Knowing Who We Are – Supporting Companion Awareness In Discussion Forums

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Abstract: In this paper we describe how learners need awareness information about co-learners in computer-supported collaborative learning systems. Awareness is essential for working collaboratively and for building a learning community. If the learner doesn't know anything about his/hers co-learners, there can't be any community, which means that there can't be any real collaboration either. In this paper we first describe a theoretical background for our research after which we introduce one possible solution to solve the demands for awareness in a Web-based conferencing systems. We also present our initial implementation of awareness support and report experiences from a course using the system.

Introduction

In many cases Web-based learning environments are used asynchronously, which obviously gives freedom of time and place for learners. But when a learner logs into the system, it is very hard for him/her to know if there is someone else present at the same time or even ever have been. Most of these asynchronously used Web-based learning environments include some kind of discussion forum. In these discussions a learner can find co-learners who have made comments and make conclusions that he/she is not alone, but especially co-learners who are only reading comments are quite invisible. Thus learners come visible only through their contributions, which can lead to wrong conclusions about the state of the discussion. Ongoing discussion might even look like a dead discussion because learners are only reading. That is why it is reasonable to give information about their visits to other learners. This information can enhance learner's awareness of co-learners and their interactions, which are essential especially for collaborative learning (Dillenbourg 1999). It even can be argued that otherwise there will not be any chances to collaborate. This awareness can inform learner that co-learners are interested in each other's contributions and can be in important role in community building. A learner must receive information, which could include who the other learners are, what they have done and what they are doing now. If learners are aware of who are the ones to collaborate with then it is possible to start building a community for learning. In this paper we consider how the technology can support collaborative learning by providing awareness information (see also Jermann et al. 2001).

First in this paper we describe a theoretical background for the research and after that we introduce one possible solution to solve these demands for awareness in Web-based conferencing systems. We present our implementation and report experiences from our experiment. Finally we make conclusions of the work we have done.

Collaborative learning and community building

Learners' work and learning in online learning environments can be seen at its best as collaborative learning. Learners are working together and building new knowledge by reflecting their thoughts with others. However, collaborative learning is a difficult concept in practice. According to Dillenbourg (1999), the words 'collaborative learning' describe a situation where particular forms of interaction among people are expected to occur. This interaction can trigger specific learning mechanisms and finally lead the participants to learn.

Dillenbourg (1999) classifies four categories in which there are different ways to increase the probability that some type of collaborative interactions will occur. These categories are:

- to set up initial conditions,
- to over-specify the 'collaboration' contract with a scenario based on roles,
- to scaffold productive interactions by encompassing interaction rules in the medium, and
- to monitor and regulate the interactions.

With reference to this categorization our work emphasizes the fourth category. Also, as an alternative to the tools for the teacher to monitor the learners, we provide tools for the learners themselves for self-regulation of their interactions. These tools offer information about community's members and their interactions, which can be used by the learner to maintain the awareness of the state of the community. In collaborative processes this information about other learners could really help. Especially in asynchronous learning environments this kind of awareness information would be helpful for interacting with other learners.

Because learners are, in most cases, inside the environment at different times this awareness information would help to keep discussions alive. A learner can check from awareness information if other learners have been inside the system and read their comments. In this way a learner can have more clearly expectations when the discussion is going to continue.

For working collaboratively is also necessary to build some kind of community. Or more clearly, if group of people are working, or in this case learning, collaboratively there is a community. That's why, because communities are everywhere (Wenger 1998). It's important to realize that these communities don't have to agree in issues, which they are dealing. Arguing, as well as discussions, agreeing and so on, is common for the communities.

Informal information about others is also good for community building. It supports especially the social aspect of the community. Nardi et al. (1998) were surprised how well a chat facility supported community building. It was especially its informal and social features that are valuable for community building.

Companion Awareness

Like collaborative learning, awareness is also a notion, which is hard to define precisely. It has lot of different aspects and it can be classified by many different ways (Liechti 2000). Definition of the awareness is depending of the context of the use and also of the characteristics of the system. In this paper we are exploring new opportunities, which the awareness can provide for asynchronous discussion forums.

Gutwin, Stark & Greenberg (1995) have defined a framework of awareness. In this framework they distinguish social, task concept and workspace awareness. Especially they focused on workspace awareness, which is essential for students to learn and work together effectively. Workspace awareness is information, which describes who is participating to the work, where are they, what have they done and what are they doing. Their focus was on the synchronous learning environments but their conclusions about awareness are valid also in the asynchronous environments.

Jermann et al. (2001) have defined another framework, which describes capabilities of tools to support collaborative interaction. In this framework they set awareness features in learners locus of processing. This means that awareness support gives information to the learner, but it depends on the learner how the information is interpreted or understood. Because of that awareness features should be quite simple and the given information should be easy to understand.

Awareness information can help collaborative learning especially in the community building. When a learner knows which other persons belong to the group, he/she can have a feeling of belonging to the community. This belonging strengthens the community and makes interactions easier. The benefits of awareness are more obvious in synchronous systems, but we believe that these benefits are important in asynchronous learning, too. Our focus is to support learners' collaborative work with awareness of their co-learners. In asynchronous collaborative learning systems this awareness information should include the following:

- information which helps to identify co-learners,
- information which supports social aspects of the community, and
- information which shows the usage of the system.

We use the notion, *companion awareness*, to describe this kind of awareness information.

Dyn3W – Learning environment

In our courses at the University of Tampere we are using Dyn3W learning environment. It is a product of project called CoWoGLe (Conferencing on the Web for Group learning), which have been going since 1996. (Hietala et al.

1997). The system has been in use on several courses and more than 1000 students have been using it over the years.

The main part of our Dyn3W system is a discussion forum. The discussions are threaded (figure 1) and because the system is using frames, it is possible write a comment and read old comments concurrently. The system keeps record of each user's usage. It also counts comments. Students are divided in groups and they working in these groups with same assignment.

New awareness features

In our system the learners are working together in small groups and they have to make a decision, which they present to the other groups. Without any awareness about the other group members this group work is difficult, especially the decision-making is hard. That's why we implemented awareness support for learners. These new awareness features include information about who group members are, what they have done and when they have been inside the system. For learners it is also possible to give an informal description of themselves. This was designed for supporting the informal aspect of communication. It is also one way to support group's community building, which is important in learning relationships (Wenger 1998).

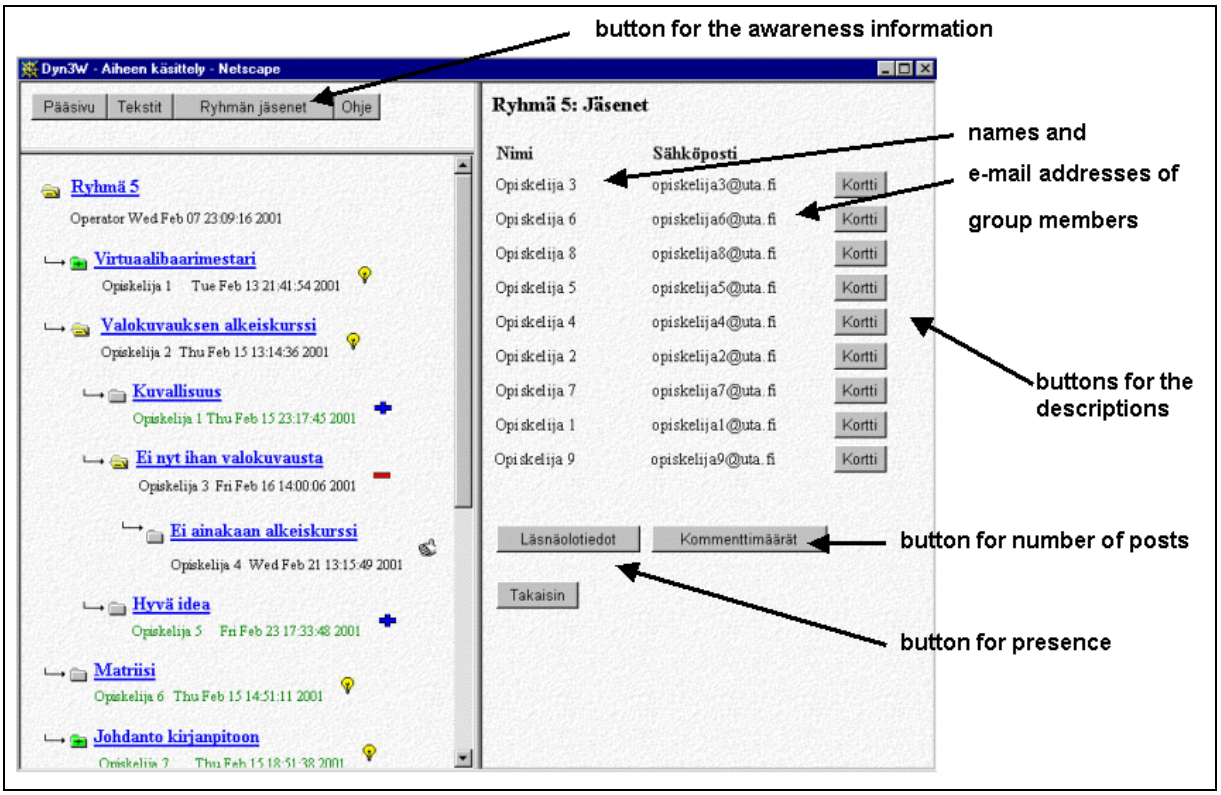

Figure 1: View from small group working area

A view from the small group's working area is shown in figure 1. In the left frame discussion tree is shown. Above that there is the button bar, which includes a button for the awareness information. This awareness information is shown in the right frame, which normally is used for reading comments from the discussion and writing new comments to the discussion.

In our implementation the learner can see him/herself as one of the members on the list of the group. Another way in the implementation could be that he/she is removed form lists and information is only about other group members. In this case it is more difficult to learner compare him/herself to others. Showing the current user also in those group listings makes it clearer that the user is a member of the group. He/she can see that he/she is in the same position with others. Also comparing oneself to others comes very easy (on right in figure 2).

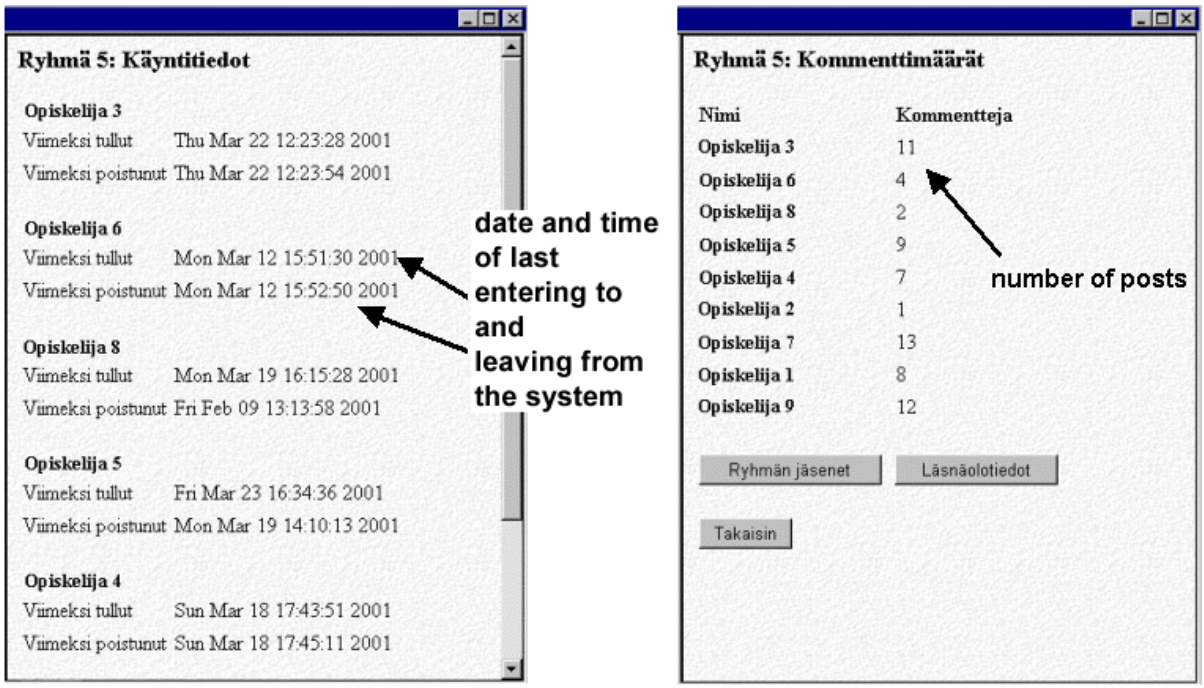

Figure 2: Views of awareness features. Presence information (on left) and number of posts (on right)

We hope that this would encourage learners to work harder. Because they can easily see how much work other group members have done, they might want to do likewise. Of course this can also lead learner to be lazy, because he/she is not only one. This problem could be solved with forced requirements, which seem to be good way to get discussion going (Sorenssen & Takle 2001).

The awareness features included also information about group members' presence in the system. This is implemented by telling which time each group member has logged in and out of the system (on left in figure 2). It could be implemented also so that system just tells who is inside and who is outside the system. But we wanted to show learners more detailed information about each group member's visits to the system.

Experiment and results

Dyn3W- system with the new features was in use on Computer-Aided Instruction course at Spring 2001. The course had 74 participants. In this course, which includes also lectures, exercises and two group projects, the assignment for working in Dyn3W- system was to collaboratively produce a short description for a good online course. For that students were randomly divided into eight groups. Four of these groups had the awareness support and four did not have this support in the conferencing system. This means there were 36 learners with support and 38 without. Because of that, we can find out different groups' usage of the system and compare if there is any difference e.g. in discussion activity. Participants used the system for a quite short period, which lasted only 4 weeks.

These new awareness features weren't introduced or explained to the learners during lectures or exercises. We did this because we wanted to find out if the users could find these tools by themselves and how they would be using those tools. In this way we can explore if learners find ways to use them and how many times they are using them. Introducing these tools just for part of participants would also be quite difficult. Introduction would also lead learners to use tools in a particular way that the teacher is thinking to use it.

As we can see in Table 1, the new awareness did not encourage our students to produce more comments than in the groups without the features (6.8 < 8.2). However, if we look a little bit closer to the data, we can find an interesting issue. It was compulsory for all participants to produce at least one comment (new course suggestion) in the group. If we consider those who produced more than only this one compulsory comment, we find that there were more students who stayed and participated in the discussions in the awareness support groups than in those without the support (29 > 28). In groups without the awareness features 26,3 % of learners made just that required comment, but in groups with the awareness features the same percentage was only 19,4. This gives a weak evidence for the

usefulness of the awareness tools. Learners with the features also had more sessions than learners without the features.

	The awareness features	
	With	Without
Participants	36	38
Sessions by average	16,5	14,7
Comments by average	6,8	8,2
Participants working more than compulsory	29	28

Table 1: Comparing the two learner groups

Most of the learners used the new awareness features at least once (Table 2). This means that most of the learners found these features easily. Most of them were using all of the features. Many learners liked to read other learners self-descriptions but they didn't give a description of themselves. As we see in Table 1, learners using the awareness features had 16,5 sessions by average and they used awareness support during 4 different sessions (Table 2).

Used the awareness features at least once	33 learners
Read other users descriptions of themselves	25
Wrote description of themselves	5
Were interested in the "presence" information	29
Were interested in the number of posts	29
Sessions where using awareness by average	4 sessions

Table 2: Usage of the awareness features

Conclusions

According to the preliminary results we got from experiment it's quite fair to say that learners were at least very interested in getting companion awareness information. The fact that learners did use awareness features quite often but not in every session, supports that conclusion.

Participants took part in the discussions as much as it has been common in this course in earlier years. So the awareness features didn't have effect for participation in way we were expecting. Duration of the online exercise might also have effects. Four weeks period is quite short, which makes the learners focusing to the task and leaving social aspects to background. On our course learners could also meet other learners at the lectures twice a week, on the campus site and so on, which probably effected also to the need of awareness information. The awareness features can be more valuable for an online course where learners are physically distributed.

Typically on every course, traditional or online, there are leamers that don't want to do more than they have to. We got weak evidence that with the awareness support for the learners we can downsize the number of this kind of behavior of learners. Somehow the awareness features seemed to get more learners to be involved to the work of community. This might mean that learners are more motivated for the course and therefore are working harder, which would hopefully lead to the better grades and learning.

We also found out that learners are interested in all kind of awareness information, but they are not ready to take extra effort for making others aware about themselves. This can be seen from the interest of other learners' descriptions. Somehow it's surprising that the learners didn't make a self-description after they have read other learners self-descriptions. Nardi et al. (1998) have made same kind of observation with personal Web pages in an online course.

Future work

In the near future we are going to rearrange the experiment we have discussed in this paper. Especially we want to get more evidence for the finding that those learners with the awareness features were more active than was

compulsory. We are also going to make some improvements to our system. We are going to highlight buttons for learner self-descriptions after the description have been done. We hope that this way the learners will not get tired with this feature, because now they can know from the button if their co-learners have made their self-description. We are also considering ways to encourage learners to writing their own descriptions.

It is also possible to give learners more or even better awareness information. One possible way to do that would be information about the reading times and the readers of each posting (along the lines of the BSCW system (Appelt & Mambrey 1999)). This means that learners should be able to see who have read their postings. So if learner makes a new posting, he/she can check later who has read it or hasn't read it. In this way learner can be more aware about ongoing discussion. In this case questions about privacy have to be considered too. Is it fair to the learners to provide so detailed information about their usage of the system for their co-learners? If it is done openly, it might also encourage learners to use the system more and hopefully in the meantime learn more in collaboration with others. We are planning to include these awareness features into our discussion forum.

In our experiment there were also peer groups without awareness support. If we in the future compare more carefully these groups with those with awareness support, we can maybe find out more detailed knowledge of usefulness of supporting awareness. A problem with that kind of analysis is the short time of usage of Dyn3W system on that specific course. The awareness features are probably more useful in longer lasting usage of online learning environment. One possible way to get analysis little bit further is to evaluate the quality of different groups' proposals and find out if there is any difference and what might be the reasons for them. This is one of the issues that we are planning to focus in our future research.

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