established faculty at UoP. Overall, one observes at UoP a comparably low impact of training courses on the eLearning adoption process of faculty.

The Dutch OUNL practice (5) is a training course which is more narrowly designed than the KU Leuven and UoP measures. The mouse-based tutoring course has a strong technical focus for tutor training, which is provided for eLearning beginners and advanced faculty members. The course has in addition in its learning contents a strong focus on OUNL's institutional platform. There is no information provided in the practice for the impact of the training on the overall teaching culture at OUNL.

The Dutch competence profiles approach (6) at OUNL is based on the idea to plan eCompetence training modules on basis of competence assessment of faculty groups. Unfortunately, the competence profile tool has so far not been applied outside the project context; therefore a real experience with the tool as measure to plan tailored training sessions for academic teachers is lacking.

The eModeration course in the Irish practice of (9) is a buy-in of NUI of an external eLearning training provider. The training is based on the eModeration methodology of Salmon, which works with a change of the teaching perspective - teachers act as students in the training courses. Main objective of the training courses is to provide faculty with ideas and methods to efficiently use ICT in online teaching scenarios. The data in the practice reports a high efficiency of the training, as it stimulates a change of teaching behaviour of the participating faculty members at NUI; but it reports also high costs as negative side-effect of the buy-in of external training provision. The Irish government funding practice (10) provides the budget for eLearning training courses like NUI offers to its faculty. All funded courses for faculty are required to present faculty factual knowledge on a range of technical and pedagogical aspects in eLearning scenarios. While some integration of these eLearning trainings into faculty development programmes at Irish universities has taken place, the national funding scheme is reported to be an unfavourable approach for the sustainability and planning of institutional training courses.

The German eCompetence network approach at the University of Dortmund (13) has intended to establish a set of faculty workshop modules with different foci and expertise levels. The training modules have evolved as offspring from network activities of eLearning actors in the university. These

courses have however suffered from a both a lack of financial resources and institutional support, as no leadership recognition for eLearning has evolved.

The Spanish Ped Care practice (15) has initiated faculty training sessions as a measure to promote a set of digital tools which have been developed to support distance teaching at UNED. These sessions combine methods and tool training, but as no promotion of the tools has taken place so far at UNED, the training sessions have discontinued.

The XML practice (16) has set up faculty training as measure to promote the use of the SCENARI platform in French universities. These trainings have a technical focus and are based on a hands-on approach which gives faculty members an active role in the production of contents for the platform.

Inference on eCompetence Development

The organisation of educational supplies remains the main approach taken in universities to foster the eCompetence of their faculties. The first key assumption of this study argues that traditional staff trainings may have serious limitations, and with the exception of the Finnish practice the evidence seems to support the low impact of traditional trainings on faculty behaviour. Why do traditional faculty trainings not produce a more efficient impact? Let us think for a moment about learning processes of participants in a traditional training scenario and their relation to competence development.

In a traditional training scenario, the subject expert presents mainly factual knowledge on a specific domain - in our case on eLearning, to a number of participants. The participating faculty members are probably confronted with theories, methods, and tools for eLearning environments. The trainer hopes that participants learn the presented factual knowledge, but why should they do so? Meanwhile students are forced to learn factual knowledge in their study courses because they are assessed in an written exam, faculty in eLearning courses have not any external assessment requirement or pressure upon them. Extrinsic motivation and personal interest of participants might have an influence on their volition to learn the presented factual knowledge faculty in staff trainings. When participants are in the better case interested in the presented knowledge and engage in some learning, they add knowledge to their subject matter competence; but in addition to this, the skills and attitudes components of the participants need to be influenced as well by learning in the trainings to build up a more holistic eLearning action competence.

What frequently lacks in traditional trainings is some relevance of the training contents for the real work context of participants. But even when this real context is included in trainings - like in the KU Leuven practice, there is still a low training impact reported on faculty teaching behaviour. What

seems to be missing is a wider sense of necessity of faculty to change their predominant teaching culture. Training will only become an efficient and powerful measure for competence development, if faculty starts to feel threatened by a massive change and to be left behind in a major organisational or contextual innovation in case they do not adopt to this change. The need to learn in order to be not left behind and find oneself in a disadvantageous situation is a powerful force for the volition to learn. This 'unfreeze' phase of Lewin's organisational change model might be an essential precondition for the effectiveness of training (see chapter 4.7). New, evolving phenomena need to be assigned with increasing values and old, existing phenomena need to be assigned with decreasing values in order to move people in a specific organisational context out of their habitual role definitions and to become more open and willing to learn. Although the new web technologies currently cause a major change, which will likely have massive implications for learning in higher education, many universities and faculties still stick to the traditional cultures and paradigms in teaching.

These considerations correspond in a way to the two key assumptions of this study which are laid out in chapter 3.5. It might be that the main conditions of the first key assumption - faculty first needs to become aware of the change and to start to make use of ICT, are also preconditions for the efficiency of staff training or any other competence development measure in universities. This *correlation of perceived change and volition to learn* is somehow already expressed in the Latin proverb: "*non scholae, sed vitae dicsimus*". Every pupil knows this proverb, but not many consider what is learned in school relevant for their perceived reality - not until reality starts to hurt a bit and makes them realise some things they learned (or not learned) are indeed relevant for their ability to get along in authentic and challenging real-life situations.

The efficiency of staff trainings depends not only on the way faculty perceives change and their volition to adapt to change, but also on the way competence development measures are designed and carried out. The Finnish TieVie practice seems to include some elements that are not present in more traditional training approaches. The TieVie approach presents factual knowledge on eLearning not in a one-, but in a multi-dimensional way. Naturally, TieVie experts deliver eLearning knowledge to the participants. But this trainer activity is complemented with a series of learner activities, which give the learning content more meaning and value. It might be interesting in future research to find evaluation methods, which measure more precisely the impact of multi-dimensional and learner-centered courses like TieVie on the competence development of participants. At this point we can only conclude that the Finnish training approach is a bit different and that the self-assessment of the TieVie informants on the training impact is positive.

8.4.4. Offer Consulting Support

Evidence

The empirical evidence found in the data for the *offering of consulting support* starts again with the Finnish TieVie practice (1). The Finnish approach includes a model of collaborative, project-based learning with direct support from trainers and peer support from colleagues. The peer review of participating faculty members in TieVie is in particular important for the creation of their electronic teaching portfolios, which is one essential assignment in the practice. Even though the creation of these portfolios, which document teaching merits and include some project work of faculty members in the TieVie courses, are demanding, participants engage in this task and peer review each others' results. Beyond the course context, a number of former TieVie participants offer peer mentoring to faculty at their local universities, and former participants gradually take over the role of acting as local eLearning trainers and experts.

The Belgium practice of KU Leuven (2) includes some level of consultation to faculty. Participants receive in the Digital Chalk courses direct technical consulting on platform issues and individual support to elaborate their assignments, which are usually project-based production of digital contents in the institutional learning platform. In addition to these course-related activities, the platform help-desk unit and the faculty-based eLearning advisers support faculty on-the-job with any eLearning - related problem. In particular new eLearning users in the faculty demand individual eLearning support.

The South-African practice of UoP (3) refers for the offering of consulting support to a group of instructional designers, who act as facilitators for participants in the eModeration courses of TLEI. In addition to this, consultants provide on-demand delivery of a customised basic eLearning course to specific departments or faculty groups at UoP. Despite these consulting efforts which aim to make faculty members more autonomous and confident in eLearning, the main load of digital course development for study courses in the learning platform is reported to rest with TLEI, and high costs of personal eLearning consulting services are mentioned.

The Greek e-Class practice of UoA (4) includes a central technical support service to faculty in the use of the learning platform. In addition to this central support service, the eLearning experts of the e-Class project provide on-demand personal support for faculty in the use of platform features and ICT tools.

With a similar focus, the Dutch MBT practice at OUNL (5) provides faculty support, in particular for technical issues with the institutional platform.

The Norwegian practice at UiO (11) includes direct eLearning support to faculty members, which is provided on-demand. In particular new eLearning users in faculty prefer this kind of personal consultation, and it is reported in the practice that this support has a positive influence on faculty motivation to integrate eLearning components into teaching.

The Spanish Innovatic practice at UAB (7) goes in a similar direction with two ICT experts, who offer technical support to Innovatic group members.

The Spanish Ped Care practice at UNED (15) offers direct consultation of technical experts on the added value of eLearning to academic teachers in their personal work contexts. Main objective of teacher consultations is the acquisition of Ped Care tools skills. Although this has reportedly increased the efficiency of teaching activities and of learner satisfaction in distance learning courses, there is a high reluctance of the majority of teachers reported in the practice to make use of Ped Case tools, which results in the lack of faculty adoption of the LRM model at UNED.

The Danish tool-box practice at Aalborg University (14) provides an initial consultation of study board members as pro-active approach to foster eLearning. This consultation subsequently takes the form of a series of workshops on the added value of eLearning in curricula planning and delivery in all disciplines covered at Aalborg University. The practice applies a participatory approach to define the role of eLearning in study courses. The practice reports the problem of high incurring costs and labour input for these series of study board consultations, as well as a lack of economies of scale as critical points of the consultations.

Inference on eCompetence Development

As the evidence shows, the offering of consulting support is next to the organisation of educational supplies a widely used measure. But is there a causal relation of eLearning expert consultation to competence development of faculty? Main objective of consulting support is to facilitate the learning processes of learners, and to make them in the long term autonomous and confident to take own decisions in a specific eLearning context. But - as far as the evidence of the practices shows, with the exception of the Finnish TieVie case this evolution of autonomy does not take place. Faculty continues to ask for consulting support, and the main workload - as pointed out in an exemplary way in the UoP case, remains with the eLearning support services.

When we take into consideration that scientists are usually excellent self-organised learners in their domains, this finding is a bit surprising. It might be that this kind of eLearning expert consultation to highly proficient science domain experts is not very efficient. Then again the Finnish practice, which

relies on peer reviews, reports considerable positive impact of peer consulting on learning processes of faculty members in the TieVie courses and even beyond the course context at their local universities. In the Finnish case, subject experts consult other subject experts on eLearning issues, which are in the same science domain. Here we might have found some evidence that the science domains have a significant influence on the volition of faculty members to accept consultation and advice on new technological developments. Scientists are used to and willing to take advice from their own science peers; they intrinscally might decline to accept advice from external experts, even if the knowledge domain is a different one than their own science discipline - in this case eLearning.

To which degree does a measure like offering consulting support have an influence on competence development? Usually, clients request support from subject experts when their own factual knowledge in a specific domain is not sufficient to make an informed decision in a complex action context. The subject experts provide the missing knowledge to the clients and may advise them to choose a specific direction or tendency in their decision-making process. The critical point in this consulting process is to make a transition in responsibility for this decision-making process and in the level of engagement from subject experts to clients. Who is finally the process owner for the decisions and responsibilities - is it the clients or the consultants? It should be the clients, but we can see in our area that too often faculty members opt for the less burdensome way and try to transfer as much responsibility and workload as possible to the consulting eLearning experts.

The evidence in the practices shows a tendency of faculty members to outsource eLearning responsibilities and involvement to consultants in place of building personal engagement to face technological challenges in their teaching contexts with own competences. This unfavourable effect of consulting support is less likely to happen in peer review and consultation on eLearning. In this case the eLearning-specific knowledge is embedded into the domain-specific knowledge and value system of the subject experts in their respective science disciplines; and the outsourcing strategy might probably not work between peers, whose main responsibility is not to work as eLearning consultant of a central support service, but as peer consultant in the same science domain.

These findings and considerations suggest that there is some *potential to think about a re-organisation* of the traditional way consulting eLearning support is offered to faculty in universities. The TieVie practice includes a number of innovative components, which may serve as indicators for re-adjusting the traditional faculty support structures for technological issues within universities. eLearning support units should consider the significant influence of science domains on learning styles of faculty, and use the powerful mechanisms which make peer support work.

8.4.5. Increase Action Readiness

Evidence

The empirical evidence for the *increase of action readiness* of faculty in the data is limited. The Belgium practice at KU Leuven (2) provides institutional grants to faculty for innovative educational projects. Meanwhile the criteria for innovativeness is not necessarily tied to technology, many project proposals include some ICT component in their frameworks. The project grants amount to up to 60.000 EUR per year per project, which is a considerable institutional incentive of KU Leuven for its faculty to develop new ideas and methods for teaching and learning. In addition to these financial incentives, KU Leuven has defined some criteria within its institutional benchmarking of faculty performance to systematically foster the career development of dedicated junior researchers, who are active in eLearning.

The train the trainers programme of the Irish Government (10) is a national funding scheme where universities apply as institutions to finance eLearning-related staff training. This national incentive aims to create action readiness for eLearning at institutional level of universities. Usually, central support units like CELT, which are responsible for issues like eLearning and staff development programmes, draft training proposals for funding. It is not evident that the incentive mechanism of providing eLearning funding will work beyond this primarily target group and positively influence the action readiness of faculty members. We can only assume at this point that the national grants have a kind of indirect impact on faculty attitude towards eLearning as an issue which has value and potential for educational processes in study programmes.

The Greek practice at UoA (4) mentions that the national e-Class project funding scheme provides additional funding as financial incentive for those university departments which decide to use the learning platform as resource for their study programmes. Neither criteria for eligibility for funding, nor funding levels are detailed in the evidence of the e-Class practice.

The German practice at University of Dortmund (13) provides an annual funding scheme for faculty members, who integrate some eLearning components in their study courses. The institutional programme budget is 20.000 EUR total per year and is allocated on the basis of eLearning project proposals, which faculty members submit for evaluation to the Media Center of the university.

Inference on eCompetence Development

As far as the evidence in the practices can be judged, one has to be rather sceptical about the assumption that financial incentives for eLearning will have a positive effect on faculty behaviour. At

least in the Dortmund case, the experience made with eLearning grants has shown that these financial incentives have produced only a short-term effect on those faculty members, who have applied for funding. Seen from its moderate results, it could be even questioned, if these faculty members have not been in first place attracted by the eLearning grants to gain funding for securing some additional financial resources in strained departmental budgets at the University of Dortmund - this would nonetheless have to be investigated by a more detailed analysis on objectives and outcomes of these eLearning projects.

Compared to the provision of project funds, which are limited in time and run the risk to be perceived by faculty as nice financial 'add-on' which can be gained without having to spend too much effort, the *career development approach* seems to be a more promising way to go. This option provides in particular junior faculty, who are engaged in eLearning, with a long-term perspective to build a career at their universities. In addition, the career approach does not exclusively work with financial incentives, but includes motivational elements, like increased job security and recognition for eLearning-related performance. A challenge is that the career development measure requires in contrast to singular project grants a considerable level of institutional commitment of universities, which decide to choose this path. It is likely to be realised in universities where the leadership has defined eLearning as a key strategic asset and agreed upon the establishment of coherent eLearning objectives and success criteria. These strategic objectives and success criteria need to be integrated in the institutional norms and value system of the university, and the leadership needs to re-allocate resources for these career paths.

In addition to these considerable internal efforts, the career development option is closely tied to the overall value of teaching in the science system. As long as the research performance of young scientists remains to be the most important benchmarking criteria for appointment at universities, the establishment of eLearning - related 'tenure tracks' will be an unusual and non-conformal leadership decision, which only some universities might be able and willing to take.

What is the role of measures that aim to increase eLearning-related action readiness on the competence development of faculty? While measures like funding grants mainly provide extrinsic motivational incentives to faculty members, career opportunities and awards add value-related influence factors to the measure of increasing faculty action readiness for eLearning. They provide social recognition for personal achievements in eLearning as a domain which is defined as relevant in a specific context. This can be either the institutional context of a single university, or the national or international context of eLearning conferences and networks. The main assumption is that career opportunities and awards will have in the long term a more significant impact on competence development of faculty than singular funding grants, whose sustainability is limited *per se*.

8.4.6. Establish Learner-Activating Quality Development

Evidence

There is some empirical evidence for the *establishment of learner-activating quality development* in the data. The Finnish TieVie practice (1) relies on the ePortfolio approach as basis for a continuing learning processes of faculty, once the training programme has ended. Main idea of the TieVie approach is that every participant creates his or her personal ePortfolio, which serves as digital container for all assignments in the courses. When the TieVie courses have ended, participants make use of their acquired eLearning knowledge and skills to extend their personal electronic portfolios, to produce digital learning materials, and to actively self-reflect upon their teaching practices. When learning of teachers continues in the ePortfolios, it is likely that this will have as well a positive influence on the quality of study programmes in their universities. This way, the personal ePortfolios add value to both the teacher profiles and to universities as a whole by presenting teaching and eLearning competences of their faculties, and by the process of self-reflective quality assessment of teaching in study programmes.

The Spanish BREVIA practice at UAB (8) has created a web repository to facilitate autonomous learning and to promote a more active learning of students in study programmes. Faculty at UAB is encouraged to actively use and to contribute to the digital web repository for course materials. The leadership of UAB supports the creation and development of the repository. A categorisation system in the web repository requires faculty to reflect upon student competence profiles in different knowledge domains, to organise digital learning materials for study programmes, to provide working guides and to define problem-based learning tasks which are integrated in the study programmes.

The Danish tool-box practice at Aalborg University (14) is a participative model for the development and implementation of eLearning components within study programmes. Repeated consultation sessions of eLearning experts in the study boards drive a process of continuous improvement (*kaizen*) for eLearning components in each study programme. The eLearning consultation model relies on active involvement of study board members and faculties at Aalborg University. Faculty members in the study boards agree to take over process-ownership for the development and deployment of eLearning strategies and decisions in their departments through the common definition and distribution of roles and responsibilities in the consultation sessions. Main problem within this practice are the considerable costs that the participatory decision process on eLearning integration is causing.

The French XML practice of the University of Compiègne (16) directly involves faculty members in the production of digital contents. Faculty members usually deliver word documents as input for the production of digital learning content. Faculty members create XML-based learning modules with technical support of platform team members. The produced digital content is integrated for use in

study courses into the learning platform. The main weakness reported for the practice is the tendency that often assistants take over the responsibilities and tasks from faculty members in the content production process.

Inference on eCompetence Development

What is the inference of the establishment of learner-activating quality development on the competence development of faculty? The idea of this measure is to situate learning of faculty members into a process of curricula quality development and eLearning integration. Faculty gain active process-ownership, and they have clear roles and responsibilities in these quality development processes. This approach of situated, on-the-job learning within study programmes as real work context of faculty members is quite different to off-the-job training courses where the work context is at best simulated. Faculty involved in curricula quality development are in the best case able to directly perceive the potential of eLearning for teaching and learning scenarios.

In the Finnish, the Spanish and the Danish practices faculty engage in self- and group reflection on teaching styles and methods in study programmes. The active involvement of faculty in curricula definition and eLearning integration in study programmes creates in an ideal situation opportunities to learn and gives this learning immediate value through the direct responsibility of participating faculty members for specific process elements in the teamwork. Learning of faculty members is driven by task requirements and by interdependencies of team members in curricula design and production processes. Through these multi-dimensional task requirements in authentic work contexts, the learning experience of faculty members is more holistic and meaningful than in off-the-job eLearning trainings.

In particular the *multi-dimensional, holistic and meaningful attributes* of the establishment of learner-activating quality development *fit well to the various key components of the action competence model*. Learning is by no means restricted to the integration of factual knowledge. New knowledge has to be directly applied to the real context of curricula design and eLearning integration; this requires a development of respective competences. These competences relate in the Finnish practice to self- and group reflection, and the to the application of ICT tools which are used to produce and extend ePortfolios. In the Spanish practice, the competences refer more to pedagogical issues in study programmes, with faculty members reflecting on learning outcomes in study courses and on the role of a web repository for the re-design of curricula. The French practice emphasises the acquisition of technical competences, which might be an approach which is too narrowly designed, as many faculty members drop out of the production process and assign assistants to take over their tasks and responsibilities.

The establishment of learner-activating quality development is a complex competence development measure with wide implications for the organisation of curricula and the integration of eLearning in universities. This measure requires a re-thinking of centralised quality assurance systems in universities. These established systems need to shift responsibility for quality assurance in study programmes from administrative units to faculty. In addition, the role of faculty in the process of curricular quality development and eLearning integration needs to be defined in a way that opportunities for learning are created. It would not make sense to solely put the burden of responsibility on faculty without giving them some flexibility in terms of time and task definitions to learn along the process. There is a need to learn more about the opportunities and potential for competence development of faculty in this area of quality development.

8.4.7. Foster Dialogue and Collaboration

Evidence

The empirical evidence for the *fostering of dialogue and collaboration* in the data is substantial. The Finnish TieVie practice (1) is organised as a cross-disciplinary and inter-institutional national network that has brought together more than 1000 faculty members between 2001 and 2006 and contains a high level of dialogue and collaboration between participants. All faculty members of the participating Finnish universities have open and unrestricted access to the courses of the network programme. The course organisation takes partly place in national workshops or 'megaconferences', partly in local workshops, and partly in virtual study modules. All staff courses require a considerable level of interaction and collaboration from all participants. The programme is based on a project-based learning approach, which is realised as a continuous development of ePortfolios. These ePortfolios document the assignment work of course participants. The informants of the practice also report a positive effect of the TieVie network activities on the overall organisation of teaching in the involved universities.

The Dutch MBT practice at OUNL(5) fosters the exchange of experiences and ideas between technical experts - as course developers in the institutional learning platform, and the faculty members - as course tutors in the digital units of study courses. This dialogue between technical and subject matter experts is reported to be one of the main added values of the MBT courses.

In the Spanish Innovatic practice at UAB (7) faculty members exchange in regular meetings knowledge and experiences on eLearning. The Innovatic case is a community of practice with a focus on pedagogical models and technological developments in eLearning. Good practices are collected and stored in a web repository in the UAB intranet. Two eLearning experts support faculty members with technical advice. The Innovatic group members spread their discussions and activities on the role of

eLearning in teaching to other faculty members within their own departments. As weakness is reported that only scarce resources are available for the practice. The total group size is small, real economies of scale are not given and the impact of the Innovatic group on the whole faculty at UAB is limited.

The Austrian Day of New Media at University of Graz (12) contains a range of informal networking, which has taken place at the event. These initial contacts between faculty members with interest in eLearning have subsequently evolved into more stable inter-organisational networks with regularly meetings and some degree of sustainability. This visibility of eLearning actors and growth of networks has been decisively encouraged by the steering committee for the use of new media in teaching at the University of Graz.

Similar to the Austrian approach, the aim of the German eCompetence network at the University of Dortmund (13) has been to bring disperse eLearning actors together and to make an inventory of existing projects in the field. The network model has been selected as constituting model for the practice. A lack of resources and of leadership support, as well as a high proportion of junior researchers without stable work positions have subsequently led to the discontinuation of this network.

Inference on eCompetence Development

What is the influence of fostering dialogue and collaboration on the competence development of faculty? Main idea of this measure is to foster learning and competence development of faculty in peer groups. The peer group approach is a widely accepted learning scenario for faculty members with a longstanding tradition in the science culture. Dialogue and collaboration between peers on the potential of ICT for teaching and learning help to raise awareness within faculty. Peer group learning contains a high level of self- and group-reflection, it fosters a mutual exchange of experience, and it stimulates reflective practice of faculty in the field of teaching and the use of eLearning. The collaboration and shared interests of peer group members are likely to have a positive influence on the volition of faculty members to learn about the efficient use of ICT in their work contexts.

Learning and the creation of knowledge between the members in a peer group evolves as a social process, which builds on mutual respect, collegiality, and a sense of belonging. This way, the learning process of peer group members fosters in addition to the exchange of factual knowledge the exchange of experiences, which have been made on eLearning. New teaching approaches are discussed and tested by faculty members in peer groups without any risk to 'lose their face' in authentic teaching contexts. Peers give feedback on tested teaching performance and contribute this way to the acquisition of new skills.

Communities or networks do usually not evolve on their own, but rely on shared norms and values - this is why peer groups within the same science domain might work more efficiently than peer group across science domains. There is a significant variation of norms and values in different science disciplines, and this is a problem for a cross-disciplinary topic like eLearning. Peer groups on eLearning frequently cross science boundaries and bring researchers from different disciplines together. It is a challenge for any eLearning coordinator in these 'mixed' peer groups to unite all members on a common ground, where they respect and understand each others' values and norms.

But not only these cross-disciplinary groups, probably all *communities need a high level of facilitation*. It is essential for the success of a community that group members agree in the phase of its establishment on a common objective and start to build trust. A clear definition of the *raison d'être* and a sense of trust are vital preconditions for sharing knowledge and expertise in a peer group. The fostering of dialogue and collaboration seems to be an efficient competence development measure for faculty. This is reflected in the evidence of the practices, where the initial creation of peer groups has evolved in a positive way. But this peer group creation is not to be taken for granted; it requires a high amount of coordination work to get things going and to trigger a common learning process of group members (see Kess, chapter 5.4.1.2.; Wenger, chapter 7.3.1).

8.4.8. Make Innovation Mandatory

Evidence

There is a range of empirical evidence in the data for *making innovation mandatory*. The Finnish TieVie practice (1) refers to this area as a weak point or a blind spot in their approach. TieVie programme managers lack information and feedback about the practical application of acquired competences in the authentic teaching contexts of participants; and they lack in consequence valid information on the real impact for the whole programme of ICT-related educational innovation in universities. The question, to which degree TieVie measures foster the use of eLearning and change the overall teaching culture in Finnish universities, remains currently unsolved and requires additional evaluation efforts to be answered.

The Belgium practice at KU Leuven (2) has explicitly referred to the crucial role of a high teaching quality in Leuven's institutional profile. The university leadership perceives excellence in its educational services as an asset in the growing international competition for students. KU Leuven has initiated several organisational measures to make an integration of eLearning at least to some degree mandatory. These measures include the strong leadership support for the integration of eLearning; the establishment of central eLearning services and departmental units for faculty support; financial incentives like project grants for eLearning components in study courses; institutional career opportu-

nities for junior researchers, which acknowledge eLearning-related achievements as a positive benchmark criteria in appointments; the installation of a central learning environment; and a positive reinforcement of faculty to deliver part of their study courses in digital formats.

The South-African practice of UoP (3) has gone a similar way as K.U. Leuven. The university has taken a strong leadership decision to implement an institutional eStrategy, which is based on the model of 'telematic learning'. This model surrounds students with technology, allowing them to enhance and extend their learning activities on and off campus. The university has established TLEI as central support unit for the telematic learning strategy; it has integrated all central services, which are connected to IT, into the TLEI unit; this includes amongst others the library, the student administration services, the IT department and the faculty development center; and all newly appointed faculty members are required to gain a certification in staff development, part of which is the eLearning programme of TLEI.

The Spanish BREVIA practice (8) has been established at UAB to support learner autonomy of its students. The BREVIA practice is using teacher commissions as leverage point to foster the use of ICT in study courses. The UAB leadership steers an implementation of the BREVIA practice through an executive commission, which is headed by the Vice-Rector for Academic Affairs. All faculties have to decide upon teaching materials for each study programme, which is digitalised in the web repository. Teaching commission members need to reflect on the impact of the use of the web repository for the delivery of study programmes, when they select learning contents. Faculty members discuss within the committees issues like teaching roles and assignments in a learner-centered pedagogical model.

The Danish tool-box practice at Aalborg University (14) uses the study boards of faculties as leverage point for the integration of eLearning into study programmes. The potential of eLearning for the delivery of study programmes is discussed within study boards, and successively an integration plan is drafted. eLearning consultants and study board members assign at the end of this process of continuous improvement roles and responsibilities for the implementation of eLearning. This way, they create a faculty ownership of projects. The university leadership provides funding for the realisation of eLearning projects at study programme level.

Inference on eCompetence Development

What is the inference of making innovation mandatory on the competence development of faculty? Main objective of this approach is to transfer or to distribute roles and responsibilities for eLearning within a university - innovation is not considered to be an exclusive leadership task, but is understood as a common endeavour which actively involves faculty.

Similar to the quality development measure, the process-ownership of change is a crucial component within the measure of making innovation mandatory. Faculty needs to feel personally responsible for the evolution of technological innovation and to gain a positive perspective by committing time and energy into eLearning. If faculty members, who engage into eLearning, are rewarded in their institution in terms of career development and recognition, this is likely to have a positive influence on their volition to learn new knowledge, on their willingness to acquire new skills, and on their attitudes to drive innovation forward. From this point of view, making eLearning innovation mandatory is a truly *holistic competence development measure*, as its adherent learning processes influence in an ideal case all three dispositional key components of the action competence model.

The *creation of a common sense* seems to be a crucial precondition for the success of the measure of making innovation mandatory. University leadership has to establish clearly defined eLearning-related norms and values in the inner social context, which are perceived by faculty as important institutional objectives. A positive influence of institutional leadership objectives on personal expectancies, goal-orientation, and intrinsic motivation of faculty is more likely to happen, if decisions on eLearning strategy actively involve faculty. This requires a distinguished leadership management, which manifests itself in behaviour patterns like: open and transparent decision-making style; efficient communication strategy to clearly represent the objectives of its innovation policy; provision of substantial financial resources; and inclusion of positive institutional norms and regulations for eLearning integration to signal faculty that this is a strategic priority for the university.

What faculty needs in this approach are clearly perceivable motivating incentives for personal commitment into eLearning, which stimulate a positive reinforcement and opportunities for learning in order to adapt to the aspired institutional innovation. Leadership decisions and signals to faculty have to avoid empty promises and unclear perspectives; quite to the contrary, they have to assure a strong and decisive support for eLearning protagonists.

The efficient application of making an innovation mandatory might in an ideal case result in a process of organisational learning on the potential of ICT. Due to its complexity, this type of measure for competence development is also the most challenging approach, which requires a high level of institutional commitment for eLearning and carries a high risk to not succeed in the way it has been previously planned.

9. Final Results and Further Research Perspective

Content

9. Final Results and Further Research Perspective

Aim of this study has been to carry out a comparative analysis of faculty competence development measures, which foster the use of ICT in teaching and learning scenarios. The central research question of this study has been: which organisational concepts and measures do universities set up to develop and foster individual competences of their academic staff members in the use of ICT? Two main steps have been undertaken to address this research question: the theoretical part of this study has explored the concept of competence, developed a generic model for eCompetence, and introduced types of measures for eCompetence development of faculty. Based on this theoretical framework, the collected project data on eCompetence development measures has been analysed and categorised in the empirical part. This chapter presents the *final conclusions* of the study. It summarises the main theoretical implications and practical consequences of this study for ICT-related training and development; it outlines the limitations of the research focus and design; and it provides suggestions for future research on competence, eCompetence and on appropriate measures for competence development.

Chapter 3 has specified the two key assumptions of this study. The *first key assumption* has been that a successful management of technology-driven innovation in universities depends on their ability to actively involve faculty in the organisational change process. Two preconditions have been detailed to attain this active faculty involvement in eLearning innovation: first, academic staff members need to become aware on the technology-driven change and potential of eLearning in higher education; and second, they need to make persistent use of the potential of ICT in their personal work routines and teaching practice.

The results of this study show that the *active involvement of faculty* in eLearning strategy decisions and implementation processes is one important element in the management of technology-driven change at universities. A sustainable integration of eLearning into universities works more efficiently in integrative innovation management approaches, where faculty take over active roles and responsibilities for the implementation and use of ICT in teaching and learning. The process-ownership of faculty is the main difference between integrative innovation management and more directive approaches, in which ICT integration is mainly organised through the establishment of central support units, which are responsible for the creation of eLearning components in study programmes of universities. Integrative and participative management approaches are better suited to raise the awareness of faculty for eLearning and to foster the persistent use of ICT in teaching and learning, because their active involvement influences not only cognitive, but also motivational and attitudinal components of competence. At the same time, integrative eLearning approaches require a whole set of comprehensive measures which need to be taken both at leadership and at faculty levels - like setting clearly defined targets, establishing strong institutional incentives, clearly defining roles and responsibilities and shared work processes, establishing and moderating learning processes in peer groups and so

forth. Meanwhile the empirical data of this study provides not a single example for innovation management of this design and scope, a number of cases, which have at least developed elements for an integrative eLearning strategy approach, are amongst the group of universities with an advanced stage of ICT implementation.

The *second key assumption* has been that the development of ICT - related competences depends on a combination of formal and informal learning opportunities and support measures for faculty. Two preconditions have been detailed to attain an efficient competence development of faculty members in the use of ICT: first, formal eLearning training programmes initiate a learning process of academic staff - but they alone are not sufficient to sustain the learning process of faculty in the use of ICT; therefore, a sustainable competence development of faculty relies in a second step on wider organisational contexts and conditions within universities.

The results of this study show that formal eLearning training programmes indeed need some *complementary institutional measures* to create a lasting impact in terms of learning and competence development of faculty. The two most widely used measures within the pool of universities, which has been analysed, are the establishment of educational supplies and the offering of consulting support. At the same time, the analysis of these two types of competence development measures shows that their impact on faculty behaviour remains low, if they are not complemented with additional institutional measures which influence the motivational level of academic teachers. The main findings for these two types of measures, and the conclusions for the second key assumption have already been outlined in chapter 8.4. What can be inferred from the outcome of the data analysis and the validation of the second key assumption is the necessity to re-think the traditional model of staff development, and to shift the focus of competence development measures from traditional training and consultation to types of measures which have a stronger motivational and attitudinal impetus on faculty readiness for eLearning.

In chapter 4, the key components of the *concept of action competence* have been explicated and illustrated in a comprehensive theoretical model. What can be said in the framework of this study on the concept of action competence? From a methodical point of view, the model of action competence has been a feasible tool to define eCompetence profiles for electronic contexts. The 3x4 competence matrix, which is illustrated in chapter 5.5, has been applied to identify and classify competence descriptors which derive from contextual requirements in specific eLearning scenarios. The action competence model and the method to identify and classify competence descriptors might be equally useful instruments in other educational contexts to specify the knowledge, skills and attitudes in each of the four key competences subject matter, methodical, social and personal competences, which are necessary as desirable learning outcomes of course participants to show adequate behaviour. This definition of desirable competence profiles for specific contexts of performance could

serve as a basis for the outcome-oriented design of study courses or training measures in educational institutions.

It has become evident in this study that *action competence is a holistic concept* which is likely to require more *holistic approaches to competence development* than are currently applied in many training and education contexts. Holistic concept means in this context that the acquisition of a specific action competence requires more than to respectively learn new knowledge, to develop new skills or to attain new attitudes. Learning needs to stimulate all three dispositional key components to foster action competence. As far as the empirical evidence of this study can be assessed, multi-dimensional approaches, which combine several types of competence development measures within a portfolio, are better suited to serve the learning needs of faculty than one-dimensional approaches, which rely on one single type of measure. A comprehensive combination of learning options and stimuli in several dimensions will increase the probability to efficiently influence all three dispositional key components of the action competence of learners.

For the development of eLearning action competence, those measures have most impact which design the *learning process as concrete activities* of faculty within their authentic work contexts. This learning process includes several stages until a sustainable competence acquisition and change of behaviour is attained. Learners develop a higher level of learning motivation, if they face an unstable and changing work context which raises their awareness on the potential of technological innovation. The provision of learning options need to be tailored to learning styles and to levels of expertise of different faculty groups. Learning activities become more relevant, if they are 'near-the-job' or 'on-the-job' activities, which are applicable to the real work challenges that faculty is facing in their daily teaching and learning routines. Universities support the efficiency of faculty development programmes, if they create additional institutional incentives for eLearning activities and achievements. Competence development measures should provide learning materials and methods, which increase the efficiency of teaching performance and add value to individual teaching portfolios in order to be perceived by faculty as a worthwhile and attractive learning activity. The impact of competence development measures on the work performance of faculty and the value of learning outcomes for the solution of problems in real work contexts need to be assessed with objective criteria. Types of measures, which include applied learning activities - like the production of eLearning projects or portfolios, which are a visible manifestation of acquired competences of faculty, seem more fit for purpose for assessing the impact of training than types of measures which mainly provide factual knowledge without any direct application task.

A challenging research problem is the question: *which competence development measures influence which action competence dispositions (KSA)?* The evidence of the effective practices support a tendency to assume that different kinds of competence development measures have different degrees of impact on the dispositional key components of action competence. One might for example assume that the measure of providing information has mainly an influence on the knowledge

disposition of action competence; meanwhile the measure of organising educational supplies influences both knowledge and skills of learners; and measures like peer review in a community of practice influence in addition to knowledge and skills the attitudes of learners.

In an ideal training design scenario, this rating of measures might be represented in a *taxonomy of scales* which assigns a range of values for the impact of specific interventions on knowledge, skills and attitudes as the dispositional core components of action competence. The table below is a short draft proposal of such a taxonomy of scales for competence development:

TABLE: TAXONOMY FOR IMPACT OF COMPETENCE INTERVENTIONS ON KSA

		DISPOSITIONS		
		KNOWLEDGE	SKILLS	ATTITUDES
MEASURES	PROVIDE INFORMATION	+++	--	--
	ORGANISE EDUCATIONAL SUPPLIES	++	+++	+
	...	...	...	...
	FOSTER DIALOGUE AND COLLABORATION	++	+	+++

But the question remains, if such a taxonomy of scales and the holistic training perspective are feasible approaches to explain the impact of learning interventions on competence dispositions. At the end of this study, and at the current point of the competence discussion, we can only assume variations of significance in *correlations between different types of competence development measures and levels of increase of action competence dispositions*. Additional research will be needed to base these assumptions, which are made on the basis of inferences for types of learning on competence dispositions, on solid empirical evidence. It is a challenging task to prove causal inference for a set of competence development measures on the acquisition or enhancement of action competence. This research field requires a different design and methods with a strong focus on psychologically grounded competence assessment instruments, which measure the impact of specific learning interventions on specific competence dispositions of learners across a sufficient period of time.

In chapter 5, an approach has been developed to specify the concept of eCompetence for academic staff. The evidence in this study shows that the *meaning of eCompetence varies according to the specific context of performance* - the eCompetence of a teacher in a lecture-centered

eLearning scenario is quite different from the eCompetence of a teacher in a highly interactive and collaborative eLearning scenario. The dependency of feasible competence profiles from specific contextual performance requirements is probably not only given for eCompetence, but for all kinds of competence definitions. It is for example likely that the meaning of 'team competence' in a department of philosophy is quite different from its meaning in an US marine corps.

This way, the context of performance contains inherent task definitions and requirements which specify competence profiles of acting individuals in different scenarios. Even though we might assume an underlying *set of basic competences* - such as a pedagogical competence in the SCIL eCompetence profile for academic teachers in eLearning contexts, there is usually a high degree of differentiation of competence components according to specific contexts of performance - as could be seen in the analysis of eCompetence profiles for the four ePlanet scenarios. Main conclusion of this perspective is the one that a generic definition of competence or eCompetence, which represents a meaningful global competence profile for a wide range of different contexts, is unlikely to evolve.

In chapter 6, *organisational and collective influence factors* on faculty competence development have been considered. The analysed evidence supports the assumption which has been made in previous research that in most universities faculty splits into a range of different types of innovation adopters with distinct abilities, opportunities, motivations and interests to get involved into eLearning. A design of competence development measures for academic staff in universities should begin with the analysis of the main interests and learning needs of these faculty types - the stakeholders involved into the faculty development should know their 'faculty types', when they think about appropriate training measures. Rather than to simply follow a supply-driven 'one size fits all' approach, they should take into consideration an expansion of their training format towards a 'fit of measure to target groups' approach; this requires a demand-driven design of tailored competence development measures for each main eLearning adopter type at their university. It is essential for the efficiency of competence development measures that individual *faculty members perceive these measures as important* for their specific situation within their organisation, or as an substantial element in their career development. This increase in relevance might be attained if eLearning-related competence development measures better fit the different motivational backgrounds and learning needs of different faculty groups in universities.

In chapter 7, a range of *types of competence development measures* has been presented and discussed. The desktop study of current HRM and staff development in both higher education and the corporate sector has shown that currently a major trend from focused training to holistic competence development measures is observable. A second major trend is the shift in HRM emphasis from formal to non-formal or informal learning. At least for the second trend the evidence in this study shows, that quite a number of competence development measures have shifted towards non-formal learning options for faculty. Many cases report positive experiences with these types of measures, which seem

to influence in particular the motivational and attitudinal readiness of faculty members to get engaged into eLearning. The evidence shows for the first trend a variation and differentiation of types of measures, which are applied in universities to foster eCompetence of faculty. Nonetheless, the predominant type of measure, which can be found in the data, remains the formal training approach. This is partly caused by the long tradition of direct training in HRM. A variation of measures is also more complex and expensive to realise than the provision of a training courses. The positive experience reported with *approaches, which combine several types of measures*, indicates that this trend should be more extensively taken into consideration and explored in future HRM and faculty development research and practice.

The desktop study has served in chapter 8 as theoretical basis for the introduction of a *typology of measures*, which has been applied for the analysis of the empirical data. The evidence of this study has shown that the boundaries between different types of measures are often fluent. It is not always possible to make a clear cut with the '*analytic knife*' between different patterns and processes of the effective eCompetence practices and to categorise them without any leeway in distinct types. The analysed practices often contain more than just one type of competence development measure. The evidence also supports the assumption that not one- but multi-dimensional approaches to competence development seem to have a stronger impact on the change of behaviour of learner groups. A variation of types of measures and their coherent combination into an institutional *portfolio for faculty development* is likely to produce a more efficient learning outcome than the delivery of a single type of measure.

These findings fit well with the assumption of action competence as a holistic concept, which requires a holistic design of competence development measures. The main problem at this point of the discussion is that those types of measures, which are likely to have the strongest impact on competence development, are at the same time the most complex and challenging measures to be put into place. Measures, which establish a learner-activating quality development, or make innovation mandatory, are the types which demand the highest degree of *eLearning commitment* from the university to be realised.

A relevant question in this context is the one, if a portfolio of competence development measures should be designed on basis of the '*most adequate fit*' to learning needs of faculty members, or if they should be designed on basis of the '*best practice*' approach. The 'most adequate fit' position requires that the main eLearning stakeholders within a university define specific types of measures, which fit the institutional strategy; they should particular foster competences for those eLearning scenarios, which the university has decided to prioritise. A university could for example decide to complement study courses, which are usually delivered face-to-face in classrooms, with a CSCL component. This choice infers in the 'most adequate fit' approach that competence development measures for faculty focus on the ability to teach in CSCL scenarios. The 'best practice' approach

would in contrast be based on a number of good practices which work independent from their specific target groups and organisation contexts. This includes basic competence development principles like: the creation of opportunities for learning and personal development; active faculty involvement into strategic organisational decisions on eLearning; and a system of rewards for high teaching performance in technology-based learning environments. Additional research is required to clarify the impact of organisational staff training strategies - or the 'most adequate fit' approach, and the impact of basic principles for competence development - or the 'best practice' approach, on the development of faculty competences.

A *limitation of this study* is the choice of the research focus, design and methods. The research design does not include direct and objective research methods and instruments for an analysis of causal relations between competence development measures and eCompetence levels of faculty. Most evidence in this study is based on reflective self-assessment of informants, who report the impact of different competence development measures on faculty behaviour in their universities. This qualitative data needs to be complemented in future research with quantitative approaches, which use psychometric research instruments to measure the effect of different types of measures and of specific training interventions on the competence levels of faculty and on changes in individual teaching behaviour.

A second research area which needs to be further explored in this context is the analysis of different faculty groups with different learning motivations and learning requirements. Not even the more advanced competence development measures in the evidence of this study have developed a method to internally *assess learning needs and interests* of faculty members. The measures are rather planned and carried out in an experimental design. The evidence of this study has for example shown that peer review between faculty members is a highly efficient stimulus for learning and competence development. But what does this finding mean for the HRM design in universities? Could it be that formal staff development measures, which are usually offered to all faculty members by a central support service, are not perceived as useful because they fail to offer tailored learning options within specific science disciplines? Should HRM managers offer their measures rather at level of the different departments and study courses than to provide a global staff development programme for all faculty members? Although some research has been undertaken on this topic, much remains to be further explored. It would for example be interesting to investigate the influence of different science domains on the efficiency of staff training measures.

We currently experience a period of rapid and disruptive technology-driven innovation. Organisations - both universities in higher education and enterprises in corporate markets, act in this innovative societal context as collective groups of highly skilled experts, who work in knowledge-intense production processes. The high level of subject expertise creates a high level of autonomy of experts in their specific knowledge domains. But the dynamics of technological innovation is causing a constant

change in the work contexts of these subject experts - they are required to continuously learn new knowledge and skills and to adapt their attitudes to changing environments. The main challenge for HRM managers is to find adequate measures which are tailored to the learning styles and needs of these highly-skilled subject experts. Additional cross-sectional research is needed to investigate how we can design tailored competence development measures, which are really based on the analysis of the main interests and learning needs of the respective target groups, and which measure the impact of training interventions on the work performance of employees in organisations in a concise and reliable way.

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