

Ad Hoc Transient Groups: Instruments for Awareness in Learning Networks

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Ad Hoc Transient Groups: Instruments for Awareness in Learning Networks

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Abstract. Learning Networks are online social networks through which participants share knowledge with each other and jointly develop new knowledge. The ultimate goals are to enrich the experience of formal, school-based learning as well as to form a viable setting for professional development. In order to attain these goals, however, participants should be aware of each other's existence in the first place. This paper introduces a case study of a Learning Network: eTwinning, a European network of teachers who exchange their experiences and seek collaboration. Based on multiple sources, a picture of the current state of mutual awareness and sense of connectedness in the eTwinning network is painted. The network proves to be divided. On the one hand there is a strong core group, which feels connected and is clearly aware of each other. On the other hand there are many participants who seem to be isolated. To engage this second group, this paper suggests the use of a peer-support mechanism called Ad Hoc Transient Groups (AHTGs). Through AHTGs participants who have a question can be connected to and helped by other members with relevant experience in the area. Finally the paper presents new areas of research in Learning Networks, particularly the design of a service that aims to encourage participants to grasp the value and opportunities offered by their Personal Learning Networks for their own professional activities and professional development.

Keywords. Learning Networks, social awareness, ad hoc transient groups, AHTG, Social network analyses, sense of connectedness, eTwinning, TellNet

1 Introduction

Learning Networks are technology-supported communities through which learners share knowledge with each other and jointly develop new knowledge. This way, Learning Networks enrich the experience of formal, school-based learning as well as form a viable setting for non-formal professional development and lifelong learning[1]. Examples of Learning Networks for professional development are networks of employees who want to improve customer services, lawyers who want exchange

knowledge and experience, or networks of teachers who exchange their experiences and seek collaboration.

A case in point is the European project *Teacher's Lifelong Learning Networks* (Tellnet), which aims to study an existing network of teachers (eTwinning) in order to support development of their competences by managing and handling large-scale data on social networks. Furthermore, in the context of this project tools are investigated to foster peer-support and collaboration as well as increase social capital in the eTwinning network.

As part of a range of studies on fostering social capital in Learning Networks [2], in this study we follow an approach where we start from a theoretical basis and end up with a prototype tested and adjusted in an existing network. We give special attention to the view of the future users as well as the actual impact the introduction of AHTGs are expected to have. Founded on earlier reports provided by eTwinning, as well as results obtained from the Tellnet project, a picture is drawn of the current state of the network with regard to participants' awareness of each other and their sense of connectedness to each other. Based on this picture, AHTGs are introduced and their role in changing the network is explained. Finally, we reflect on future research regarding AHTGs.

2 The eTwinning Network

eTwinning* is defined as the network for schools in Europe. It promotes teacher and school collaboration through the use of Information and Communication Technologies (ICT). In other words, the eTwinning network (over 120.000 users) is a large online environment in which teachers can work with each other and learn from each other. Through this network, collaborative projects can be started on a wide variety of subjects. They range from improving teaching skills of math teachers to having multiple primary school students working together and learning about different cultures [3]. At present eTwinning undergoes a transitional phase. Since the beginning of the eTwinning action in 2005, its main purpose was the facilitation of collaborative school projects across borders in Europe, whereas since 2008, its aim has broadened towards the delivery and maintenance of a social network for teachers [4]. In parallel, the eTwinning platform has gone through major changes. New social networking features have been added to the platform to allow eTwinning teachers (eTwinners) to do projects, to socialize, to extend their professional network and to improve their teaching skills [4]. The socialization of the network is, therefore, paramount to eTwinning's future development.

In the following part, we outline a view on eTwinning using various sources. By combining different approaches and data, we can build up a meaningful current status of eTwinning. The following information is explained:

- Monitoring report of eTwinning in 2009.
- Survey measuring the sense of connectedness and general connectivity (n=795).

* www.etwinning.net

- Social network analyses (data from the eTwinning platform).

2.1 Monitoring Report eTwinning 2009

In December 2008, eTwinning conducted a survey asking eTwinners about their opinions on and actions in eTwinning. The survey was conducted online in 22 different languages. In total, 1308 eTwinners responded [5]. The 2008 survey revealed a clear distinction between primary (2/3) and secondary school teachers (1/3). Also, while many different topics are taught (e.g. Mathematics, ICT, Literature), the topic Foreign Languages clearly dominates the survey, accounting for 44.3% of the teachers. Looking at the data extracted from the eTwinning platform in June 2010, we can further define the subjects taught by eTwinners. While there are more than 20 different subjects that the teachers indicated in the data, four are most common ones, namely Foreign Languages, Language and literature, ICTs and Maths (see Table 1).

Subject taught	N	%
Foreign languages	57782	9.2%
Language and literature	19508	3.1%
Informatics/ICT	15609	2.5%
Mathematics/Geometry	13829	2.2%
Other	524272	83.1%

Table 1 – Main teaching subjects

A second classification can be based on the reason for registration as this provides insight into the different goals eTwinners have. In the 2008 survey, the four main reasons for registration were:

- Help students meet other students (main).
- Meet other European teachers.
- Find partners for projects/Comenius actions.
- Improve teaching skills.

The survey also finds that eTwinners came into contact with eTwinning initially either through colleagues, teacher training activities, or by browsing the Internet.

A third classification can be made based on whether or not an eTwinning participant has participated in a project yet. As explained previously, before 2008, the idea of cross-border school collaboration projects was the main driver for joining eTwinning. Out of the 1308 2008 survey participants, 1024 or 78.3% had already participated in an eTwinning project. This means that the respondents to this survey consist of the core eTwinners who are active in project collaboration among many other activities in eTwinning. The data from the platform collected in mid 2010, shows a reversed trend; a small percentage of teachers collaborate in the projects whereas the majority have no involvement in the project work (73% of the eTwinners had not yet participated in a project), while of those that did half participated in multiple projects.

Most respondents in the survey of 2008 indicate that they are satisfied about the coordination with partners and almost all participants (>95%) who were in a project were satisfied with eTwinning in general. Moreover, they report that the projects impacted their teaching practice in numerous ways, for instance:

- Making it fun.
- More interest in taking part in future projects.
- Improvement of ICT skills.
- Improving foreign languages and communication skills.
- Learning about other school systems.
- Learning new teaching techniques.
- Improving skills to work in interdisciplinary teams.

There are however challenges to overcome during a project. Such as:

- Lack of time.
- ICT problems.
- Difficult to find a partner.
- Difficult to organize the work online.
- The user friendliness of the eTwinning platform.

2.2 Sense of connectedness

Sense of connectedness (SOC) represents how well someone feels connected to others and feels he or she is part of a community [6]. As part of an ongoing experiment a survey was conducted to better understand the SOC of the eTwinners, their characteristics and online behaviour.

The survey was based on the SOC questions proposed by Rovai [6]. eTwinners were invited to participate when they taught one of the major topics as shown (see Table 1). In the end, 795 eTwinners filled in the survey. Obviously, this is only a subset of eTwinners, who can be classified as active as they have to come to their desktop to see the invitation.

The main result of the survey is that the majority of respondents feel well connected with an average of 6.65 on a 10 point scale (SD= 1.2). Interestingly, the SOC is positively correlated with the number of projects responding eTwinners were involved in $r = 0.22, p < 0.001$. Also, SOC was positively correlated with the number of months they had been part of eTwinning $r = 0.19, p < 0.001$. Unsurprisingly, the number of months and number of projects were also positively correlated with each other $r = 0.32, p < 0.001$.

Results also show that respondents indicate that around 50% of their eTwinning contacts are online contacts solely. In other words, many respondents have multiple contacts whom they meet face-to-face as well. This is an important result as it indicates that eTwinning should be seen more as a blended social network than a full-blown online social network. The fact that it is a blended network for a large group influences on how to interpret the visible social network. eTwinners, who might be labelled as isolates in the network based on project participation, could have a strong set of relationships based on face-to-face meetings and not be isolated at all.

A large proportion of the respondents think their amount of contact with other eTwinners is just right with a mean of 4.8 on a 9 point scale (Figure 1). Yet variation in this preference is high – it covers the whole range from 1 to 9. The majority of the respondents indicate they would like to have more contact with fellow eTwinners.

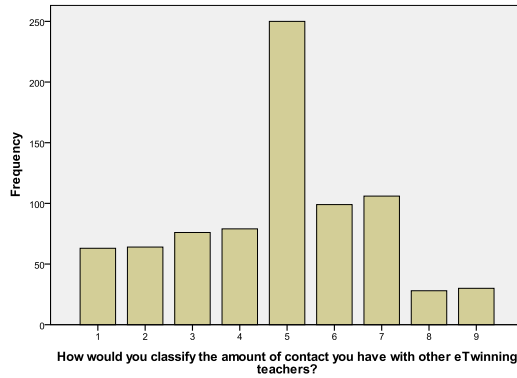


Figure 1 – Amount of contact (1- too little to 9 – too much)

Most eTwinners made some new contacts in the past six months (see Figure 2), most of which were established through the use of the Internet.

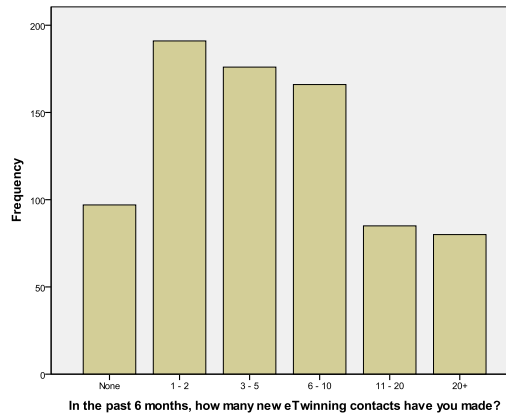


Figure 2 – New contacts made

In the six months preceding the survey, 42.5% of the eTwinners had been in contact with the eTwinning National Support Service (NSS) for support. In relation, 60.1% reported having had contact with other eTwinners for support. Most eTwinners prefer a mix of support of the NSS and their fellow eTwinners (Figure 3). Yet, to be three distinctive groups seem to prevail. On the one hand there are those who prefer support from the NSS. Then there are those who prefer support from their fellow eTwinners. Finally, the largest group prefers a mix. Interestingly, these preferences are not correlated with any of the other indicators measured.

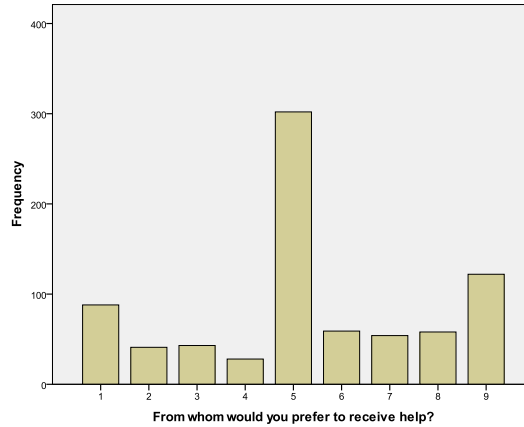


Figure 3 – preferred support ranging
(1 – Fellow eTwinner to 9 – eTwinning Support Service)

2.3 Social Network Analyses

Based on a datadump provided by eTwinning, Social Network Analyses (SNA) were conducted. In order to understand better the current state of the network, a set of questions was constructed. In the following part, a subset of questions is selected to conduct the first SNA to provide a deeper insight into the underlying relationships. The following four questions were selected for the first round of the SNA to test the analysis tools. The analyses were performed by colleagues from the RWTH University in Aachen, Germany [7].

Question 1: When looking at the project collaboration network, is it possible to divide the network into sub-communities and if so, what is their relation to the rest of the project collaboration network?

Even if the project collaboration does not constitute the most important part of eTwinning since 2008, studying the project collaboration network, its structure and core using the SNA measures gives insights into how possible new mechanisms could be created to help other networks to grow in the future.

Through the analysis, we were able to identify 2776 separate clusters (see Table 2). These clusters are formed through eTwinners collaborating in projects. First observations show that there are four very large clusters that create the core of the eTwinning project collaboration network. The biggest one contains 8807 eTwinners, two other clusters with about 3000 and one of 1172.

Apart from these large clusters, there are many small clusters. As Table 2 shows, 2627 of them consist of 2 to 9 eTwinners. It seems that the small clusters are those of people who collaborate only on one project during the time they have been part of

eTwinning, the cluster size most likely corresponding to the number of the project partners.

Cluster size (N eTwinners)	Number of times identi- fied
8807	1
3669	1
3175	1
1172	1
100-1000	9
10-100	136
2-9	2627
Total:	2776

Table 2 – eTwinning network clusters

What we can understand from the clustering formation is that, for example, in the largest cluster, there is a group of eTwinners who have collaborated with each other in a high number of projects where partnerships create complex ties among themselves. Moreover, we see that there are four sub-communities in the core of eTwinning.

Lastly, we calculated the modularity of the clustering. The modularity indicates the quality of the cluster, a fraction of any node's connections within its cluster (internal edges) and its connections to other clusters (Pham et al., 2011). Empirical observations indicate that a modularity greater than 0.3 corresponds to significant community structures. In our analysis, we observe a modularity of 0.4, indicating significant community structures.

Question 2: When looking at the project collaboration network, how dependent is the eTwinning project network structure on a small core group of eTwinners?

The analysis was done based on the projects eTwinners participated in at the time of the snapshot, i.e. in mid 2010. eTwinners who did not participate in project collaboration were excluded from the analysis. Figure 4 shows a typical degree distribution that follows a power law, therefore indicating that the project network is scale-free. In a scale-free network one can usually observe a few big hubs followed by many small clusters[8].

This means that the project collaboration network is dependent on core eTwinners that can be seen as bridges (hubs) between different clusters. Nodes with a higher degree tend to have a lower clustering coefficient (clustering decreases when degree increases). That means lower-degree nodes are placed in dense groups (clusters) and these clusters are connected via hubs (nodes with high degree). However, as the betweenness is quite low (less than 0.1) there are apparently no super-hubs who exclusively connect the clusters. Clusters are typically connected via several hubs. In con-

clusion, although eTwinning is dependent on a core group, this is a large and well-connected group.

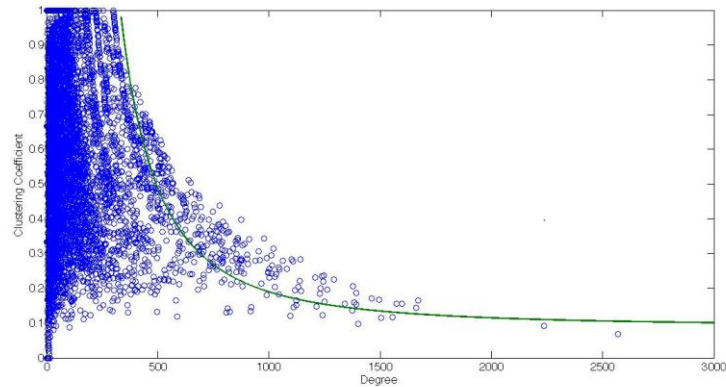


Figure 4 - Project Clustering vs. Degrees

Question 3: Over the years, how many eTwinners have gone inactive and were these eTwinners individuals who were connected through the project collaboration network?

The eTwinning platform uses different indicators to calculate “inactive” teachers, i.e. teachers who for example have not logged in onto the eTwinning platform during a predefined period of time. At the time of the snapshot, in mid 2010, out of the 114.020 (at that moment registered) teachers, 2750 individuals have been flagged as “inactive”, resulting to 2,4% of all participants. The degree and clustering coefficient was calculated for these teachers. From the degree distributions, we can see that they follow a power law, the same as distribution in Figure 3. Actually, inactive teachers seem just a sample of the same distribution of the whole network. This distribution also holds when we constructed a network based on the blogs or the emails the teachers produced. The fraction of teachers who have clustering coefficient equal to NaN (Not a Number; means that they have only a connection - degree = 1), is 17.5% (project collaboration network), 49.01% (blog network) and 63.41% (email network). 41.4% of the inactive teachers do not have any activity in these (project, blog or email). Even for those who took part in various networks (projects, blog or email), they are quite isolated (as they have low degree and are placed in small, possibly disconnected, groups).

Question 4: eTwinners can create lists of MyContacts on their Desktop adding interesting people to the list for possible future collaboration. Is there any evidence that teachers have added people from different countries in their contact lists?

As eTwinning by nature promotes cross-border collaboration, we also find that in “MyContacts”, eTwinners overwhelmingly have added people from countries other than that of their own. If the creator of the list has a value of 0, it means that all contacts are from other countries, and 1 means that all contacts are from the same country. The mean for all eTwinners who had “MyContacts” is 0.16, indicating a strong preference for incorporating eTwinners from other countries in their lists. Figure 5 shows that only a fraction of contacts are within the same country.

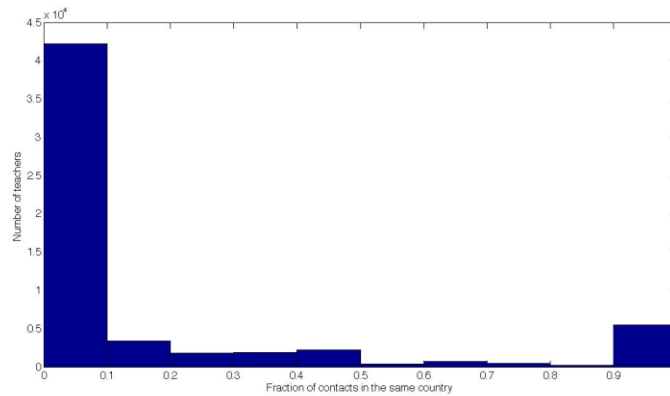


Figure 5 – Fraction of contacts in the different country than that of the e-Twinner (bar on the left) and in the same country (bar on the right).

2.4 Network picture

Given the data just presented, we can now paint a picture of the state of eTwinning. The results can be discussed from the eTwinners’ and from the global perspective. We first discuss them separately and then combine them to give an overall conclusion. This then leads to a discussion of future work.

2.4.1 eTwinners’ Perspective

As we found a strong core group found using the SNA methods, it is not surprising the eTwinners who responded on the sense of connectedness survey report that they have a rather high sense of connectedness, on the average, 6.65 on a 10-point scale. The likelihood that the respondents on the survey mainly belong to the core group is also reflected in the many new contacts they made in the six months preceding the survey. Only a few of them reported having made no new contacts whatsoever. The new contacts made in the last six months were primarily made online; yet it was reported that half of their contacts are not based solely on online situations. This reflects that eTwinning is a blended network, a network which combines online interaction with face-to-face interactions at for instance eTwinning conferences. The impression obtained is that those eTwinners who invest time and participate in school collaboration projects are likely to become part of the core group. Once they are in the project collaboration network there are many incentives and contacts to keep people active. From this we

conclude that the way the core group is organized provides a good base for eTwinning's future improvements and sustainment.

Yet, these results need to be seen in the perspective that most respondents of the survey are probably part of the active and connected part of eTwinning. Typically, surveys are unlikely to reach those people who are inactive, and this case is no exception. Due to the restrictions to use personal information, the data used by the project partners have been anonymised. This means that there is no way to identify a real teacher or a real school in the data without the consent of the individual. However, the results give us a good insight in the core eTwinners and shed some light on those that currently are not connected in any of the identified networks.

Finally, some eTwinners clearly prefer to receive support solely from the Central and National Support services and the others only from fellow eTwinners. Yet the majority prefers a mix of the two.

2.4.2 Global Network Perspective

As one can see from the numbers of eTwinning teachers, it is a large, fast growing community of schools and teachers in Europe. Most of the eTwinners remain active in eTwinning, meaning they log in at least once every 6 months. From the network point of view, to study eTwinning, evidence of collaboration between users is needed. In our case, we use the eTwinning platform to gather this evidence. At first, we looked at networks that were created through project collaboration, through contacts, use of internal messaging. Looking at the project collaboration network, we find that 73% of eTwinners are not connected. This may indicate that many eTwinners are not aware of each other, as they are not collaborating and interacting with each other through the platform. But note that interactions might take place outside of the platform. Those we cannot account for, though, in the Tellnet studies.

From the network point of view, this raises the concern that the network is very dependent on a small core group of users. When a network depends on a small core group, it is prone to fall apart when one of these core members drops out [2]. While the data show eTwinning is indeed dependent on a small core group, the SNA also shows this should not be a concern:

1. The core group consists of thousands of people.
2. The core group consists of many communities.
3. These communities are linked together through many connections rather than only through specific eTwinners.
4. The fraction of "inactive" teachers is relatively low.

Therefore, we may say that the core group of eTwinning is a strong and well-connected group, which provides a stable basis for future development and sustainability of the network. At the same time, however, many eTwinners remain unconnected to the project collaboration network, meaning that on the eTwinning platform we cannot show any type of interaction with others through these networks. From the perspective that lurking is not necessarily a bad thing, this does not have to be problematic per se [9].

As an overall conclusion, the eTwinning network has established a strong core group that is well interconnected and supported. We believe that this core group will provide eTwinning with a strong base for the future. However, as this core group has been established using the snapshot of data, it also shows that a large number of eTwinners are not connected to the core network. Therefore, we suggest that now is the time not only to expand the connections in the network, but also to interconnect the networks further. eTwinning therefore now needs to focus on the eTwinners who are not part of the core network yet and efforts should be made to connect them to the core group. The use of peer-support mechanisms, such as the AHTGs tool described in the following section, in our view will improve the collaboration, sense of connectedness and social capital of the eTwinners.

3 Ad Hoc Transient Groups

In Ad Hoc Transient Groups (AHTGs) participants that have a request are helped by other participants in a private space ('ad-hoc') and for only a limited amount of time ('transience') [10, 11][†] (Figure 6). By creating many short-term moments of contact between participants of a network, an increase and larger spread of ties between participants is expected. It is expected, furthermore, that by introducing AHTGs, the sense of belonging will increase because participants will have more contacts and will perceive the community as more effective since members help each other to meet their needs [2]. Especially, the use of a matching system is believed to be of importance in such a large network such as eTwinning. It allows participants to become aware of each other, to increase their contacts with those whom they otherwise might never have met.

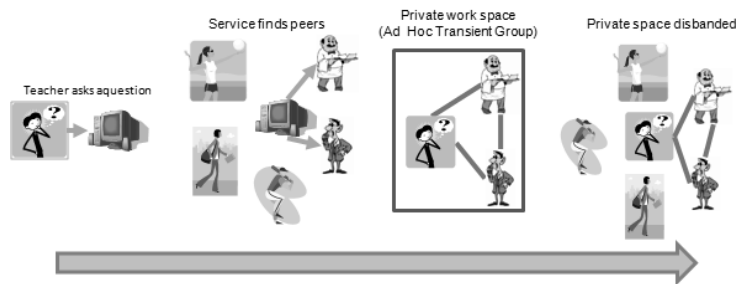


Figure 6 – General flow of the AHTGs peer-support service

[†] In the referred to articles the term Ad Hoc Transient Communities is used instead of Ad Hoc Transient Groups. We choose to use the Groups terminology in line with a redefinition (see Fetter, S., Berlanga, A.J., Sloep, P.B.: Fostering Social Capital in a Learning Network: Laying the Groundwork for a Peer-Support Service. *International Journal of Learning Technology* 5, 388-400; 2010), as we deem communities are generally larger and are of a more permanent nature.

3.1 Validation of the AHTG tool

In order to validate the idea of implementing a peer-support service in the eTwinning network, a workshop was conducted in the eTwinning Conference of 2010. The aim of the workshop was to validate the design of the AHTG tool. In preparation of the workshop at the eTwinning Conference 2010, we constructed the initial design of a peer-support tool based on design considerations [3] determined earlier, namely:

- Participants need to be able to find the right participants with a matching system.
- Participants need to be accountable for their actions through ratings.
- Participants need to be shown other participant's previous activity and contacts to increase sense of belonging.
- Participants need to view the tool as usable and accessible.

We prepared four mock-up screenshots of the service (for an example, see figure 7), thus representing the main functionalities of the service. Each screenshot showed a step in the process of the service and was accompanied by a short questionnaire.



Figure 7 – Example of screenshot used in the workshop

In addition to these questionnaires, a questionnaire was constructed that asked about the eTwinning network, peer-support and possible improvements (see Table 3). This questionnaire was filled in at the start of the workshop. The goal behind these initial questions was twofold. First, it was for our own understanding of the people active in the eTwinning network. Second, we wanted the teachers to start thinking about the current situation in eTwinning network with regard to asking questions and getting into contact with other teachers.

Why did you join the eTwinning network?
Is it easy to get into contact with other eTwinning teachers and if not how could we improve this?
Do you have any thoughts on how we can involve people not yet connected to the other eTwinning teachers?
Is it important for you to be able to reach other teachers in the eTwinning network?
When you have a question about anything that has to do with eTwinning, what is currently the best way to get this question answered?
With regard to getting a question answered, what room for improvement do you see?

Table 3 – Initial questions asked

The workshop was set up in line with the user-centred design approach as described by Parmar [12]. This approach holds that the use of ICT should be seen as a tool, and should be developed together with stakeholders, enabling a more user-defined service that fulfils the actual needs of the stakeholders. Feedback was received through the questionnaires and by asking the teachers directly in the workshop to elaborate.

Multiple participants were eTwinning ambassadors and almost all used eTwinning on a regular basis. As the group was small (22 participants), opinions aired cannot be generalized to the whole eTwinning population. Yet it does give an insight into the more active eTwinners, especially with the inclusion of the eTwinning ambassadors who are in regular contact with many eTwinners.

3.2 Descriptive results

The results reported below are based on a combination of the answers on the survey as well as spoken or written feedback. Due to the open nature of the workshop and survey, results are descriptive in nature.

When asked for what purpose the eTwinners would use the peer-support tool, the responses varied. This indicates the many different goals that the teachers have in eTwinning and how each has his or her own specific needs.

- Discussions.
- Ideas.
- Professional development.
- Technical problems.
- Related to area/curriculum.
- How to use eTwinning.
- How to organize a chat session.
- How to get a quality label.

As is clear from the goals and needs, people want to collaborate with other teachers. Yet, the question how easy or difficult it is to contact others had very varied responses. Some found it very easy, some thought it was very difficult. This will reflect the different level of expertise eTwinners have with regard to the use of ICT and eTwinning in general. On the other hand it points to the need to improve eTwinning in this regard, as finding new contacts should be easy for all eTwinners.

Regarding how eTwinners perceive the support they get from eTwinning, responses indicate that support mainly comes from the eTwinning National or Central Support Office and its ambassadors. In other words, while eTwinners indicate they would often like to receive support from their fellow eTwinners, most support comes through different channels. Nevertheless, there is a need to contact other eTwinners and receive their support. To achieve this, the eTwinners suggest using a number of communication tools, such a chat or a forum. In relation to this, they indicate that a better, more helpful website would be appreciated.

In line with the varied goals and needs are the reasons eTwinners gave to join eTwinning. The following three reasons sum up well the different angles from which the participants approached eTwinning initially.

- eTwinners feel the future of education lies in international collaboration between teachers and their students.
- eTwinners feel eTwinning provides a way to learn and use ICT in an innovative way.
- eTwinners feel eTwinning allows them to share knowledge and experience.

Overall participating eTwinners appeared to be social and to know exactly what they did or did not want. For example, when asked how comfortable the teachers felt about rating each other, it became clear that the community had a strong sense of oughts and ought-nots. While such ratings are common in many online Q&A communities, participants were very clear that they did not want to rate their peers. Also, they seemed generally concerned about the well-being of the eTwinning network.

4 Conclusions and Future Work

For Learning Networks to flourish, participants need to be aware of each others' existence and connect with each other. As the example of the eTwinning network shows, this to happen cannot be taken for granted. While it is clear that eTwinning has a strong, well-connected and large core group, the majority of registered participants seem to be in isolation. As is proposed in this paper, one way to reach these isolates is by using a peer-support service that uses AHTGs. Through this service, eTwinners can get in touch with each other in an easy, fast and meaningful way. Thus AHTGs might prove especially useful for those just starting in eTwinning. That is, as it might seem impossible for some newcomer to find the right person in such a large network, having a matching system that does the search for you will lower the threshold to actually ask a question and get connected. The results of the workshop also showed some important considerations for the actual design of the service. Most, importantly was the finding that eTwinners did not want to rate each other. Ratings were planned in the initial design but have been removed because of this finding. In addition, the user interface was improved because of the feedback.

As presented, the results of the validation workshop underline the importance of such a tool. The positive feedback of the participants together with the insight gained from the data-analysis allows for in-depth testing of AHTGs in a large-scale Learning Network such as eTwinning. Indeed, at the time of writing, a first pilot in eTwinning using AHTGs is being conducted. Furthermore, a second version of the prototype is

already underway using insights and feedback gained from the first. Results from both experiments in which the prototypes were used should provide valuable insight into the usability of AHTGs and their effect on the social network.

Future research to increase eTwinning involvement in the social network could focus on the development of the participants' Personal Learning Networks as places for their professional development. We define a Personal Learning Network (PLN) as a network of people set up by an individual specifically in the context of his or her professional activities through online platforms to support his or her professional non-formal learning. These egocentric networks can be diverse and suited to the needs of individual eTwinners, catering to their individual expectations from contacts within the network. PLNs, including contacts made online as well as contacts made outside the online social platform, are created through networking activities by the eTwinning at the centre of the networks.

Networking activities are at the core of the success of real and online networks. One possible reason for reduced levels of interaction in online networks could be that online networks often inhibit the engaging, free-flowing conversations that lie at the core of face-to-face networking activities. Teachers can interact with others, exploring each others' experiences, interests and capabilities through open dialogue. In the course of these conversations, individuals also define their own strengths, interests, expertise and experience, their own "professional identity" as it were.

Services provided on the online platform could then target the development of eTwinners' Personal Learning Networks. This could include dynamic feedback on digital identity creation, through social proxies [13] or the development of networking skills [14].

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