

# **From Learning to Practice. New Strategies for Knowledge Management in the Digital Economy**

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## **Abstract**

The Internet does not represent a method for knowledge exchange by itself; moreover it is a technical platform for the access to information from different sources, especially in a space- and time-independent way. Therefore a completely new frame results for the management of knowledge, including instructional design and learning. Following that perspective the paper deals with new approaches to organizational processes and infrastructures in relation to the process of knowledge exchange.

The paper is organised in three steps: first it is described how the central instrument of formal internet based education, the so-called learning community is organized. To do so the author introduces first into eLearning in general terms and than into a typical design from the academic educational practice. In a second step the development of a professional application for voluntary inter-organizational knowledge-exchange, a so-called community of practice, will be introduced. The chosen example is based on a large scale R&D activity currently taking place throughout Germany with finally several thousand participants.

Finally the author suggests that the baseness on a real setting, that is typical for a community of practice, can be adopted for regular academic education. In that sense the learning community could become a virtual community of practice. Such is especially suitable for organization and management studies, when dealing with interdisciplinary knowledge structures combining management and subject related issues.

## **Keywords**

knowledge cooperation, learning communities, communities of practice, business education

## **Learning communities: an example of cooperative use**

### **Basic issues**

Internet-based instruction (“eLearning”) is present in all mouth and enjoys large popularity particularly in rather education-far contexts. This teaching and studying form is widely new at school and at university – which brings a number of special requirements with itself. The competence for development and use of eLearning is undisputedly an important feature of future educational practitioners. Surprisingly such is more of a media-scientific and educational nature, but less primarily of a technical one. Important aspects are media

organization, estimation of media effects, cooperative media usage and particularly self control of the learner's behaviour. Whether and in which way internet-based instruction, respectively eLearning fits into school education and which challenges line up for teachers like learners may be considered due to these aspects. The author argues that the introduction of the Internet is connected with a paradigmatic shift that can be linked to concrete challenges for teaching and learning (Köhler, 2004). Also the use of eLearning technologies as a lessons' medium leads to new requirements for instructors too, not only learners are exposed to these changes. In a similar way school practitioners, including teaching profession students, need to take over a double role: as a teacher and as a continuous self-educating learner. This is not principally a new expectation – but due to the increased velocity of technological change and update on content information those are exposed to new requirements.

Steering the knowledge exchange process is - as described above - less of a technical nature but refers to social and organisational issues instead. The learning process is in both forms, i.e. the mediated and the face-to-face form, related to intense cooperative actions between the participants. Only a long-term co-operation leads to the development of collective knowledge, as it is the case for the emergence and stabilization of common opinions, goals and interests. Shared knowledge develops over time within social communities. Here individuals develop a joint identity, which is characterized by its own culture of learning.

### **Cooperative work within a learning community**

A Learning Community is to be understood as a group of persons, who are connected by joint learning. A basic condition is that the learners attend the same lecture and meet in a (virtual) learning space, settle the same exercises or use the same learning software. In the course of a social and cooperative - i.e. collaborative - learning process solidarity between the individuals develops and forms a „community”. One of the starting points for its functioning is the production of inter-personality, which becomes by means of new, Internet-based hypermedia very different (Köhler, 2005).

Table 1. Characteristics of a Learning Community

<b>Main characteristics of a Learning Community:</b>
- group of persons
- connected by joint learning
- learners attend the same lecture together / settle the same exercises
- social and cooperative - i.e. collaborative - learning process
- production of inter-personality
- solidarity between the individual members develops
- a „community” arises

Virtual learning communities are basically virtual communities, in which the acquisition of knowledge or skills by its members is explicitly seen in the foreground (Döring, 2001). These goals fit the character of traditional face-to-face learning communities (cp. classrooms, seminars). Still such traditional face-to-face communities offer advantages that are not convertible into an on-line community. Main examples are the possibility of various interactions among the participants, the immediate feedback and the independence from the information and communication technologies.

## A prototypical learning community

In the following a design is described that addresses especially the systematic variation of the organizational and collaborative aspects which we considered being fundamental for the educational usage of these information & communication technologies. In that sense our design might be of a prototypical character. It is based on an interdisciplinary teaching project within the media-didactic programme at the University of Potsdam. Here we used an urban planning simulation in the context of a research seminar for the disciplines educating science, urban sciences and media studies. In this simulation 10 groups with 3-5 members each and different media support participated. Task of the groups was to develop and present in relation to the other groups its own position regarding the reconstruction of the Potsdam City Castle. Participants of the simulation had been randomly sorted into groups. Each of them represented a special interest group (city administration, political parties, etc.). Knowledge transfer was realized within these interest groups by different medial forms (email, Chat, video conference etc.) and for all groups uniformly by a learning management system (LMS) support. For such use of the learning management system Blackboard in the version 5.7 was chosen.

Since the members of the groups before the planning simulation did not know each other, the groups could meet face-to-face at the beginning. The following figure gives an overview of the representation of the groups in the LMS:

The screenshot shows the Blackboard LMS interface in a Microsoft Internet Explorer browser window. The address bar displays the URL: [http://black.rz.uni-potsdam.de/bin/common/course.pl?course\\_id=\\_308\\_1&frame=top](http://black.rz.uni-potsdam.de/bin/common/course.pl?course_id=_308_1&frame=top). The page header includes the university logo and navigation links: Home, Help, Logout. The main content area is titled "Discussion Board" and features a sidebar with navigation options: Announcements, Course Information, Staff Information, Course Documents, Communication, Discussion Board (selected), Groups, Tools, Course Map, and Control Panel. The main content area lists four group areas, each with a dropdown menu, a title, a description, and message counts.

Group ID	Group Name	Description	Message Count
1	Ihre Kommentare zum Seminar	Hier können Sie Ihre Anmerkungen und Kritiken zum Seminar ablegen.	[1 Message] [All read]
2	1. Gruppe "Oberbürgermeister / Stadtverwaltung"	Diskussionsplattform für die Gruppe "Oberbürgermeister / Stadtverwaltung" Diese Gruppe nutzt folgende Technologien: Klassisch (Festnetz-Telefon, Brief, Fax)	[12 Messages] [5 New]
3	2. Gruppe "Kapitalgeber"	Diskussionsplattform für die Gruppe "Kapitalgeber" (Banken und Sparkassen) Diese Gruppe nutzt folgende Technologien: Videokonferenz (NetMeeting) und email	[19 Messages] [All New]
4	3. Gruppe Bürgerinitiative „A-Historisches Potsdam“	Diskussionsplattform für die Gruppe Bürgerinitiative „A-Historisches Potsdam“ Diese Gruppe nutzt folgende Technologien: Telefonkonferenz und email	[11 Messages] [8 New]
5	4. Gruppe "Bauwirtschaft"		

Figure 1. Group areas in the LMS

For a more detailed understanding of the function it is possible to access all related learning communities under <http://black.rz.uni-potsdam.de> (seminar “Kooperative Mediennutzung” in the discipline “Erziehungswissenschaften”; Login: “anonymous” and Password: “1234”). Also the monitoring of these learning communities was following a specific field research design. The following tables give an overview of the experimental group design, timeline and content of measurement:

Table 2. experimental group design

Support strategy		Timeline of group activity measurement		
Organisational:	Medial:	meeting $t_i$ ( $i = 1$ )	meetings $t_i$ ( $1 < i < 5$ )	meeting $t_i$ ( $i = 5$ )
In-group	face-to-face	1*3 members		1*3 members
Inter-group	mediated	9*3 members		9*3 members
sum:		10*3 members	10*3*3	10*3 members
Total number:		10 groups * 3 members * 5 meetings		

Table 3. Timeline and content of measurement

Time $t_i$	Measurement of
1	Communication of the first Meeting
2	Communication of the latest Meeting; Own Team Community
2	Communication of the latest ftf Meeting; Communication of the latest mediated meeting; Own Team Community
3	Own Team Communication; Own Team Community
4	Communication of cooperating teams; Community of cooperating teams
4	Own Team Communication; Own Team Community
5	Communication of cooperating teams; Community of cooperating teams
5	Own Team Community after the Planning game; Community of cooperating teams after the Planning game

A detailed summary of the findings is reported in Köhler (2005).

## Communities of practice

### Basic principles

While research regarding Learning Communities is primarily focused on the context of schools and universities, the concept of Communities of Practice (CoPs) was always strongly connected with the context of work. Like the concept of Learning Communities the CoP-approach is based on the concept of situated learning. That has been described as legitimate peripheral participation (LpP) in a CoP (cp. Lave & Wenger 1991). At the beginning of the learning process and in the state of LpP the novice takes up a position at the fringe of the community. Free of the responsibility that full membership would bring, he participates only partly in common practice (described as peripherality). However at the same time he has full access to the common practice of community members (legitimacy). The process of situated learning leads to the expert status and a full membership within the CoP and represents

thereby also a process of cultivation. LpP thus describes the relationship between experts and novices and the process of growing into the community.

The motivation of the participants arises by the desire for intensified sharing of common practice as well as for improvement. Only through this shared practice learning objects can become important for the individuals (see Arnold). It has to be taken into account that frequently not the exchange with the experts is most efficient but rather the exchange with other novices (Lave & Wenger 1991, S.93).

Naturally the knowledge exchange and learning process is not finished after developing expertise. The introduction of novices is mainly a variation of the learning process. Three central elements constitute a CoP (cp. De Cagna, 2001):

- Domain: The members must have expertise in a common domain. In contrast to teams CoPs are defined not by a common task but by the shared interest in a topic;
- Community: There must be a group of people, who interact with each other, develop ideas jointly and exchange experiences;
- Practice: Shared practice of the members is developed over time within the Community e.g. by joint problem solutions.

Although CoPs in enterprises are mostly created by actors from outside the organisation, it is always self-organized without a “teacher” role. The activities and topics of a CoP reflect the understanding of the individual members of relevant topics in their daily practice. CoPs represent a place of common peer-to-peer knowledge exchange and learning - participants exchange ideas and best practices and generate new knowledge to improve their individual practice.

### **The development of a community of practice**

As mentioned the author is currently participating in the implementation of a Community of Practice for industrial safety specialists (Kahnwald & Köhler, 2005). Due to the isolation of such experts in the enterprises an increased interest of the target group in support and exchange after the basic formation is assumed. For this homogeneous group of users (currently several thousand persons in Germany) with common interests the construction of a situated Community of Practice was recommended by experts. For that purpose an Internet platform was developed and is online since May 2005, based on the open source community-system „open sTeam” (see <http://www.opensteam.org>;) developed by the University of Paderborn (Hampel et al., 2005).



Figure 2. Message-board of the „Sifa-Community”

How is that “Sifa-Community” developing? In the following we give a description of the medial functions that will be implemented. Beside editorial contents on topics of the industrial safety the offered communication tools form the heart of the platform. Each member of the community can publish its personal profile on an individual homepage. That profile serves as a personal visiting card. With the help of the user profiles members may establish personal contacts within the community by communicating their own interests and find experts for special problems. Message boards are the most important asynchronous communication tool of the Community. The observation of selected boards will be possible. Also users receive a message by email, if new articles were published in selected discussions-threads. In the context of the pre-study and in the discussion with experts topics, which are of special interest for the Sifas will be isolated. In the beginning there will only be a small amount of boards in order to keep navigation clear and to active users bundled. For synchronous communications Instant Messaging Chats had been. For the kick-off of the Community-platform a scheduled chat with experts will be offered as opening meeting. Instant Messaging is a synchronous communication possibility similar to the chat. As soon as a member of the Community is on-line and logged in to the system, it can receive text messages from other members. The Community members can arrange themselves a personal buddy-list. In this list it is indicated automatically, which of the „Buddies“ are logged in into the community. With them a Chat session can be arranged instantly, and/or they can be contacted via instant messaging.

Apart from the exchange of the Sifas among themselves by a coaching by chat, message-boards, and consultation via email is offered by experts involved in the long-term study.

## **Conclusion: toward a learning community of practice**

What can we conclude regarding the usage of new media for the instruction and learning? Tergan writes that “an educational-didactical indication for the use of hyper-medial training systems [is] given], if ... cooperative learning is to be used...” (2002, p. 107). Further criteria would be missing structures of the subject, caused for example by relations of contents to different disciplines, the realization of context-referred, situated learning scenarios with a higher proportion of multiple forms of information coding, connected to self-guided, constructional learning with an interest in cognitive flexibility. With these characteristics a concretely manageable access to the learning-theoretically justified selection of new media is given.

The baseness on a real setting, that is typical for a community of practice, can be adopted for regular academic education. In that sense the learning community can become a virtual community of practice. Such is especially suitable for organization and management studies. Already the reported urban planning simulation in the context of a project seminar for the disciplines education science, urban management and media studies meets such requirements to some extent. In the literature is also discussed how typical business related topics can be trained by using virtual community environments successfully (Geister et al., 2003).

Principally it is possible to develop the subject area in way that allows meeting the basic requirements of a Learning & Practice Community, including its presentation in relation to other Learning & Practice Communities. As technological basis already an average community software system or learning management system does provide the necessary functional modes. Basically the requirements are:

- Development of a subject related simulation of reality;
- Use of the learning management system or similar technology;
- Specific design of groups.

To what extent during that processes the chosen media technology is principally efficient has not to been discussed here. Moreover our focus was the functioning of virtual learning communities as communities of practice and to what extent CoPs can be a model for both, training and knowledge work. Our field-exploratory designs had been developed in order to meet the criteria of such a learning situation. Organizational and media support for knowledge co-operation was ensured in the planning game on the Potsdam City Castle. Participants from different disciplines had to decide by themselves, which knowledge they wanted to use for the successful conclusion of the simulation. This knowledge concerned both handling the media and knowledge about the Potsdam City Castle and the role of the groups taking part in the discussion around its potential reconstruction. The organizational support in form of the planning game led to a high degree of authenticity and a large transferability on the discussion up-to-date taking place in the region around a reconstruction of the Potsdam City Castle, its financing and the later use possibilities.

In that sense instruction method for collaborative on-line learning was the process of the simulation. To what extent this organizational framing for a collaborative knowledge transfer is suitable in virtual learning communities in general needs further attention. Obviously – as our findings show – less the concrete knowledge appropriation is relevant, moreover the situative building of connections of the knowledge is important – connections that lose then afterwards again its meaning. In the long run the main issue is – as it is in Communities of

Practice (cp. Brown & Cole, 2000; Köhler & Kahnwald, 2005; Kahnwald & Köhler, 2005) – primarily the immediate or time-near accomplishment of a new task, i.e. the creation of suitable knowledge connections. Thus – as our findings show – in particular work on the knowledge connections brings requirements of co-operation and communication in the foreground. As an example the observed difficulty of changing from the knowledge exchange within the teams to the knowledge exchange between the teams, that had been observed in our experiment, may serve. However – what is another finding – the team-members are not conscious of the special meaning of communications and do often not meet the requirements in a sufficient manner.

The settings presented here surely represent a specific use of new media for processes of knowledge exchange that is highly typical for the current situation in both, industry and academic education. Here for example the absence of the manager or of the instructor and the need of an immediate re-combination of new knowledge from different sources is a typical demand. In some way this has already the character of a new paradigm. As suggested in the literature the new forms of knowledge exchange lead to new roles and new strategies for knowledge management in the digital economy. Such roles, namely moderators with highly specified skills to steer the peer-to-peer cooperation in virtual communities are already described in some of the literature. Mainly two different types can be found here: the so-called online tutor and the information broker. Whereas the tutor does mainly focus on the social and communicative aspects the broker has a specific interest in the more technical aspects as information and network relations. Surely one can assume that both aspects are necessary.

However current research is not able to decide, what aspect is more important, as it mostly deals with one or the other form in a separate manner. Also it is obvious that a number of further questions cannot be answered at the current stage of research. In that sense the suggested field-experimental design needs to be specified to measure in particular the impact of individually assigned media usage. As next step in our research a further experimental examination of the medial and organizational support forms under controlled conditions would be necessary.

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