Ad Hoc Transient Communities to Enhance Social Interaction and Spread Tutor Responsibilities

Proceedings of the Sixth IASTED International Conference
WEB-BASED EDUCATION
March 14–16, 2007, Chamonix, France
ISBN Hardcopy: 978-0-88986-650-8 / CD: 978-0-88986-651-5

AD HOC TRANSIENT COMMUNITIES TO ENHANCE SOCIAL INTERACTION AND SPREAD TUTOR RESPONSIBILITIES

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ABSTRACT
A Learning Network is an ensemble of individual users, institutions and learning resources which are mutually connected through and supported by information and communication technologies. Learning Networks are particularly attractive to self-directed learners, who themselves decide on their learning programme as well as on the timing, pace and place of their studies. Such learners may easily become isolated, which is detrimental to their studies. Supporting them, furthermore, may rapidly lead to staff overload. This paper proposes that setting up *peer support* in *ad hoc*, *transient communities* helps tackle both problems. An overview of pertinent literature is presented to substantiate this proposal.

KEY WORDS
community building, learning networks, peer tutoring, self-directed learners, ad hoc transient community

1. Introduction

The term 'learning network' can be used in a number of ways. Harasim and colleagues [1] define learning networks as 'groups of people who use CMC (i.e. computer-mediated-communication) networks to learn together, at the time, place, or pace that best suits them and is appropriate to the task'. Others define networked learning more broadly as student and teacher experiences with the use of computers in learning ([2]). In our definition, a Learning Network ([3],[4]) is 'an ensemble of learners, institutions and learning resources which are mutually connected through and supported by information and communication technologies in such a way that the network self-organizes and thus gives rise to effective lifelong learning'. Although all views involve the use of networked computers to support learning, there are also significant differences. Our view stands apart in that it emphasises how a Learning Network's organizational, educational and technological characteristics jointly trigger learning of self-directed learners through self-organization ([4]). Thus bottom-up created organizations arise that consist of groups of learners who share a common interest or a particular (learning) goal. Studies in other domains show that bottom-up created organizations can be at least as effective and efficient as top-down designed ones ([5], [6]).

In our conception of a Learning Network, the self-directedness of the learner is taken as the starting point, rather than as an element in a design based on particular instructional principles ([7]). A Learning Network thus offers learners opportunities to act that are on a par with the opportunities staff have in traditional, less learner-centred educational approaches. Learners are allowed to create their own learning activities, build their own learning plans, and share their learning activities and plans with peers and institutions. Learner self-directedness, however, may rapidly degrade into learner isolation. Learners who do not feel socially embedded in a community will not flourish, to the detriment of their academic achievements and their appreciation of academic life. In general, individual success or failure on a learning activity depends on the extent to which learners perceive themselves as participants of a community ([8]).

Self-directed learners are also likely to make extensive demands on staff. After all, they do not come in cohorts or classes, nor do they have uniform learning paths and goals that may be captured in fixed curricula. This learner heterogeneity is bound to lead to a great variety of tutoring requests. Because of the lack of an available social structure, self-directed learners cannot rely on each other's help either, which tends to increase the staff workload even further. What little evidence is available, seems to support these arguments ([9] *fide* [10]). Rumble ([11] pp. 81, 82) quotes as much as twofold load increases. Ideally (and overly generalising), it is an online teacher's main role to facilitate student learning processes, while a teacher in a traditional setting should primarily select and share content ([12,13]). So in online learning, the teacher is to provide the students with timely feedback regarding their learning *process* rather than the subject matter or their learning *products*. In practice, however, online teachers are responsible for both the learning process and the learning product. This includes such activities as (1) grading, (2) initiating, receiving and responding to messages, (3) collecting and marking assignments, and (4) maintaining and updating course content ([12]). De Vries, and co-workers ([14]) note that

teachers in online and blended learning environments find initiating, receiving and answering questions of learners time-consuming. In other words, online teachers receive numerous content related questions that need to be answered. As argued, taken together these responsibilities could easily overload the teacher. It is therefore that we seek to develop technologies that enhance a student's learning process and yet do not increase, or preferably lower, the workload of teachers ([10]).

This article proposes that *peer tutoring* in *ad hoc*, *transient communities* will both enhance the social embedding of learners in a Learning Network and keep the staff load within bounds. Peer tutoring is a form of co-operative learning ([15]), which has as an interesting side-effect that many teacher related responsibilities, such as providing learner support, are passed on to the learners themselves. We use the term 'ad hoc, transient communities' to denote communities that, whilst being part of a larger community (Learning Network), fulfil a specific goal and exist for a limited period of time. First, we present a detailed account of what this proposal for peer tutoring in ad hoc, transient communities entails. This includes a sketch of a suitable technological infrastructure for it. Rather than straight-away build such as system and carry out empirical tests, we surveyed what the extant literature had to say about the proposal: could it work and if so, under what conditions? The final section of the paper is devoted to a discussion of these questions with the ultimate aim of assessing our proposal's overall viability. The discussion includes a brief digression into possible other uses.

2. Enhancing social interaction and spreading tutor responsibilities

Ad hoc, transient communities are set up to address a particular request (their ad hoc-ness) - say, answering a content-related question - and to last for a limited period of time only (their transience) - say, until the content question has been answered satisfactorily. (A similar notion, used a few years ago in the context of discussions on the 'new economy', is that of 'episodic communities on demand', see [16], p171.) Requests may differ widely. They may demand support in regards to the learning content or the learning processes; they may ask for an assessment, for additional learning material, and even for information regarding administrative matters ([14]). The community consists of at least two learners: exactly one in the role of *tutee*, and one or more in the role of *tutor*. Although, common sense tells us that the group size of the community should not be too large (about five people?) the co-operative learning literature does not specify an optimal group size. Little distinction is made between interaction patterns for dyads, small groups (three to six members), and large groups (seven or more members) although the interaction patterns may differ ([17]). However, the number of inactive group members (i.e. lurkers) increases as group size increases (because of the diminished individual accountability of the group members), the effect of the increased group size on the interaction patterns of the active members may indeed be negligible ([18]).

By assumption, an ad hoc transient community always starts with some learner who has a specific request and thus adopts the role of *tutee*. Depending on the nature of the request, peer learners now have to be found that are suitable for the *tutor* role. Due to the bottom-up character of a Learning Network and the self-directedness of the learners, the chances that a tutee herself easily finds a fellow learner who is both willing and capable to act as a tutor, are slim. Among other things, the lack of classes, cohorts or other readily available, homogenous groups of learners to select from, are to blame. A mechanism is needed to designate peers with whom actually to populate the community. We have worked out such a mechanism for content-related questions; *mutatis mutandis* the same reasoning applies to other kinds of requests.

Four different questions have to be answered to determine how *suitable* a learner is to act as a tutor with regard to a specific content related question:

1. Has the learner sufficient mastery of the content to answer the question (*content competency*)?
2. Is the learner a sufficiently competent tutor to support the tutee (*tutor competency*)?
3. Is the learner eligible to answer the content question (*tutor eligibility*)?
4. Is the learner available to support the tutee within an acceptable timeframe (*tutor availability*)?

Content competency reflects the tutor's mastery of the content relevant to the content question. If available, an electronic learner dossier (e-portfolio) in which the learning activities of a learner have been logged could provide a suitable resource to determine this. Tutor competency refers to the ability of a tutor satisfactorily to support peers who have questions regarding the content. This information could be acquired by letting tutees rate tutors' past performance. The content competency as well as the tutor competency of a learner should be visible to all members of the community to assure individual accountability ([19]). For the same reason, rating should not be anonymous.

Tutor eligibility is an important factor in spreading tutor responsibilities over all learners in the Learning Network. If content and tutor competency were to be the only factors deciding who becomes a member of a content-related, ad hoc transient community, a run-away effect is bound to occur. First, those who participate often are likely to become better tutors, if only since they are in a position to accumulate points on ratings. Second, assuming a (not necessarily strictly) hierarchical organization of the content, those who have progressed further will be able to answer more questions than those who have just started; someone who has finished should be able to answer *all* questions. This effect is exacerbated if we consider that in a Learning Network both learners and staff are seen as participants. Since staff people

should have superior content and tutor competencies, it is unlikely that learners will ever become tutors, which is undesirable both from an economic (not overloading staff) and a pedagogic (having learners learn from tutoring) point of view. To avoid this, a comparison should be made between the tutee's electronic portfolio and those of the potential tutors. Only those tutors are eligible for inclusion in the ad hoc, transient community that are 'nearest neighbours' to the tutee; that is, potential tutors with far superior content and tutor competence should be excluded (the idea is related to the Vygotskyan notions of scaffolding and zone of proximal development). Research shows that teaming up tutees with nearest neighbours who have portfolios equal to theirs, is as beneficial for learning as teaming up tutees with nearest neighbours who have better portfolios ([20]).

Finally, tutor availability refers to such practical issues as actual short-term presence in the Learning Network (avoiding absence due to holidays, days off, illness, et cetera), or workload (i.e. studying for exams, past participation in communities). This information could be retrieved from the learners' electronic calendar.

Following our example, assume a content question has been raised by a tutee and several suitable tutors have been identified. Once the tutors are members of the thus formed ad hoc transient community, they should start working on the answer for the content question. This is an ill-structured, collaborative process that should encourage group members each equally to contribute to a final answer ([17]). The collaborative process should continue until the tutee is satisfied with the co-constructed answer. At that point in time the ad hoc transient community has outlived its purpose and ceases to exist.

What technical infrastructure is needed to implement the described mechanism? (See [21] for a more detailed discussion.) To be able at all to populate such communities with learners, their characteristics need to be stored in some kind of repository, at least for as long as they are participants of the Learning Network. A permanent, sufficiently rich e-portfolio that is maintained outside of a specific Learning Network would be ideal. Software agents or similar devices are needed to mine these repositories and compute a learner's tutor suitability. Ideally also, when asked to answer a question, tutors should not have to start from scratch but be given proto-answers derived from existing text bodies. Proto-answers should be ranked for suitability, using language technologies such as Latent Semantic Analysis ([22]). Finally, a system should be available which offers tutee and tutors a collaborative workspace. It should be seeded with the proto-answers and maintain a historical record of the changes that the participants have made. It should also be equipped with mechanisms that alert the participants to new contributions. Systems that combine the functionalities of a wiki, for collaboration, and a blog, for alerting through some kind of RSS-based mechanism, would come close to meeting these criteria (<en.wikipedia.org/wiki/Wiki>, and <…/Blog>).

To what extent does the extant literature lend support to the beneficial effects we claim ad hoc transient communities exhibit? We'll first look at the literature on peer tutoring, then to that on communities.

3. Supporting literature

Time-effectiveness. Fox and MacKeogh ([10]) studied the effects of a particular form of peer tutoring on invested tutor time. Students had to make a synopsis of a relevant article. In addition, they had to identify important issues and raise questions about the article. The synopsis together with the issues and questions were put on a bulletin board. Students had to read the synopsis posted by their peers and react to it through questions or comments. Where appropriate an online discussion could follow. Fox and MacKeogh compared this set-up to a face-to-face setting. The tutors in the online situation spent less time than the face-to-face tutors, yet there was no effect on learning outcomes. So peer tutoring led to greater time-effectiveness.

Social embedding. From the perspective of this paper, (face-to-face) peer tutoring has the beneficial side-effect that it provides learners with a reciprocal social support system ([23]). The greatest academic productivity is obtained when the performance of group members is transparent and quantifiable to all other group members ([19]). Fantuzzo et al. ([23]) report less overall subjective distress for students who followed their peer tutoring strategy and thus were individually accountable. Satisfaction with academic life was also enhanced by peer tutoring and it appears to have a beneficial influence on the class climate too ([24]) because students interact more with each other than with the teacher. Students involved in peer tutoring were more intrinsically motivated and more engaged with the learning environment, had a more positive perception of their learning experience, and experienced less task-related anxiety than students who work independently ([23]). Besides, according to Anderson and colleagues the co-operative process stimulates reflection; the peer interaction improves self-esteem and commitment to work as well as a sense of belonging ([25]). They also note that the more time a student spends on a given project during a first tutorial, the more willing she is to attend subsequent tutorials.

Learning Effects. A further side-effect of peer tutoring is that it may enhance learning or knowledge construction. Although Fox and MacKeogh ([10]) failed to find beneficial effects of peer tutoring on learning or knowledge construction, a number of other researchers did find such effects ([20],[23],[24],[26]). Additionally and interestingly, research shows that tutors benefit more from peer tutoring than tutees. The reason for this seems to be that tutors need to prepare to teach and, most importantly, actually teach ([23]). Therefore, *reciprocal* peer tutoring is advocated, in which learners take turns in acting as tutor and tutee ([20],[23],[26]). Note that in Learning Networks such reciprocity is likely to occur.

Most reciprocal peer tutoring strategies provide those in the tutor role with a structure that supports them effectively to guide their tutee's learning process ([27]). Wong and coworkers ([26]) use cognitive tools that supply task specific support to the tutee, diagnosis and comment support to the tutor, and a communication facilitating dialogue structure to both the tutee and the tutor. King et al. ([20]) taught their students four types of questions that they could use in the tutor role to guide the tutee: *review* questions, *probing* questions, *hint* questions, and *thinking* questions. The questions are best used in this order. Finally, Fantuzzo et al. ([23]) asked their learners to create ten multiple choice questions with answers and references to where the answers could be found in the learning material. Subsequently, these tests were administered to a tutee, the answers were scored by the tutor and the wrong answers were discussed. According to Fantuzzo et al. ([23]) such structured learning formats and the mutual exchange process involved in peer tutoring are responsible for the beneficial effects on knowledge construction and social interaction.

King and colleagues ([20]) state that such structured-learning formats shift the dialogue between tutor and tutee to a higher cognitive level, that includes mutual exchange of ideas, explanations, justifications, speculations, inferences, hypotheses, conclusions. Their research confirmed that such high-level discourse facilitates learning, that is, knowledge construction: the structure that offered guidance on questioning and sequencing led to superior knowledge construction; the structure that only offered guidance on questioning led to more knowledge construction than a structure with no guidance. This pattern was the same on an 8-week follow-up retention test. The importance of high-level interaction for knowledge construction is also emphasised by Greenwood, Delquadri and Hall ([28]), who carried out a longitudinal study on peer tutoring in a classroom setting. They found that students in peer tutoring classes were more deeply engaged in academic behaviour and less engaged in task management behaviours, and thus achieved higher learning outcomes than students in regular classes.

Social space. A sound 'social space' is characterised by affective work relationships, strong group cohesiveness, trust (i.e. perceived reliability of the word of other group members and genuine interest in the welfare of group members), respect, belonging (i.e. recognition of membership), and satisfaction ([29],[30],[31]). Social interaction enhances the emergence of social space. Three social prerequisites should be met in order for social interaction, in particular co-operation, to occur: (a) any two individuals must be likely to meet again in the future (*continuity*), (b) all individuals must be able to identify each other (*recognisability*) and (c) all individuals must be able to know how any other person has behaved in the past (*history*). If individuals only meet once, they are very much tempted to behave selfishly, which negatively influences the co-operation process. In addition, if individuals are not identifiable and no history of a person's behaviour is available, group members are more likely to act selfishly because it is impossible to hold them accountable for their actions ([32]). Meyerson et al. ([33]) and Coppola et al. ([34]) discuss the notion of 'swift trust', which seems relevant here. Swift trust emerges in temporary teams whose existence is formed around a clear purpose and common task with a finite life span, that is, in what we've dubbed ad hoc transient communities. Swift trust fosters a willingness to suspend doubt about whether others, 'strangers', can be counted on to 'get the group's task done'. Swift trust thus helps establish engagement and commitment.

Community member characteristics. The thriving of a community also depends on the characteristics of the people in it. First of all, people differ with regard to their experiences with communities. Often community members are divided in veterans and newbies. Brown ([35]) found that veterans showed good community behaviour. They were supporting and encouraging peers, sharing knowledge and experiences, reflecting on past learning, and sustaining friendships and/or acquaintances begun earlier. Newbies, however, depended much less on other group members and were wont to rapidly call for tutor help. They preferred a tight social structure (schoolclass) with frequent interaction and helpful assessment from the tutor. Therefore, it seems advisable to populate a community with both veterans and newbies. Because of their experience, veterans model good community behaviour to the newbies. Newbies can turn to veterans for support and encouragement instead of to the tutor. Although this helps to create an online community, veterans need an incentive to continue to interact with newbies. Veterans are inclined to do their 'duty' in the beginning but after a while tend to restrict their communication to veterans only, which is detrimental to community building ([35]).

Second, participants of online newsgroups differ in their inclination to either lurk or post in a community. A lurker, by definition, belongs to a community but never posts in it. The percentage of lurkers in communities is very variable, it may range from 0% to 99% ([36]). For example, lurkers make up 45.5% of health support communities while the lurker population in software support communities could be as high as 82% (cf. [36]). Reasons for not posting range from 'didn't need to post', 'needed to find out about the group', 'couldn't make the software work', 'didn't like the group' to 'had nothing to offer'. Posters and lurkers are attracted to and join a community for the same reasons. However, posters feel their needs are better met, perceive more benefit and feel a greater sense of membership than lurkers. Partly because posters do not regard lurkers as inferior members, lurking is not necessarily a problem in active communities. Without a critical mass of posters, however, a community will never thrive ([36]).

Community characteristics. Communities are characterised by (a) boundaries, (b) rules, (c) monitoring possibilities and (d) sanctioning mechanisms ([18],[37]). Successful communities have clearly defined *boundaries*.

These boundaries protect the collective good of the community to outsiders and encourage ongoing interaction because the group members are likely to meet again. In addition, successful communities have a set of *rules* that govern the use of common resources and point out who is responsible for producing and maintaining the collective goods. Community members themselves should be responsible for setting and modifying these rules. As was discussed earlier, individual accountability facilitates co-operation. By *monitoring* each other's actions in a community, community members see whether their fellow members comply with the rules; if so, this will make them more willing to comply themselves. A transparent community with clear *boundaries* and rules allows group members to sanction the behaviour of other group members. This happens mostly by informal social control mechanisms but sometimes more firm measures are necessary. These measures could be as severe as banishment (blocking out) from the group. So monitoring and sanctioning, if used wisely, are important facilitators of co-operative relations ([18]).

4. Summary an conclusion

We have argued that the self-directedness of learners in a Learning Network creates at least two problems. First, in so far as self-directedness leads to isolation, it negatively affects their academic achievements; second, in so far as self-directedness leads to heterogeneity it increases the workload of staff. Section 2 described how peer tutoring in ad hoc transient communities could in principle solve these problems. But can it reallly?

Before carrying out empirical tests, we carried out a literature survey, reported in section 3. It revealed that peer tutoring spreads (part of) the tutor workload over peers, thus increasing the time-effectiveness of a tutor (1). It also revealed that the social embedding of students is enhanced by learning environments that facilitate social processes such as engagement, commitment and a sense of belonging (2). Third, higher-order, academic cognitive processes proved to be promoted if tutor(s)-tutee groups were supported to structure their interaction (3). As far as working in a community-like structure is concerned, the literature showed that for a social space to emerge, one should establish continuity of contact, recognisability of members, and a historical record of actions (4). Furthermore, to assure the liveliness of such a community, it should be populated with a heterogeneous group consisting of veterans and newbies; lurkers and posters (5). Finally, the literature made it clear that to facilitate co-operation in a community, clear boundaries and a clear set of rules that can be monitored and sanctioned within the community are required (6).

Ad hoc transient communities will almost automatically fulfil some of these demands. The very use of peer tutoring, it seems, should lead to increased time-effectiveness on the part of the tutors (item 1). Furthermore, social embedding almost seems to be a by-product of peer tutoring, the only constraint being that one should heed the need for transparency and quantifiability of contributions (2). Finally, the very way in which the communities are put together guarantees that they consist of exactly one newbie – the tutee - and a few veterans – the tutors; by definition all are posters, although some tutors may behave as lurkers more so than others (5). So here too, the demand is met almost automatically.

Other demands seem less easy to fulfil, but one could readily add some specific design constraints to promote this. Measures should be taken for instance to maximise the learning effects. Reciprocating tutoring effects is one of them and, as we already noted, in the Learning Network as a whole users sometimes ask a question, sometimes answer them (3). Recognisability of community members may be guaranteed by forbidding the use of aliases such as screen names. If one does not want to ban pseudonymity entirely, users that go by a pseudonym should adopt a persistent one. A historical record of user actions can easily be maintained by logging all their actions, the most significant of which become part of the user's e-portfolio; continuity of contact during the community's short lifetime can be guaranteed (whatever happens thereafter is another matter) (4). Finally, although measures beyond what has been discussed are needed to create bounded communities, that are monitored and contain sanctioning mechanisms, this extension could certainly be made (6).

At this juncture one may conclude with some confidence that peer tutoring in ad hoc, transient communities stands a good chance of both lowering the tutor load and increasing the learning effectiveness in Learning Networks. To some extent the requirements the literature survey unearthed will be met almost automatically, to some extent entirely feasible additional design constraints would help meet them. Obviously, in how far these expectations are borne out can only be assessed in empirical tests, which is the next step we intend to take. Before doing so, however, another means of assessing the potential worth of peer tutoring in ad hoc transient communities, would be to ask what further purposes they may serve. A brief discussion thereof forms the final part of this paper.

First, the content question that the tutee has asked and its answer could be stored in a list of frequently asked questions (FAQ). This would benefit future learners with a similar question. Of course, if an answer is answered by consulting a FAQ, there is no need anymore to establish an ad hoc, transient community for it. The comparison to be made here is between fulfilling the individual learners' need for a quick and adequate answer and the community's need for increased sociability, from which ultimately the individual users will also profit. This is as much an ethical question (Is it morally defensible to withhold an answer to an individual for the benefit of the whole?) as a practical one (Will users abandon the mechanism of the ad hoc transient community in favour of other, speedier mechanism?).

Second, even though each particular ad hoc community disappears its members could be helped to stay in touch. After all, sociability is a virtue in itself and by allowing the fleeting relationships that have emerged in the ad hoc, transient community to last, sociability in the Learning Network as a whole is fostered. At the negative side, when users build up such networks of their own, it becomes gradually less likely that they will make use of the ad hoc transient community as a mechanism to have their questions answered. This has several negative side-effects. For one, if users form their own subgroups in the larger community, they might be less inclined to interact with people outside their little community. This is detrimental to the quality of the peer tutoring as fewer peer-experts are available.

More importantly, even though the tutee may be satisfied with the answer that has emerged, she may still want to learn more about the subject. She may attempt to find additional materials in the Learning Network or ask another question. Alternatively, she might take out a 'subscription' on similar, future ad hoc communities. Similarity could be defined in terms of the people that are drafted to serve on the future communities but also in terms of subject matter similarity (measured via Latent Semantic Analysis). The original tutee could then be alerted via for example an RSS-feed, and follow or even contribute as a peer to the discussion in the new community.

No doubt, many more potential uses of the ad hoc transient community mechanism and, no doubt, even more qualms surrounding its use, may be identified. These examples, though, suffice to indicate that peer tutoring in ad hoc transient communities has a wealth of possible uses beyond the most obvious ones. This further adds to their value.

Acknowledgements

The present work was carried out as part of the TENCOMPETENCE project. This project is funded by the European Commission as an Integrated Project with contract number 027087 under the Sixth Framework Programme. The present work reflects the authors' view only and the authors nor the Community deny all liability for any use of the information contained in the present work.

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