

Enhancing the Social Capital of Learning Communities by Using an Ad Hoc Transient Communities Service

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Abstract. In online learning, communities can help to enhance learning. However, because of the dynamic nature of communities, attaining and sustaining these communities can be difficult. One aspect that has an influence on, and is influenced by these dynamics is the social capital of a community. Features of social capital are the social network structure, the sense of belonging and, the support received and provided. It is hypothesized that these features can be improved by using Ad Hoc Transient Communities (AHTCs). Through an AHTC learners are brought together for a specific, learning-related goal ('ad hoc') and for only a limited amount of time ('transience'). To test whether the use of AHTCs has a positive influence on the social capital, a learner support service which enables the use of AHTCs is proposed. Furthermore, requirements, pre-requisites, and future research are discussed.

Keywords: Social Capital, Ad Hoc Transient Communities, Sense of belonging, Received and Provided Support, Peer Support, Social Network Structure, Learning Communities

1 Introduction

Community formation in online learning environments has the capability to enhance learning [1]. An online community also gives participants a sense of belonging, provides easy access to other participants and prevents the feeling of isolation participants might experience [1-3], thus reducing the chance of participants dropping out [4-6].

However, since community formation is a dynamic process, it is inherently unpredictable [7, 8]. While communities need a certain amount of dynamism (e.g., participants come and go, information flow increases and decreases, etc.) to be able to emerge and stay in existence [4], too little or too much dynamism can again have adverse effects such as a low information flow or a high drop-out rate [9, 10]. One aspect of communities that influences and is influenced by these dynamics is the social capital [11]. Social capital represents the participant's relationships within a social network, as well as the mutual support between participants [12]. The features of social capital include: (1) the social structure of the network – how are participants

connected - [2, 13], (2) the sense of belonging to the community [6, 14-16], and (3) the social support received and provided [17].

In order to improve the social capital of online learning communities, we hypothesize that each feature mentioned above needs to be improved upon. With regard to these improvements the concept of Ad Hoc Transient Communities (AHTCs) seems very promising. Sloep [18, 19] introduced the concept as a means through which learners are brought together for a specific, learning-related goal ('ad hoc') and for only a limited amount of time ('transience') [19, 20]. In particular, Van Rosmalen et al. [18] tested a peer-support service that created Ad Hoc Transient Communities, through which participants were able to receive support from their peers within an online learning community. The results of this research seem to indicate that AHTCs have a positive influence on the social support received and provided. However, because of the novelty of the AHTC, there is no evidence on the effects AHTCs might have on the social structure of and sense of belonging to the community.

Fetter et al. [21] hypothesize that the use of AHTCs not only improves the support aspect of social capital, but also has a positive effect of the social network structure and sense of belonging. To test for these effects, as well as further extend the previous findings by Van Rosmalen [18] it is suggested to use AHTCs in an existing online learning environment and test for the effects on the social network structure, the sense of belonging, as well as on the support received and provided. By introducing AHTCs we aim to improve the social capital of the learning community in three ways. First of all we aim to improve participants' connectivity. Secondly, we expect the threshold to make and fulfill request will become lower for new participants. And thirdly, we expect to increase the effectiveness of the community as whole.

In order to facilitate the testing of these hypotheses, a service needs to be constructed that allows the emergence and tracking of AHTCs in learning communities. In this paper the outline of this service is introduced, as well as the requirements and pre-requisites needed for the service to be effective. First some theoretical background is given, followed by a concise explanation of the AHTC concept. Subsequently, the service is described and finally conclusions and future research plans are presented.

2 Social Capital

Social capital represents the relationships amid participants within a social network, as well as the mutual support between participants [12]. These 2 aspects can be split up into multiple factors that influence and are influenced by the amount of social capital of the community. These factors are the social network structure, the sense of belonging to the community, and the support received and provided.

2.1 Social Network Structure

The social network structure is an integral part of the social capital and [13]. It represents how participants are connected to each other as well as how (sub-)

communities are interconnected. These connections (or relationships) allow information to flow throughout the network and to the acquisition of new or the reinforcement of existing social contacts [22]. When looking at the quality of the social network structure there are multiple factors to take into account, for instance:

- The number of connections [22]
- The strength of the connections, within and in between communities [23]
- The spread of the connections [24]

Combining these factors gives a better view of the quality of the social network structure and provides insight into possible bottlenecks. One of these bottlenecks occurs when a small core group of very active participants makes the community prone to becoming instable [21]. Because most communication and activity goes through the core participants, the loss of one or more of them may well disrupt the communication and information-flow throughout the whole community. Participants can become isolated when they are only connected to a core person. A community which is dependent on a small group of core participants is said to be highly centralized [24].

High centralization brings another problem in its wake. In a highly centralized network core participants are the contact persons for most other participants. This will easily lead to the core participants being flooded with requests. This is problematic because it has been shown that participants are more likely to stop participating if they become overloaded with information [9].

In summary, for the social network structure to have a positive influence on the social capital, there should be (a) connections between participants that (b) should consist of weak and strong ones, which (c) should be spread out in a decentralized way.

2.2 Sense of Belonging

The sense of belonging or sense of community is an important feature when considering the social capital [16]. Participants need to feel part of the community, feel they have peers they can trust [25] and are able to collaborate with and / or ask for support [6, 14]. A low sense of belonging can lead to feelings of detachment, isolation, distraction, and lack of personal attention, heightening the chance of participant drop-out [4-6]. Drop-out is an important problem for online learning communities; it is often 10 to 20 percent higher than it is for learning communities where participants meet face to face [6, 26, 27]. Improving the sense of belonging is not only positive for reducing drop-out. It has also been shown to increase the students' involvement in community activities, improve retention, as well as encourage them to make more contacts [6, 28].

2.3 Support received and provided

Support is an aspect of social capital tied to knowledge sharing actions within a community. According to Lesser, Fontaine and Slusher [29] actions of mutual support

positively influence the social capital in two ways. First, the support given and received becomes a sort of informal currency. It allows participants to validate each others' performance and willingness to help. Second, the combined efforts result in a more positive view on the community as a whole, especially when subjects are closely linked. Additionally, for social capital to be useful, it needs to be maintained, by reestablishing, sustaining, and creating relationships between people [12, 25], for instance through receiving and providing support.

In order to bring participants together as well as being able to provide the support necessary participants can be invoked as peer-tutors. This even has the added benefit that collaboration with peers can be a valuable method for both parties to improve learning [30]. In line with these considerations Van Rosmalen et al. [18] tested a peer-support service that created Ad Hoc Transient Communities, through which participants were able to receive support from their peers.

3 Ad Hoc Transient Communities

Through an Ad Hoc Transient Community (AHTC) participants are brought together for a specific goal ('their ad hoc ness') and for only a limited amount of time (their 'transience') [19]. Berlanga et al. [20] summarize the features that characterize ad hoc transient communities as follows:

- the self-organizing powers of the community and the absence of hierarchies
- the negotiation processes that the members engage in
- the members' expectations of the actions and behavior of their fellow members
- the work of the members towards a set of goals through united actions
- the emergence of relations of swift trust between the members

Van Rosmalen et al. [18] used a question and answering module to create an AHTC within a course on basic computer skills for informal, lifelong learners. In the study, individual learners could ask a question to their peers. Using a matching mechanism, two peer-learners were selected to act as tutors. Their selection was based on several criteria such as availability, content competency, and eligibility [18]. The participants selected would then deal with the question within a private wiki. The experiment showed a positive effect on learning when selecting peers at random for the AHTC (control group). However, the effect proved to increase when using the matching mechanism for the peer selection (experimental group). Its use significantly increased the responsiveness, quality of the answers, and perceived usefulness [18]. So in this particular case, the use of AHTCs improved the support feature. However, the study did not look into possible positive effects of AHTCs on the social network structure and / or the sense of belonging. This is what we now aim to investigate.

4 AHTC Service Outline

As mentioned before, our main assumption is that learning communities will benefit from using AHTCs, by improving the social capital of the learning community. To support our claim, we have to investigate three issues. The first issue is to investigate whether using AHTCs will decentralize the social network structure. By spreading out the (often numerous) requests over multiple participants through matching, it is expected that a multitude of relationships will be in effect within a short period of time. By making sure that most participants are not just connected to a central participant a case of drop-out does not so easily lead to sudden isolation.

Second, by providing a way for participants to easily meet each other through the AHTC, we expect the sense of belonging to the community to increase. This applies especially in the beginning, when participants might feel reluctant to ask questions because they feel incapable of returning the favor. However, with AHTCs participants are capable from a very early stage on to fulfill requests from others: Because the moment the participant has some content competency, she could already be matched to others without that competency.

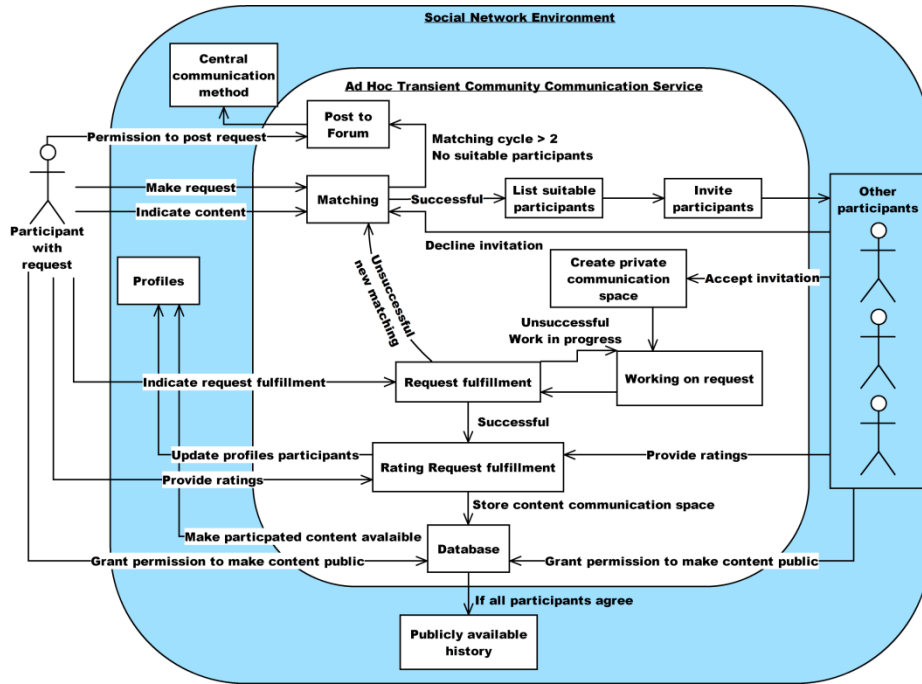


Fig. 1. AHTC service

Third, the support that is received and provided will give meaning to the community. The fact that knowledge is shared and requests are fulfilled is not only a goal, but also an influence by itself. It defines the effectiveness of the community as a whole, as well positively influences factors such as the sense of belonging [29].

In order to test whether the use of AHTCs will have the sought after positive effects on social capital, a learner support service which facilitates AHTCs is needed (see Figure 1). Through this service, participants will be able to make requests for collaboration and support. As can be seen below in Figure 1, whenever a participant has a request a matching mechanism is set in motion that searches for peers that fit the request. In case of a successful match, participants are invited to a private communication space where the request can be fulfilled. Once fulfilled, the participants are asked whether they are willing to make the result publicly available in a ‘frequently asked question’ (FAQ). Below, each part of the service is explained in more detail including some considerations.

Request – Each request will be entered through a form within the social network environment. The participant types in the request and selects from a drop-down menu to which content the request belongs.

Matching – Based on participants’ availability and content competency values, a ‘matching score’ is calculated. Based on this score, a list of participants most suited to support the request is created. Starting from the top of the list (highest matching scores), two participants are invited through e-mail. In case of a decline the next participant on the list is invited.

Environment – Upon the acceptance of a request, a private space is created, accessible only to the participants involved. Depending on the possibilities of the social network environment, the space can have different forms, such as a wiki or a forum space. This space will always include the text of request, selection boxes to indicate request fulfillment, as well as having access restrictions. Only the participant who made the request as well as the participants that accepted the invitation are allowed access to the private space.

Request fulfillment – The request will be handled as dealt-with (successfully or unsuccessfully) once the participant that made the request indicates this to the system. In case of an unsuccessful fulfillment, either a new AHTC is created or the participant is asked for permission to post the request via the publicly available communication method. This way, it is hoped that other participants who were not matched, might still fulfill the request.

Ratings – Once a request has been dealt with, all participants are invited to rate the quality of the request fulfillment (1- very poor to 10- excellent).

Storage – The request, all communication in text format, and ratings are stored in the database and stay available for the participants involved. The profiles of the participants are updated based on the ratings, and request fulfillment. The profile page thus will show how many requests someone has fulfilled and the average quality of these answers. Furthermore, a private link is provided for the participant to quickly access the history of any request they were involved in. With each of these entries, all participants involved are asked whether they agree to make the content of the AHTC publicly available. If all participants agree, the content is posted to a publicly available history in the social network environment.

5 Conclusions and Future Research

As has been argued, we expect the use of the proposed AHTCs learner support service has a positive effect on the learning community as a whole and, particularly, on the social capital of the participants. It is hypothesized that AHCTs help to decentralize the social network structure, strengthen the sense of belonging, and intensify the support received and provided. In this paper we have presented how AHCTs should be designed. Based on the proposed design, future research includes simulations to validate the design as well as the development of a prototype for actual experimentation. Once the prototype has been built and tested, a final longitudinal experiment will be conducted in an existing online learning setting.

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