# A New Pathway for E-Learning: From Distribution to Collaboration and Competence in E-Learning

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The article describes the current challenge for e-learning in higher education, which is to support development of competence. This poses great challenges to e-learning in higher education, mainly because the way it has been designed, in many cases, does not fit with supporting competence development. Rather, it facilitates the mere transfer of knowledge. Two different modes of e-learning organization are differentiated and described: the distributive and the collaborative e-learning modes. It is argued that the collaborative mode holds more potential for competence development than the distributive mode.

Since the declaration of the "no significant difference phenomenon" (Russel, 1999) the question of how e-learning[1] can make a difference compared to non e-learning has changed its meaning. The focus of Russell's work has been the comparison between e-learning, distance education, and traditional face-to-face educational settings. Today it is widely accepted that this was a comparison between apples and oranges because media not only changes the educational organization, but also demands a changed pedagogy and carries meaning itself.[2]

The focus in today's e-learning research has changed. To compare if e-learning or traditional learning is more effective/ efficient is not seriously considered.

The focus in the discussion about how e-learning can make a difference, moved from e-learning as a *technological innovation* to e-learning as a *pedagogical innovation* and today has arrived at a discussion about the strategic level—how e-learning can make a difference through stimulating a new learning and organizational culture. E-learning demands for a "total system" approach (Garrison, 2004), including economical questions of sustainability and business strategies, pedagogical and technological questions, and organizational and cultural questions. However, in the heart of today's discussion about e-learning is the pedagogical design because it is clear that e-learning in the long run will only have success if it manages to show an educational added value and to make use of its pedagogical innovation potential (Kerres, 2001, p. 89, Seufert & Euler, 2002).

This view is also supported by Schulmeister (2005, p. 487). He differentiates two worlds of e-learning between which there are gradual intermediate levels (Figure 1). In e-learning *World A* the students are learning with predefined content whereas in e-learning *World B* the students are creating knowledge in a collaborative way within a learning community.
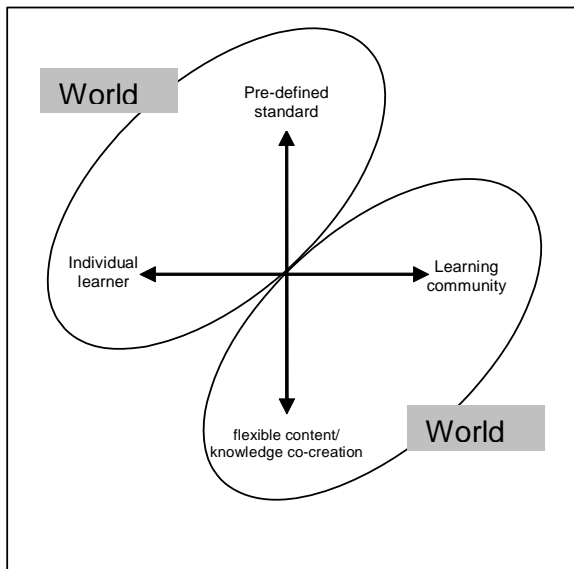


**Figure 1.** E-Learning worlds (Schulmeister, 2005)

To make the difference means to realize the full potential of e-learning as a pedagogical innovation. In this article it is suggested that this means to use technology to create learning opportunities, which are suited to equip the individual with *competences* rather than with subject matter knowledge. It is clear that today's challenge in education lies in the stimulation and support of competence development: For higher education the Bologna process clearly stresses a stronger focus on competence development (Bologna, 1999; Tuning, 2004). The results of the European project "Tuning" (Tuning), for example, show that the competences which should be acquired by students in the future can be described consensually. Competences instead of qualifications, employability[3] instead of inflexible job profiles are clearly put in the foreground in future higher education (for a comprehensive discussion of the terms "Employability[3]," "Key Competencies," and "academic quality" see Kohler, 2006). This is challenging teaching and learning organization, especially under the conditions of a stronger introduction of information and communication technologies in teaching and learning processes in higher education. The higher education arena thus faces a challenge: How can e-learning make a difference and support the development of competences?

The article focuses on the sector of e-learning in higher education and suggests that today's challenges in e-learning in higher education lie in the development of competencies. The next section defines concepts and gives background for the field of competence development. In the section after that the challenges of achieving competence development through e-learning are outlined. Then a section  suggests a shift from a distributive to a collaborative mode of e-learning and introduces Computer Supported Collaborative Learning (CSCL) as a way to facilitate competence development. To underline the fundamental differences in both approaches (distributive vs. collaborative) the debate of CSCL as an emerging paradigm is referred to. The shift from e-learning in a distributive way to e-learning in a collaborative way is proposed as a concept which makes the difference. The final section summarizes the main aspect of the article and concludes that more research on individual competence development processes through e-learning is needed.

## THEORIES AND CONDITIONS OF COMPETENCE DEVELOPMENT

The concept of "competence" is a diversely defined concept. Within the scientific debate different theoretical meanings of competence can be identified. A definition by Franz Weinert (1999, p. 44) shows the different components, which are interpreted in a diverse range of ways: "Competence is a roughly specialized system of abilities, proficiencies, or individual dispositions to learn something successfully, to do something successfully, or to reach a specific goal. This can be applied to an individual, a group of individuals, or an institution." He elaborates that competence is a system of *dispositions* which are the prerequisites for meaningful activities and which are influenced through practical experience and learning processes (Weinert).

According to Weinert (1999) nine distinct approaches to defining the concept of competences are presently discussed in relevant research literature: (a) Competence as a general cognitive ability, (b) as specialised cognitive ability, (c) the competence-performance model, (d) the modified competence-performance model, (e) objective and subjective self concepts, (f) motivational activity tendencies, (g) the action competence, (h) the model of core-competencies, and finally (i) the concept of meta-competences. Weinert stated that it does not make sense to seek integration of these approaches because then they would loose their power of differentiation.

In the following, the concept of *action competence* is chosen for the further elaboration. It is defined as the ability of self organization in a specific educational or professional context (Weinert, 1999). One important assumption in this model is that competencies can be learned and developed through practical activity. The necessity of an active, self-organized learning process is stress, and competences can not be taught through a purely instructional approach. Educational theories like the constructivist approach support the development of competencies because they emphasize learners own activities and social interactions, a connection of individual and collective activity, which has a central position in the concept.

On basis of this general characterization of the action competence Erpenbeck and Heyse developed a typology of four core competences for an acting individual: (a) Special or subject matter, (b) methodological, (c) social, and (d) personal competences (Figure 2). These core competences are not distinct categories but rather interdependent dimensions of individual action competence (Erpenbeck & Heyse, 1999, p. 156). Van der Blij (2002)

added to that *knowledge*, *skills,* and *attitudes*: "Competence is defined as the ability to act within a given context in a responsible and adequate way, while integrating complex knowledge, skills and attitudes." It expresses that the application of competences always has to take part in a specific situation, and that these actions are influence through *knowledge*, *skills,* and *attitudes*. Attitudes in turn are shaped through values, motives, and experiences of a person. Competences become visible through an individuals' *performance* of an action as a response to a specific situational context (Erpenbeck, 2005, p. 218): "Competences are grounded in knowledge, are constituted through values, are dispositioned through skills, are consolidated through experiences, and are realized on basis of will." (translated from Erpenbeck & Heyse, 1999, p. 162).

Figure 2 is visualizing the described elements of competence. In the centre there is a learning process. Through learning knowledge, skills and attitudes are acquired. They form the basis for the development of competencies. All four elements of action competence are interlinked. Together they lay grounds for action which becomes manifest through performance in a specific situation. Competences are enabling individuals to react in uncertain contexts to nonforeseeable challenges with nonroutine and complex actions.
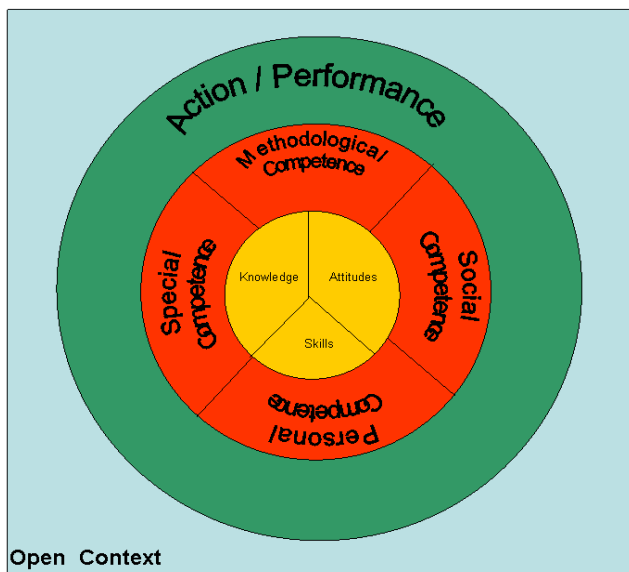


**Figure 2.** Action Competence (adapted from Ehlers, Lazarz, & Schneckenberg, 2006)

Erpenbeck (1997) emphasized the aspect that competences are dispositions for an action—that is, they become visible and manifest only if they are "realized" in an action. They are thus not directly "visible" or can easily be assessed by conventional methods (written test, oral exam, multiple choice questionnaire, etc.). He related back to Chomsky's (1965) thoughts according to which competences are shown in performances. Competences are therefore only visible when used (Erpenbeck & Rosenstiel, 2003, p. xxix). Action and competence are therefore inseparable connected: Competence leads to action—and action results in competence.

## COMPETENCE DEVELOPMENT THROUGH E-LEARNING

Although in recent research a potential for the development of action competence through e-learning could be identified (Stieler-Lorenz & Krause, 2003), the development of action competences through e-learning is at the same time viewed critical (Erpenbeck, 2005, p. 231). Still most of the e-learning environments in higher education are following the paradigm of *distribution* rather then *collaboration* and in doing so merely facilitate the logistics of learning material supply (Organization for Economic Cooperation and Development [OECD], 2005).[4] These kinds of learning environments have their strength especially in the support of information and presentation which support the gain of methodological and subject matter knowledge and job-related qualifications (OECD.). Modern employability, on the other hand, demands job-related action competence and stresses apart from special/ subject matter competences also personal, activity related and socio-communicative competences which are routed in rules, values, and norms. If and how technology enhanced learning environments can be used for the development of such action competences is—especially in relation to the described contradiction—still open and subject to the theme debated in this article.

One hint how e-learning has to be organized can be taken from North's (2005) step-by-step concept of competence development. Figure 3 represents an adaptation of the knowledge concept of North by Wildt (2006). It shows that competence development builds on practical application, motivation and the ability to assess actions against existing standards (to find out if the action was suitable).
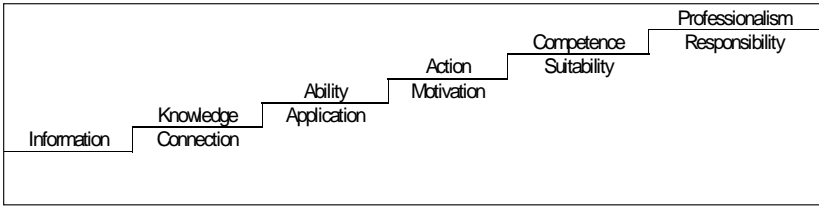
**Figure 3.** Steps to professional competence (translated from Wildt, 2006)

The concept shows the interrelation between knowledge, skills, and action. In the first step information is connected and on the second step they are applied and result in abilities. This is transformed in activity through motivation and will. Competence, however, demands evaluation if the performed activity is suitable in a given context. For this, an individual needs standards (to assess what is suitable in the specific context)—they then lead beyond the concept of competence to professionalism. Wildt includes here also the responsibility towards clients and society. Especially the last three steps activity, competence, and professionalism are seen by Erpenbeck (2005) as difficult to be realized through e-learning.

Erpenbeck (2005) suggested that e-learning has great difficulties in creating experience-related and value-oriented learning opportunities, a problem which can only be solved in relation to the problem of interiorization. Interiorization—or incorporation/ internalization—of new values is the result of acting in uncertain, challenging, nonroutine, and complex contexts. As a result of being urged to act in such learning contexts, learners start to question their own values and preassumptions. Values, which are serving as structuring elements for every activity are then *labialized* in such contexts. Having successfully coped with such a situation, the interiorization of new values takes place. In case of successful rule-, value- and norm interiorization e-learning can become a full scale alternative to competence based face-to-face learning environments in which not only subject mater knowledge can be distributed but also action competence acquired, and experiences made and expertise learned (Erpenbeck & Heyse, 1997). E-learning can then make the difference. Interiorization thus means the acquisition of rules, values and norms under the influence of individual emotions and motivations.

> The interiorization process represents the greatest challenge for every e-learning environment if it wants to be competence oriented. It requires *social interaction*, *conflicts* and *irritation*, *problem solving,* and a high degree of authenticity in every learning situation.

Learners have to interact in *problem-oriented* scenarios in groups, and confront their own values, solutions, and situations with those of other individuals and groups. Collaboration, labialization, and irritation are therefore the basis for competence oriented e-learning (Erpenbeck 2005). As it is suggested in the headline of this article e-irritation is a necessary component to foster the process of labialization and stimulate the development of competences.

The consequences are clear: To stimulate potential for competence development and initiate labialization and Interiorization processes, e-learning environments have to follow a clear problem oriented, authentic and collaborative didactical design. The development of action competence can—in this sense—be supported through learning environments, which are designed according to the principles of situated learning and cognition (Mandl & Krause, 2001). The next section is suggesting the model of Computer Supported Collaborative Learning (CSCL). It is argued that it can make the difference because it carries a strong potential for action competence development.

## FROM DISTRIBUTION TO COLLABORATION

### Shifting the E-Learning Mode to Collaboration

However, the shift from a distributive mode of e-learning to a collaborative mode of e-learning, from a knowledge transfer model to a competence development approach, opens not only the opportunity to make the difference but also poses great challenges to the planning, organization and provision of e-learning. Many forms of e-learning, especially those who use e-learning in a "distributive" mode, can hardly help students to develop competencies. This is especially true for personal, socio-communicative and action related competencies. The ever growing demand for a competence oriented educational process and the use of e-learning models, which hardly are made to stimulate competence development, can be seen as a *basic*

*contradiction* in the field e-learning, since its introduction. On the one hand the use of e-learning in higher education is growing and growing, on the other hand many of the presently implemented models of e-learning are often unable to support the development of individual competencies because they use e-learning in a mere distributive model to facilitate the logistics of e-learning material transfer.

CSCL is a social and interactive form of learning, which follows the objective to support the development of different competences. Table 1 presents an overview of the shift from distributive to collaborative learning. CSCL is based on a learning process in which an individual learns together with others in mutual exchange of a topic, a task, or to solve a problem to acquire the same but also different objectives. In the CSCL concept the described necessary characteristics for the development of action competence are supported: *social interaction*, *conflicts, irritation*, and *problem solving*. The concept follows a constructivist learning theoretical approaches. From this point of view, learning is a self-organized process which necessitates an active knowledge construction process, which in turn is influenced by preknowledge, experiences, and attitudes of the learner (Mandl & Krause, 2001, p. 4). In addition to that, the constructivism opens a second perspective on knowledge: "to acquire knowledge," "to share knowledge," or "to solve problems self-guided" (Arnold & Schüßler, 1998, p. 78). In this sense it is important that for competence development, learning situations are created in which self-organized, learner oriented, situative, emotional, social and communicative learning is supported (Mandl & Krause; Zawacki-Richter, 2004, p. 262). To change the e-learning mode from a distributive mode of "learning material supply logistics" to a mode of CSCL, creates greater opportunities for learners to develop competencies in authentic learning situations and social interaction (Zawacki-Richter, p. 263).

**Table 1**

Characteristics of the Distributive and Collaborative E-Learning Model

| e-learning model Characteristics | Distribution Model | Collaboration Model |
|---|---|---|
| **Goal of teaching/ learning** | Knowledge, Qualification | Competence |
| **Knowledge is** | Stored, Processed | Constructed |
| **Paradigm** | Reproduction, Problem solving, Understanding Remember | Reflection[1], to invent new experience active social practice |
| **Technology use** | Presentation, Distribution, Information | Collaboration, Communication |
| **Learners mode of involvement** | Acquisition Metaphor | Participation Metaphor |
| **Teacher is** | Authority or Tutor | Coach, Player |
| **Teacher activity** | Teaching Helping Demonstrating | Collaboration, interaction oriented practical experiences |
| **Interaction type** | Transfer model | Communication, Exchange (Interaction) model |
| **Assessment Type** | Knowledge Reproduction Test, Multiple Choice | Performance, Skill application, Evidence based assessment, e-portfolio |

[1] Reflection on learning is a common thread going through most learning perspectives or theories to some degree. Dewey recognised it as far back as 1916, while Cowan sees reflection as a necessary pedagogical method and Kolb includes it in his experiential learning cycle (as cited in Mayes & Freitas, 2004).

Shifting the mode in e-learning makes a difference. It helps to use e-learning to support the development of competences and leads to changes in at least three ways:

- First, it enables e-learning to not just replicate what is going on in traditional university classrooms settings but to use technology to enhance the existing learning opportunities by creating new forms of access and by connecting people and resources in form of collaborative networks.

- Second, it has an individual dimension which addresses the needs of individuals to develop competencies for taking part in an emerging learning society. Support of competence development is the first means of empowering learners to become self-guided and self-organized individuals, which enter into the necessary learning processes them-selves.

- Third, it has an organization dimension. Educational organizations need to change and to open their rigid traditions of time-pattern oriented, and hierarchically structured knowledge transfer if they want to enter into a knowledge coconstruction process with their learners. E-Portfolio instead of multiple choice test and collaborative, learner led design of curriculum and learning process instead of predefined distributed knowledge cubes.

## CSCL – A new Paradigm to Support Competence Development?

The debate about CSCL as a new paradigm underlines that CSCL is indeed a different mode of e-learning. It goes back to Timothy Koschmann, who in 1996 published a book with the title: "CSCL – Theory and Practice of a new Emerging Paradigm." He argued that the change of the instructional models in the area of information and communication technology can be labeled a paradigm shift in the sense of Kuhn (1976)[5]. He analyzed that with CSCL the focus now lies on the group cognition rather than on the individual development—and that this point of view is incommensurable to the traditional, more individual view, and by that fulfils Kuhn's conditions for a new paradigm (Kuhn).

The same thought was later taken up by Sfard (1998), who formulated the incompatibility of the two paradigms in two metaphors: the acquisition-metaphor (AM) and the participation-metaphor (PM). The AM views learning as a transfer of knowledge to the individual. The empirical research in this paradigm focuses therefore especially on the change of mental models of individuals. The PM localizes the learning process rather in the intersubjective-, social-, and group processes. Empirical research therefore focuses on participation patterns in the group process. Sfard, however, does not identify a paradigm shift but views both metaphors equally.

In his work "Computer Support for Collaborative Knowledge Building" (2001) Gerry Stahl stated that a paradigm shift from a rather individualistic to a more group oriented cognition has not (yet) taken place. The culturally transported individualistic views are too strong—in the western cultures— which are expressed in Descartes "cogito ergo sum." However, Stahl strongly recommends reinforcing CSCL research with a strong group- and participation oriented scope. John W. Maxwell (2002) from the University

of British Columbia published an article in which he doubts the emergence of a new paradigm. He argued that the condition of incommensurability has not (yet) been met and one learning paradigm has not overcome the other one. Maxwell also identified a change but analyzes this from a pragmatic perspective as different types of the same genre who all have the same justification to exist and develop—just like Kerres and de Witt (2002) within their *pragmatic approach* to media didactics.

In our view it should not be the goal to identify the one and only fitting and suitable paradigm for learning or teaching. We believe that a "one-size-fits-all" approach for e-learning and CSCL does not exist, neither for didactical design nor for empirical research. The core question then is, under which conditions individuals can learn successfully with media. The aim has to be to describe the process of creating learning environments in order to reach certain defined objectives, and do so—in CSCL—in a collaborative way. Kerres and de Witt (2002) are clearly emphasizing that the search for the one and only correct approach has so far hindered the didactical evolvements in e-learning rather than promoted it.

## SUMMARY AND CONCLUSION

The article describes that the current challenge for e-learning in higher education is to support competence development. This poses great challenges to e-learning in higher education because the way it has been used in any cases so far is not designed to support competence development but rather facilitate mere knowledge transfer. Two different modes of e-learning organization are differentiated and described: the distributive and the collaborative e-learning mode. It is argued that the collaborative mode stimulates more potential for development than the distributive mode. Therefore computer supported collaborative learning (CSCL) is described and suggested as a way to support competence development in e-learning. To underline the differences between CSCL and the distributive mode of e-learning the debate about CSCL as a new emerging paradigm is discussed.

The article shows the conceptual connections between CSCL and competence development and suggests the collaborative mode of e-learning as a model to stimulate competence development in higher education. However, not enough research has been done in this field—especially not enough

empirical evidence has been acquired to show how individuals develop competences through collaborative processes in e-learning, and how teachers can facilitate this process. The individual competence development process within a collaborative learning environment between the different actors, like teachers and other learners, should therefore be subject to further analysis. The shift from distributive to collaborative e-learning is not only a question of pedagogical design but also of organizational processes—a culture of sharing and collaboration within an organization therefore has to be facilitated along with its introduction.

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## Notes

1.  E-learning in this article is defined in a broad sense as making connections among persons and resources through communication technologies for learning-related purposes (Collis, 1996, p. 17).

2.  Most experimental comparisons of learning/teaching methods do not result into significant differences, respectively the few significant results are contradicting. A well known meta-analysis was entitled "The no significant difference phenomenon" in which over 300 empirical studies were compared and which resulted into the title of his work (Russel, 1999).

3.  Employability is about having the capability to gain initial employment, maintain employment and obtain new employment if required. In simple terms, employability is about being capable of getting and keeping fulfilling work. More comprehensively, employability is the capability to move self-sufficiently within the labour market to realise potential through sustainable employment. For the individual, employability depends on the knowledge, skills and attitudes they possess, the way they use those assets and present them to employers and the context (e.g., personal circumstances and labour market environment) within which they seek work.

4.  Privateer (as cited in Garrison, 2004, p. 77) said that digital technologies (eLearning) require radically new and different notions of pedagogy. It makes little sense for academia to continue a tradition of learning significantly at odds with technologies that are currently altering how

humans learn and interact with each other in new learning communities.

5. Reflection on learning is a common thread going through most learning perspectives or theories to some degree. Dewey recognised it as far back as 1916, while Cowan sees reflection as a necessary pedagogical method and Kolb includes it in his experiential learning cycle (as cited in Mayes & Freitas,  2004).

6. The term "scientific paradigm" refers back to Kuhn. He defined a scientific paradigm as a "general explanation pattern or to generally accepted theories, (…) which are steering at the same the future research direction" (Kuhn 1976, citation translated from German). According to Kuhn in a normal science everything is concentrated to solve problems in the frame of the existing paradigm which is in turn enlarged and refined. Questions relating to the basis of assumptions were usually not posed and also problem which only occur outside of the paradigm were not seen. Through this effect no new theories and developments were developed within the paradigm. Only through emerging irritation or disturbances which lead to a reduced problem solving capacity of an existing paradigm, new approaches and para-digms were developed.