Project Deliverable Report

Internal Deliverable nr ID8.16 Learning network management

Workpackage WP8
Task 8.1
Date of delivery Contactual: 01-06-2008 Actual: 27-06-2008
Code name Version: 0.0 Draft ☐ Final ☑

Type of deliverable Security (distribution level)

Contributors
Authors (Partner) Francis Brouns, Peter van Rosmalen, Peter B. Sloep, Adriana J. Berlanga, Liesbeth Kester, Marlies E. Bitter-Rijpkema (Open Universiteit Nederland)
Contact Person Francis Brouns

EC Project Officer

Abstract (for dissemination) In the second 18 months of the TENCompetence project, we elaborated the model for ad hoc transient communities and network management, to include profile and eportfolio aspects and redesigned the application as a service.

Keywords List learning network, community, policies, ad hoc transient communities, sociability

TENCompetence Project Coordination at: Open University of the Netherlands
Valkenburgerweg 177, 6419 AT Heerlen, The Netherlands
Tel: +31 45 5762624 – Fax: +31 45 5762800
Learning network management

Domain model

A learning network is, among other things, a community of people (members) who share the intention to learn something about a particular domain of knowledge. Actually, calling a learning network a community presumes already too much, as its connotation is one of people who somehow interact and have a shared history. We do not assume this to be the case up front, although it may, as a matter of contingent fact, happen to be true for some of the members. Eventually, it will become true. Either way, we assume that strengthening the social ties within a (learning) community will positively affect learning. So, through active participation in the community the learning goals people have set for themselves will be attained more effectively, more efficiently, more attractively; or, put differently, reshaping a learning network as a community enhances the quality of the members’ learning experience. In order words, a learning network should self-organise such that a community emerges. The main characteristic of effective communities evolve around social space and social interactions (Kester et al., 2006; Kreijns, 2004; Nichani, 2001; Rovai, 2002), next to a clear boundary (Kester et al., 2006; Weber, 2004), common goals, rules and sanctioning mechanisms (Kollock & Smith, 1996; R. Koper & Sloep, 2003). Another characteristic is the heterogeneity of the community population and the different roles each of the members can take. The model for network management thus evolves around guidelines that foster social space, guidelines for community characteristics and guidelines for community population. To foster social space, three social prerequisites should be met in order for social interaction, in particular cooperation, to occur: (1) any two individuals must be likely to meet again in the future (continuity), (2) all individuals must be able to identify each other (recognisability) and (3) all individuals must be able to know how any other person has behaved in the past (history) (Kollock, 1998).

Community characteristics are set by the proximate and ultimate goals learners have. The goal affects the amount of social interaction. Peer-tutoring could be one of the solutions to stimulate social interaction. A community should be populated with people in various roles, or a mix of expertise, and types of people (trendsetters, lurkers, posters) (Nichani, 2001; Preece, Nonneke, & Andrews, 2004) and should allow people to take on different roles. Even if it would be possible to force a learning network to become a community, this would never be as effective as a community that emerges from the learners themselves. Learning networks, like communities are dynamic with changing composition and purpose. Resilient communities are able to deal with these dynamics. The social structure of a network determines resilience. In centralized networks, activity evolves around a small core group of people. For a more resilient and efficient community the network should become less centralized. Good selection criteria for matching peers in the ad hoc transient communities should function towards a more stable and efficient network (Fetter, Berlanga, & Sloep, submitted).

Required functionality

Learning networks, and also ad hoc transient communities, rely on active participation of the members (Kester et al., 2006; E. J. R. Koper & Sloep, 2002) and should provide tools, applications and functionality that allow and encourage these interactions (E. J. R. Koper, Rusman, & Sloep, 2005; R. Koper & Specht, 2007) as well as contribute towards sustainability of the community. Following an analysis of popular existing online communities, we distinguish the following required...
functionality that allows users to manage, organize, and regulate resources and communities (A. Berlanga et al., 2007).

**Self-management.** This is related to administration and sharing; permitting users to create own profile, contacts, communities, networks, resources, and tags, etc. **Self-organisation** permits user to interact and react to member’s resources: commenting, recommending, copying, subscribing, rating, bookmarking, seeing related resources. **Self-regulation** allows users to control existing resources and communities: create private and public resources/communities/groups, mark communities/resources/groups as offensive.

**Ad hoc transient communities**

As we stated before, we believe that strengthening the social ties within a learning community will enhance the quality of the learning experience. Mechanisms that allow or promote strengthening of social ties involve users engaging in joint activities in different roles. Role specific user characteristics and descriptors related to a particular activity are required. Users should be recognisable and identifiable. Ad hoc transient communities are seen as the vehicle to organise this (Kester et al., 2007; P.B. Sloep et al., 2007; P. B. Sloep, van Rosmalen, Kester, Brouns, & Koper, 2006). Ad hoc transient communities serve a specific goal, are limited in time (i.e. dissolve when the goal has been attained), and operate according to social exchange policies that enhance social embedding and knowledge exchange. Surveys among higher education staff indicated that having to repeatedly answer content related questions of students imposed a high workload; while they still indicate this as a valuable contribution towards the learning process (de Vries et al., 2005). Therefore our first implementation consisted of a peer-tutoring ad hoc transient community to assist learners in finding answers to content-related questions (Kester et al., 2007; P. B. Sloep et al., 2006; Van Rosmalen, Brouns et al., 2007a; Van Rosmalen, Brouns et al., 2007b). This proved to be very effective, not only towards the proximate goal of obtaining an answering to an immediate pressing question, but also towards the more ultimate goals of improving interactions and providing learner support and even of promoting social space (A. Berlanga et al., in press; van Rosmalen et al., 2008; Van Rosmalen, Brouns et al., 2007a; Van Rosmalen, Brouns et al., 2007b; Van Rosmalen et al., in press; Van Rosmalen, Sloep et al., 2007).

**Theoretical background**

There are examples that large networks, that allow sub-communities to arise such that a few community members get together to address a specific goal, are usually more effective (Lui, Lang and Kwok, 2002). That would support our notion of ad hoc transient communities. Setting up ad hoc transient communities does not guarantee that the desired effect will occur or that learner will interact. Solely providing environment with, suitable, tools does not mean that people will use it or use it for the intended purpose. We analyze motivational factors and incentive mechanisms and their effect in successful communities as described in the literature; we look at effects of these mechanisms both as proposed by relevant theories and as found in successful online communities (A. Berlanga et al., 2007). Based on that, we propose and describe a design rationale for a profile and portfolio type incentive, and argue why it will enhance participation in (ad hoc transient) communities. There is an extensive literature on how to set up and maintain communities as well as on policies for effective communication and stimulation of participation (Bitter-Rijpkema, Martens, & Jochems, 2002; Bogenrieder & Nooteboom, 2004). In the literature,
many theories on motivation to contribute to and participate in, mostly peer to peer, communities have been described. Researchers looked at psychology and community behaviour reviews for theories to explain users' behaviour in communities and mechanisms to enhance contributions and participation. The self-organisation, social exchange theory, systems, and expectation-state theories provide sufficient backing for the general principle behind the mechanism of ad hoc transient communities. Additional support for our claims can also be found in behavioural and psychological literature on motivational mechanisms on why people would participate and contribute in communities. (Millen & Patterson, 2002) and (Erickson & Kellogg, 2000) argue that visualising users and their actions in a community is important to stimulate participation. (Cheng & Vassileva, 2005) present five theories (reciprocation theory, consistency theory, social validation, persuasiveness of liking, theories of discrete emotions) to explain why community members would participate and contribute; they applied design rules based on these theories to a P2P system used by university students. (Lui, Lang, & Kwok, 2002) summarised psychological studies by several authors to explain motivation and incentives for participation in communities and reported that both individual and interpersonal factors play a role in the motivation of people. The individual factors again can be divided into extrinsic motivations (rewards, personal needs) and intrinsic motivations (altruism, reputation). (Ling et al., 2005) applied design principles based on social psychology theory to the Movielens application, a movie rating site; they were able to confirm that people would contribute more when the system showed them how unique they and their contributions were, and when they set specific goals to attain. Most authors seem to conclude that incentive and reward mechanisms have to be in place for people to share knowledge.

Profile and eportfolio information for enhancing social interaction

For social interaction to occur at all, people need to get acquainted with each other. This is done on the basis of personal information. Visualizing the users in the system and their contributions to and participation in the community should promote contribution and participation because it raises awareness of a user’s own actions and those of others; it also demonstrates people’s responsibility and the consequences of their actions (Erickson & Kellogg, 2000). (Meyerson, Weick, & Kramer, 1996) and (Coppola, Hiltz, & Rotter, 2004) discuss the notion of swift trust, which emerges in temporary teams whose existence is formed around a clear purpose and common task with a finite life span. Swift trust helps to establish engagement and commitment. This is exactly what is required for our ad hoc transient communities. Several studies showed the relevance of background information on personal profile and expertise information on knowledge exchange and building of trust in teams that had to jointly work on a product ((Rusman, van Bruggen, & Koper, 2007; Rutjens, Bitter-Rijpkema, & Cruyzen, 2003). An easy to use template, pEXPi (abbreviation for personal expertise inventory or personal identity and expertise profile) was developed to allow community members to introduce themselves and their expertise (Rutjens et al., 2003). This pEXPi has been used successfully in various academic communities and according to the participants this contributed towards learning interactions and emergence of community feeling (Ogg et al., 2004). We believe that a user’s profile should be designed not only to give information about the learner, but also to foster interaction (A. Berlanga et al., in press), encourage participation and motivation (Brouns et al., 2007) and develop trust (Rusman et al., 2007). Profile and eportfolio information is also required for the peer matching selection criteria for the ad hoc transient communities. To that end, we conducted a first exploration of existing popular profiling sites, to determine what kind of information is made available in users' profiles and how they motivate
registration and stimulate contribution. All these sites have in common that the
services they offer evolve around the members’ profiles. Given their capacity to
encourage members to be connected with other members and their growing
popularity, we believe that some lessons can be learned from these successful sites.
Registration for all of these sites is free, because the main aim of these sites is to get
as many members as possible. The sites provide extensive information about the
benefits of the membership and importance of the profile and assist in compiling the
profile, often already in the registration process. Most sites ask the members to
complete only a brief profile during registration, but provide ample opportunity after
registration to extend and expand on the profile, even beyond the bare necessity for
the type of profiling site. The main strength of these sites is the affordances for

Model implementation
The peer selection criteria and algorithms that have been used in the first prototype
have been improved to ensure a proper selection of peers and allow fallback in case
some selection criteria could not be met. This turned out to be more important for
the tutor suitability and availability. Tutor suitability is only calculated when content
competence has a value higher than 0. And for availability we had to incorporate a
time-span in which peers were excluded from the invitation cycle when they did not
respond for a while, to prevent the invitation cycle from failing.

Our first technical implementation of the model for peer tutoring ad hoc transient
communities was not yet set up as web services and did not fully comply with the
TENCompetence infrastructure. A substantial part of the model implementation relies
on LSA (Latent Semantic Analysis). Configuration of LSA parameters greatly depends
on the type of resources in the domain as well as on the subject domain itself. We
designed and tested algorithms to automate setting up of the document collection,
document space, construction of list of common words to be excluded, and
parameterization of the SVD options.

Next we redesigned the first prototype to suit the PCM infrastructure and available
data and indicated extension points. We made a full inventory of data we required,
and whether that data is present in the current PCM services and more importantly
could be retrieved as required from the API. At some points, we either made small
adjustments in our design, for example to use alternative tools, or ask for extensions
of the current PCM services. For those we submitted change requests. Change
requests involve extension of database structure to store additional required data
and options to enter these data, as well as extension to the PCM API. Another aspect
the PCM infrastructure has to deal with is related to privacy of user data. Because at
some moment of time we at least expose the peer’s name and email address, the
users must be able to indicate whether or not this data is publicly available.
References


Rovai, A. P. (2002). Building a Sense of Community at a Distance [Electronic Version]. International Review of Research in Open and Distance Learning, 3.


