eLearning Project
Exemplo - Elex

CREATION AND DEVELOPMENT OF A VIRTUAL COMMUNITY OF PRACTICE

V7 – English
15 January 2005

Sometimes You cannot understand
because it happens from time to time
that You move to others in one way,
and going away, You are no longer the same.

Aleksandr A. Blok

The search for truth is difficult in one sense and easy in another;
the fact that nobody is able to understand it properly is a sign of this;
nor is it possible that everyone can miss it, but everyone can
say something about nature; each contribution taken on its own may contribute
something or nothing, but all these contributions taken together
will lead to a certain greatness.

Aristotle - Metaphysics.

1 FOREWORD

The aim of this document is to propose a **conceptual scheme** and a reference for discussion for formulating and experimenting with a reference model to be followed as a methodological guideline for operating a community of practice.
Why, you may ask, are we starting off with two quotations, one from the greatest Russian poet of the Twentieth century and the other from the Greek philosopher who perhaps more than any other influenced the development of thinking in the Western world (and more). In reality, these quotations are proposed with the humility of one who is convinced that the masters of the past always have something to say, even to the people of today, who are so poor in time, but so rich in things to think about.
In particular, the two quotations seem to have been designed specifically to identify two important aspects of the community of practice designed for learning: in the first place, the interaction with the members of the community, in other words with the peer group, is a process which changes anyone involved. In the second place, the fruit of the interaction, the learning, is a collaborative phenomenon which takes on its most real dimension if considered collectively and not as a sum of individual knowledge.

This text aims at identifying conceptual and methodological references for the construction and management of a community of practice within the discipline of Vocational Training and, in particular, e-learning.

As a result, this document has a structure which can be roughly divided into two parts: an initial section designed to give the points of **reference for discussion** and greater detail, in the form of questions and slogans, and some key concepts. This initially means considering:

- the factors defining the practice of cooperative learning, understood above all as observation, and not as a set of theoretical definitions;
- the procedural and operative factors which can be observed;
- the methodological factors to be kept under observation.

This first section serves to establish the logical points of contact between arguments and heterogeneous disciplinary areas (communication, knowledge management, psychology and so on), and to establish the ground rules for the discussion and details.

The second area of reflection relates to **further investigation of some methodological aspects**. In particular, themes are considered such as:

- building a community of practice (definition and areas of operation);
- promoting and structuring cooperative learning strategies;
- the "weight" of the technological element in the life of a community of practice;
- how working in a community of practice influences the change of "identity" of the participants;
- monitoring the work of a community of practice.

The document pays attention to the expectations of the Commission which can be seen in the ELEX project, and for this purpose provides methodological and operative indications.

As this is a paper for discussion by a group intending to make cooperation a call for learning, this document must not be seen as a "closed", definitive text, but as one open for cooperation by everyone.

1.b A first classification

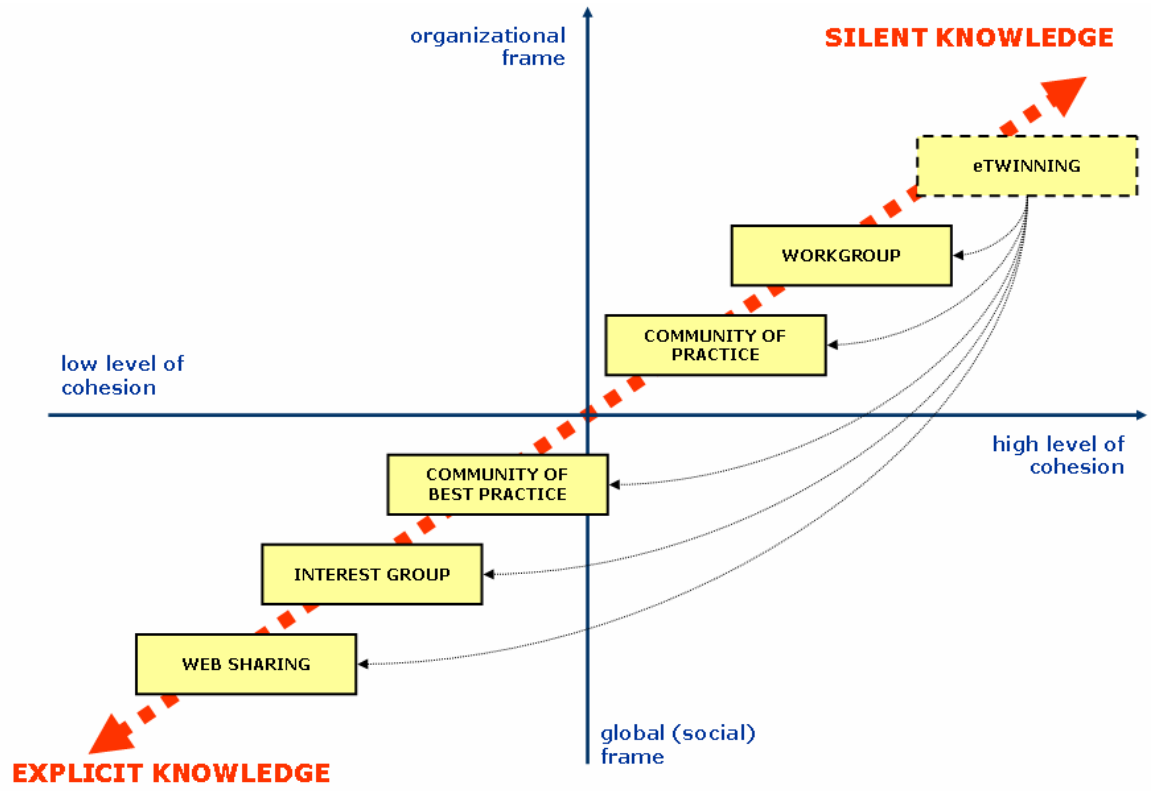
The "virtual" professional community

Professional communities traditionally appear in the organizational sphere as a formal or informal grouping of individuals who share similar or complementary activities and practical experience, usually learned on-the-job. These communities can use the network as a tool for facilitating and distributing the mechanisms of construction and socialisation of knowledge. The most obvious advantages are in terms of flexibility of organisation, being able to communicate without constraints of time or space, allowing a virtual meeting place everyone can attend at their own times, habits and pace, eventually acquiring and bestowing visibility (and hence added value) to their own activities and products.

The terms "virtual community" and "community of interests" are often seen as interchangeable. This may not be strictly correct - not all communities of interest are necessarily "virtual", but there is a very important underlying concept: the common interest plays a basic part in defining the level of membership, involvement and participation of individuals in the community.

Various forms of membership in on-line communities

The learning processes with peers, learning mutually or reciprocally-so to speak, thus represent a special form of professional growth, based on shared knowledge and common good practices. These dynamics generally find fertile ground within professional communities which can take on different forms and intensity of participation according to greater or lesser levels of membership and socialisation of their members. One way of classifying professional communities operating on networks is based on three main indicators: the **scope of the community** (global or within its own organisation), the **level of cohesion** between its members, the main **types of knowledge** (tacit or explicit) exchanged within it (Fig. 1)



Relationship between scale of community and level of membership (reworking of a diagram published on the site www.knexsis.com)

The figure shows some possible forms of membership of professional communities on line:

- *Working groups:* This is a formal membership, generally limited in time and remit, oriented to producing a project or solving a problem. They usually operate within the scope of the organisation to which they belong, and the respective members are strongly motivated to complete the task assigned to them. Thus the physical proximity of the members becomes a guarantee of the possibility of frequent work meetings.

- *Communities of Practice:* These are characterised by being joined spontaneously by members who, through sharing knowledge in working together, foster peer to peer learning processes. The CPs can involve members coming from different institutions, which gives them a greater capacity than working groups. However, this capacity is restricted in geographical terms, as the members of a CP need to hold periodic meetings to reinforce their social network and maintain a high level of cohesion.

- *Communities of best practice* Here we do not have a community whose forces are combined to identify and define cooperatively the best practices to handle a given problem, but which come together to share practices which have already been experienced and evaluated as "best". Communities of this nature, which do not have to collaborate intensively to achieve a specific objective (as in the case of working groups and CPs) often have a medium/low level of membership. In addition, having a remit which is more distributive/informative than creation, they can generally be characterised by a greater geographical capacity.

- *Interest groups:* These are informal groups whose aim is to spread information and put people who share common interests into contact with each other and allow them to interact. Their purpose is characterised by a wide geographical capacity (more global than local) and thus a low level of membership.

- *Sharing over the Web:* This is not real membership, but rather a channel designed for circulation of materials, documents and information within a professional network. In other words, we can say that while interpersonal communication in a professional context is favoured in interest groups, sharing over the web complements this in terms of circulating informative and/or factual material. Due to this characteristic, sharing over the Web has the widest global range, but a very low level of membership among those of which it consists.

Eventually, a particular type of professional on line community can be considered the one generated by *E-twinning* (or eTwinning).
E-twinning can be described as a collaboration between two people or two institutions or équipes or groups that carry on, together, some activities by the use of the information and communication technologies (ICT). Even when this exchange is only between two people, however the aim is to connect different institutions and to promote within it the acquisition, circulation and the transfer of knowledge, experiences, good and best practices, etc.
In fact the e-twinning can allow the creation of a wide-ranging collaborative community, some wider networks, when one or both its members act as go-between or "bridges" towards other people or groups within or without own institution (see Brown and Campione *Community of Learners* model). According to the type of collaboration established between the two subjects, there will be the creation of community of different typology, from the simple collaborative dyad to the work group, until to the Sharing over the Web, with levels of different cohesion and with a different attention to the tacit or explicit knowledge.

N.B.: Working groups and Communities of Practice are characterised by a high sharing of tacit knowledge, while interest groups, and even more so groups sharing over the Web, tend to give priority to the circulation of explicit knowledge.
This does not mean that in the groups, above all the CPs, there is no exchange of explicit knowledge, but that the "raison d'etre" of CPs mainly lies in the need to share skills, practice, know-how and, in general, everything that is implicit in professional experience and difficult to find in documents, databases, reports, books, etc.

2 Section One: the points for discussion

This document arises from the need to find and put forward a reasonable, feasible answer to three questions:

- **first : how can a group of people who do similar work and want to cooperate with each other, but rarely have an opportunity to spend much time in the same place of work, be allowed to "function"? What characterises this group as a community of cooperative learning?**

The question has aspects which are methodological (such as tools, methods, approaches to be used for working together), technical (which of the many technologies available are to be used), psychological (the meaning of interaction between "peers" operating in the same field but in different cultures and environments), and motivational (such as pressing for constant, sustainable participation). More in detail, the reference can be made not only to learning taking place in a co-operative way, but also to those forms of interaction in which learning is generated through the mutual, reciprocal and implicit activity of sharing knowledge that brings to the creation of new knowledge.

- **second : what is implied by the decision to use distance communication tools (hence mainly ICT), which are not just a method of interacting, but a way to develop an environment and a method of learning for those who take part in the process?**

The question is connected with the technical aspects of communications on the internet (for example, synchronous or asynchronous) which are of vital importance in the functioning of communities of practice, as well the relationship of the participants with the (expanding) world of the tools which can be used by the communities of practice.

- **third : what are the methodological aspects to be kept under observation in order to make the collaboration sustainable and ensure that the work of the community and the learning are effective?**

This question is related with the aspects of daily functioning and the day-to-day operations of the community as well as the aspects of selection and production of output and, finally, the methods of monitoring their own operations which every community can select and structure.

Answering these three questions in the context of the communities set up in relation to the Elex project is, more generally, connected with the methods selected by EVTA to manage and facilitate knowledge internally. This means supplying a methodological and operative discussion on the meaning of organising and leading a stable community of practice, in particular for VET-linked learning and e-learning.

It also means giving a reply to the basic questions raised by the project funding organization, in other words the EU Commission, consisting of supporting the creation and development of a virtual practice community, with the aim of discussing, learning and experimenting on the use of ICTs in VET through exchanges of knowledge and experience.

These three questions will then be used as vectors for in-depth discussion and reflection.
Each of these can be introduced by some "slogans", emphasising their scale and complexity, even if very briefly.

We will start with the first question (how can a group of experts who intend to cooperate remotely function?):

The presence of the absentees: or **team working** but from a **distance**;

Communicating, cooperating, learning: the three wheels of **cooperative and mutual learning**.

For the second question (the use of ICTs as a tool), we have:

Aladdin's Lamp: or **Internet** can fulfil many desires, but the thousands of possibilities offered by ICTs can **complicate life**.

E-identity: does learning and being in a network **change** the members of the community? And if so, **how** ?

For the third question (which methodological aspects will facilitate the work of the community), we have:

The lonely crowd: or **creating value** with cooperative and mutual learning can be a **motivation** for **sustainable use** by the community members.

Learning with method: or the (many) **variables** to be considered when setting up a community of practice.

2.1 The presence of the absentees: or team working, but from a distance..

It may be useful, as an introduction to our discourse, to remember some **concepts underlying cooperative learning** and the wish to set up a community of practice.

According to a formulation that seems convincing, for a community of practice to be born, all that is required is a quite banal situation which can be seen in the everyday life of all of us. If I have a problem or a need, I ask for help from someone who may already have been in this situation and resolved it, like a colleague or a group of colleagues. If I find the solution, I've learned something new; if I don't find it, or what I find doesn't seem adequate, I try to find it with others (like colleagues) who have or may have the same problem as me[1].

The community of practice can thus be defined as a network (more or less formal) which is dedicated to exchanging knowledge between professionals sharing similar problems and the desire to share knowledge and experience as a way of creating individual and organisational value.

From this fundamental concept, we can identify some basic principles which we can use to establish the behaviour of a group which wants to be a community of practice.

- Learning must be fundamentally recognised as a social phenomenon: this is generated by sharing and negotiating meanings.
- Knowledge is integrated in the life of the community which shares values, beliefs, languages and ways of doing things. In fact, knowledge and community are closely linked: for knowledge to be generated, it is first necessary to negotiate the language defining it and the rules governing it.
- The learning process and the process of belonging to the community are inseparable. The identity of the individual is defined in relation to the context of the community of which the individual is a part, in the same way as the individual's process of learning is linked with that of the group. The production of knowledge is a collective process and the cognitive heritage is no longer the exclusive prerogative of the individual but of the entire community.
- Knowledge and practice are inseparable. In fact, the benchmark of knowledge is action: not only does one learn from doing, but only those who know how to do can demonstrate that they know.
- The ability to contribute to the community creates the potential for learning. The sharing and negotiation of the meanings operated by individuals activate abilities to understand and interpret the context, as well as potential to create new knowledge, reorganise knowledge through new variables and new categories designed and used by the community. [2].

If the initial situation seemed at first glance to be rather ordinary, looking more closely the organisation of a community for creating and sharing knowledge can be seen to have both originality and specific characteristics, plus a considerable degree of complexity of both "reading" and management.
In addition to this, the situation is complicated by physical distance, which is a distinctive characteristic of virtual communities. Physical distance implies the necessity of managing the spaces and time between the moments of communication, in order to avoid the risk of transforming geographical distance in psychological distance, i.e. in a barrier to communication. For example, virtual communication cannot use non-verbal communication parameters for which presence is necessary: is it possible to replace them with writing or with emoticons ?

To sum up, for our community to be able to function (and here we begin to find an answer to our introductory question), **certain conditions need to be me**t:

[1] Trentin G., Insegnare e apprendere in rete (Teaching and learning in networks), Bologna, 2000.
[2] Trentin G., Dalla formazione a distanza alle comunità di pratica attraverso l'apprendimento in rete (From distance learning to communities of practice through network learning), Ortona, 2000.

- there must be a "**something in common**" stimulating the individual to join and remain in the community. As communities of practice have the basic characteristic of being voluntary, there must be a specific interest, a common problem, a general objective which is sufficiently clear;
- **participation must be active**, so as to create a social link based on interaction and the exchange of knowledge, but also on the re-interpretation of the object under consideration and research as a consequence of the results of the exchange;
- a **negotiation must take place** the rules must be shared, otherwise the individual will be excluded or rather auto-excluded from the community. The negotiation and sharing relate to the active participation, but also the reciprocal nature of the information, acceptance of protocols, conventions and timescales. This thus creates a repertory of common resources which are consolidated over time, in other words (to quote Etienne Wenger) languages, styles of action, awareness, recurrent modes of action and thought[3].

2.2 **Communicating, cooperating, learning:** the three wheels of **cooperative learning.**

The conditions described above are the basis of the functioning of the community; they mean that the work in a network can activate a mechanism for giving value to knowledge and abilities which the individual members have acquired in the course of their specific work, as well as making professional topping-up and learning possible.
But what kind of learning is this? As is known, learning is generally considered to be a never-ending, continuous process, which is life-long and takes place whether one is aware of it or not.

If, among so many epistemological models dedicated to how individuals learn, we use the diagram of three Cartesian axes which identify the three main interacting areas by which learning takes place[4], we see that this can be considered as the result of the simultaneous interaction of a physical environment, a social context, and the individual environment.

In particular, learning whose dimension is rooted in interaction with the social context is defined as cooperative learning, as, depending on each case, it relies on the possibility of learning through others, learning from others, or learning with others.

A useful contribution for considering the way a community learn (o, rather, create new knowledge from interaction) can be taken from the Nonaka's conceptualisation on the processes in which the new knowledge is produced through the continuous transformation of knowledge from tacit to explicit and vice versa:
a) socialization: from tacit knowledge to tacit knowledge (example: tutoring from who has more experience towards a beginner)
b) externalisation: from tacit knowledge to explicit knowledge (example: an expert explains whether to make to work a thing)
c) combination: from explicit knowledge to explicit knowledge (example: to learn from lectures, formal meetings)
d) internalisation: from explicit knowledge to tacit knowledge (example: to learn from seminars, video, books, courses, etc.)

Learning in a community of practice is not completely intentional or deliberate; moreover, learning is mutual (reciprocal and borrowed) more than collaborative or cooperative, and is based on the socialization of the experience and the knowledge.

[3] Wenger E., Communities of practice: The social Fabric of a Learning Organization, "Healthcare Forum Journal", 1996.
[4] See Midoro V., Per una definizione di apprendimento cooperativo (A definition od co-operative learning), Ortona, 2000.

The exchanging of knowledge takes place first and foremost through a process of communication which is characterised as placing reliance on the skills of the group, the existence of a shared and understood objective, the creation and handling of shared spaces, the existence and acceptance of clear lines of responsibility, but with no insurmountable restrictive confines[5].
In other words, cooperative and mutual learning takes place through the acquisition by individuals of knowledge, skills or attitudes which are the result of group interaction; this is individual learning as a result of a group process[6].
Cooperation, therefore, is based on the real interdependence between members of the group the use of mutual assistance linked with a sense of responsibility for the group and its aims. Thus learning which takes place through communication and cooperation relates to both individual learning linked with the activity of the group in order to carry out a common task, and to the learning of the group as a whole[7].
In addition to this, beyond the "utilitarian" perspective (because the CoP serves me, I learn something, I find answers, we work to a common objective…) it must be underlined the emotional aspect, the sense of affiliation to the same community: the possibility of "becoming someone" opposed to the "to know or to learn something".
In a CoP the identification and development of the identity bonds play a role more conclusive than in a group of learning. Therefore, "the mutual appointment" it is not simple sense of responsibility or interdependence to do together something.

Equally, the accent set by all the authors on the fact that the Communities of practice are characterized by an elevated sharing of tacit knowledge (contrarily of the groups of interest), it again underlines the importance of the processes of identification/identity: tacit knowledge is almost intangible, yet real and more solid of explicit knowledge, because it is based on the really individual experience. It is extremely useful too, because is able to determine appropriate and immediate solutions to unexpected problems.
Tacit knowledge is not codifiable and transformable in manuals or report or data for database, so it is necessary to complete some socialization and sharing actions, able to make it explicit, for creating new knowledge. Nevertheless this sharing is possible only if the affiliation to the community mechanisms are activated.

As a conclusion, because communication and cooperation can trigger a process of mutual learning, it is vital for there to be conditions for receiving feedback from others and for this to be motivating. In fact, this helps to create a context favouring participation and at the same time inhibits factors of dissipation or centralisation[8].

All this takes place when the *space* within which communication and cooperation take place is specifically constructed, not casual. When the space which is constructed to promote cooperative learning is a *virtual space*, very different problems arise from those of the traditional classroom. The virtual space consists of a set of remote networks connected together without a central core, in which each terminal (thus, in our case, each member of the community) becomes an active node for traffic to flow through. But this is an argument for the point below.

[5] Schrage M., No more teams ! Mastering the dynamics of creative collaboration, "Courrency Doubleday", New York, 1990.
[6] Kaye, A. R., Learning together apart, Berlin, 1991
[7] Midoro V., Per una definizione di apprendimento cooperativo (A definition od co-operative learning), Ortona, 2000

[8] Calvani, A. Rotta M., Comunicazione e apprendimento in Internet. Didattica costruttivista on line (Communication and learning in networks: constructivist didactic on line), Trento, 2000.

2.3 **Aladdin's Lamp:** or Internet can fulfil many desires, but the **thousands of possibilities offered by ICTs can complicate life.**

Let us try to consider some characteristics of the virtual space in which cooperative learning can take place:

- The Internet is a set of global networks connected together, which represents the world's greatest communications system;
- it has the power to synchronise places which are materially distant from each other;
- it has the capacity to modify the organisation of daily life, acting on perception of time and the way of working;
- it has the power to alter relationships with others and to trigger socialisation processes.

An initial consequence of the network is the development of a new model of communication, based on the fact that each individual connected to the Internet works simultaneously as a transmitter and a receiver in terms of the information accessed. As this communication process is interactive, the individual can participate actively in the construction of the flow of information relating either to the content or to the path which this flow will take in the network. This characteristic is defined as network paradigm, consisting of a communication model founded on the interaction between information data and the social context in which the flows of information circulate[9].

Another consequence of the above characteristics is that the quantity and variety of information available on the Internet are almost limitless and that it is easy to look up this information on line or download it directly to one's own computer. It should be remembered here that network information management methods vary widely, from banks to hypertexts that can be examined as web pages, an important argument for the Elex Special Interest Group.

However, two principles which to some extent are pivotal for the Internet and virtual space must be added to the characteristics described above; these are the **usability** of the data, and **interactivity**.

Usability is understood as the degree of immediacy with which it is possible to identify and acquire the content in which one is interested, and depends to a great degree on the precise identification of the reference target, on the profile the message is calibrated on.

Interactivity is linked with the instrument itself and the characteristics of use (link, hypertexts, connections, etc.) which connote the space of the network as a "place of experience" where virtual, simulated actions can become real in the subjective view of the individual activating them[10].

Remote resources and information and communication technologies, however, do not seem to be designed solely to solve problems - they sometimes create new ones. In 1965, the well-known futurologist, Alvin Toffler, had already invented the term "Future Shock". According to its author, this expression meant that the human neurological system was poorly equipped to cope with and adapt to the scientific, technological and social changes taking place at increasing speed at all levels of modern society. These changes meant a continuous bombardment of stimuli induced by technology which, although their pace was tolerable before the second world war and allowed people time to adapt, afterwards moved so fast that the effect on the nervous system became traumatic. According to Toffler: *"the ability to adapt does not depend entirely on being aware of going in what you would consider as the happy direction*

[9] Rice, R. R., Computer mediated communication system network data: theoretical concerns and empirical examples, “International Journal of Man-Machine Studies”, 1990.

[10] Castells M., The Rise of the Network Society, Oxford, 1996

or an unhappy direction; it is the speed itself which compels the change in the rate of decision making and all decision systems have a limit as to how fast they can make complex decisions".

So speed of change, information overload and the spamming risk can be a barrier to the community proper functioning. With regard to this theme, the on line CdP should:
- be equipped with an usable virtual space, easy-to-use, with tools at service of the participants (generically speaking "user friendly")
- work as a "Aladdin's lamp", in other words as an authoritative interlocutor that helps clarify the information that is reliable, valid, usable to propose different interpretations, etc.

It has been noted (by Umberto Eco, semiologist and writer) that the great difference between a papery encyclopaedia and Internet is the fact that the reader of the encyclopaedia is protected by the authors, who guarantee, thanks to their own authoritativeness, competence, etc., the validity and reliability of the information, while on Internet there is everything…
What a work to find reliable and guaranteed information !

2.4 The lonely crowd: or creating values with cooperative learning can be a motivation for sustainable use by the community members

The virtual space made available by the Internet makes it necessary for the users to take on board the concepts of technology as a simple manager of information and as *a tool for developing relationships* and a possible support for "social conversation" between peers who possess knowledge[11].

In fact, the virtual space in which the community manages its own interaction is an extremely dynamic space, in which any intervention can alter and change, recreating the interactive scenario outlined by the previous contributions[12]. Our virtual space (which may in fact be defined as cyberspace according to Castell's approach) is a space of flows and not of places, flows which are activated at the moment of their fruition, overcoming the time link of the events referred to.
The flows take the form of content, whether they consist of Web pages or are messages in the virtual community, newsgroups, chatrooms, etc. These are thus the outcome of an operation of continuous negotiation and redefinition, which is like the construction of a mosaic which the individual is making for his own pleasure or on the basis of specific requirements.
To conclude, interaction in our virtual space can be referred to two main levels[13]:

- an **informative dimension**, which consists of the individual access to the information content;
- a **participatory dimension**, which consists of the wish to interact between individuals who have taken similar routes when navigating the network, when looking for specific content and thus sharing a symbolic heritage of activities and meanings.

The integration of the two levels gives rise to a community of learning, because in the "place of experience" virtual space, the information content and the interaction tool are carried out and balanced efficiently, promoting comparison between the members of the community in relation to the content.
Cooperation, working together through a subdivision of tasks and roles, is accompanied by an explicit wish to give value, or to create something new and different through a deliberate, structured process, which goes far beyond a simple exchange of information.

[11] Barret E., Text, ConText and HyperText, writing with and for the computer, Cambridge, 1988.
[12] Rossi P., L'interazione tra un'organizzazione ed una comunità virtuale: processi in atto e risvolti simbolici Iinteraction between an organization and a community of practice). Studi organizzativi, 2004.
[13] Micelli S., Imprese, reti e comunità virtuali (Business, networks and communities), Milano, 2000.

2.5 **E-identity:** does learning in a network **change the members of the community?** And if so, **how?**

Cooperative learning, as considered in the preceding paragraphs, was not "invented" with the arrival of telematic resources: this method of learning is already spoken of for craftsmen shops and professional studies and this "heritage" has provided the jumping off point for designing and organising methods for some on line teaching systems. However, while it is true that on-line cooperative learning is only one of the many ways of learning, it is also true that the use of remote technologies for communicating and learning radically transforms the perception of those taking part in the process, to the point where some analysts talk of a change of identity in those who take part in the virtual communities[14].

In fact, the adoption of a virtual space and interactive methods of interpersonal computing encourage the participants in the community of practice to rethink the very nature of cooperation, which is managed by measuring and integrating carefully technological aspects such as the choice of software, planning of environments, usability criteria, selection of synchronous and/or asynchronous systems, methodological aspects, such as the method of organising exchanges, aspects of context, such as time constraints, membership of the working organisation and aspects linked with the dynamics of the group emerging from the conversational dimensions. But we have to be cautious: only a part of these choices can be thought of previously, while the most part is object of negotiations between CoP members and result of their interaction.

2.6 **Learning with method: or the (many) variables to be considered when setting up a community of practice.**

Very roughly speaking, not to repeat what has already been said, the main variables should be remembered which, according to the literature (Schrage, 1999) constitute the **basic factors for the success of any form of cooperation and thus of cooperative learning** as well:

- the skills of the group members;
- a shared, understood objective;
- mutual trust and respect;
- the creation and handling of shared spaces;
- multiple forms of representation (for the creation of meaning);
- continuous communication (even if not constant);
- formal and informal environments;
- clear and accepted lines of responsibility (without restrictive confines);
- lack of any need for a physical presence;
- lack of any need for unanimous decision-making;
- selective use of people outside the group.

[14] Midoro V., Dalle comunità di pratica alle comunità di apprendimento virtuali (From communities of practices to virtual learning communities), Ortona, 2000.

3 Section Two: Methodological aspects

It may be appropriate, at this stage of the document, systematizing from a methodological point of view the reflections in the previous paragraphs. This will relate, in the first place, to some functional aspects and some basic characteristics of communities of practice; in the second place, attention will be focused mainly on the methods that can be adopted for monitoring the functioning of the community.

With regard to the functional aspects of the communities of practice, we will try to consider some elements which, as briefly seen in the preceding paragraphs, seem to be of vital importance.

3.1 Interactive dynamics

The interactive dynamic is one of the major differences between individual and collaborative learning: in fact, it is true that even processes based on cooperative learning can use materials and structured content intended to be used individually (a form for the description of a good practice can also be read in stand alone mode). But it is also true that the greater or lesser level of interactivity determines the choice of communication strategies as well as the conditions of applicability of the approach in question[15].
In fact, learning can take place in a network not only because the computers of the community members are connected to each other, but because there is an active network of inter-relationships which are functional in achieving a learning objective.

The community uses the technologies by variable means:

- it can use a "networked " or "mixed" learning environment remotely and physically, under the greater or lesser coordination of a "learning director";
- it can stimulate interactions between peers by means of socialisation of knowledge, problematic situations, solutions, activating processes of self-managed learning.

3.2 Voluntary nature of participation

Members of the community of practice are there because they have something to give and something to take, not because they're joining a club. As has already been seen, when taking part in a community, what is at stake is learning through the development of languages, habits, and culture. The major motivation is the desire to share knowledge and experience, perceiving this as a value for both the individual and the organisation.

It is for this reason that communities of practice are based on mutual trust and combine interdependence with loyalty among the participants, who are trustees of the organisation's skills and, as such, represent an important knowledge bank

3.3 The mutual commitment of the participants

The mutual commitment of the participants is linked with some relations (functional or other) which are set up between the members of the community. The relationships relate to the actions they have to carry out in cooperation (for example, identifying good practice) and which take place in conditions of mutual dependence, due to the fact that each member of the community recognises the work of the other members as important for the purpose of carrying out the common task. [16]

[15] Trentin G., Dalla formazione a distanza alle comunità di pratica attraverso l'apprendimento in rete (From distance learning to communities of practice through netork learning), Ortona, 2000.
[16] Wenger E., Communities of practice: learning, meaning and identity, Cambridge, 1998.

3.4 The common task

The task to be carried out in cooperation is handled via internal negotiation between the members of the community, who, for this purpose, agree the role of each and the way in which it is to be carried out. Efficient execution of the task requires all participants in the community to feel that it is their common task.

3.5 The common "repertoire"

This characteristic of the community relates to the objects and procedures used during the common work. In general, these are of two types: the materials, such as the study materials (e.g. practices, good and bad), the tools supporting use of technologies, and the products produced during the interaction, such as texts, hypertexts, web sites, projects, programs, etc. The second type relates to the technology supporting the community: this refers to the characteristics of the communication system measured by the computer and the languages and cultural codes used.

3.6 Right of reply

This is connected with the mutual respect and trust on which the relationships between the members of the community are based. The group is not a mere vessel for information, but a place (a virtual space) where information is prepared. Thus, the knowledge generated by the community is not subjective or objective but, thanks to the continuous interaction between the participants, becomes a "narrative" knowledge which promotes learning by its members and their organisations. [17]

3.7 Some fundamental critical variables

When considering the set of reflections put forward, we should pay special attention to some critical variables which are considered to be fundamental for the implementation and sustainability of a community of practice.
In fact, there are some conditions which are at the core of the capacity of a group of peers to learn effectively in cooperative mode; these are: time, motivation, and writing.

Time is probably the most critical variable, as it is often mentioned by members of communities of practice as one of the least available resources, which, however, plays a major part in conditioning the work of the group, restricting participation and assiduity and sometimes leading participants to withdraw. The time variable is linked with the virtual tool, which leaves great freedom in terms of access and organisation but which, having no coercive power in relation to the participants, leaves them exposed to the vicissitudes of their daily work. Participating actively in a community requires time to prepare thoughts, documentation, reflections and propose theories to be put forward to the other participants. Time is also linked with the possibility of concentrating, which is often difficult in objective logistic situations (working in “open space”) and due to the fact of working in a public context.

The limit placed by this variable can only be exceeded through the individual members of the community taking responsibility, which must, however, be supported and facilitated by the organisational structures of which they are a part. The hierarchical levels of responsibility in the organisation to which they belong must provide the participants with a sort of safety net - justification, to permit participation less subject to lack of time..

[17] Winograd T., Flores S., Understanding computer and Cognition, Norwood, 1994.

The variable represented by lack of time is closely connected with the **motivation** with which the members of the community face the task of dedicating space and attention to the work of the group. There can be no doubt that motivation must be strong and constant: in fact, in the case of on-line collaboration, an initial motivational base is difficult to find, because the significant task, sustained in time, is impeded, or one of the basic assumptions on which the community of practice, is denied. The level of participation, initially good, can be weakened by a lack of direct connection between the group discussions and the professional activity of the individual. In fact, some arguments may seem remote from day-to-day working practice and generate a form of detachment (if not a destructive, hostile attitude). Finally, it must be considered that the sense of community is not created when members "register" in the group, but is the outcome of a slow process (which, as has been seen, is to some extent fragile as well) of identification with the community, the common task, its values and meanings.
The motivational factor is not only linked with how to cultivate it and keep it alive: the object is relevant for the purposes of our discourse today as well, in other words the motivation to use the community (for learning purposes) the motivation to share (one's own knowledge), and the motivation to innovate (through variation in the previous knowledge and creation of new knowledge). [18]

The motivation variable is highly subjective and, as such, relates to delicate aspects of the psychology of the individual: working as a group and on line increases the requirements participants must meet in terms of flexibility, adaptability, mental openness, and being prepared to dialogue and share knowledge. Working to mature such characteristics can be one way of strengthening motivation; according to some, the idea should not be set aside of supporting motivation by instituting a reward system, not only and not so much in terms of tangible benefits, as of intangible aspects such as status.

Finally, the **writing** variable is of central importance, as the communities operate within the environment of Computer Communications, and messages are written and stay on line. In everyday professional life, writing follows linguistic formulae which are almost always standardised and tested, with short communications and content of an organisational and technical nature. The social dimension is compressed into standard formulae or is absent. This leads people to fear using communication on line, where whatever one writes may be analysed and criticised by one's peers.

In this case again, the individual needs to be supported, becoming habituated and stimulated to communicate freely his or her own ideas, theories and suggestions without fear and, above all, without ever renouncing expressing his or her own point of view.

[18] Ruta C.D., Turati C. Organizzare il knowledge management (Organizing knowledge management), Milano, 2002.

4 Monitoring a Community of Practice

With regard, however, to the methodological aspects linked with monitoring the activities of communities of practice, we start from a consideration as to what makes the community function, in other words the link between its members. Wenger identifies the link between the members of the community as two aspects: on one side, the fact of shared experience, and on the other, a passion for the shared task. As is obvious, passion is an exquisitely subjective characteristic, and monitoring it requires a mainly qualitative approach[19].

In the following paragraphs, we will consider two approaches to monitoring community of practices: one based on the Open and distance learning experience, the other focussed on the Social Network Analysis perspective. But before we go on considering these two methodologies, we'd better take note of the main topics in monitoring a community of practice.

Monitoring a communication process is perhaps nothing new, in view of the forms of monitoring and evaluation of the general communication processes taking place in the press and electronic media. However, our case is mainly represented by Computer Mediated Communication, which multiplies the number of variables to be observed, and consequently the number of choices to be made, such as timing out and levels of transparency.
In spite of this, there is an advantage over the forms of communication where there is a physical presence: the messages are written and deposited, and it is therefore possible to reconstruct a history of the contributions of the individuals and the activities of the community as a whole, which also lead to forms of adjustment by the coordinators, which cannot be conceived without data which come from systematic observation.

The monitoring of a community of practice can take into consideration aspects linked with quantitative variables: for example, the degree of participation can be estimated through calculation of the contacts of the individual participants. The quantitative data, however, do not have the purpose of measuring the functioning of the community mechanically, so much as to provide a support for formulating estimates on some variable which refer to qualitative aspects. In fact, the focus can be on some more qualitative aspects, such as the interpretation of the content of the messages and interaction, or the degree of sociality.

The most complete monitoring models take both aspects into consideration, also for a practical fact already evidenced: the quantification of interactions is not linked with a pure statistical exercise, but aims at underlining the progress of the discussion between the community members and the directions taken by the discussion. In other words, it can permit identification of critical points and moments of "failure" of communication, enabling the coordinators to take the appropriate steps to put this right.
The quantification of exchanges identifies the degree of interactivity and also the degree of interdependency of the various contributors; however, in addition to displaying the number of replies to a message, this says nothing about what happened during the discussion, for example, if and how a change has taken place in those taking part.

A. The ODL view.

Monitoring models developed within the context of Open and distance learning focus attention on aspects such as **profundity** and **breadth** of the discussion[20]. What exactly is meant by these terms?

[19] Wenger E., Communities of practice: The social Fabric of a Learning Organization, "Healthcare Forum Journal", 1996.
[20] Jones S. (a cura di), Doing Internet research: Critical issues and method for examining the Net. Sage Publications, 1999.

This model uses the term **profundity** to describe the calculation of the number of replies following an original message regarding one topic. This makes it possible to identify and weigh the interest generated by the argument, and the coordinators of the community have adopted communications strategies which can orient the discussion to this specific argument.

The **breadth** (or scope) is defined as the calculation of the number of direct replies produced by a given message. This indicates the capacity of the message to generate the collaborative construction of knowledge.

When moving between examination of the mainly quantitative and qualitative aspects, the focus moves to analysis of the types of message and, in general, the content of the exchanges between members of the community.

A proposal to classify the qualitative aspects relates to a method of quality analysis considering the interaction between the members of the community[21].
The method of approaching the interaction categories break down into three groups:

1. **the dimension of the discussion**; this can have five main aspects:
    - affirming and proposing arguments for discussion;
    - the tendency to accept or reject a form of authority;
    - the tendency to counter, discuss, or attack in a more or less critical manner;
    - the inclination to express attitudes of solidarity or of a relational nature;
    - the predisposition to action and the incentive to achieve objectives.

2. **the communication management dimension**, which distinguishes the prevalence of:
    - formal communication;
    - informal communication.

3. **the message perspective dimension**; which relates to the various possible communication typologies, for example:
    - socio-emotional communication;
    - conceptual communication;
    - task oriented communication.

Analysing the messages exchanged on the network through these dimensions, it is possible to consider the evolution in time of the virtual community, enucleating the main attitudes and most widespread communication typologies. These attitudes may be widely different, from a predisposition to hide one's presence (*lurkers*), to over exposure.
A possible classification, which is clearly not exhaustive but useful for hypothesising a taxonomy of attitudes, is the following:[22]

1. **participation with regard to the subject under discussion**; this is collaboration aiming at giving an opinion, a comment or a reaction to an argument put forward, without necessarily leading to a dialogue with the other members of the community;
2. **interactive participation, or participation relating to the flow of the discourse;** this is the reply to a contribution already seen by the community or connecting explicitly to another message to justify one's own;
3. **directive participation, or tending to maintain the discursive flow of the argument**; this is collaboration aimed at taking the discussion back to the main argument and keeping it there, and consists of taking a position of authority which is formal (the coordinator) or substantial;

[21] Calvani, A. Rotta M., Comunicazione e apprendimento in Internet. Didattica costruttivista online (Communication and leanrining in Internet. Constructivist didactic on line), Trento, 2000.
[22] Banzato M., Apprendere in rete. Modelli e strumenti per l'e-learning (Learning in networks: Models and tools for e-learning). Torino 2002.

4. **destructive participation or relating to different arguments**; in these two cases, the participants want more or less explicitly and manifestly to move the centre of the discussion or oppose the authority of the person who put forward the argument;
5. **abnormal or unexpected participation**; this is participation by someone collaborating in the discussion in an aggressive or insidious manner or entering a closed forum casually.

A.1 Operative elements for monitoring the community of practice[23]

Here we propose some operative indications arising from practical experience: the monitoring activity on a community of training professionals collaborating remotely through a discussion forum on topics related to the professional profiles of trainers, such as the training processes for trainers, informal learning, teacher support actions, actions in support of professionals.

The outline given to the monitoring activity, in view of the need to have a complete representation of the functioning and learning ability of the community, has considered both quantitative variables and more qualitative dimensions. With regard to quantitative analysis, the variables which can be considered relate to the calculation of the total number of messages, the total number of contributions per participant, with distribution focusing on any sub-environments where the main discussion is structured.

The qualitative analysis, however, can be unfolded in three main dimensions:

1. the **function** of the message within the flow of the community's communications; this function can have the following values:

- **informative** function; for example, descriptive message, report, etc.
- **regulating** function; for example giving instructions and/or directives;
- **persuasive** function; for example argumentation designed to convince;
- **expressive** function; for example states of mind or mood.

2. the **relationship** the message wants to set up, which may be:

- **confidential**;
- **conciliatory;**
- **critical**;
- **collaborative**.

3. The **content** of the message, in other words its contribution to the development of the discussion and to the learning of the community. This can be:

- **constructive**, designed to develop an idea which is already present in the discussion;
- **explanatory**, designed to give the motivations for a given point of view;
- **exploratory**, designed to request or develop hypotheses;
- **propositional**, designed to make proposals.

The messages are read in the light of the three categories designed above. The outcome of this reading shows whether or not the description given to the work of the community is correct and provides information for the realignment of the process. In particular, information on the presence of critical or aggressive behaviour is of interest as is, more generally, the “conflict dimension” of the collaboration.

[23] These operative elements are taken from an intervention of Cinzia Dal Santo (Studio Eidos of Vicenza), during the workshop “Monitoring and evaluation as support to training and development actions”, November 2003, within the context of an ESF project funded by the Veneto Region

In addition, the presence or absence of affective tones by members of the community is of interest (these can be identified in the presence in the messages of personal references, witticisms, or emotive icons).
Information on the role of the coordinators and the collaborative behaviour is vital for management of the community. In the former case, coordinators need to understand what will impel the participants to be active and what the moderators must do, or to summarising the various points of view.
In the second case it is important to understand to what extent the members of the community (individually and as a group) have a favourable, active attitude to the collaboration. In fact, this means understanding whether the community is successful and whether there are conditions for effective cooperative learning.

B. The Social network analysis approach.

Our second approach has been developed within the context of the social network analysis. According to this perspective, the virtual communities may be considered as social networks in which everyone represents a network node and the links show the relationships or the communicative flows among the people.
To study these communicative and relational flows within the on line communities it can result particularly effective the Social Network Analysis approach (Mazzoni, 2004[24]).

The Social Network Analysis (SNA) consists in the mapping and measuring of the relationships and the communication flows among people, groups, organizations, computers and other information/knowledge processing entities (Krebs, 2002[25]).
The SNA is born within the structuralist anthropology (the Manchester school of Gluckman and Mitchel) and the Lewin sociology and it develops in the last 20 years in sociology and in the studies on the communication when it meets the "graph theory" (Tateo, 2004[26]).
In this theoretical model the social world is considered as a net of exchanges of information among the actors, whose configurations constitute the different typologies of group.
For a long time the social nets analysis is been applied to the study of the CMC. Particularly, the SNA is considered useful for studying the communities of great dimensions.
As we told before, online communities can assume different typologies: the SNA allows to gather its characteristic structure by the analysis of the models of relationship and interaction among its members.
Equally the SNA can be used "as a powerful diagnostic tool" to evaluate in real time the dynamics within a community, to verify *in itinere* the correspondence with the design aims, "to understand the lack of connections among groups that should have it, to underline the improvement hints to accelerate the knowledge and information flows, to recognize team and individuals that play the central roles (the guides, the experts, the mediators, etc.), to identify team or individuals that are apart from others, to discover the bottle necks that stop the information circulation", etc. (Benzi, 2004[27]).

For these reasons, according to interesting and recent studies on the online communities monitoring and evaluation (Aviv and to the., 2003; Martinez and to the., 2002, 2003; Palonen and Hakkarainen, 2000; Tateo, 2004; Mazzoni, 2004; Mazzoni, Calvani, Thin, Bonaiuti, 2004[28])

[24] Mazzoni E. (2004) Tools for a quantitative approach to the study of interactions. Form@re, 27.

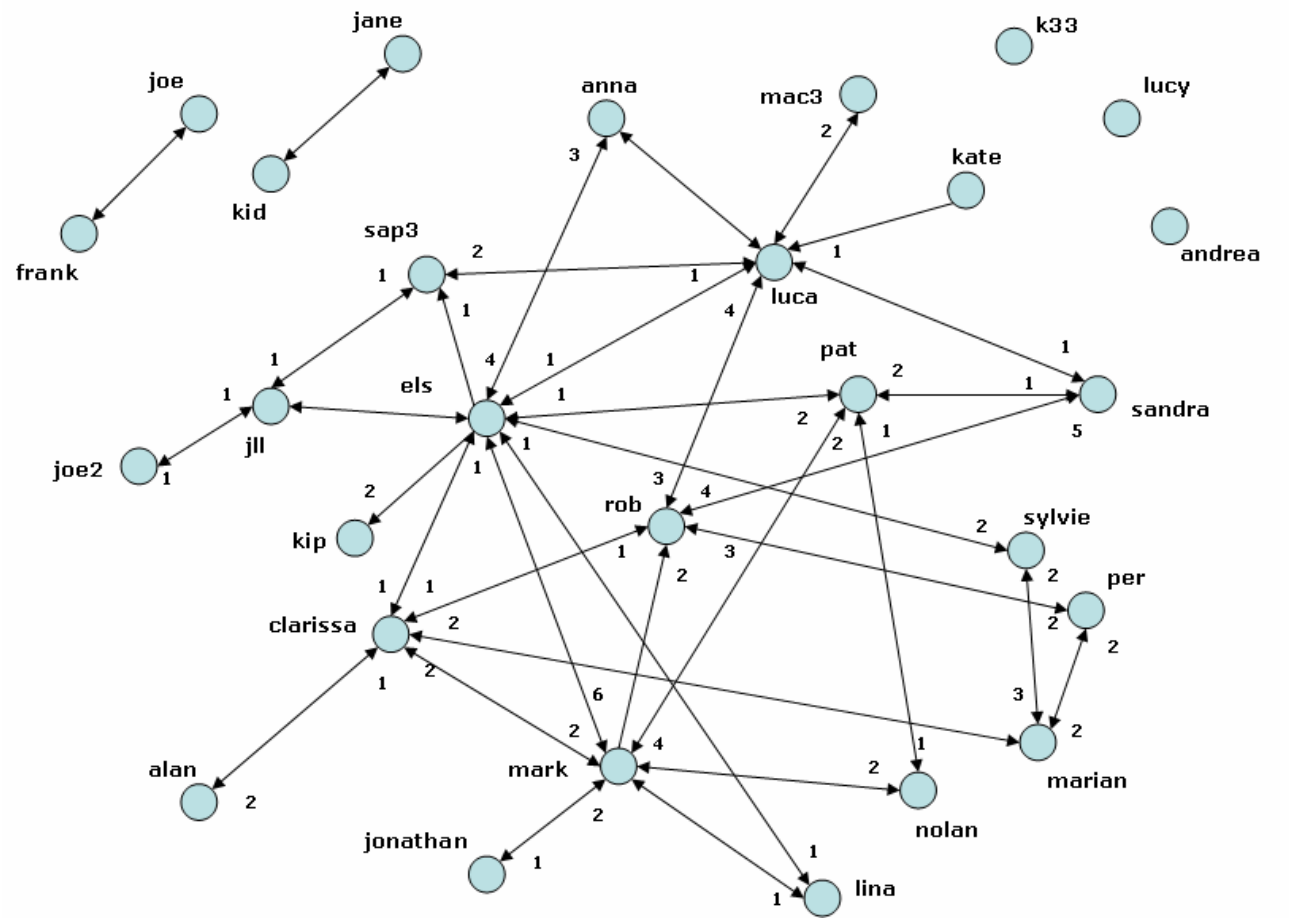
[25] Krebs V. (2000) The Social Life of Routers. Applying Knowledge of Human Networks to the Design of Computer Networks. The Internet protocol journal, Volume 3, Number 4, pp 14-25

[26] Tateo L. (2004) Structure of relations and reasoning content of messages in computer mediated communication . Form@re

[27] Benzi M. (2004) Introduction to Social network Analysis. e-Organization

[28] Mazzoni E., Calvani A., Fini A., Bonaiuti G. (2004) Representing through Social Network Analysis interactions of co-operational networks strong and weak points. Unpublished.

we would like here to propose an approach that integrates the SNA with messages qualitative analysis methodologies[29].
The SNA is focused on the relationships among the people, rather than on the single individuals characteristics.
Departing from the quantitative data on the interactions (sent messages, received messages, answers to messages, etc.), it is possible to build a matrix that allows to graphically represent the social net of a virtual community.

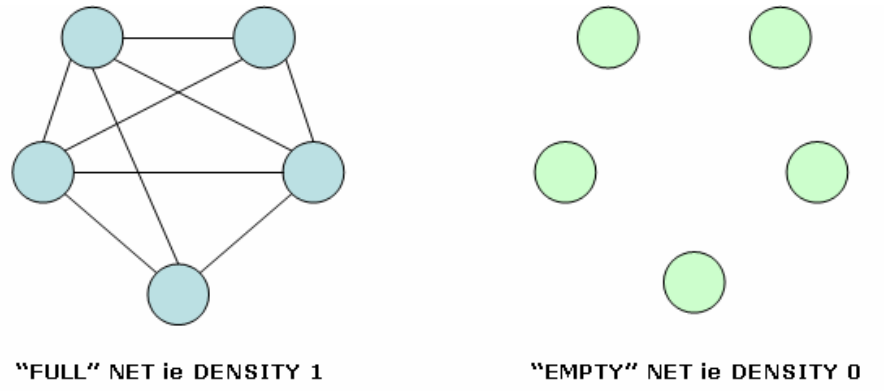


A virtual community graph example (from Mazzoni, 2004 - Software: NetMiner)

Through the SNA it's possible to analyse the different community structural characteristics, among which we remember:
- Inclusiveness (number points included in the various parts connected of the graph) - It points out the percentage of subjects that participate in the interactions: the highest value (100%) shows that all the group members interacted with the others and there are not isolated subjects.

- Density (general level of the links among the graph points) - It describes the general level of connection among the community members; an high value shows that every subject has interacted with everybody or almost all the others, while a rather low index points out that some people have interacted in selective way with determined subjects and not with others.

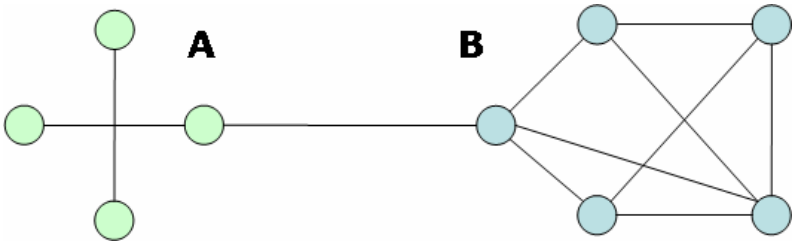
[29] The SNA operative examples are taken from the Elvis Mazzoni researches (University of Bologna- Italy) on the Psychology Students Web Forum, edited in Strumenti per un approccio quantitativo allo studio delle interazioni. Form@re, 27, 2004.



Full or empty density community graph example (Soda, 1998)

- Cohesion – It indicate the presence of subgroups in which a community can be divided.

- Connectivity (relationships frequency and extension) - It shows the "to work together" ability of a network and its vulnerability; a low value points out that the interactions among the members are weak (and the vulnerability is high) and that the community risks to break up when some subjects (that play the "bridges" or go-between role) cannot participate anymore or when some interactions among subjects are interrupted.



A low connectivity and high vulnerability group example: if A or B are eliminated or the communication among them is interrupted, two subgroups that don't communicate remain.

- Centralization (the set of the graph central points) - It describes the community actors that have a leading or central position; it shows the community type of leadership and collaboration (equal, subordinate, alternate, etc.).

These indexes need a series of mathematical calculations but there are also software (Cyram NetMiner, Ucinet, Multinet, Negopy, Gradap…) that allow to quickly have the graphic visualization of the social network of the online community activities and the fundamental parameters calculation.
These analyses should be integrated and eventually reread or corrected with the results of the processes communication qualitative monitoring.

5 Conclusions and index of the report

Part to be implemented after the contributions from practitioners and experts interviewed.