

# System Support for Social Learning in Computer Science at a Distance University – The University of Hagen

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**Abstract.** Students working collaboratively are more successful than students working alone, these fact was shown by research on technology-supported learning and teaching have clearly confirmed the general understanding that. Therefore, it should be a logical consequence to integrate communication and collaboration as a key factor into a distance study environment. However, this is not a trivial task from various points of view. For instance, for public universities in Germany studies have to be free of charge – which then raises the question, how to finance highly interactive small classes? Another problem is the professional restrictions of working distance students: their time budget is very limited. The consequence is that students typically have very limited contact to their peers and their tutors until the final examinations. The drop-out rates are extremely high. E-learning improved the situation substantially (even though poorly used by the teachers in many environments), but by far not enough. Former research showed, that students’ want more social learning application. This paper shows how social learning could be integrated in an existing technical and organizational infrastructure and so open up new possibilities to approach these challenges, and how it can be used to improve the situation substantially.

**Keywords:** E-learning · Social learning · Distance education · Learning management system · Personal learning environment

## 1 Introduction

Distance study systems face fundamental problems like isolation of students and finding a compromise between requirements of private and professional life and studying [7]. To improve the situation the University of Hagen (FernUniversität), the only public distance teaching university in Germany with about 75,000 students, started to develop a Virtual University (VU) in 1996 [1]. The new form of teaching and learning through the Virtual University eased the situation of the distance students remarkably, but there remained a lack of social interaction and group-awareness. Various research projects as well as our own experience clearly show that being part of a group and having suitable

communication partners lead to higher and more consistent motivation and therefore to more successful and faster studies [1, 3, 7, 8, 14, 17, 20]. An additional effect is that organizational support by the university gets less critical as students can easily and very directly assist each other. This, in turn, reduces overhead at the university. A survey at our university also showed that most students are convinced that contact to fellow students, especially through different types of groups, is of utmost importance for successful learning [1, 3]. They are not satisfied with the existing system and call for new and better communication and group support [1, 3] and social learning.

The obvious conclusion of these observations is that a new learning environment with strong emphasis on social learning is necessary. The kernel concept of the vision developed here is to start out from the students' view and research results as described above – which is completely different from the classical approach to deliver content and to have group elements and communication as an add-on. To build this platform the integration of Web 2.0 technologies is essential. To provide such a new and community oriented environment we have to look closer into the various fields of groups and their mechanisms with the goal to support these groups with the necessary technical and organizational features. The necessary first step has been to investigate the different group types and their meaning in a distance teaching setting. The paper exemplifies two possible technological solutions to support social learning for the group types already existing University of Hagen. These group concepts, their properties, the way they are used by students, their overall potential have been main topic of another paper, therefore only the conclusion is citrated in this one. A detailed discussion of a complete e-learning system centered on social and community aspects cannot be given here due to space-limitations; further research is going on about how to build this kind of system.

The paper is structured as follows: Sect. 2 contains the state of the art, Sect. 3 describes the current situation and developments for group support at the University of Hagen. The following Sect. 4 investigates alternatives for a technological solution of the integration of social learning. The paper concludes with a short summary of the findings and an outline for further necessary research.

## 2 State of the Art

Schulmeister [19] not only evaluated 23 existing studies about learning management systems but also undertook his own research about more than 62 learning management systems. He concludes that existing learning management systems typically focus on delivering content; they do not support building and establishing long-lasting student groups, or – if at all – they do it very poorly [19]. This correlates with our own results as only 19 % of our students use the integrated communication features and only 2 % the groupware functionalities [1, 3]. If group oriented features are available, they are provided only for advanced students in the context of the provided content. These results are confirmed by research of Kerres [9].

Today, the importance of collaborative learning and working is without controversy in the research community [1–11, 17, 19, 20]. But the group processes and the various categories of group types in a more general meaning are still not well understood as will be investigated in chapter four of this paper, [6, 15, 16, 17]. Some valuable insights can be found in the field of community oriented learning [5, 8–10, 12–14, 18]. However, the community types discussed in this field, like learning community or community of practice, do not sufficiently cover the needs of distance learning students as they are either too strictly structured (e.g. restricted to an exactly defined group of students like in classes) or just the opposite, they have no structure at all. Some essential group types are not considered.

Many different definitions of “group” exist in different disciplines (computer science, psychology, sociology etc.), but none of them clearly describes the different existing group types in distance education from a practical point of view [6, 8, 11, 15, 17].

Therefore, we undertook our own definition of group types at our university and found the following different types (Table 1):

**Table 1.** Group types at the University of Hagen [4]

	Member	Institutionalization	Content oriented	Duration	Intention	Liability
A	Varying, no limitation of members Students of different universities and of different faculties.	None	No	Unlimited	Motivation, interdisciplinary communication, networking, questions of every day life	Low
B	Varying, usually not more than class size. Students of one university and the same faculty.	Low	Yes	Starts out of a specific learning event, lasts until credits are achieved or until degree; one term or longer	Collaborative learning, preparation of exams, motivation, support in organizational matters	High
C	Fixed, 2 to max. 5 students. Students of one university and usually the same faculty.	High	Yes	As long as the teaching event itself, usually one term. Sometimes alter to B.	Working together at a given or chosen topic, outcome is i.e. a piece of software or a written contribution	Medium

A: Study group, B: Learning team, C: Working team

More detailed information about the group types could be found in [4]. In our own study [1, 2] we found out the current need of our students (Table 2):

**Table 2.** Group types at the University of Hagen [2]

<ol style="list-style-type: none"> <li>1. Easy access, intuitive to use</li> <li>2. Professional information management</li> <li>3. Awareness-function</li> <li>4. Integrated communication and interaction possibilities like:             <ol style="list-style-type: none"> <li>a. Interdisciplinary communication and interaction, e.g., by integrating popular social networking sites like Facebook</li> <li>b. Infrastructural support to set up and to support different group types</li> <li>c. An Alumni network</li> <li>d. Private rooms without access for teaching staff.</li> </ol> </li> <li>5. High security measures</li> <li>6. Integrated linkage to existing Web 2.0 tools (Messaging tools, Social Networking Sites, blogs, social bookmarks etc) for instance via the Open Social API</li> <li>7. Personalized information learning and knowledge management</li> <li>8. Intelligent search engine</li> </ol>
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### 3 The Hagen Situation

As very shortly described in Sect. 2, we do have different types of existing social and learning groups at our university. Also, we do have a wide variety of very different existing learning technology. And we do have pressing needs of our students to fulfill. Besides the didactical possibilities a new technological infrastructure has to be installed, as the current situation could not be run for long in an economically reasonable way. The current technological situation is, that we run two different learning management systems, three different collaborating system and many small solutions at the faculties (Table 3):

**Table 3.** e-Learning software at the University of Hagen

Learning-management-systems	Groupware	Assignments	Conferencing	Communication / Information	Student support
Moodle Lernraum Virtuelle Universität (LVU) Mahara	CURE BSCW	Lotse WebAssign	Adobe Connect IRC	Email Newsgroup Blogs	Self-manage-mentool (SMT)

To decide, which solution will be suitable, we developed a reference model on the basis of Gross and Koch [8]. In this model all social entities, social interactions, system

support paths and the different tool classes are described. A detailed description could be found in the author’s doctoral thesis (to be published) (Fig. 1).

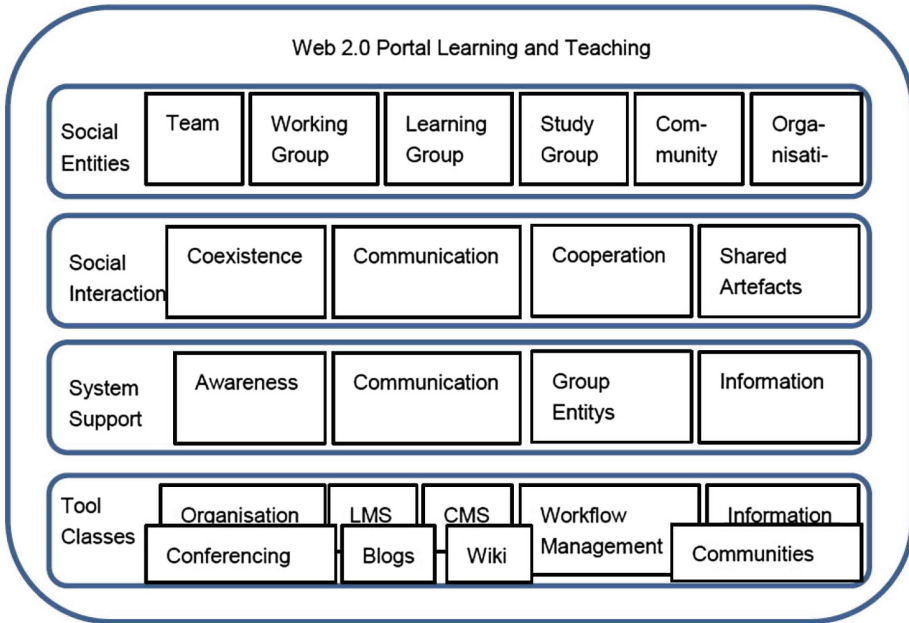


Fig. 1. Reference model for social learning in distance education [8]

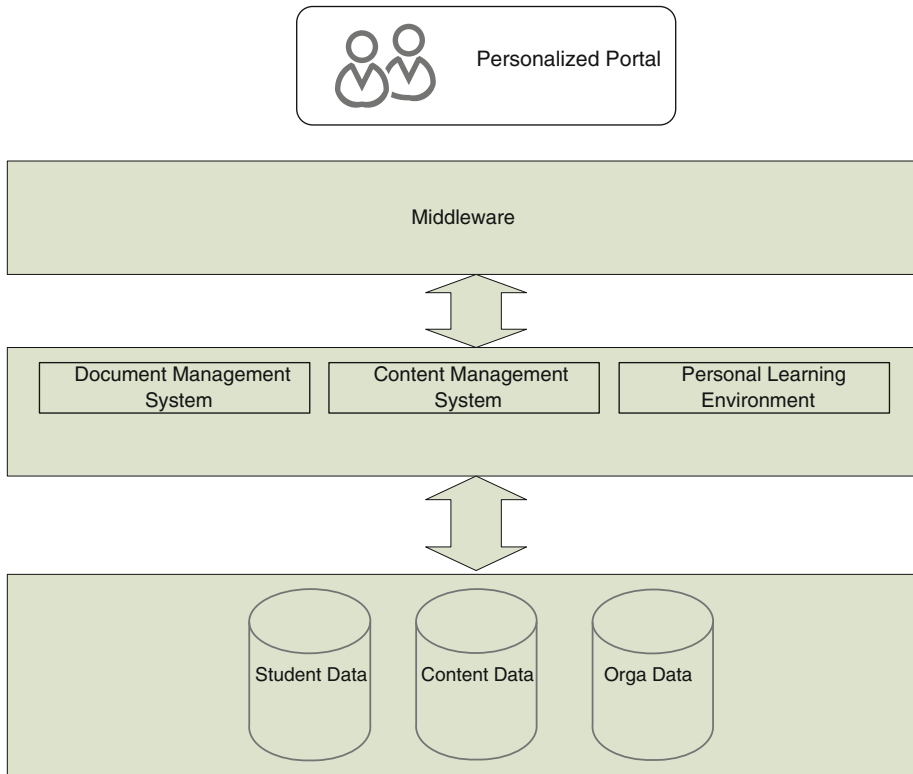
#### 4 Possible Solutions

As possible solutions we examined different systems like portal software, community software, and groupware, different types of learning management systems, campus management systems and personal learning environments (PLE). Currently, we found out, that the PLE is the solution that matches the most needs of our students. The ongoing discussion now is, to decide which one is the best to fit in the existing architecture and will a complete change be better than a step-for-step replacement? As a researcher, I understood, that some of these questions are not only didactical and technological, but also political in an organization like an university. Therefore, we focused on two possible infrastructure solutions:

**Solution 1 – Complete change.** In this scenario, we will replace all old learning connected systems by suitable new ones:

The advantage of this solution is the manageability, as the whole system architecture will be in future less complex and therefore easier to administrate. On the other

hand, some of the features our teachers and students are used too, will be a lot more different and/or also new, this could cause less acceptance of the system (Fig. 2).



**Fig. 2.** System support for social learning in distance education – Solution 1

**Solution 2** – In this scenario, we will add necessary new learning support systems for social learning by suitable ones:

The advantage of this solution is the comfortable access for current users, but the variety of the different systems could lead to the fact, that most users will not know about the systems and therefore not use it (as shown in our study [1, 2] nearly half of our students do not know, that the university runs two different learning management systems!). Another problem is the manageability of the system. The more complex system architecture is, the more complex is the administration of the whole system. Even by now, we do have a lot of problems with all the different application interfaces (Fig. 3).

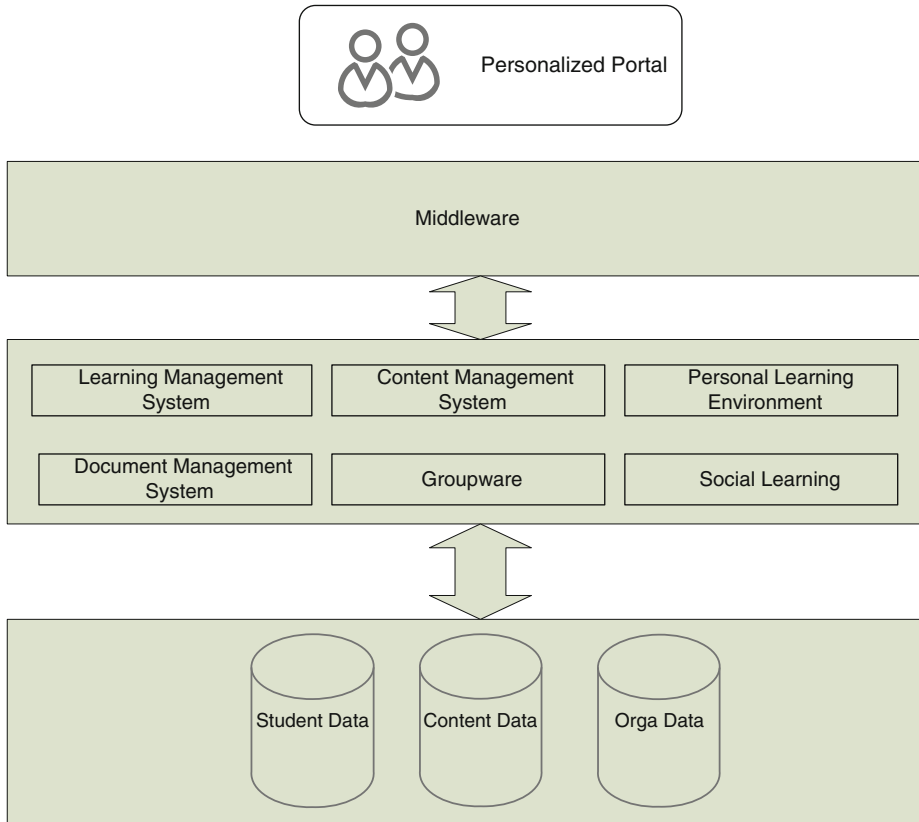


Fig. 3. System support for social learning in distance education – Solution 2

## 5 Conclusion

The students' needs are clearly identified [3, 4, 10, 13] by now and the task of the university is to improve the current situation according to the given suggestions. It is of utmost importance to restructure the current learning environment with a strong focus on the support of communication and interaction processes by installing community oriented features as described above. Not content and organizational functionalities are central, but finding adequate communication partners and being part of a group as early as possible and as long as possible. Becoming part of a group is useful even before enrolment. Students, teachers and staff should form a virtual community for learning and teaching, supported through adequate technology. This platform must provide easy to use functionality for

- organizing, discussing and publishing content collaboratively
- discussing and solving specific problems together
- creating different types of groups.

To achieve this goal, it is necessary to develop a new learning portal according to the students' needs. First suggestions are given in this paper. Currently, an ongoing discussion process throughout the university is discussing the different solutions. The author started out a couple of different feasibility projects in small courses to test the different possibilities. The experience so far favored the first solution. The detailed description of this new environment (architecture, features, interface, necessary restructuring) of this Social Learning Support System of the doctoral thesis of the author.

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