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**TOWARDS THE HIGHER E-LEARNING NETWORK:  
FUNDAMENTALS AND STRATEGIES OF  
E-COLLABORATION**

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**The discourse of “higher e-learning” in Germany**

After the ending of most state funded university projects in the field of e-learning in Germany the question of the “impact” appears on the agenda. With simple causal statements about learning success or failure in dependence of factors such as teacher behavior, choice of methods, size of class or additional forms of educational differentiation, instructional research traditionally has had its difficulties. Anyone who predicted positive effects of internet-based learning scenarios ran the risk of being blamed as a traveller in the “land of zero hypotheses” (Schulmeister 2001). To put it moderately the research on the educational use of digital media initially was invited to consider at least three overlapping areas: First of all basic formal aspects of traditional academic courses, secondly the possible interactive levels of the distributive and communicative functions of internet media and, inseparably interconnected, the issue of the learning paradigm which structured the different media arrangements. Another research approach forecasted a “natural” and “self-evident” integration of distributive and communicative internet tools into universities even without further accompanying measures. According to this point of view the real structural problem for the establishment of higher e-learning was the incompatibility of the idea of a “autonomous responsibility” within the field of university teaching and the division of labour within the field of digital media production. But even this stronger technological approach had to admit its “helplessness”, when the specialized assistance of academic instructional designers was lacking. Though this predetermined breaking point in the process of conceptualizing learning arrangements was elegantly labelled “instructional knowledge engineering“ it had to be stated that the instructional design and the transformation of expert knowledge depended on a special type of (autonomous) teacher: The instructional design process relies heavily on a person who is well aware of the way he is compiling and retrieving specialized knowledge; a stage where knowledge has not yet reached the level of tacitness (Kerres 1998). The success of the so-called “instructional media designer” and all the work of the state-funded projects was therefore based on the existence of a very personal bound expertise. In short, the competence demanded here is the ability to observe an observer. Not only the knowledge (know that) of the expert, but also the ability to reflect on expert knowledge in action (know how), i.e. to make the implicit parts explicit, is part of this expertise. Not alone the actualization of the mastery is in the center of attention, but also the designating characterisation of the prerequisites for the masterly success and its situational adjustment is necessary (Neuweg 2004). Even if instructional media designers wanted it, they couldn’t avoid Humboldt. There has to be still a focus on the classical nature of successful academic instruction, i.e. on a “close community with analogous interests among peers and the awareness, that the same place harbours a number of refined persons, who dedicate themselves only to the advancement and dissemination of science” (v. Humboldt 1920). Before any extension or transformation by digital media the analysis of the discursive dimensions of collaborative knowledge construction, which is a basis of the academic

class situation, remains in the center of attention. Only along the development of a framework of collaborative knowledge construction the communicative specifics of the digital media and their relevance for the potential outcomes of hybrid learning models in the context of higher education can be discussed.

### **(Collaborative) knowledge construction in the academic seminar**

Language is the most important instrument of cognitive transformation processes. In discourse (competent) members of a social group support others in assessing the adequacy of contexts (Fischer 2001). The process of knowledge construction in discourse can be conceptualised at least along two dimensions: an epistemic dimension is relevant for the specification of task-related speech acts and a dimension of co-construction is relevant for the specification of the interaction processes during collaborative knowledge construction. Against this background the seminar is a combination of single or group work tasks and discussions which can be considered as an instrument of collaborative knowledge construction. Tasks related to the reading and summarizing of texts provide the potential of cognitive elaboration because of the necessary active reconstruction of the thematic development. But again eventual success depends heavily on the instructional selection, arrangement and structuring of the material (task-orientation), in order to support the learning process as precise and individually adjusted as possible. Clues about the classification criteria of specific knowledge domains are essential here. The domains have to be specified in regard to their segmentations and interconnections. Especially in the case of interdisciplinary knowledge transfer the parameters of this transfer have to be cleared. Most important: there are criteria of relevance which determine the selection of knowledge from one domain and its integration into the different pattern of the other domain.

#### ***Learning tasks and external representations***

Learning tasks initiating analytic and productive problem solving can be understood as open construction tasks. Besides the necessary reflection on the specific knowledge domains the production of learning tasks demands the instructor's knowledge about the nature of the "information processing" of the learner. He needs to take in account the cognitive strategies of the learner and his previous experience with the (different types of objectives) of learning tasks (Seel 1997). Only this interplay of metacognitive procedures and strategies facilitates the acquisition of "key qualifications" like transfer and problem solving skills. In the perspective of instructional design such learning task can additionally be extended to the realm of external representations. A prominent role is played by case-based scenarios because they can enable learners to create their own patterns of knowledge representation and so successfully apply them in different situations in the future. Comparisons and contrasts between analogies and differences in varying cases can open up multiple perspectives and diverse thematic approaches (Spiro et al. 1988). So the use of instructional models can be particularly suitable for the promotion of interdisciplinary understanding. The approach of a "didactical transformation" with the aid of instructional models aims at the representation of relevant aspects and at the same time at a reduction or omission of irrelevant aspects for the benefit of an accentuation and clarification of essential features. Models of similarity or analogy can help to simplify cognitive transfers substantially. In addition textual, optical, or acoustic information can be added to the model.

#### ***Co-construction: Cooperative problem solving and learning***

If learning tasks in the context of the academic class are the issue the question of cooperative learning is raised. The inherent advantages of cooperative learning settings are: the high immersion of the cooperating group members, the common design and control of learning, the enthusiasm for the group membership as well as the communication and cooperation ability. There are different theories about the impact of cooperative learning (Dillenbourg 1999). However these theories seem to be oriented to a complementary development of neo-piagetian and neo-vygotskian positions. The first are stressing the socio-cognitive conflict as a trigger of cooperative processes and individual processes of cognitive

restructuring. The second refer to the reciprocal condition of social and individual development and in particular on the competent other for the individual development: Not only the cognitive conflict arising from the diverging opinions is solely responsible for learning, but also the respective communication promotes the learning process in its specific way. The core of this communication is the exchange of explanations. Explaining consists of supplying an as coherent as possible structure of explanation for the dialogue partner so that he can integrate it into its previous knowledge. Giving explanations improves also one's own understanding. Thus giving explanations is doubly valuable: it takes fundamentally part in the exchange of concepts and in one's own elaboration. This does however not mean, that receiving a detailed explanation will necessarily cause a successful process of learning or problem solving. Like learning tasks explanations have to address the specific problems and thematic focuses of the dialogue partner. So it is not sufficient for cooperative learning settings to evoke cognitive conflicts. It also demands continuous efforts of the co-operation partners to coordinate their discourse and actions. For this reason the methods of cooperative arrangements were developed in such a direction that they structure the cooperative learning to the point that the participants can exchange themselves intensively and elaborate their knowledge together (Webb 1989). In regard of the acquisition of reading competence the method of the so-called reciprocal teaching (Palinscar & Brown 1984) stresses, e.g., the relevance of the verbalisation of adequate questions and summaries. The elaboration of this assumption leads to instructional methods of the collective presentation of the thoughts, suggestions and criticism. According to a metaanalysis emphasising on motivational aspects further factors for successful group learning could be named: decisive is the aim of the group to enlarge the knowledge of the individuals and the group as a whole; the co-operation should also become clearly manifest in the results of the group work (Marsick & Kasl 1997).

### **Instructional potential of the digital media**

It is the active-discursive dimension, which is decisive for the learning success. The media tools applied in instructional settings therefore have to be related to this dimension. E-Learning systems raised hopes in regard of the support of collaborative knowledge acquisition. These hopes were based on the "hypertextual" and/or "hypermedial" features of the tools as well as on the text based communication tools, which have developed within the internet. In an ideal case the hypermedial structures correspond to the organisation of a knowledge domain. The relations of these structures have a semantic-pragmatic and a navigational dimension (Schulmeister 2003). Studies though, which focus on the factors of success in interacting with hypertexts, lead to unsurprising results: The users' cognitive styles and their abilities of spatial cognition are the dominant factors (Chen & Rada 1996). Because of this reason hypermedia systems refer back to the instructional design problems of learning tasks - like mentioned above - and also to the expertise of the e-learning designer. Users of e-learning systems can reasonably cope with their task only when the coherency of the materials can be reconstructed according to the task while browsing these materials. However to understand the organisation of the specific materials some previous general knowledge about the knowledge domain seems inevitable. For this reason the solitary use of such hyper-media systems is more adequate for advanced learners than for beginners. Therefore providers of instructional media products have to emphasize that the main objective of their products is to meet the students desire for a systematic ordering of contents (Kerres & de Witt 2003). An instructional product might try to lay open the principles of its design to improve the learning process, it will however never fully escape the dilemma of invisibilizing the 'rules of reflection', which regulate its implementation in hypermedia structures.

### ***Communication tools: Media structure and interaction***

Insofar the exchange of explanations was mentioned before as a critical factor for the success of an instructional setting, the focus in regard to communication tools there has to concentrate on the change of the language under the conditions of technology. Language is a characteristic of human consciousness and the main media of subjective expression. Under technological conditions it loses some of its features like the possibility of "meta-communicative" expression. Also the reduction and

stereotyping of the language code in channelled communication is leading to an objectification and alienation of one's expressions. (This applies again to the signs of affective communication like emoticons, which have been introduced for compensatory reasons). Altogether the referential dimension of language (and the arbitrariness of possible referents) is becoming more relevant. Though chat communication has oral qualities it is in many cases impaired by specific barriers. Such barriers are: the separation of language producer and product, the disjunction of reference and expression, the substitution of expression by a computer-based data and transmission process, the geographical separation of the participants, and the playful possibilities of fictive constructions of identity.

### ***The instructional use of communication tools***

The relation of tools and instructional design has been lit up by the considerations about so-called "degrees of synchronicity": The assumption is that different communication processes and different levels of interaction require the use of different types of communication technology. An appropriate application of media can be yielded on the basis of the differentiation of convergent and divergent processes of discursive cooperation. For convergent processes, which demand intensive feedback in order to organize group activity, a high synchronicity (chats) is suggested. For the divergent phases, when the partners are supposed e.g. to read and collect information and ideas, media with a low synchronicity (forums, BBS) are increasing the efficiency, because here a high parallel potential exists and possible feedback can be processed in the shared materials (Dennis & Valacich 1999).

### ***The discursive potential and the role of tutoring***

From the perspective of oral communication every person can participate directly and simultaneously without their individual voice necessarily being overheard, so that also characteristics of written communication are preserved: when a statement is posted everyone can contribute, correct, enlarge or challenge it by starting a new topic (Shank 1993,). In spite or rather because of the problems mentioned above in this type of communication there is the capability to underscore the discursive aspects of meaning and understanding. Implications of ideas can be unfolded and can be contextualized in the framework of the respective knowledge domains. Conceptual patterns can be elaborated and can be used to set up and confirm hypotheses. The "multilogical" structure, i.e. not only dialogical, permits the contribution of arguments and examples over a longer period. A hybridised dimension of information can arise from the uploading of own or internet based sources, and the discussion can spread out into further contexts. A possible result is the comparison of world views and the 'organisation of knowledge'. Because to take part in such discourse means to write there is specific pressure on the participants to rethink and reorganise their own processes of thinking, i.e. through the process of writing (Moss & Shank, 2002). However the problem of the arbitrariness and the loss of control on further connections to one's own contributions is standing in opposition to the benefit of technology-enhanced discursivity. The success of appropriate learning settings depends in high rate on the abilities of the persons in charge of the learning progress. One has to invest adequate time to thematically organize and guide the asynchronous discussions the synchronous communication. Questions which are close to the topics should be flexibly and sufficiently preconceived. The students need also assistance to keep their contributions close to the questions. Also very helpful are regular and consistent summaries of the state of art of the discussion (Beaudin 1999).

### **Scenarios and strategies in the learning network "RION"**

Due to the growing awareness that internet courses at the basis follow the concepts of various established seminar forms and the demand of a prominent role of the tutor, the euphoria of virtuality was referred back to the history of instructional design in the context of the German universities. Their subjects, the formulation of criteria for curriculum development, the designation of educational standards and the clarification of learning processes turned out to be symptoms of several unsolved problems of the mass university. From this angle the historical development of jurisprudence which

determined the formation of law as well as the formation of the curriculum and its contents raised specific problems for the establishment of an interdisciplinary juridical teaching network in the field of computer and law<sup>1</sup>. The attempt to transfer the structure of the law into a concentric curriculum and the "coexistence" of an empirical and normative orientation in the practice of case-based legal reports has traditionally lead to tremendous coherent inconsistencies. Therefore the possibilities for an (external) instructional model representing the law with the help of hypermedia were limited (Stingl & Remmele 2002). Nevertheless other projects tried to cover the issues of the history of law and the specific role of tacit knowledge. But the dream of a "knowledge architecture of law" which could make accessible the complex structure of law with the help of the "visual grammar" of several "knowledge tools" was soon over: "The possible paths through the architecture of law are precisely represented in our knowledge tools, but the learner himself has to decide on the right path on every concrete occasion."<sup>2</sup> Juridical decisions can't be described purely informational because they always require acts of interpretation. In the field of law database systems therefore remain a tool for advanced learners and experts. The educational background of the RION-network students, beginners and advanced learners, was characterised by a strong heterogeneity. Due to diverging curricular profiles and the special position of the field of computer and law the dominating, strong instructional learning paradigm was changed to an instructional design which strengthened cooperative learning scripts (O'Donnell & Dansereau 1992) and accompanying tutoring. At the same time the participating partners had to be trained in the organization of local blended learning courses (Nett et al. 2002). After that the next step was the development of a common strategy for the realization of interdisciplinary courses for the participation of faculties in the field of law, computer science and economics (Stingl & Remmele 2003).

## Conclusion

In the context of the university e-learning can't get rid of the roots of the academic seminar. The historical development of the universities, curricula and academic instructional design pose specific problems to the use of e-learning media technology which inescapably results in a necessary change of the learning paradigm. Especially for the establishment of a nation-wide learning network cooperative methods have to be adjusted to the current situation of the universities, the needs of the students as well as the faculties. In our case the disadvantage of internet communication, the lacking co-presence of the interaction partners which is counterproductive in most e-learning courses was turned into a constitutive advantage. The final conception of the learning network was inevitably founded on the necessity for computer-mediated group work. Therefore the effort of a content-related prestructuring could be reduced, the motivation of the students arose from the common interest of the selected topics and their understanding for the basic necessity and the value of the collaboration. The tutors could remain in the role of competent moderators and discovered the necessity to assign several parts to the students in order to initiate the interaction in the work of the group.

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<sup>1</sup> <http://www.ri-on.de>

<sup>2</sup> [http://www.mmja.euv-ffo.de/State\\_of\\_the\\_Art/state\\_of\\_the\\_art.html](http://www.mmja.euv-ffo.de/State_of_the_Art/state_of_the_art.html)

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