Social learning in formal education through peer collaborative networks and activities: research results and hazards

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ABSTRACT
Learning Management Systems (LMSs) and Learning Networks (LN) are particularly suitable for lifelong learners as these systems are online social networks designed to support formal as well as non-formal learning. Lifelong learners want to learn what they need, when they need it and at a place and pace that suits them. However, formal education is geared by fixed installments and assessment. These two approaches can be met by relaxing the deadlines for the first, and adjusting them for the second. Thus, we could combine the heterogeneous background of non-formal learners with those that need to meet the demands of traditional curriculum-based formal education. In both cases, the learner needs to be put central. Moreover, learners in an LN and in an LMS need to rely on learning through and with others, by sharing knowledge. That this is a feasible option is shown by the positive effects of collaborative learning and peer tutoring in formal education, as well as the by the interest in social learning in the digital era. However, these systems must necessarily provide learner with support services. In this paper, we argue why social learning and peer support are relevant to learners in digital Learning Systems.

Key words: collaborative learning, learning networks, learning management systems, social interaction.
1. INTRODUCTION

Over the years we have gained confidence and reliability with our students thanks to the online systems we persistently use for our language or didactic classes and what once was an LMS (Learning Management System) to teach our subjects, has now become a Learning Network due to the fact that, even though they no longer belong to the running courses we teach every year at the University, they still log on and participate regularly. They help out with those students who muddle through the systems due to their lack of digital competence and benefit from the many resources we provide, participate in the online debates to give and receive advice and even collaborate in the many new activities we set up every year.

Many of these students are now professional workers (PW) or about to be so. They and our present students are not on the same level when they need access to learning or seek for information about certain aspects related with second language acquisition. The first may only need specific information about different aspects and may not want to follow a course of studies, possibly because it would be very hard to combine work and formal face-to-face classes and, besides if they are former students of ours, they have already done most of the activities. But we also have people who have not been in our classes and only look for specific information at a point in time. Also, most people in this case, have already finished their course of studies and are not in the position to return to university and follow another fulltime study. Not only because it would be hard to combine it with job and family life, but it would also be overkill. After all, they might not aspire to become qualified linguists, but only want to get to know the basics, participate in the collaborative activities we provide and keep up their English level. For something very specific, they could try to find some written resources, books, documents, specific information about this and that, access to the open resources in the system, etc., but it is far more likely they would obtain the knowledge they required more directly and efficiently from consulting colleagues working in the field or students who are freshly acquiring new and up-to-date knowledge. And they would like to do that at a time, place and pace that suit them.

On the other hand, students are geared by other motivations that might not arise from curiosity or professional needs as in the case of PW but from the fact that they are subject to submission deadlines and / or exams and other such like mishaps. The logistic and content flexibility needed for PW is something that can't be covered in traditional educational settings (Sloep, 2009b; Francis Brouns, F., Hsiao, A., 2012).

Instead, new forms of learning and new settings are required. Learning Networks provide for this as they consist of online social networks and can be adapted and designed to support this kind of non-formal learning, meeting the demand for logistic and content flexibility, and providing services and facilities to support learning through knowledge sharing. One
important characteristic of Learning Networks is the social, community aspect where individual learning goals are obtained in a social context through interaction and collaboration with others and where the goal of the collective is required to maintain the Learning Network (Sloep, 2009a; Sloep, 2009b). The Learning Network as a whole benefits from strengthening the weak ties (Levin & Cross, 2004; Nardi, Whittaker, & Schwarz, 2000), connecting people who are members of the network with others who have no connections to bring in new knowledge, while knowledge sharing can benefit from strong ties between people who already established trust (Plickert, Côté, & Wellman, 2007).

In this paper we will show how our Moodle system has served to meet the demands of both users: PW and students and how knowledge sharing has benefited both. We will present our model for a peer support system to promote and enhance knowledge sharing in Learning Networks. We will also illustrate how we carried out the experiment even though verifying this model in practice, in particular in Learning Network conditions is difficult, even though carefully designed experiments where included. The remainder of the paper is structured as follows. In the next section, we briefly explain why knowledge sharing and social learning is important in Learning Networks. In section 3 we explain how our network is structured and introduce our notion of ad hoc transient groups as underlying mechanism for peer support systems in Learning Networks. Section 4 describes some of the prototypical peer support systems we implemented and the results we obtained when testing those. Finally we draw some conclusions for future work.

2. COLLABORATIVE LEARNING

Participants in Learning Networks learn by sharing knowledge through interaction with others. Through this collaborative process learners can obtain mutual understanding and build knowledge (Hsiao, Brouns, Kester, & Sloep, 2011; Kester, van Rosmalen, et al., 2007). Although learners can find part of the required knowledge in learning books, articles and by doing activities, learning is an inherently social process; it takes place in a social context, and people learn from and by others. Even when an individual starts by learning from existing explicit resources, at some point this is not sufficient and the individual learning process stagnates. At this point, the person has to call on others in order to ascertain and contrast the knowledge acquired. The learner has to make the problem known to others so they can work together in small groups to negotiate common understanding. And finally the results have to be fed back to the Learning Network to close the cycle (Stahl, 2006). In our classes, the teacher guides the necessary interactions by using relevant instructional methods. For example, collaborative learning and peer tutoring are used to structure student-student interactions and to stimulate students to discuss their learning and negotiate meaning. Various studies have shown positive effects of collaborative learning, peer tutoring and social learning, mostly in traditional
educational settings – including online environments (Arcos, Ortega & Amilburu, 2006; Dillenbourg, 1999; Stodel, Thompson, & MacDonald, 2006). Learners benefit in two ways by collaboration in social settings, firstly because it improves learning outcome by reducing isolation, providing a sense of belonging, being able to make use of the collective intelligence. Secondly, because helping others is in fact ‘learning twice’ and valuable in itself (see Sloep & Kester, 2009).

While studies in online and distance education have shown that carefully designing opportunities for social interactions can promote collaboration and cooperation (Dillenbourg, 1999), most of the times these methods work well because they are implemented in formal educational settings where there is a teacher to carefully design the learning material, tasks, the situations and the interaction structures to promote interactions.

On the other hand, when Learning Networks have no structure and no control and people are forced to collaborate on topics and with people that are distant, not only physically but psychologically, one perceives a lack of social structure, and in the end participants will get the feeling that they do not feel part of the group of fellow students and do not feel they belong (Dawson, 2008).

Learners who do not feel part of the community do not feel engaged or committed to the group and thus they are not inclined to initiate interactions. Lack of interactions and reluctance to engage in social interactions can result in isolation of learners that in turn has negative effects on learning outcomes (Wegerif, Mercer, & Dawes, 1998).

This means that there are several reasons why a Learning Network has to provide a ‘social support system’ that assists learners in initiating and maintaining social interactions with the most suitable peers and social structures that are conducive to knowledge sharing and construction (Kester, Sloep, et al., 2007). As shown above, learners has to experience a sense of belonging, feel part of a community before engaging in interactions that come naturally in communities and Learning Networks should take on these community aspects. According to Wenger et alt. (2002), learning communities are groups of people who acquire new knowledge through cooperation and collaboration. To succeed, a learning community depends on its social space, its member characteristics, and the characteristics of the community as a whole. An effective social space is characterized by affective work relationships, strong group cohesiveness, trust, respect, belonging and satisfaction (Rovai, 2002). Through social interaction social spaces emerge. Kester and colleagues (Kester & Sloep, 2009; Kester, Sloep, et al., 2007) distinguish three main conditions that have to be met before knowledge sharing will arise. For social interaction, in particular cooperation to occur and for social embedding, there should be continuity (it must be possible and likely for people to meet again in future), recognisability (people should be able to recognize each other), and history (people should know the past behaviour of the other participants). If these conditions are not met, people are
more likely to act selfishly, because they can’t be held accountable for their actions (Erickson, Halverson, Kellogg, Laff, & Wolf, 2002). Accountability is an important element in trust formation between group members (Rusman, Van Bruggen, Sloep, & Koper, 2010). Moreover, there should be a clear goal and a clear set of rules to abide by (boundary condition); and the group population should be heterogeneous and contain novices, experts, lurkers, active participants to assure liveliness (heterogeneity condition) (Preece, Nonneke, & Andrews, 2004). In this respect, our Learning Environment, made up of former and current students principally, has an ideal setting for a fruitful Learning Network.

From an instructional design perspective, cognitive load also can affect contribution and participation in knowledge sharing. Cognitive load is used as indication of how much mental processing and mental effort a person needs to spend in performing a certain task. Rather than being an indication of difficulty, it indicates how much mental processing is involved. The aim of instructional design is to optimize cognitive load as much as possible by reducing aspects of the design that result in unnecessary processing and by increasing processes that contribute towards learning. Cognitive load is also used as a means to evaluate the usability of a computer application (see e.g. (Hollender, Hofmann, Deneke, & Schmitz, 2010) or in our case the peer support system in Learning Networks.

3. NETWORK STRUCTURE

The foundations of our Learning Network consist of the materials, activities and resources used the previous year and of the registered students enrolled in the course together with those former students that wish to continue receiving instruction and also wish to collaborate in the activities for the course. One of the reasons why former students continue visiting the online system is that when we bring small groups of learners together around a specific well-defined topic, this would allow the participants to work at the issue and solve the problem. While doing so, they improve their knowledge and also get to know new people, forging new relations and ties. Once the issue is tackled, the group dissolves and a new one is formed for other activities, but relations and ties can continue in the network. When these ad hoc transient groups are formed frequently enough, they could promote the formation of relations in the Learning Network, increase sociability, turn weak ties into strong ties enhancing knowledge sharing, and improve network structure. At the same time, learners get assistance in performing learning activities while pursuing their ultimate learning goal (Kester & Sloep, 2009).

The generic model contains five phases, of which the first three steps - creating an activity, defining its context, identifying suitable peer tutors - are required to determine the context of the request. In Moodle and using the “workshop” activity, allocation of peers is done automatically by the system. On the other hand, the students themselves or the lecturer form the
collaborative groups. The actual support request is dealt with in the last two steps: creating the answer and receiving the answer or, in our case, the assessment, which amounts to practically the same thing (Brouns, Fetter, & Van Rosmalen, 2009; van Rosmalen, Sloep, Kester, et al., 2008).

Whether this is effective depends very much on the selection of the most suitable peers who are deemed suitable to provide the required support. The peer selection criteria very much depend on the context of the support request. In the context of learning, the main criteria are content knowledge, proximity or eligibility, tutoring competence and availability. It seems obvious that the peers at least have some knowledge about the subject of the question. Although peers not necessarily need to be more competent than the person asking the question, peers at similar levels of expertise use more concrete statements, because they are within each other’s Zone of Proximal Development (Vygotsky, 1978), while more experienced peers approach the goal at a more abstract level (Hinds, Patterson, & Pfeffer, 2001). Tutoring competence indicates how well a peer is able to help the learner. The exact implementation of the selection criteria is carried out by the system, and since there’s no obligation for anyone to perform a given task, those who want to do it are prone to go through with it till the end. This sole fact selects learners by mere interest and, to some extend, it also so assures success.

4. RESEARCH FINDINGS

To verify our model and test selection algorithms we implemented the model in two groups. Group Type 1 was our English Language courses (English Language CIV, English for Specific Purposes, Computer Studies), and Group Type 2, our didactics and methodology master courses (Spanish-English as a Foreign Language, Applied Linguistics for the Teaching/Learning of English). All studies applied the same generic peer support model for the proposed activities: assign a suitable peer to help and assess a learner, which in turn was also an assessor. Our Learning Network on English language learning and didactics has been used repeatedly in our studies and turned out to be a good subject to recruit participants. The Learning Network covered a variety of topics all related to practicing English skills and methodology related topics and within the course, several activities, which are not self-checked, have to be assessed and corrected by peers, following detailed well-wrought rubrics. For each course we provide self-check activities as well as peer support activities as mentioned. These include English grammar practice, reading, listening and writing. In each of the courses we have a new Learning Network based was set up. Materials were revised and new participants were recruited. The Learning Network has been used mainly English and methodology courses, which has a mix of practice, English Practice, as well as for a study on cognitive load.
4.1 Group Type 1 (GT1)

Apart from the bulk of the activities which are self-checked and do not need any help from either teacher, lecturer or students, in the Moodle system that we have for these courses, there are a number of exercises, queries and collaborative issues which have to be assessed by the students themselves. These areas of interaction include: forums, workshops, wikis and glossaries.

In the forums students normally debate around a topic proposed by the lecturer and find the answers to their proposals, suggestions, etc., resolved by the other fellow students or by the teacher him/herself. The other source of interaction comes with the casual queries formulated by the students around their activity in the system or outside the system. These are again answered by their fellow students and teachers. Very few queries remain unanswered and the experience has shown us that by promoting active participation in the course forum many problems are solved instantly, mainly by experienced students from previous years, making it a time-saving resource.

Workshops are our greatest source of student interaction and in our language courses we practice peer assessment to check and provide some feedback on writing essays or on our “story-telling activities” (Arcos, F.; Ortega, P.; Amilburu, A., 2008, 2009). For every unit in our language courses, there is a writing activity, which is normally peer assessed. Assessment is carried out with the help of a rubric, previously agreed upon in class, and the parts of which form the basis for assessment criteria. Other than that, marks have to be agreed on and discussed among the participants.

The wiki activity is another source of collaboration tasks. People discuss and collaborate, usually on writing summaries of books and articles from newspapers, to have a brief account of everything that has been read along the course; something which is very handy especially towards the end of the course when exams abound. Often long discussions and debates follow up until the people that make up the group agree on a given summary or review.

Finally, the glossaries: Very similar to the wikis, students have to build a glossary for every unit and collaborate on the entries for words, idioms and sayings. Teams of people are in charge of writing down the glossaries and again agree on the format, definitions and examples.

At the end of the semester, we carried out a survey among participants. 10 questions were asked about whether they liked the peer support system and would like to have access to a similar system in future learning situations. 95% answered positively. Moreover, Students liked the system and were more likely to ask questions to peers than to teachers. However, it seemed that spreading the load of answering queries by applying the economy principles (readymade answers) reduced quality of answers. This warrants further research.
We must also say that, except for a few students, mainly those who were not registered in the subject, dropped out; but only a few. We relaxed the deadlines to make room for casual mishaps and the success was outstanding.

4.2 Group Type 2 (GT2)

The same principles that worked for GT1 are applied to GT2, the only difference being that the type of activities vary considerably since there are no self-checked exercises and that all the activities are to be done in groups using first, the “wiki” to write rough copies before the final version is, finally, sent for marking to the “workshop” module in Moodle. This is where peer assessment is carried out, again using rubrics to weigh students performance. For this group, only forums, wikis and workshops were used and since they were older students, the topics required more teacher intervention.

The topics around which they worked were summaries of books and articles, research writings and didactic activities for Second Language Teaching (SLT). The cognitive load was unquestionably greater than with GT1. GT2 required a more profound feedback in some cases, which, unfortunately, not all peers had the capacity to provide or the time to look for appropriate answers; and very often teachers had to intervene.

The same survey used for GT1 was carried out for GT2 with uneven results. 82% favoured the peer support system and thought it was interesting to compare how differently one same task is conceived and understood by the people in the group. Sharing ideas has enhanced their understanding of teaching and learning methodologies. Collaborating to research and devise activities was more interesting for them than assessing other colleagues’ tasks.

5. CONCLUSIONS

There seems to be sufficient evidence to support our notion of peer support and learning through knowledge sharing in Learning Networks. Support can be found in literature and is mainly based on findings in formal education where collaborative learning and peer tutoring result in benefits for learning and can lead to deeper learning provided the learning tasks are designed as such. Students in online education benefit from communication and collaborative tasks (Dawson, 2006). Our initial studies confirm the benefits of selecting suitable peers to share knowledge with, both language-learning courses (GT1) as in our master courses (GT2) conditions, and provide insight in what selection criteria should be. However, our studies also showed that merely providing the opportunity to collaborate is not sufficient. The peer support system needs to provide not only a communication and interaction structure, it also needs to provide the affordances that motivate learners to use these to actively engage in interactions and actively promote sustainability of interactions.

In our model, we already factored in the characteristics of well-functioning communities: i.e. accountability, boundary and heterogeneity that should act as incentives for
participation. Apparently, the model did account sufficiently for incentives. A lot of research investigates motivations of participation and contribution and many theories exist to explain why people would contribute. Theories stem from sociological, psychological and behavioural domains, apply economic principles or look at game theory. A commonly referred framework is the social exchange theory, another one the prisoner's dilemma: people weigh their benefits against the investment of participation (cf. Sloep & Kester, 2009)). Others argue that it is important to visualise user and their actions (e.g. Erickson, et al., 2002) so they become accountable. Individual and interpersonal factors also play a role, or intrinsic (altruism, reputation) and extrinsic (rewards) motivations.

Participants of the studies involving the Learning Network on English language learning (GT1) are part of the course and so registered voluntarily. So, we could assume some intrinsic motivation, at least to learn about the topic, if not, motivation to engage in interactions. That could also be due to the design of the material in the Learning Network. The activities and lessons were designed as self-study material, in the sense that no teacher was required. In the master studies (GT2), participants were aware they participated in research and were invited to ask questions. This provided some additional incentives to use the support systems (forums and emails) and ask questions. The cognitive load for these studies was greater than in the language courses and required asking lots of questions; also the learning tasks stimulated the need for knowledge sharing. Yet again, the participants were voluntary and only those who registered coming from previous courses did not have the need for a certificate. It was among these that we had the greater amount of dropouts. As a matter of fact, these students in the end either left the Network because they did not want to engage in the proposed activities or simply their work petered out after a few initial attempts. In these courses, the compromise is very demanding; not only because of the effort it requires to complete assignments, do research, and so on and so forth, but also because, on top of all that, they have to “instruct” others on what they have done. And then, there’s the “deadlines” issue, which can’t be negotiated since registered students, those who need a certificate at the end of their course, need to be assessed when the course finishes.

In all studies, participants were informed that the material was designed for about 60 study hours over a period of 4 months. However, the total duration of the studies varied. In the master studies, a limited total duration might have put too much time pressure on the participants to allow them sufficient resources to engage in knowledge sharing or asking questions.

As pointed out above there are many factors that influence and determine what constitutes a good peer support system. In doing research one tries to isolate factors to be able to determine what factors are crucial and have to be incorporated. Investigating isolated factors can become troublesome when conditions are not completely satisfied or outside researchers’
control. Furthermore our studies also showed that doing research in a truly online Learning Network situation can be challenging. On the one hand this makes it hard to do our research and experiments, on the other hand it strengthens our argument that Learning Network services not only have to provide affordances but also show to the learners the benefits of collaboration and knowledge sharing.

Our future studies need to carefully evaluate what conditions and factors are applicable; investigate possible causes for conflicting results and repeat studies and conduct follow-up experiments.

6. REFERENCIAS BIBLIOGRÁFICAS


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