

Studying in Web 2.0 – Virtual University as Virtual Community

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Abstract— Our experience and research on technology-supported learning and teaching have clearly confirmed the general understanding that students working collaboratively are more successful than students working alone. 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 have been extremely high. A lot of students study more than six years to reach a first degree. E-learning improved the situation substantially (even though poorly used by the teachers in many environments), but by far not enough. This paper shows how Web 2.0 opens up new possibilities to approach these challenges, and how it can be used to improve the situation substantially.

Keywords - group types; e-learning; Web 2.0; collaborative learning; Virtual University.

I. INTRODUCTION

Distance study systems face fundamental problems like isolation of students and finding a compromise between requirements of private and professional life and studying [13]. To improve the situation the University of Hagen (FernUniversitaet), a distance teaching university with about 60.000 students, started to develop a Virtual University (VU) in 1996 [19]. 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, 2, 6, 7, 13]. 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 [3]. They are not satisfied with the existing system and call for new and better communication and group support [3].

The obvious conclusion of these observations is that a new learning environment 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 is to investigate the different group types and their meaning in a distance teaching setting. The paper exemplifies some group types through already existing or forming groups in the e-learning environment at the University of Hagen. These group concepts, their properties, the way they are used by students, their overall potential are the main topics of this paper. 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: Section II contains the state of the art, The following section III investigates the various group types relevant in a distance teaching environment and the consequences for a new type of learning system. Section IV describes the current situation and developments for group support at the University of Hagen. The paper concludes with a short summary of the findings and an outline for further necessary research.

II. STATE OF THE ART

Schulmeister [16] 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 [16]. This correlates with our own results as only 19% of our students

use the integrated communication features and only 2% the groupware functionalities [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 [7].

Today, the importance of collaborative learning and working is without controversy in the research community [6-11, 17]. 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 section four of this paper, [6, 15, 17, 18]. Some valuable insights can be found in the field of community oriented learning [5, 8, 9, 12, 14]. 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 [5, 6, 12, 17].

III. THE VIRTUAL UNIVERSITY

The University of Hagen has extensive experience in distance education since more than 30 years. Therefore, it was a logical consequence to start using the Internet for learning and teaching purposes at a time when not many universities saw the opportunities. The benefits of distance education, time- and location independence, and the advantages of the Internet (fast information, easy communication and cooperation possibilities) were combined in the project Virtual University, Germany's first university to offer all its services in the Internet beginning in 1995.

When the project started a suitable software platform was not available in the market, so a platform was built based on Internet technologies and a commercial database system. The virtual university system now integrates all functions of a university into a complete, homogeneous, extensible system with an easy to use and intuitive student-centred user-interface. Currently, about 60.000 students are using the Virtual University of Hagen. The ongoing project includes experimenting with and evaluating different forms of teaching and learning in the Internet.

It turns out that the most popular teaching events are highly interactive events like virtual seminars, practical training and online exercises. Our experience shows that teaching methods with a high rate of group activity using electronic communication have the quality to break down the students' isolation. Students using electronic communication within the virtual university are much more motivated than before; the dropout rate is decreasing and the feedback is entirely positive [1, 2, 10, 13].

We also learned that some of the groups students took part in during a teaching event lived and were active long after the event itself. In some cases the relationship between

the group members established during a teaching event in the internet was stable long after the students finished their studies [1, 2, 10]. Others researchers, i.e., Leh [8], Palloff and Pratt [12] also state the importance of communication and cooperation.

The expectations of students regarding the teaching and learning environment have dramatically changed over the last years. In a study with more than 2000 participants we found that about 43% of our students want more Web 2.0 functionality in the university learning environment [3]. This includes communities, blogs, wikis and especially social networking. Related research is consistent with these findings, e. g., Kerres [7] and Peters [13].

Motivated by these results we have been looking into the various types of groups and their mechanisms with the goal to support the initializing of groups and to secure their stability and liveliness.

As a first step we investigate the different group types already existing in e-learning environments. As an example we use the University of Hagen.

IV. GROUP TYPES

The importance of collaborative learning and working is meanwhile without controversy in the research community [611]. But the description of group processes and group types in a more general meaning is still open. A discussion of the definition of “group” itself would definitely exceed the length of this paper, as there are many different definitions. In this paper, we will use the expression “group” in the sociological sense of “social group”, which essentially means a group is defined as a collection of humans who share certain characteristics, interact with one another, accept expectations and obligations as members of the group, and share a common identity [17].

In contrast to a psychological definition, where clearly a face-to face contact is required [15], we concentrate on mainly “virtual” groups, which mean groups where face-to-face contact is not given or is given only via electronic channels. These “virtual” groups are essential for students in e-learning environments.

Out of the context of e-learning situations we define three group types:

- Study group
- Working group and
- Learning group.

A. Study Group

The study group, as the most complex of the three group concepts, consists of students of one or more than one university. The affiliation to a certain faculty, discipline or the participation in a certain teaching event is not important. Normally, study groups do not span more than one university, but it is possible and also desirable. Study groups are also a chance for interdisciplinary exchange. Organized interdisciplinary networks can be highly successful as is demonstrated by some open knowledge communities in the Internet. An example is <http://www.wer-weiss-was.de>, the largest German speaking knowledge community.

The study group is an informal group, meaning it is not formally initialized by an institution as is the case with the working group. The main issue of the study group is to create a social network.

The group members find each other spontaneously, e.g., in events for new students, via voluntary work, through the student council, in discussion groups concerning students' issues like finding jobs and so on.

The size of such a group varies between small (starting with three) to very large with open end.

Study groups often continue throughout the complete study time; sometimes they turn into social networks that live long after the studies are finished.

Since the American sociologist Granovetter published "The Strength of Weak Ties" [5] in 1973 the positive effects of social networks have been well known [9, 12, 14]. For example, access to relevant information concerning the private and professional life is highly facilitated for members of such a group. An interdisciplinary study group elegantly supports the following situations, and may smoothly lead to a network with obvious benefits for its members far beyond the original idea of a "learning network":

- A construction engineer urgently needs legal information. In case he knows a lawyer, he will gain the information a lot faster than in case he knows none.
- Job vacancies are first known to the members of the study group; professional support for your children at school is best given through a known teacher, and advice in medical questions can be given by doctors.

Our evaluations and a study of the HIS Company very clearly show that students are aware of the advantages of study groups, especially interdisciplinary ones, and - this is important - they expressly wish that the university supports them. The reason is that they want a homogenous social environment, closely linked to and compatible with their learning environment [3, 4].

However, this type of group has virtually no support by universities [3, 4, 7]. So far, most distance teaching universities do not understand that this is a central concept leading to a closer relationship with the university, a feeling of "being part", which then leads to a decreasing number of dropouts and finally a supporting community of alumni.

Currently, the members can only use the given electronic communication channels like chat, email, different groupware tools, forums, etc. Mostly, they use the university newsgroups. The problem is that newsgroups are very large, it is difficult to follow certain topics, the members are more or less anonymous, there is high fluctuation, and there is definitely no socially binding element to stabilize the community. Conference systems are only useful for small groups of users, so they are not adequate, either. Learning management systems are hardly applicable for the purpose of social networking, as they are focused on courses and learning events. Tools like wiki webs and weblogs would make sense for the use in study groups, but they have to be integrated into a homogenous environment, and be organized in a meaningful way for students.

Students have the possibility to use existing free student interest communities, one of which is the German community study-board [<http://www.study-board.de>] or the community NASPA [<http://www.naspa.org/about/index.cfm>] for US students. Both provide services for all students, irrespective of faculty, number of terms and grade. As these communities are very widespread and their purpose is to offer services for mainly on-campus students, the provided contents and contacts are mostly too general for distance teaching students. Some of the most important topics in a distance teaching environment are not addressed and hard to address in such a general environment, such as the question about the best strategies to organize work life, private life and studies. Furthermore, the use of these services is completely outside of the student's learning space.

By far the most efficient solution for distance teaching universities is to provide a community platform, tailored to the students' needs, and integrated with the e-learning space. Apart from the fact that this solution simplifies the life of distance learning students substantially, this is a central feature to create the long-term bond and the "I belong" feeling for students - an effect that a distance teaching university has a much harder time to achieve than traditional universities.

B. Learning Group

Learning groups are related to study groups, as they are also informal groups with varying members and no formal enrollment. The members are usually students of one university and the same field of study, but in principal students of other universities with similar studies could also take part in the learning group. In contrast to working groups, learning groups are not limited to just one learning event; usually they stay together throughout the duration of the study and some even longer [1, 2, 10]. The members find each other in related learning events, like introductory meetings or basic instruction lessons. The size of a learning group varies between two or three members up to a maximum of ten. Experience shows that the average number is about four members. The main intention of learning groups is not, or at least not in the first place, social networking as is the case with the study group, but collaborative learning for the preparation of exams and for motivating each other to keep up with the studies. Also, all forms of organizational advice related to the studies are given by the learning group (which courses should be taken, how to prepare best for an exam, where to find good information resources, etc.).

The reliability of the group members is more important than in the study group, as undependable members could disturb the whole group. The average lifespan of such a learning group is to the end of the studies of its members, even if some members stay in contact beyond that time. As these groups are informal groups, fluctuation of members is a known phenomenon (members move, terminate their studies, new members join in, etc.). Learning groups are highly suitable for large teaching events with a high contingent of self-study, such as introductory courses, beginners'

seminaries etc. Tutors should encourage the building of learning groups.

Good suitable components for the technical support of these groups are groupware tools to communicate and to share files. Also wiki webs, weblogs and e-portfolios are interesting options for a learning group. An increasing number of students are also using audio conference tools like Groupspeak or Skype, which are very convenient for small groups. Learning management systems are partly suitable for the purpose of collaborative learning, if they provide groupware functionalities.

C. Working Groups

Working groups are the most common and widely-used form of groups in e-learning, and also the best investigated type of group [6, 12, 14, 15]. The main difference to the other two group types is that their purpose is very clearly defined by the issue of the learning event this group belongs to. Another difference is the guidance by the tutor, which is essential for the groups' success [1, 2, 6, 15]. This type of group is clearly an institutionalized formal group. Working groups are ideally appropriate for small teaching events, such as seminars, colloquies or practical trainings; they are closely related to project groups in companies.

The building of working groups depends on the organization of the learning event itself. Some tutors prefer to arrange the group themselves, according to their specific didactic preferences. Other tutors leave the building of the group to the students themselves. For both methods, the moderation of the group is very important, as the failing of one member could cause a drawback for the whole group, which in turn may lead to the failure of the whole group. Experience shows that a restriction to the number of up to five students is useful. Otherwise, the group is difficult to organize and the risk of disappearing members is high [1, 6, 10]. Normally, a working group lives only as long as the learning event itself. In some cases working groups alter to long lasting learning groups. For this type of group various tools can be used:

- Collaborative Work Software
- Conferencing tools (audio and/or video)
- Learning Management System
- Wiki webs and social networking tools

Which tool to choose depends on the didactic issues of the tutor, the number of students, the availability and accessibility and also the personal likings of the tutor and the students. A typical example for university working groups is the virtual seminar:

A total number of fifteen up to twenty students divided into small groups of a minimum of two and a maximum of four students together create contributions about aspects of a specific topic, e.g., knowledge management. The contributions cover up to twenty pages of text per person. To prepare these contributions, students use a groupware system. In intervals each group presents its results via audio or video conference, followed by a discussion with their fellow students and the teacher. The whole seminar runs throughout one term (about three months).

D. The current situation of group types in Hagen

The University of Hagen is the typical distance teaching institution with fully employed students, students with small children, students with handicaps. Participation in ongoing groups and group work is only possible for most of them if that is possible from a distance, i.e., if these groups are Internet-based.

Nevertheless, it is still difficult for the students to start groups and to participate in existing ones: there remains the challenge to find each other and then to keep the group running.

A few students started study groups on external platforms, but – for the reasons given earlier (no integration into the e-learning space, diversity, not visible in the university information space etc.) – these are not very well known. However, the fact that these groups exist in spite of the described difficulties proves how useful this kind of group is considered by students.

One of the central problems for students to start study groups on external platforms is to gain access to the necessary data of their fellow students. The only possibility so far is the general newsgroup for distance students with more than 80 threads a day. A start has been made with electronic contact lists, provided by the students' council (called ASTA), but these lists often don't contain the necessary data like faculty, degree, interests, etc.

A community in the sense of social networking is not available, but it is absolutely necessary. A technical reason is the wide variety of tools which students have to use if they have to start study groups on "foreign" platforms. The essential point, however, is that these functions need to be kernel features of the university e-learning and information space, well integrated and easy to use. It is important for students to be part of a group from the very beginning [3, 4]. So, instead of just adding some social software tools to the university infrastructure, a concept is required which integrates social software as a fundamental feature and thus creates the added value mentioned earlier for students and the university alike.

V. CONCLUSION

Three types of groups have been identified in this paper. These groups have different characteristics, and technical and organizational requirements. The support of these groups leads to essential improvements for distance teaching organizations. Some of the benefits are:

- The social binding of the students to their university will be strengthened; students will identify themselves with their organization.
- Students with a strong bond to their university embedded in a well-working community are supposed to be more successful as students without this support [4].
- A working infrastructure for group support helps to decrease the costs for small learning and teaching events as students are able to organize themselves and to support each other before they apply to the responsible teacher [3, 4, 13].

- Well-organized group support possibilities help to decrease the organizational support load (e.g., less questions of the type “What course should I take?,” if adequate study groups are available with colleagues to discuss this issue). Decreasing work load also means decreasing costs and additionally a satisfied customer.
- Students are able to organize their time budget effectively by using spare time and unplanned free hours with easy access to a well organized communication and collaboration space.

Note that the support of groups requires not only the appropriate technical infrastructure, but first of all an integrated social and organizational concept. A possible solution is the implementation of a personal learning and community environment (PLCE) as suggested by students themselves [3, 4]. This PLCE should fulfill the following requirements:

1. Easy access, intuitive to use
2. Professionell information management
3. Awareness-function
4. Integrated communication and interaction possibilities like:
 - a. Interdisciplinary communication and interaction, e.g., by integrating popular social networking sites like Facebook
 - b. Infrastructural support to set up and to support different group types
 - c. An Alumni network
 - d. Private rooms without access for teaching staff.
5. High security measures
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
7. Personalized information learning and knowledge management
8. Intelligent search engine

- 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. The detailed description of this new environment (architecture, features, interface, necessary restructuring) of this University as Community is part of the doctoral thesis of the author.

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