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Networked identities: understanding relationships between strong and weak ties in networked environments

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Abstract

In this paper we take up a critique of the concept of Communities of Practice (CoP) voiced by several authors, who suggest that networks may provide a better metaphor to understand social forms of organization and learning. Through a discussion of the notion of networked learning and the critique of CoPs we shall argue that the metaphor or theory of networked learning is itself confronted with some central tensions and challenges that need to be addressed. We then explore these theoretical and analytic challenges to the network metaphor, through an analysis of a Danish social networking site. We argue that understanding meaning making and 'networked identities' may be relevant analytic entry points in navigating the challenges.

Introduction

The term 'networked learning' suggests an alternative perspective on learning, which Jones and Esnault (2004) present in contrast to Communities of Practice (CoP) (Wenger 1998) and the research area of Computer Supported Collaborative Learning (CSCL). They argue that the metaphor of networks may be a better way to understand different forms of social organization and that the theory of CoP is in danger of omitting an understanding of networks as also composed of weak ties, which can be equally important in relation to learning. In a recent paper the tensions between the metaphor of networks and CoPs are presented as a core challenge to the research area of CSCL and online learning research in general:

> It is an interesting research question whether the Internet will help foster more densely knit communities or whether it will encourage sparser, loose-knit formations. (Jones *et al*. 2006, p. 45)

We shall argue that these two poles do not necessarily constitute oppositions, but that the tensions arising from contrasting them and relocating our views on social organization and learning suggest some theoretical, methodological and analytic challenges to the metaphor of networks and networked learning.

Through our discussions and analysis we shall argue that the metaphor of networks and the notion of exploring weak and strong ties is a valuable contribution to networked learning, but in addition that this perspective is itself confronted with some challenges which need to be addressed. The discussions take their departure from the concept of 'networked individualism' and notions of weak and strong ties, and from these discussions we point out some methodological and analytic problems or challenges. Firstly, we point to the problem of how to circumscribe a network (or the unit of analysis), and secondly, we discuss the possible lack of social fabric in understandings of the notion of weak and strong ties.

Furthermore, we relate these discussions to other theoretical and methodological developments within current thinking on learning, technology and Internet culture.

We illustrate the challenges and developments through analysing and discussing a 'community' or 'social networking site' called Arto.dk, which is used mainly by young Danish people between the ages of 13–17. The analysis and discussion is based on a long-term ethnographic study and analysis of the site carried out by one of the authors (Larsen 2005). In this paper we report some of the findings from this study and extend it by analysing the site through the metaphor of networks and the notions of strong and weak ties.

We have chosen this as our case because it builds on a network metaphor unlike most popular networked learning environments. While 'social networking sites' might not seem the obvious choice for educational research or the learning sciences, we are slowly beginning to see an educational adoption of such technologies. Recently, Facebook has become an issue of debate in educational research, and to illustrate this point we note that some UK universities have begun experimenting with Elgg,[1] which is an open-source learning system adopting a social networking structure in its design (Hewling 2006). If this emerging trend gains momentum, then understanding the socio-technical infrastructure of such sites, and how they analytically and methodologically challenge researchers will become an important issue for networked learning. On the basis of our analysis we argue that the concept of 'networked identities' might be a viable concept for addressing the research challenges outlined.

Networked learning – strong or weak ties as the focal points for learning research?

Within educational research there has been a great interest in the concept of CoPs both as an analytic tool and as a way to pedagogically design online learning environments (Dirckinck-Holmfeld *et al*. 2004). Therefore, there has been a strong focus on understanding communities as a form of social organization and how to implement the notions of CoP in pedagogical practices (Dirckinck-Holmfeld 2006). At the same time, several authors have emphasized the need to focus on types of social relations other than communities and have suggested that CoPs can be viewed as *one* specific type of social organization; namely a network composed of

strong ties (Jones 2004a; Jones & Esnault 2004; Jones *et al*. 2006; 2008). These authors stress the importance of weak links in networks and generally argue that networks are a better metaphor for understanding the organization of social practices which might contribute to a better understanding of learning. The metaphor of networks and networked learning in contrast to other theories, for example CoP or theories within CSCL, do not privilege a particular view of relationships between the nodes in a network, i.e. 'community' or 'collaboration'. From the metaphor of networks the authors question whether tightly knit and coherent communities with strong ties are the most dominant type of social organization or alternatively whether researchers and educators should embrace the notion of 'networked individualism' adopted from Castells (2001). The notion of 'networked individualism', as noted by a number of sociologists, is an extension of the sociological trend of individualization (Castells 2001, p. 128). Castells further argues that the Internet and networked technologies act as the material support for this sociological trend of individualization:

> But the most important role of the Internet in structuring social relationships is its contribution to the new pattern of sociability based on individualism. [. . .] Increasingly, people are organized not just in social networks, but in computer-communicated social networks. So, it is not the Internet that creates a pattern of networked individualism, but the development of the Internet provides an appropriate material support for the diffusion of networked individualism as the dominant form of sociability. (Castells 2001, pp. 130–131)

In our interpretation the concept of 'networked individualism' embodies an interesting and seemingly contradictory trend; namely that we are witnessing an intensified personalization and individualization, while simultaneously being increasingly dependent on, connected to and mutually reliant on each other. We will argue that, as a description of emerging social forms of organization, the concept of networked individualism is a valuable perspective in understanding networked learning.

The problem of circumscribing a network

In this section we take up two different, but interconnected challenges. Firstly, we discuss the problematic distinction often made between online and off-line contexts, which also echoes a broader concern related to the

community versus network debate. Secondly, we take up a challenge concerning the unit of analysis when dealing with networks.

Within educational research there has been a particular focus on fostering 'online communities' or 'virtual communities' focused on supporting and nurturing online discussions within bounded spaces (Dirckinck-Holmfeld *et al.* 2004; Ponti & Ryberg 2004; Jones *et al.* 2006). Equally, studies of online culture have tended to distinguish between the 'real' and the 'virtual' as two distinct worlds and treat online communities in particular as exotic islands and bounded social spaces independent of time, space and the local (Hine 2000; Jones 2004b). Hine suggests that we need to move from a perspective of the 'internet culture' towards 'internet as a cultural artefact'. This represent a shift in focus from viewing online activity as being disconnected from 'real life' activities to meaning something, which is also always locally embedded and acts in terms of fluid movements between online and off-line contexts; something Wellman *et al.* (2003) term 'glocalization':

> Taken together, the evidence suggests that wired residents have become 'glocalized,' involved in both local and long-distance [. . .]. They connect both with neighbours and far-flung friends and relatives. Moreover, the wired nature of the contemporary Internet means that the more people are online, the more they must stay physically rooted to fixed personal computers and Internet connections at home, work, school or public places. The paradox is that even as they are connecting globally, they are well placed to be aware of what is happening in their immediate surroundings. (Wellman *et al.* 2003)

In the first instance this raises some problems related to analyses relying largely on the collection of digital traces (Enriquez 2008), but also we wonder if the pervasive role of digital technologies in everyday life has not obliterated the meaningfulness of distinguishing between online and off-line.

We would argue that we need to enhance our analytic focus on movements, flows and a continua of activities across domains, rather than focusing on bounded spaces, separated contexts of activity, practices or singular, coherent communities. It seems that sociocultural learning theories in general are becoming increasingly interested in learning that happens not only in discrete contexts (such as a school class, a workplace or an organizational unit), but rather in learning that

happens across and between these discrete constellations (Engeström *et al.* 1999; Dreier 2002; Lave 2002; Nielsen & Kvale 2002; Engeström 2004). This broader trend also relates to discussions concerning the differences between the networked learning metaphor and CoP's:

> [. . .] networked learning is concerned with establishing connections and relationships whereas a learning environment based on Communities of Practice is concerned with the establishment of a shared practice. (Jones *et al.* 2006, p.46)

We agree that this has been one of the outcomes of much pedagogical use of the ideas of CoP's, but we also want to stress that ideas such as boundary crossing and brokering have always been central to the theory of CoP. We recognize that these are not the concepts that have been most widely adopted by the broader educational research community (which Wenger (2005) notes himself). However, in a recent research proposal, Wenger (2005) outlines some ideas for future research. In this proposal the notion of identity becomes a core issue. The analytic focus has moved slightly away from CoP's and onto people's movement between different CoP's and larger-scale learning systems. Thus, he focuses on how identity is developed through participation, immersion or withdrawal from CoP's and through people's multi-membership and boundary participation in different communities over time (Wenger 2005). In our interpretation this closely resembles the notion of networked individualism (Castells 2001), and it also seems to take a more networked view, as the focus is moved away from the particular community towards individual trajectories or relations. We believe that these developments are both very interesting and can prove useful to the notion of networked learning.

A very important analytic and methodological question arises from the foregoing discussion: What actually constitutes a network or the unit of analysis, and what does it represent? If we are moving theoretically and empirically towards an understanding of learning as happening across boundaries and by engagements in different contexts, then what actually constitutes the network or the unit of analysis? Can the network be limited, for example, to a course or the interactions in forums? Does software analysis of the interaction in an online course capture the 'full' network, as Enriquez (2008) asks by referring to face-to-face interactions?

How could software analysis capture an intermixture of 'real' and 'virtual' contexts, or the complex relations constructed through social networking sites, as we shall return to?

The possible lack of social fabric in understanding relations or connections

We generally adopt the view that the notion of CoP and learning theory in general can gain a lot by being viewed through the metaphorical lens of networks. However, on the basis of the discussions above we also want to voice some concerns with the notion of networks and some of the analytic methods and assumptions related to it. Firstly, much in line with Jones (2004a), we find it interesting that networks at different levels of scale seem to be evolving from and sharing similar underlying structures or properties that can be described through mathematical laws. For example, a power law distribution in which a large number of nodes have relatively few links, whereas a few have a large number of links and appear to be central nodes in the networks. However, this does prompt some questions which are also taken up by Jones (2004a) and Enriquez (2008). Our reservation would be that, even though the underlying structural properties or laws of networks are the same, this does not in itself explain why some nodes are more influential than others. Our claim would be that the actions, practices and meaning-making processes might be very different, though the underlying structure is the same. We see the concepts of identity and meaning-making processes to be central in this regard, and we shall argue that connections or relationships are also heavily concerned with meaning making and identity.

Secondly, when talking about weak and strong ties, a question related to the parameters for whether a relation is strong or weak arises. How do we establish whether a relation is strong or weak? What parameters can we use? The number of messages could signal a large flow of information between nodes and suggest strong ties (Jones 2004a), but equally, would a low flow mean that the relation is weak? What would be the parameter in analysing and understanding such relations? Would it be necessary to incorporate analytically other measures apart from the structural strength of a relation; such as the 'strength' of meaning people give to the relation? These questions and challenges are illustrated and explored through discussing the social networking

site Arto.dk based on a long-term, ethnographic study of the site.

Methodological and theoretical background of the study

The data collection and analysis of the empirical material in the study theoretically and methodologically draws on Mediated Discourse Analysis (MDA) (Scollon 2001) and Nexus Analysis (Scollon & Scollon 2004), and it is based on an extensive virtual ethnographic investigation (Hine 2000) carried out by one the authors (Larsen 2005). The virtual ethnography consisted of a seven-month participant observation (from February to August 2005) on www.arto.dk. During this period of time the author had a profile on the webpage and was online every day for at least one-and-a-half hours. The intentions of her research project were openly stated in her profile text. She documented her observations and experiences in field notes and took several hundred screen dumps of the site. Apart from participating as a regular user the author conducted focus group interviews, created a small qualitative 'questionnaire' to which 60 of the author's Arto-friends replied. Furthermore, she had several informal conversations with the users both on the site and through alternative communication channels (such as MSN Messenger).

The theoretical framework of the study was rooted in MDA (Scollon 2001) and Nexus Analysis (Scollon & Scollon 2004) which is a theoretical and methodological framework within MDA. MDA distinguishes itself from other discourse studies by focusing on social actions, rather than focusing mainly on written text or language. As a consequence the unit of analysis in the study was the identification of the crucial social actions carried out on the website. The social actions were identified through the methodological framework of Nexus Analysis where the unit of analysis is a Nexus of Practice.[2] Therefore in this study Arto was analysed as a Nexus of Practice by drawing on Nexus Analysis, in which ethnographic observations are an important part of the data collection.

In Nexus Analysis one must obtain a 'zone of identification', find the central social actors, observe the interaction order and establish the most prominent cycles of discourse within the nexus of practice studied (Scollon & Scollon 2004). By using the different data collection methods the author collected four types of data which

Fig 1 Author's personal profile page at Arto.dk.

are crucial to understand and analyse a Nexus of Practice: Members' generalizations (via the qualitative questionnaire), neutral ('objective') observations (via the screen dumps and field notes), individual members' experiences (via group interviews and informal conversations with users) and observer's interaction with members (via using the profile for participant observations and virtual ethnography) (Scollon 2001; Scollon & Scollon 2004). In the following sections we describe Arto and present the central findings from the author's study.

Case description

In recent years the social networking site www.arto.dk has become the most visited website in Denmark among young people between 13 and 17 years old. Arto is a hugely popular website for communicating and connecting with existing and new friends. Online the youngsters create their own profiles with pictures and descriptions of themselves, they chat, debate, write

blogs and comment on each other's pictures. The most frequently used feature on Arto is the guestbook (GB) which is used to communicate short text messages. Fig 1 is a screen shot of a profile on Arto (belonging to one of the authors) seen on the main page.

The main page of the profile, the GB and the gallery are among the most used features on Arto, but Arto also contains games, jokes, a movie site, postcards, and the users also have access to chats, forums and the ability to create clubs (Larsen 2005).

On the profile page a photo of the owner is shown along with her personal information: name (navn), age (alder), state (landsdel), civil status (civilstatus), occupation (beskæftigelse) and so on. To the right there is a list of the user's friends (the so-called Arto-friends) which everyone can see. The 'friend list' reflects the network metaphor that the website is based on and one can apply for friendship with a user, who can then either accept or reject the application. Below there is a space in which the user can narrate his/her own personal homepage/profile text. Here the user mainly puts

descriptions and pictures of himself/herself and his/her best friends. The GB is located in the top menu bar. The most frequent messages consist of small messages like 'Hi, what are you doing?' or 'Popped by', etc. Next to the GB the gallery (galleri) is located. Here the users can upload pictures, comment on them and receive comments back from the other users.

As can be seen, there are many different features on Arto. Based on the long-term observation and analysis of the site the author divided the features into four overarching categories that also cover different types of actions carried out by the users:

- The social and contact enabling features (such as the GB, the chat section, the debate forum, the clubs etc.)
- The personal and branding related features (such as the profile, the picture gallery, the blog, the notice board, the profiling messages on the front page, etc.)
- Entertainment (such as games, videos, jokes, papers, etc.)
- Support and practical information (such as rules, safety guidelines and the support section) (Larsen 2005).

In her study the author especially focused on the actions carried out by means of the personal and branding related features and the social and contact enabling features as they were the predominant social actions on the website. Also, the features in those two categories (especially the GB, the profile and the picture gallery with the comment function) were pointed out by the users as the ones they used most frequently.

Central findings from the study

The analysis focused on the central social actions carried out by the young people on Arto. The study focused particularly on how young people develop friendships and identity on Arto. From an analysis of the social actions the author identified four central themes: a sincerity theme, a body theme, a love theme and a friendship theme.

Within 'the sincerity theme' she analysed how the identity of young people is neither fragmented nor characterized by 'role playing', but rather how most of the young people strive to construct themselves with an identity that appears as sincere and real as possible. One of the reasons for the strong focus on sincerity stems from a small group of users on Arto creating fake profiles, the so-called 'fakers'. Even though the false profiles are often easy to see through and the majority of the users do not take them seriously they spend a lot of time exposing and pointing out the fakers. They do so by typing 'FAKER' or 'Get out of here, faker' in the faker's GB. This predominant discourse about sincerity and being real should be seen in light of the fact that Arto functions as a 'trust network' where one not only maintains existing friendships, but also forges new friendships on the basis of already existing friends. The analysis showed that the users primarily use the site to communicate with youngsters from their local environment talking about non-virtual things such as boyfriends or girlfriends, school, parents, etc. As such the youngsters really do not distinguish between online and off-line on the website, which is just a part of their everyday life (Larsen 2005).

Within the 'body theme' the author illustrated how the youngsters are interested in body and appearance, and how they comment on each other's looks in the picture gallery. The comments are highly in demand and the users often urge others (friends or strangers) to comment on their pictures. They do so because they seek attention and acknowledgement from others. Mostly, the feedback they get consists of messages saying how beautiful, hot or nice the person looks. One can be almost sure to get some positive comments, because as the author found, there is a widely practised unspoken rule to comment in a positive manner on Arto. Thus, the youngsters are helping each other in being continuously acknowledged and they use the picture gallery to get a feeling of self-confidence in their sometimes insecure teenage lives (Larsen 2005).

'The love theme' encompasses the evidence that there is a predominant discourse about love in the actions of the young people, which is connected to the way in which they maintain their friendships. Users (both boys and girls) write about how much they love their best friend(s) and how much other persons mean to them, especially, in their profiles. Sometimes they do not even write anything about themselves, but populate their profile with comments praising their friends. As a consequence of this strong discourse of love between friends In Real Life (IRL) it has become very popular for the users to have one of their best friends design their profile.[3] Here they invite others to portray them in a positive and commendable way and thereby avoid being

perceived as smug or self-centred. Similarly, some users choose to put in messages from 'the ones that matter' in their profile text. Here, they pick out GB messages themselves to be displayed on the front page of their profile; some even demand messages from friends which they can put in. By doing this the users have the opportunity to choose the messages which will reflect them in the most positive manner. Therefore, there is also an aspect of branding in the actions of the young people. By using their network of trusted friends they make sure they are portrayed in a positive manner on the website (Larsen 2005).

In the final analytic theme, 'the friendship theme', the author discussed the notion of friendship which in many ways has a different meaning on Arto, as the website has expanded the possibilities of forming and maintaining friendships. A concluding point in the study was that the youngster's construction of identity is heavily relational because their identity is co-constructed through their network of friends. This happens not only by using the site and its functionalities but also through using their friends as mediational means (Larsen 2005).

In the following analysis we revisit some of the empirical material and findings to show how the young people continuously construct their participation, within the website as a whole, as an intersection between networked performances based on loose ties to engaging in more closely connected networks or communities of practice.

Analysing the case through the lens of the network metaphor

Through the analysis we shall show the value of not only taking a networked, relational perspective, but also through the analysis we will highlight issues reflecting the challenges we raised earlier. We will also touch upon how different 'mediational means' are used to create what we call 'networked identities'.

Altering the relations possible in the network
An interesting change happened on Arto during the online ethnography. This was a user-initiated change to the types of relations possible on the website. As mentioned previously, the relations to others were formed primarily around 'knowing each other' (the existing offline friends) or 'getting to know each other' (new possible friends), but at some point the users started

to create differently organized networks (communities) based on joint enterprises or shared interests. As can be seen from Fig 1 and the case description, the metaphor of the website is formed around the construction of a personal, individual profile, which is then linked to other individual profiles. Several mediational means afford exactly this use: one is prompted to put in age, name, physical location, civil status, occupation and there is a 'personal diary'.

Despite the different mediational means and affordances made available to the users many of them began to make new profiles to create a specific community or a specific club. Instead of giving the profile a user name they gave it a club name and the profile's picture gallery was for example used as a 'members list' showing a picture of each member. Eventually, this practice among the users resulted in Arto's staff creating a specific functionality for clubs or communities on the website. Now there are more than 25 000 clubs.[4] The aims of the clubs vary greatly; some are extensions of already established groups of friends with strong ties (e.g. three friends who upload pictures in their club or an elementary school class who uses their club as a virtual space for spare time activities), others are interest groups such as groups of football supporters, fans of 'The Simpsons' or a computer game club. These might feature more weak ties. This is, however, very difficult to speak of in general as people engage in several different clubs and may feel obligated or related to these in different ways. The important thing is not whether the specific clubs are based on strong or weak ties, but that there was an urge among the users to change the ways of connecting and relating to each other. It points to the fact that types of relations, whether they are strong or weak, can be based on very different meanings such as acquaintance, friendships or a shared interest. This suggests that a relation is not merely a relation, but a relation of a certain kind.

Moving and navigating between strong and weak ties
As described above the people who frequently use Arto continuously shift between different ways of relating to others. The website in itself is a very good example of how people in practice move through different types of relations in a profoundly networked structure. This is due to the interweaving between strong and weak ties that the technology affords. This for instance plays out in the practice, described above, in which the youngsters draw on strong ties (their trusted network of

friends) when they are portraying themselves; while simultaneously inviting weak ties (foreign Arto-users) to comment on their pictures.

However, as we shall see, it is not unproblematic to identify what constitute strong or weak ties. Some young people use Arto to construct and maintain networks with strong relationships, whereas others use it just for fun, to kill time or to establish newer or weaker relations. This became clear through the empirical investigations when the users answered the question 'What does Arto mean to you?' In the following section we draw on some of these answers which represent different views while being representative for all the answers given (adopted from Larsen 2005 – our translations, punctuation and capitalization have been kept).

Arto enables people to form and maintain simultaneously strong or weak ties and users make use of these possibilities very differently. Some use it to get in touch with new people that might in time turn into close friends as one of the users suggests: '. . . it is hard to explain, I have actually written with people in here who are some of my really close friends today . . .' (Girl, 15). Others primarily use it to maintain the relations they already have IRL: 'that I can arrange to meet with my friends and stuff like that!' (Boy, 13); 'that I can just sit and talk to my friends' (Girl, 17); 'that I have more contact with my friends . . . also when we're together . . . because then we might talk about something that happened in here . . .' (Girl, 15); 'That I won't lose some of my IRL-friends!' (Boy, 17). Yet others seem to favour the exploration of new relations: 'it's a fun way to get in contact with other people' (Girl, 15); 'Not so much . . . But it's a great way to meet new friends' (Boy, 15). It is quite clear that they attribute very different meanings and 'weight' to the relations they form – from 'essential to life' to just having a bit of fun: 'Everything' (Boy, 15 years); 'Arto is my way to all knowledge and humour I can capture – I don't think I could live without Arto, but I could live without my mobile phone' (Boy, 14); 'It is almost my life . . . I have a lot of friends you know . . .' (Girl, 14); 'Hmm . . . Well, it's something I bother spending my time on' (Girl, 13). Friendship and relations matter a great deal to the young people as the statements also show.

The most prominent and visible mediational mean to indicate relations between each other is the 'friend list'. This could suggest strong ties between the nodes, but at the same time there are very different interpretations

among users as to what constitute 'friends'. From the questionnaire, the interviews and the 'rules for friendship' written in the profile texts by some of the users, it became clear that there are very different practices and opinions about the use of the friend list. Some users hold the view they will not accept friendship applications from users with whom they have never communicated or met IRL. They do not want to appear on friend lists with people unless they know them very well. Those users distance themselves from the so-called 'friend-hunters' who send out friendship applications to almost everyone:

> I have a lot of friends who have a profile on Arto. On my list I have 'only' about 20. If there is one thing I can't stand it is the 'friend-hunters' who jump from profile to profile applying anyone. But they are mostly small kids who realize that it is not cool to have several hundred of friends who never write them anyway.' (14-year-old boy in questionnaire, our translation, Larsen 2005)

On the other hand, some users do have more than 100 friends on Arto that are scattered all over the country and whom they might have met through the forums or the chat. They seem to value and nurture having a very diverse set of relations to many different people and some use their existing friends to find new ones:

> Sometimes I am visiting Lisa's profile. Then I take some of her friends and I look around. [. . .] there are also many I have never talked to, but who I then write to, and now I have started to talk to them too.' (15-year-old girl in group interview, our translation, Larsen 2005)

These examples not only highlight the problem of determining both the strength of the relations, but also how much these relations actually reflect whether a person is central or peripheral in a given network. Though it may be possible to trace networks on Arto and establish persons with many connections or those who frequently write to others from 'digitally harvesting' the friend lists, it is difficult to say what this means in the eyes of the participants, as there are multiple and conflicting interpretations of 'friendship'. It could reflect both that the person is popular and respected, but equally that they just value having a lot of friends on their list; and to some users this would denote a 'loser'.

From the statements and when looking at the profiles on the site it is clear is that they reflect a variety of the activities people engage in and display a multi-membership in many different networks both online and
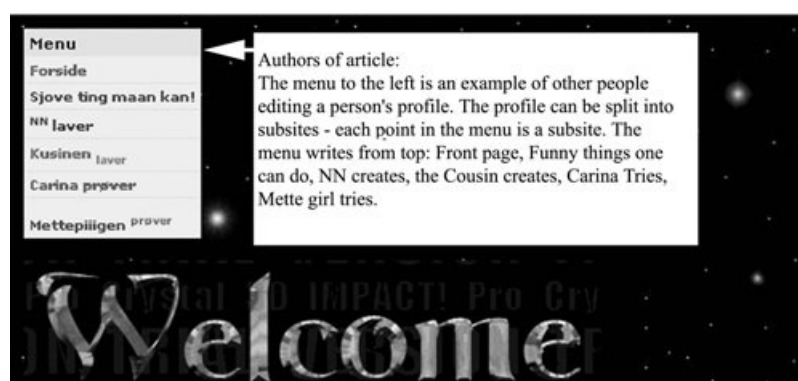
Fig 2 A 'personal' profile text from Arto.dk illustrating multiple authors.

off-line. The memberships actually often span or wipe out distinctions such as online and off-line spaces, as can be seen from the statements: 'that I have more contact with my friends . . . also when we're together . . . because then we might talk about something that happened in here . . .' (Girl, 15); 'That I won't lose some of my IRL friends!' (Boy, 17). In relation to these remarks, in particular, it is interesting that one of the respondents uses the networked environment to maintain the relations to his IRL friends and equally that a girl comments on how the networked environment enters as a discourse in IRL discussions. It points out that network relations are a very composite and layered phenomena that span time, place and online/off-line contexts. As Jones (2004a) suggests, network relations are dynamic and composed of actions and histories that may suddenly be invoked in other contexts.

The composite nature of relations is also visible in the profiles on the site. They often feature very diverse references to classmates, a boyfriend/girlfriend, best friends, broader interest such as sport or computers, preferences/dislikes and also which clubs on Arto one is a member of. Thus, they are very complex representations of a person's identity and how they are related to different practices and networks. This underlines the problem of identifying what actually constitutes relevant networks to the participants. However, strong ties are actually made explicit in very interesting styles which, similar to the self-initiated clubs, have come about through creative use of the mediational means in the profile descriptions.

'Open-source' networked identities

The profiles originally afforded a personal, individual space. Despite these affordances people use the profiles to portray each other and to signal strong ties. As mentioned earlier, it is common for owners of a profile to invite their best friends or a boyfriend/girlfriend to write and design a description of the profile owner (see Fig 2). This way of using the profiles is quite interesting. For one thing it reflects a new way to make strong ties visible, because as we argued earlier, to some degree, the friend lists lost their function to signify these types of relations. It seems therefore that Arto users have reconstructed the profile descriptions to signal these strong ties (Fig 2).

The example also tells us a great deal about how the users interpret the notion of identity, which is indeed quite complex and encompass some interesting tensions. As described earlier, one very prominent shared understanding among the majority of the users is that it is very important to be 'real' which means that creating a 'fake' profile is almost considered a crime. However, the notion and actual performance of identity is inherently relational. Users actively use other's descriptions of them in their own profile pages, or let others describe who they are. The way in which they portray each other bears a close similarity to testimonials or 'reviews' building on a commonly shared understanding that they must speak extremely positively about the person. In this way people are actually in control of the other's construction of their identity to the degree that they can be almost certain that it will be a positive one.

Having other people commenting on one's personality and self-description (or even narrating it) we interpret as a reification of relational identities or even an 'open-source' identity, which profoundly expresses the double nature of networked individualism. The users are very much 'real' and themselves, but at the same

time they all expose very reflexive and relational identi-
ties – they basically exist and become real through their
networks. Their identities are continuously constructed
through the networks by drawing on both strong and
weak ties in their multiple networks; here, weak ties are
especially enacted through a shared practice of leav-
ing positive GB messages or comments on people's
pictures. Clearly, recognition and constant acknowl-
edgements are quite important to the users and this is
also why these networks are so important. It is impor-
tant for users to be constantly assured that they look
good and that others like them; therefore, both weak and
strong relationships are invoked or invited to do this
continuously. The strong relations further function as a
'trust network' between the users. Often they find new
friends through their network after having read a posi-
tive 'review' of a user on an existing friend's profile. In
this sense the existing strong ties become bridges to new
relations, as we previously illustrated in one of the state-
ments from the interviews.

Final discussion

We will conclude the analysis by discussing it in rela-
tion to the challenges we initially identified, and by
summing up what we mean by networked identities,
which is significantly inspired by Wenger's (2005)
notion of identity and the notion of networked
individualism. We have stressed the notions of
meaning-making processes and identity in the networks
as part of the analysis. We find these to be essential in
relation to understanding the interpretations of different
participants as to what count as strong or weak relations
in complex networks, what kind of relations are being
experienced as meaningful and even what actually con-
stitutes the relevant networks.

The complexity of ties 'networked identities'
By using the term 'networked' we wish to stress the
multidimensional, relational aspects of identity and the
complexity of the networks that people are related to in
practice. These are continuously constructed by invok-
ing both weak and strong ties across networks. The net-
works span not only online/off-line spaces, but are
equally dynamic and historical in the sense that previ-
ous actions in a network can be incorporated in other
overlapping networks. By using the term 'networked
identity' we hope to capture the richness and complexity

of the relations we continuously engage in across con-
texts such as work, school, spare time, online or off-line.
The term 'glocalization' adopted from Wellman *et al.*
(2003) and the notions of 'networked individualism'
seem to fit very well the way young people use this
social networking service, and there seems to be a
simultaneous utilization of weak and strong ties, as well
as a profound mixture of online and off-line contexts.
The latter to an extent where we think the term 'on-life'
would actually be more appropriate.

The tensions between becoming increasingly indi-
vidualized and increasingly reliant on others seem to be
the very social fabric of this social networking site; their
individual identities basically exist and become real
through their networks, which points out that this
double nature of 'networked individualism' can be an
analytic entry point to understanding networked identi-
ties and networks.

The possible lack of social fabric in network analysis
In relation to doing research on networked learning our
analysis reflects the notion that networks are extremely
complex; not only in the sense of grasping the structure
or architecture of the network, but equally in how to
interpret and understand the relationships and ties
between people. We voiced a concern in relation to
understanding networks primarily as a specific structure
or composition of relations that can be graphically rep-
resented or mathematically described. Though all net-
works may share similar underlying structures, we have
tried through the analysis, to describe the ways that the
social rules and practices for such networks might be
very different and that the representation of the struc-
tural properties might not fully reflect the meaning-
making processes or views of the participants. We have
argued that, though some nodes on Arto might appear to
be central nodes or strongly tied with others, this does
not necessarily reflect the participants' understanding of
what would constitute central or influential nodes. We
have pointed out that having multiple relations, through
the friends list, does not per se indicate that a person
holds an influential or central position, as a multiplicity
of relations are a debated issue within the network. To
some people, a large number of connections could even
signify a low social status (e.g. friend-hunters). By this
we certainly do not mean to say that structural analyses
cannot reveal potent and interesting analyses of such
sites. We merely point out that having an understanding

of the meaning-making processes might be a condition to identify parameters to include in such an analysis. Maybe it would turn out that other ways of relating to each other (than e.g. the friend lists) would yield a different picture of centrality, as we have highlighted through the users' creative use of the profile texts. This is also related to the question concerning the identification of weak and strong ties and what parameters can be used to judge whether a relation is strong or weak. Flow of communication between two nodes may suggest a strong relationship, but as we have pointed out in the analysis; the 'content' and the meanings assigned to different types of relations can vary greatly. Though two nodes may interact frequently in a discussion group about 'The Simpsons', they might not feel that they are very strongly related in the sense of 'friendship' or even 'acquaintance'. Therefore, based on the analysis, we would argue that identifying the parameters, which are used to judge whether a relation should be termed weak or strong, may contain other aspects than, for example, number of exchanges between nodes. The parameters used are a very important issue that should not be rendered unproblematic when doing research on networked learning environments.

Addressing the problem of circumscribing a network
What also emanates from the analysis is that even identifying what constitutes the network(s) or unit of analysis can be problematic. If we are increasingly interested in notions such as interacting networks, multimembership and boundary crossing within learning research, then what is the unit of analysis? Though we are aware that we have chosen a case that is not directly comparable to, for example, a university course, we would hold that we have chosen a case which actually reflects the multiplicity of relations and networks most people are engaged in. Delineating the unit of analysis is of course a common challenge in all research enterprises, but if we explicitly aim to study multimembership and boundary crossing or learning which is happening across contexts these tensions become aggravated. As we have pointed out in the analysis the users of the site engage in multiple networks and how we can follow the movements across such networks, or even identify which networks are most important, becomes problematic, as Enriquez (2007) also points out.

We cannot present final or full-fledged answers to any of these challenges, but we will suggest that one (out of many) entry points into understanding social forms of organization and networks could be to incorporate the notion of identity or 'networked identity' in understanding the meaning-making processes. We would suggest that these notions might serve as anchorage in engaging in analysis of complex networked learning environments. We view networked identities as fundamentally multidimensional and relational, which means that the unit of analysis cannot be delineated to an individual, and neither can it be reduced to just one particular network (or CoP); rather, the analytic task would be to engage in an understanding of the relations between the nodes and the multiplicity of networks they engage in. Since the term networked identity is significantly inspired by Wenger's (2005) notion of identity, it is also rooted in the understanding of meaning. However, meaning is not tied to a CoP or a 'shared practice', but is seen as being negotiated and acted out in the intersections of different, overlapping networks. We view the negotiation of meaning within particular network structures as an important factor in relation to the challenges we have mentioned. From this we would argue that the meaning-making processes, which unfold and are enacted in the networks, are central to understanding the network(s) itself, but they are also central to identifying the parameters needed to judge whether relations count as weak or strong; and to unravelling the types of relations existing in the network.

The educational value of exploring the network metaphor and weak and strong ties
In the context of networked learning we believe this analysis can inform the theory of networked learning through pointing to some challenges and problems that arise when adopting the metaphor of networks and the notions of strong and weak ties. But equally we believe the analysis can inform the pedagogical design and construction of networked learning environments. We wonder how networked learning systems would look if they were genuinely based on the metaphor of networks and intersections of weak and strong ties. For instance, one could imagine learning environments that took their departure in students' and lecturers' networks, interest groups and research projects rather than solely being constructed around subject matter and courses. As mentioned in the introduction, we are slowly beginning to see the contours of educational exploration of learning environments resembling (or being) social

networking sites. It will be interesting to see if and how environments in which students and lecturers can display a wider variety of their interest and relationships to different networks and enterprises develop. Which types of identities and relationships will emerge, and can such environments bridge and enable new relationships between different disciplines, environments and people? In order to understand such learning environments we believe that the notions of networked individualism, networked identities and strong and weak ties might be very important analytic concepts. However, it is important that we recognize the complex social fabric of overlapping and multidimensional networks.

Notes

[1] For more information on Elgg, please refer to http://www.elgg.org or http://www.eduspaces.net (a social network for educational researchers and practitioners built on the Elgg software). Recently, Brighton University has adopted the Elgg software as its main online learning environment (please refer to: http://community.brighton.ac.uk/)

[2] A 'Nexus of Practice' is defined by Scollon as 'a recognizable grouping of a set of mediated actions. [. . .] . . . the concept of the nexus of practice simultaneously signifies a genre of activity and the group of people who engage in that activity' (Scollon 2001). In a nexus of practice the actors are rather loosely connected and the concept differs from Wenger's term 'Community of Practice' (Wenger 1998). A nexus of practice is not necessarily a 'place', but every linkage of a set of repeatable actions, which are recognized by a social group could be viewed as a nexus of practice.

[3] Actually, this became so common that in December 2005 Arto created a feature that allowed users to assign others the rights to write in their profile description, without having to hand out their username and passwords (because this practice caused some misuse).

[4] Also, the clubs have adopted the linking feature of the profiles, so it is now possible for two clubs to link to each other and thereby be 'friend clubs' in the same way the individual users can be 'Arto friends'.

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