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New e-Learning Environments: e-Merging Networks in the Relational Society

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1. Introduction

It was only a few seasons ago that explorations into the remote frontiers of the e-learning field invited venturing into *blended learning*, *mobile learning*, *networked learning* or maybe into *complex adaptable e-learning systems*, if we were really adventurous learning technologists. Web 2.0 culture artefacts and other technology-based options were made available to integrate them into our regular practice: instant messaging and blogging, Yahoo® Groups, professional or social network memberships or Skype® video-conferencing on one hand. Radio chat broadcastings, *SharePoint® Docs*, purpose-built forums within on-line communities, or regular webinars on the other. Any of them would seemingly increase our sense of learning and connectivity. However, just a season later, with *Second Life®* and other like-environments, we joined Manuel Castells (Castells, 2004) and others in witnessing the *Rise of the Network Society*, as well as a relentless shift from the knowledge-based societies into *relational-based economies and societies* (Allen, et.al., 2009).

Today, in the realities of the web 3.0, as e-learning practitioners, we seek to actively converge for collaborative learning in groups and organisations that evoke the networked community metaphor in a number of shapes and colours. As learning professionals, we are now dealing with intriguing learning environments: *edupunk*, expanded education, lifelong learning, *edupop*, incidental learning, and ubiquitous learning, seemingly sample versions of emerging environments such as *invisible learning* (Cobo & Moravec, 2011).

In such intriguing context, the first part of this chapter attempts a literature review on how different forms of networks, (linked to knowledge for community development) map out the nature, development and impact of collective knowledge, also known as *societal knowledge* (Tuomi, 2007, Huysman & Wulf, 2005; Huysman & de Witt, 2004; Dvir & Pasher, 2004; Engestrom, 2004). In the second part of the chapter knowledge-creation is highlighted as a knowledge-based development practice in distinct networked settings, such as knowledge networks, networks of practice (NoPs) or even networked virtual cities, in which social knowledge facilitation is fostered. By means of characterizing those emerging actors and territories, this chapter will include exploring spaces for conversations where “there is a convergence between the ‘sciences of development’ and the ‘sciences of knowledge’ as together, they refer to the whole domain of human experience and potential”. (Carrillo, 2002:384). In the third part of the chapter, this approach will be followed by a deeper inquiry on the role of networked practices, on how they add value to the social capital of members,

communities and regions through access negotiation, autonomy and participation (Wasko & Faraj, 2008, Cox, 2007, Monge & Contractor, 2003, Brown & Duguid, 2000, Augier and Vendelo, 1999).

2. Meaning construction and connectivity in e-merging contexts

Indeed, our present societies are powerfully shaped by the presence (and/or absence) of on-line, self-paced development processes. We clearly keep building multi-cultural, multi-ideological information highways. By doing so, we are seemingly shaping our globe into a world of parallel systems of meaning (Toumi, 2004). In this multi-meaning universe, the emerging societies in different parts of our world are increasingly depending on international links and networks to live on: their communication activities become critically important in the social construction of communities that learn (Tuomi, 2004). In these emerging societies, our culture-led communication artefacts and culturally-based arrangements such as technologies, information systems and connection infrastructures are intending to make our communication activities more intense and more relevant to others. At the same time, access to meaningful communication (or the lack of it) is shaping our self-perceptions as individuals; and our perceptions about other humans, cultures, and value systems in many ways. Hence, our unconventional exchanges of information, knowledge and experiences over the Internet are becoming permanent and personal processes of meaning negotiation. Message significance depends on who and where are the users at the moment of interaction. This meaning negotiation is the new reality of e-learning environments and Internet-based interactions happening world-wide on a 24/7 basis: an increasing flow of continuous and creative interaction.

At the core of this complex makeover of the social, economic and technical sub-systems, sits the system of learning on which each of our societies rely on. Our systems of learning are historical societal structures now seemingly developing into systems of meaning creation (Tuomi, 2004). Indeed, the learning systems in our societies appear to be challenged by the power of networked communication with varying levels of intensity. More than an information revolution, the new millennium has openly confronted us with a learning revolution (Sloman, 2001). Intranets, virtual communities and e-learning are seemingly only the tip of a gigantic iceberg in this emerging revolution. Predictably, given the emphasis of communication in meaning-creation processes, information and communication technologies (ICTs) in such models are indeed playing a major role in the system of learning of emerging knowledge-based societies, or k-societies.

On the other hand, a key assumption of (strong) connectivity, knowledge-intensive learning environments is that the more social interactions elicited, the more meaningful the learning experience would be. Therefore communication activities in these environments become critically important in the social construction of communities that learn (Tuomi, 2004a:1). In these emerging models, the support of information and communication technologies (ICTs), information systems and connection infrastructures are required to make our interactions more intense and more relevant to others, beyond the regional frontiers.

Connectivity has been defined by some scholars as: “a process by which individuals are in a continuous flow of communication by means of a networked computer and are able and willing to share information for learning purposes” (Sloman, 2001:4, Wasko & Faraj, 2008,

Cox, 2007, Monge & Contractor, 2003, Brown and Duguid, 2002, Augier & Vendelo, 1999). In this working definition, the connectivity processes are seemingly determined by the intensity of the flow of information coming to and from each practitioners' interactions as part of a network. However, it has been Barabasi's (Barabasi, 2002) seminal *Theory of Networks* that has influenced recent views on networks for research purposes. Barabasi's portrait of Internet as a collection of sub-networks, one of which is the World Wide Web which has been the basis for distributed learning models and the development of network-based learning and knowledge-creation. For Barabasi, a network is a number of nodes (in our case, practitioners able to access a personal computer in the workplace) linked or connected to one or more nodes (other practitioners and/or learners) in order to exchange information, which constitute "the very nature of the fabric of most complex systems" (Barabasi, 2002:222). Some *Theory of Networks* derivations imply that humans act as nodes, or take part of a de-humanised system of knowledge-creation. Although this has been widely critiqued in e-learning circles (Delargy and Lethany, 2005; Servage, 2005; Garrison and Anderson, 2003; Salmon, 2000, Paloff & Pratt, 1999), this *Theory of Networks* has brought a common ground for e-learning as a knowledge-creation process, thought not to occur in isolation. Learning is hence perceived as a collective product in a network. And it can thus be defined as the "resulting knowledge created through the interactions with other individuals or groups in an body or organization" (Jones, 2004b). Learning, (although a very personal matter) must never be an individual matter" (...) one learns best by and with others" (Sumner, 2000:272). For this reason, the basis of networked learning is communication, "characterised as the degree of 'noise' accepted by the host institution. The more communication there is with and amongst the learners, the more noise there is in the system: "that noise is the sound of people coming together to learn" (Sumner, 2000:272). Such considerations are critical to shed some light into the practice of learning that is technology-mediated, adult-targeted and delivered in emerging structures generally known as networks.

3. The theory: knowledge-based networks and the relational society

However, research on networks of social nature has been traced out from Henry Fayol's work, a French mining engineer and director of mines who developed a general theory of business administration. In 1916 he published his experience in the book *Administration Industrielle et Générale*, where he promotes a team spirit to build harmony and unity within the organisation. He called it *Esprit de Corps* (body spirit). This principle is thought to have triggered research on organisational network structures. More recently, the discussion of team-based network structures in management literature has been influenced above all by the research of Peter Drucker (Drucker, 1989), Charles Savage (Savage, 1990), and new millennial scholars like Seufert (Seufert, 1999) and Brown & Duguid (Brown & Duguid, 2002).

From this view, the term *network* designates a social relationship between actors. Actors in a social network can be persons, groups, but also collectives in the form of clusters, institutions, communities or even societies (Seufert et al., 1999). Networks are determined by *contents* (e.g., products or services, information, emotions), *form* (e.g., duration and closeness of the relationship) and *intensity* (e.g., communication-frequency). It is thought that form and intensity of network relationships establish the network structure (Burt, 2000). Moreover, the relationships between the actors are founded upon personal-organizational or technical-institutional interconnections on a long-term basis (Seufert et al., 1999). Network

members' relationships stem from their individual autonomy and interdependence, their tensions between cooperation and competition as well as reciprocity and stability. Clearly, "boundaries are constructed socially by the network members" (Seufert, et.al., 2003).

Like Barabasi's view of internet, networks of a social nature disregard the usual tacit social norms and boundaries and even change them (Servage, 2005:304). Thus they convey a characteristic of network-based learning experiences, which assume equal power relations amongst participants (Bottrup, 2005:514). From this perspective, active participation in a network is regarded as a learning activity comparable to intense training and development courses at the workplace (Bottrup, 2005:508). These concepts are particularly advantageous when the workplace is a knowledge-intensive environment (from universities and research centres, to innovation clusters or government social projects etc.), where complex learning networks are already an embedded tradition of the workplace, and the analysis of formal and informal networks of learning becomes a complex, multi-layered task.

3.1 Knowledge networks

Indeed, in recent years a number of scholars have attempted to define the elements and characteristics of *Networks*, especially those who add value to the social capital of organisations. For instance, Monge & Contractor (Monge & Contractor, 2003), suggest three kinds of value-adding, on-line networks for learning, of which, for the purposes of this chapter the third category of networks is highlighted:

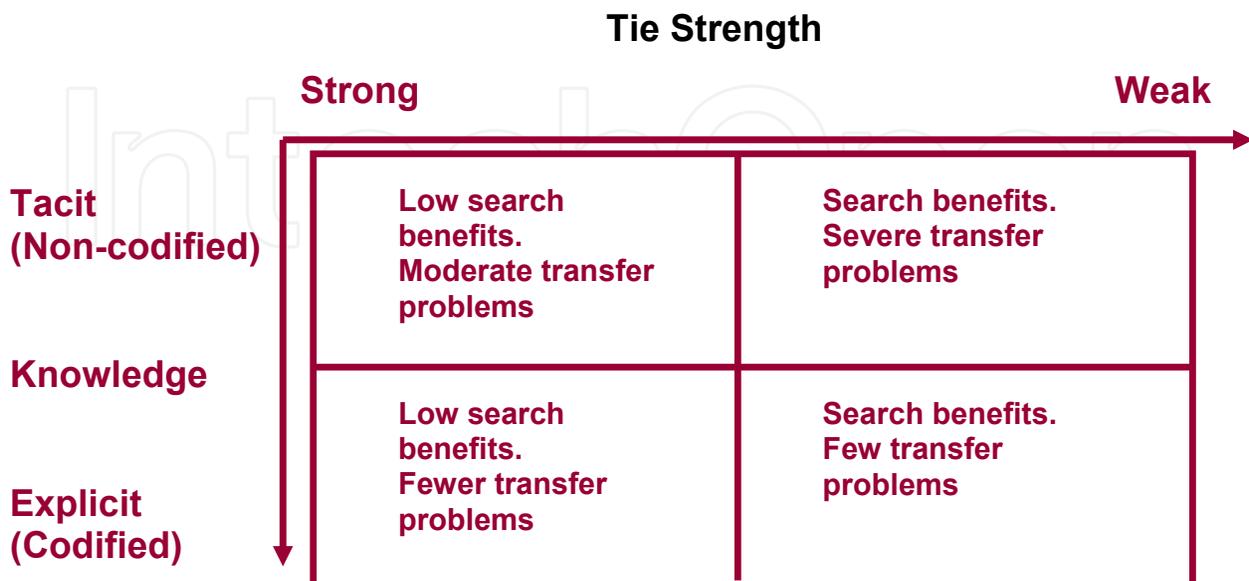
Social Knowledge Networks. Its not who you know, its what they think you know. These networks are created by relationships between people who discover each other through their own knowledge (content, projects, comments, questions, answers): not just "social" information ("who knows what?" instead of the "who knows who") of the typical online social network services. These networks are also known as user-generated networks.

(Monge & Contractor, 2003).

Seemingly, *Social Knowledge networks* are overcoming typical on-line barriers of meaning construction by generating a common theoretical base and language of exchange amongst its users. Indeed, user-friendly, internet-based networking technologies have accelerated the development of new forms of exchange: open and public technologies have enabled the creation of strong networked communities, and "virtual" networks by underlining the role of shared community repositories (documents, databases, research outputs) that enable the network to generate a common language or practice.

Social Knowledge networks are also defined by different degrees of knowledge transfer capabilities. Hansen (1999) found that weak ties help a sub-network search for useful knowledge in other sub-network, but impede the transfer of tacit knowledge, which requires strong ties between the two parties to an effective transfer (see Figure 1). Strong ties are defined by *bonding, bridging and linking social capital*. Bonding social capital refers to the intra-community ties within relatively homogeneous groups (family and ethnic group, amongst others), in which members can depend on in situations of need. Bonding social capital helps build group cohesiveness and a sense of shared goals Bridging social capital refers to the inter-community ties between individuals and groups, which cross social divides, such as ethnicity, gender and socio-economic status. Although these are unlikely to

be as strong as the intra-community ties, it would seem that a combination of both is required for individuals to “transcend their communities and join the economic mainstream” (Granovetter, 1995).



Source: Adapted from Hansen, 1989, in Augier and Vandelo (1999).

Fig. 1. Network Strength

Linking social capital or embeddedness, for some authors (Taylor, et.al. 2004), refers to the nature and extend of the ties connecting the civil and political spheres (Taylor, et.al., 2004:228) and/or the relations between individuals and groups in vertical, hierarchical or power-based relationships (Healy, 2002:79). The concept of embeddedness reflects a relatively horizontal distribution of power relations that fosters mutual trust and cooperative norms between citizens and the state (Wallis and Killerby, 2004:250). Strong ties seemingly allow for face-to-face interaction between the two parties involved in the transfer, and thus the richness of the media used for the knowledge transfer is high and better suited for transfer of tacit knowledge (Augier & Vendelo, 1999).

Nevertheless, according to Hansen, (after Granovetter, 1973) distant and infrequent relationships, i.e. weak ties, are highly efficient for knowledge sharing because they give access to novel information by bridging otherwise disconnected groups and individuals in organizations. Surprisingly enough, opposite strong ties are likely to provide redundant information as they often exist among a small group of actors in which everyone knows what the others know (Hansen, 1999, p. 83).

3.2 Networks of practice

On the other hand, Knowledge-based Development (KBD) and associated disciplines had foreseen the use of networks throughout further different dimensions. The emerging networked forms of people-interaction converge around shared practices as they also share meaning and identity. However, “some of the more prevalent groups of theorists/practitioners are often not linked in concrete daily practices and are rarely physically co-present yet are capable of sharing

a great deal of knowledge based on similar experiences” (Kuhn, 2006:106). Brown and Duguid (2002:143) suggest that such groupings be termed “networks of practice” to signify that the relations among members are looser than in communities of practice (Kuhn, 2006:107). Consequently, NoPs appear as on-line systems “distributed in space whose interaction is intermittent, semi-public” (Cox, 2007:766), while a community of practice (CoP) is mostly a face-to-face group with a common sense of purpose nested within a larger network. Such network can take the shape of a *network of practice* (NoP) (Kuhn, 2006) or a *constellation of practice* (Wenger, 1998:126-33). Hence, a working definition for a *Network of Practice* (NoP) as another kind of value-adding, on-line networks has been advanced, since

Networks of Practice. are a community form of fast knowledge diffusion and assimilation over a wide network of Communities of Practice (CoPs) for the creation of new knowledge and meaning. This kind of on-line learning approach also provides a home for the identities of the members through the engagement in the combination of new types of knowledge and the maintenance of a stored body of collective knowledge.

Brown and Duguid, (2000).

In CoPs, learning is generally situated and therefore the local context is essential to construct the meaning of such interactions. While an on-line environment can arguably support situated learning (Lave and Wenger, 1991), the kind of exchange reached within a *Network of Practice* (NoP) is seemingly overcoming typical on-line barriers of meaning construction by generating a common theoretical base and language of exchange. This kind of on-line learning approach also provides a home for the identities of the members through the engagement in the combination of new types of knowledge and the maintenance of a stored body of collective knowledge. NoPs can seemingly overcome the constraints posed by situational learning by establishing ground for common understanding. To this respect, Wenger (1998) has later proposed a learning-in-a-network model within the social community as a *constellation* of interrelated (networked) CoPs, while Brown and Duguid (1991) have introduced notions of *Surrounding Knowledge-ecology systems*. In any case, the Networks of Practice (NoP) are seemingly developing a stronger ability than CoPs that allows the transfer of knowledge and the facilitation of learning through social links.

Molly Wasko and Samer Faraj have also advanced that a NoP is similar to a community of practice (CoP) in that “it is a social space where individuals working on similar problems self-organize to help each other and share perspectives about their practice”. However, in a network of practice, “people work within occupations; or having similar interests, they congregate electronically to engage in knowledge exchange about the problems and issues common to their shared practice” regardless of distance and situational spaces. (Wasko & Faraj, 2008:4). Moreover, differences between NoPs and CoPs rest in that most networks of practice rely on electronic communication. NoPs exist beyond a common organizational environment or physical space. In them, NoP members “have the ability to reach everyone in the network, while a CoP is defined by localized tight-knit relationships” (Wasko & Faraj, 2008:4). Clearly, NoPs do not share the material and social context that is typical of CoPs (Brown & Duguid, 2001). In a NoP, “their members do not interact directly and do not share practices per se, and yet they are connected to each other” (Vaast, 2004). Rather, NoPs appear as open systems that emerge spontaneously, “by sheer will of its members and whose eagerness to collaborate, learn and create knowledge together increases with time” (Cox, 2007).

3.3 e-knowledge cities

A third kind of value-adding, on-line networks in the wider social context, (still a matter of debate and contestation) involves the essence of a comprehensive and socially constructed human (individual and collective) capital definition. It is commonly known as Social Capital. Amongst the definitions built around this concept, the OECD Report on *The Well-being of Nations: The Role of Human and Social Capital* has defined human (collective) capital as “the total of social networks together with shared norms, values and understandings that facilitate cooperation within or amongst groups” (OECD Report, 2001, in Healy, 2002:78). In this context, social capital is thus “a metaphor about advantage” and the contextual complement of human capital (Burt, 2000:3). Human capital is perceived a close complement of social capital. (Healy, 2002:78).

Yet, *Social Capital* concepts find their conceptual roots in political science and sociology. In their comprehensive literature review on the evolution of social capital conceptualisations, Marleen Huysman and Volker Wulf (2005) propose a working definition for social capital, adopted here for the purposes of this paper:

It refers to networked ties of goodwill, mutual support, shared language, shared norms, social trust and a sense of mutual obligation that people can derive from. Social capital is about value gained from being a member of a network. Social capital is often seen as the glue that brings and holds communities together.

(Huysman and Wulf, 2005:2).

Such definition is the result of years of collective action. The first systematic contemporary analysis of social capital was produced by Pierre Bourdieu, who saw it as a durable network of relationships (1980, in Portes, 1998:3). But it was Granovetter in 1985, (in Huysman and Wulf, 2005) the one who introduced the concept of *embeddedness* of social action, bringing the element of *trust* into the scene. Also, on a theoretical level, Coleman (1988), Burt (1992) and Portes (1998) have provided key contributions to the discussions on human capital and its relation to social capital. Later, it is Putnam (1993) the one who brings social capital to the level of civic engagement, and applies it to cities, regions and whole nations. Social entities, especially cities, are more pre-eminent in the analysis of learning, and we witness the emergence of learning city and knowledge city (KC) knowledge-based models, with integrative and global aspirations. Social capital becomes the prevalence of the network, through which information and knowledge are transmitted more efficiently (Halal, 2005:13).

In this context, cities are taking a leading role as units of analysis, and are re-defined by their history, cities take a leading role and are re-defined by their history, their experience and their level of development. As for individuals, all of these constitute the cities' identity, and the way its citizenship use knowledge to build their infrastructure, their institutions and their future. In the process, most of them are also building knowledge repositories or “depots” of information and “know-how” strategies from which they can withdraw elements of creativity to thrive in challenging times. Seemingly, in a knowledge-based urban community ‘people link to form knowledge-based extended networks to achieve strategic goals, cultivate innovation and successfully respond to rapidly changing conditions’. (Chatzkel, 2004:62).

In emerging knowledge-based development contexts, a new way of conducting innovation is already operating, quasi-independently of the current money system: its chief requirements

are things like time, imagination, knowledge, initiative and trust, with money moving from primary to secondary concern (Paquet, 2010).

Hence, a qualitative change in us as individuals has taken place: we are driven by a fundamental division between the self and the net (Castells, 2004) and is constituted not so much by any notion of identity, but rather of *dividuals*: “we are made up of multiple micro-publics, sharing tele-presence with intimates with whom we are in near-constant contact” (Deleuze in Varnelis, 2010). Not surprisingly, emerging sorts of agents, networks and also cities are progressively finding a place in these new scenarios. For instance, our well known *knowledge worker* (Drucker, 1973) later diversified into prototypes of the *knowledge facilitator* (in Garcia, 2007) has been identified in the relationship economy as a *knowmad*, a type of nomadic knowledge worker (Durrant, 2010, Moravec, 2008). *Knowmads* are thought to be creative, imaginative, and innovative people who can work with almost anybody, anytime, and anywhere, able to instantly reconfigure their social learning environment (Durrant, 2010). They are also active first-rate knowledge network weavers (Paquet, 2010). But most importantly, they take part in networks that are bringing about “emerging cognitive infrastructure, in the shape of multitude of *virtual cities*”; these *cities* will “bring together people with shared values and orientations towards the future, and who are in a position to collaborate to bring something new into the world” (Paquet, 2010). indeed, spaces such as these in which people live, work and learn (Garcia, 2007), are uncharted territories worth exploring in the next paragraphs.

4. Networked practice: new learning environments and actors

At the core of this complex makeover of the social, economic and technical sub-systems, sits the system of learning on which each of our societies rely on. Our systems of learning are historical societal structures now seemingly developing into systems of meaning creation (Tuomi, 2004a:2). A key assumption of (strong) connectivity, knowledge-generating environments is that the more social interactions elicited, the more meaningful the knowledge experience would be. Therefore communication activities in these environments become critically important in the social construction of communities that learn (Tuomi, 2004). For this matter, it can be advanced that a full-color collage of ideas and trends is arising in the e-learning front. Edupunk, expanded education, lifelong learning, edupop, incidental learning, and ubiquitous learning are explored –each of them as an invitation, from very different perspectives, to explore patterns of learning that are more flexible, innovative and creative. Learning is available anytime and anywhere.

4.1 Telecentres as knowledge networks, by Telecentre operators agency

It is only recently that the humble community access points, or *telecentres* have been deemed as the core starting point to develop *Knowledge Hubs* into *Knowledge Networks*.

The first *telecottages* were established in Scandinavia and community technology centres (CTC) were established in the US (Ariyabandu, 2009). According to Molnár and Karvalics (2001), the first community technical centre was opened in Harlem, USA, in 1983, with the primary aim of bridging the growing digital divide between the upper and lower levels of society. CTCs offered free access to technologies and placed great emphasis on training at

low cost. This same idea of creating places where the members of a community could access Information and Communication Technologies (ICT) was also followed in 1985 in the villages of Vemdalen and Harjedalen in Sweden (Molnár and Karvalics 2001). From these beginnings, two basic telecentre models can be identified: a) the Scandinavian model with the social aim of connecting the rural and village societies thus supporting their development, and b) the more profit-oriented Anglo-Saxon model, providing long-term access to the ICT devices primarily aiming at profit production (Rega, 2010).

However, since *telecentre* is a generic term which has acquired variety of names depending on the type of use (they could range from Multipurpose Community Telecentres, Community Tele- Services Centres, Community Information Centres, Community Learning Centres Telekiosk, Telecottages, etc.). Hence a working definition of telecentre could be

A public ICT access point with value-adding knowledge, training, and services to support its community's economic, social and educational development, reducing isolation, promoting education, employment, health and like services, empowering women and bridging the digital, economic, social and gender divides that polarize our societies

(adapted from Ariyabandu, 2009:10).

As telecentres are transformed into a more development-oriented version of knowledge networks, their *Knowledge-hub* potential becomes the key intermediate step between common telecentres and *Knowledge networks*, as emerging actors in the regional development scenario. A conventional knowledge hub can be described as:

A vibrant public ICT access point which is accessible to communities to gain, share and organize knowledge depending on their needs and environment.

(adapted from ESCAP 2006, in Ariyabandu, 2009:10).

In a knowledge-based scenario, *Knowledge hubs* can localize knowledge gained from peer ICT-based access points in other regions and serve their community. They could also contribute to creating knowledge by providing experience gained from the local communities to the benefit of the global networks at large. Indeed, knowledge networks, as knowledge hubs, are thought to trigger many other knowledge functions such as education, employment, agriculture and health besides providing conventional ICT facilities to bridge the digital divide. It is thus thought that rural/marginal community empowerment can be attained if the community is provided with access to information and knowledge to improve its livelihood and seek for sustainable development. However, such process involves the emergence of new partnerships, governance structures, participation and business plans. Such partnership dynamics could capture and manage relevant information, and eventually generate more knowledge from the fragmented and otherwise lost collective knowledge of communities.

However, it was deemed important to identify who are the actors behind potentially transforming Telecentres into Knowledge Hubs and Knowledge Networks, focusing on e-Learning elicitation and skill development for Telecentre operators. In the Latin American context, telecentre users' efficiency such as gathering information, managing relevant information, and generating knowledge they can actually apply, are highly intangible issues yet to be explored (Huerta, 2007). Nevertheless, the presence of telecentres in the region since the mid to late nineties left a rich heritage for networking and a form of knowledge-based networks. Some of them have since disappeared; new ones emerge and others continue to

work and have become part of an active community fostered and supported by www.telecentre.org (Caicedo, 2009). In Colombia, for instance, the Colombian National Telecentre Network led by Colnodo is “on its way to becoming a sustainable initiative that will offer continuous support to telecentres in Colombia and the region” (Caicedo, 2009). Of a special note amongst such success stories of Colombian telecentres is CINARA’s knowledge network dealing with Water Supply, Environmental Sanitation and Water Resources Conservation in hydric stressed areas such as the Alta Guajira near the Atlantic coastal border (Latorre, 2010). This particular group is benefiting from telecentres’ networked technologies to facilitate and build permanent focus groups that include local government institutions, private sector and hydric-stressed communities. Also a skills development process was triggered by participatory research within the community, in which the indigenous knowledge was re-valued. Telecentre operators strived to generate a network in which partnerships were built, horizontal relationships were created and participation was the articulating principle of the whole project. As they work in consultation teams, solutions to the communities’ acute lack of water emerge as they follow principles of knowledge-based development initiatives that are environment-friendly and people-centred (Latorre, 2009).

From this perspective, it is of extreme importance that Telecentre operators become efficient e-learners and dominate the theoretical aspects of the cognitive e-learning process (learning as knowledge creation), so they are able to lead users to their next level of e-learning capabilities. If operators are not familiarized with learning processes, “they would be unable to support or guide his/her users correctly or will not be able to offer learning options to trigger significant learning amongst the Telecentre users” (Flores, 2005:47). Researchers in the Latin American region perceive Telecentres as an optimal context for well trained promoters, suitably enabled to guide the users in how to take advantage of the digital technology and the learning how to learn frameworks (Flores, 2005:75). Under emerging networked models, it is hoped that telecentre operators can be empowered (through training) to become self-taught, autonomous learners, able to advise on activities and active courses addressed to the different learner groups that telecentres serve. Such kind of knowledge-agent could become a companion who helps others to become aware and sensitive to on-line learning, guiding others to learn on a self-taught and independent basis.

4.2 Networks of practice through network facilitators

While knowledge networks are thought to facilitate development, novel knowledge is deemed to be found in networks consisting of weak ties, which can then link for collaboration with strong-tie networks for transfer of tacit knowledge elicitation. This is where Networks of Practice become a key element of emergent learning environments.

At the macro level, there have been numerous attempts to generate awareness on international networks’ social capital. An effective way of creating synergies within such international communities and networks of practice has been the consultation of City benchmarking. By using knowledge-based development frameworks, CoPs and NoPs have started a modern tradition (Beaverstock, et. al., 1998) seeking to gather consensus on KBD practices to identify and recognize best practices in a number of aspects of urban communities: economic competitiveness, entrepreneurial activity, environmental sustainability, freedom of expression, e-government initiatives, or innovation (Kriščiūnas and Daugeliene, 2006). Hence, a stream of awards of different nature are being presented to

cities: *Global Location Attractiveness Ranking*, *Global Competitiveness Report*, *Best Business Environment*, *Transparency International*, *Intellectual Property Rights Protection*, *Most Globalised Nation in the world*, *Most Network-Ready City*, *Most Walkable City in the World*, just to name a few. Such is the case in Networks of Practice such as the MAKCi exercise, in which the multiple weak ties existing within the entire NoP would potentially allow multiple opportunities of knowledge-creation episodes.

Launched in November 2006, the *Most Admired Knowledge City Awards* (MAKCi Awards) is a consensus study that includes an annual consulting exercise established to identify and recognize those communities around the world who are successfully engaging in formal and systematic knowledge-based development processes under the flag of Knowledge Cities (Carrillo, 2007). The MAKCI Awards can be defined as a “knowledge-based initiative whose contribution to innovation depends largely on human imagination and creativity and the knowledge assets available at a point in time and context” (Malhontra, 2003). The MAKCi consultation, as a collaborative research study, represents a community space to build meaningful, collective knowledge that would contribute on an annual basis to the understanding of Knowledge Cities dynamics and transformations.

Clearly, the cornerstone of the MAKCi exercise is a consultation to a Panel of Experts, which is integrated on an annual basis by invitation only. A MAKCi executive committee invites the participation of researchers and practitioners with credentials in Intellectual Capital (IC), Knowledge Management (KM) Knowledge-based development (KBD), and/or Knowledge-based Urban Development (KBUD) practice. As part of such emerging global network, experts are invited to interact on a virtual platform with fellow researchers and practitioners, all of them coming from diverse disciplines, regions, nationalities and ways of life. They converge in this consultation space to discuss and establish the relative future development capacities of worldwide urban communities by assessing their capital value base in a knowledge-based world. In practice, the MAKCi Panel of Experts seemingly acts as a social knowledge network. Even further, as it conglomerates experts from a number of specific KBD regional CoPs, it fits the identified notion that characterizes it as a Network of Practice (NoP). Indeed, in knowledge-generating exercises such as MAKCi, the networked interactions between geographically distant communities of practice (CoPs) within the network are rather complex. According to Kuhn (2006), a possible approach to interaction success is “to create connections within the network by nurturing individuals who can be members of two or more communities simultaneously” (Kuhn, 2006:108). For Kuhn, such connectors or “brokers” are members of the network who “translate, coordinate, and align perspectives through ties to multiple communities” (Kuhn, 2006:109). In the context of the MAKCi exercise, consultation dynamics has relied on a core of active and steady panel members, and some other roles in peripheral participation such as the *Forum Facilitator* and the *MAKCi Technical Secretary*. Such roles would need enough legitimacy to influence the development of the consultation, mobilize attention and address conflicting interests. It also requires the ability to “link practices by facilitating transactions between them and to cause learning by introducing into present practices elements from another community’s practice” (Wenger, 1998:109).

In the particular case of the MAKCi NoP, it was observed that most panel members showed scholarly scope, group legitimacy and technical flexibility. Scholarly scope was observed in experts’ knowledge and ability to discuss KBD topics on line with informed and authoritative skill. By doing so, their participation has impact and influence on the panellists

providing leadership, direction and vision to the exercise; which led them to gain legitimacy amongst participants' different groups. It was also observed that those panel members in their role of connectors or brokers adapted easily to the technical intricacies of participating in a network-based discussion platform, with little or no concern of the environments created through the use of virtual forums. These panellists were already internet-literate as per the demands of their own academic/professional work.

Nevertheless, the MAKCi exercise, as an example of NoP, relies on the full list of Panel participants. Each and every member of the network of experts participating in each successive edition has an echo and contribution to the exercise. Every member of the panel impacts and shapes interactions even if his/her voice is not heard (i.e. the lurkers or observing participants' case). As most experts are somewhat familiar with each other's perspectives and work, (within their sphere of common events and projects, or CoP) they are fully aware of how their contributions can balance exercise outcomes or trigger further discussions. Overall a sense of fellowship, a space to converge with acquaintances and old friends encourage participants to convene as panellists in the exercise (Chase, 2008). As experts agree to participate on a voluntary basis, clearly on a good-will venture, free knowledge sharing is part of the freedom spirit within the MAKCi exercise. Such spirit, and the Delphi methodology that permeates MAKE and MAKCi studies has kept a core experts group fairly consistent over the different editions of the exercises. To that extent, good will and trust are at the core of the MAKCi NoP to function and perform (Chase, 2008).

4.3 e-knowledge cities and network weavers

A lot of the measurable social capital of human communities is triggered by interactions in the marketplace. The internet, extranets, and intranets, are increasing those interactions exponentially (i.e. e-Bay). That's also a promise for knowledge markets (Davis, 2007). This vision of Knowledge Markets is conglomerating notions of e-Learning, social capital and Knowledge Cities, in emerging notions of e-Knowledge Cities, in which networks are the core basic structure and scaffolding of urban reality.

Such networks are part of the city's capital, and it can take different forms. With time, as the city's population grows and diversifies, so does its knowledge, and the channels and networks through which it is distributed. Portes indicates: "whereas economic capital is in people's bank accounts, and human capital is inside their heads, social capital inheres in the structure of their relationships... To possess social capital, a person must be related to others, and it is those others, not himself, who are the actual source of his or her advantage" (Portes, 1998). Clearly, in the e-learning realm, social capital concepts like this have triggered swift advancements, with new dynamic and powerful forms of *network weaving*. Some scholars believe that "something ground-breaking is to emerge" with a critical mass of people now "aware of one another and adeptly making use of microblogging – talking *and* listening – to become acquainted with one another and building mutual trust and knowledge". People who purposefully create social capital are thought as first-rate *knowledge network weavers* (Paquet, 2010).

In these emerging e-Knowledge Cities, new intersections of social capital, entrepreneurship, knowledge, innovation, money, and finance are at the forefront. However, innovation is no longer about financial investments. It is more about time, imagination, knowledge, initiative

and trust. In these contexts, visionaries such as Sebastien Paquet see “an emerging set of tools and customs -- cognitive infrastructure, when you think about it -- that will give us the necessary scaffolding to grow a multitude of *virtual cities*”. These cities will bring together people with shared values and orientations towards the future, and who are in a position to collaborate to bring something new into the world. “They are part and parcel of the emerging Relationship Economy” (Paquet, 2010).

But who are the actors and knowledge agents in this emerging networked world? Several pieces of social Infrastructure, such as Symbionomics, networked tribes, peer production etc join the powerful concept of *Knowmads*, who are the Telecentre operators and the NoP Knowledge-Facilitators of prior network-based Learning environments. *Knowmads* are the network weavers of these emerging e-Knowledge Cities.

The Knowmad term was coined by John Moravec, and he defines it as a *nomadic knowledge worker* –that is, a creative, imaginative, and innovative person who can work with almost anybody, anytime, and anywhere. Industrial society is giving way to knowledge and innovation work.” (Moravec, 2008). Technologies allow Knowmads to work either at a specific place, virtually, or any blended combination. Knowmads are able to instantly reconfigure and re-contextualize their work environments (Moravec, op. cit.). In fact, they develop a set of peculiar characteristics (see Table 1).

Competences	Knowledge Workers	Knowledge Agents & Knowledge Facilitators	<i>Knowmads</i> & other knowledge network weavers
C1. Highly inventive, collaborative & intuitive, able to generate new ideas.	35%	60%	70%
C2. Highly adaptable to new contexts and challenges. Unafraid to failure.	35%	60%	90%
C3. Uses information and generates knowledge to solve unknown challenges in a variety of contexts.	35%	60%	90%
C4. Able to create socially-constructed meaning.	50%	80%	90%
C5. Network generator, always connected to people, ideas, institutions & organizations.	50%	80%	90%
C6. Able to generate horizontal knowledge networks.	50%	80%	90%
C7. Digital Literate, knowledgeable on technology uses and purposes.	70%	80%	90%
C8. Attentive to contexts and information adaptability & usage.	70%	80%	90%

Competences	Knowledge Workers	Knowledge Agents & Knowledge Facilitators	<i>Knowmads</i> & other knowledge network weavers
C9. Values and promotes knowledge-sharing and free access to information.	70%	80%	90%
C10. Practices life-long Learning: Able to learn & unlearn quickly, adding new useful knowledge.	70%	80%	90%

Source: Adapted from Cobo, 2009, and Cobo & Moravec (2011)

Table 1. e-Learning Competences Decalogue in the e-Merging Paradigms (estimated)

5. Discussion: New learning environments, new challenges

The identified typologies of networked e-Learning environments and their key knowledge agents, emerged as clearly inscribed in the context of core processes (such as e-learning) eliciting Knowledge-based perspectives. Learning is seemingly part of a global convergence of knowledge systems. However, the frameworks that could bring the analysis into the different levels of networks (Tuomi, 2004b) are yet to be created. Emerging frameworks attempt to highlight the importance of interactions, dialogues and *knowledge moments* for value-based knowledge sharing in multiple and emerging learning spaces of city participation.

Paradigms	Information Society	Knowledge Society	Relational Society
Aim	Tacit knowledge conversion of performing individuals and Archiving Information in purpose-built repositories.	Developing Social Capital in communities, and later Value-driven Capital systems in cities and societies	Developing parallel systems of meaning through relational-based knowledge networks at a global scale.
Some key Authors	Callon (1991) Latour (1987), Wiig (1997),	Brown & Duguid (2002), Sassen (2002), Huysman & Wulf (2005), Dvir (2006), Siemens (2006), Gundry (2006), O'Reilly (2005),	Eijkman (2008), Engestrom (2004), Tuomi (2002, 2010), Varnelis (2010), Paquet, (2010), Cobo & Moravec (2011).
Key words	Informatics, knowledge storage and transmission	Connectivity, Network Interaction, Globalization Real-time Dialogues, Fractal Knowledge	Conversations, Meanings, Knowledge Markets & Global Markets for ideas and capital.
Target Agent	<i>Communities of Practice</i> and their potential of knowledge sharing	<i>Knowledge citizens</i> in cities and regions integrated as performing systems for value-creating knowledge sharing.	Practice-based <i>knowers</i> and <i>knowledge revolutionaries</i> able to manage social conflict and change.

Paradigms	Information Society	Knowledge Society	Relational Society
Users	Every member of an interconnected city/society, engaged in innovation through technology-based interaction.	Social networks such as Communities of Practice (Wenger's CoPs) engaged in problem-solving activities. This includes emerging virtual CoPs and NoPs.	Every member of a globalised city/society, generating continuous contacts and interactions in meaningful "conversations" and/or <i>Knowledge moments</i>
Key Actors/ Core Knowledge Agents	Knowledge Workers	Knowledge Facilitators	Knowmads (First-rate knowledge network weavers)
e-Learning Sample Practices	<ul style="list-style-type: none"> * e-Training * Computer-Aided Instruction * Computer-based Training * Simulation-Based Training * On-Line Learning * Computer Assisted Learning 	<ul style="list-style-type: none"> * Distributed Learning * Web-based Distance Learning * Networked Learning * Blended Learning * Interactive Computer-Aided Learning * Computer-Supported * Collaborative Learning * Interactive Learning Environments 	<ul style="list-style-type: none"> * Socially Distributed Thinking * Intelligent/Virtual Learning Environments. * Invisible Learning
Web Affordances	Web 1.0 DoubleClick Ofoto Akamai mp3.com Britannica Online personal websites Evite Domain name speculation Page views Screen scraping Publishing Content management systems Directories (taxonomy) stickiness	Web 2.0 Google AdSense Flickr BitTorrent Napster Wikipedia Blogging upcoming.org and EVDB search engine optimization cost per click views web services participation wikis tagging ("Folksonomy") syndication	Web 3.0 <ul style="list-style-type: none"> * Drupal /Jumla (Personal Webpage management) * Microblogging * UTube Message creation, communication & Learning * Yahoo, Ask Jeeves interactive Questions * LinkedIn , Yahoo & Google Networked Groups. * Symbionomics * Regional & National scale synchronization through FaceBook and Twitter.

Source: Adapted from Huysman, M.H. and Wulf, V. (2005); Tuomi, I (2002), Gundry (2006), O'Reilly,(2005), Cobo & Moravec (2011).

Table 2. e-Learning practice in emerging Social Paradigms

The types of networks identified during the building up of the present research work seem to have triggered the emergence of a clearer path for networked knowledge-generating strategies, and attempted to highlight that knowledge facilitation is at the core of network-development processes. The chapter has advanced the importance and role of a skilful knowledge facilitator within the three types of network presented, that actually correspond to the historical, socio-cultural and technological progressions depicted as the Information, Knowledge and Relational Societies displayed in Table 2.

Indeed, the wide variety of networked learning models and approaches reviewed during this chapter could be seen with contrasting degrees of culture, technology, innovation through the social determinants of three historical moments. Viewed from a social capital perspective, those three moments of Society are determined by people's degree and capabilities for relationships.

Most approaches observed during research responded to the generic reference of networked learning, a dominant phase of e-learning, although they convey different learning and development purposes. These network-based learning processes emphasize different degrees of social interaction and thus produce different social learning processes and outputs. Since for the purposes of this piece of research work connectivity has been defined as the process by which individuals are linked by means of a computer and can share information in a network (Sloman, 2001:4), the intensity of knowledge creation is critical. Clearly, these principles have determined the kind of facilitator skills that have emerged for each of the facilitator types identified through the three network frameworks (Telecentres, NoPs and e-Knowledge Networks).

Such findings in terms of networking possibilities within the different networked e-learning approaches observed in three international contexts attempted to bring about a multidisciplinary view of networked facilitation strategies at the practitioners' level, then within the e-learning arena so different levels of interaction could be appreciated following the same basic notion of a network.

6. Final thoughts

This Chapter has aimed to contribute to the existing e-learning, and networked knowledge-creation bodies of knowledge from the social facilitation role perspective. By developing a comprehensive review of Network notions and examples, an exploration of e-learning as a knowledge-generative process was carried out, using a novel approach that adds to uncharted areas of e-learning territories.

The chapter has sought to include a review of the state of the art in Knowledge Networks and parallel notions, in which technology-mediated learning processes in institutions and regions have been deemed paramount. Such extensive literature concepts have been presented along with a metaphor of *meaning-negotiation* and *connectivity*, as well as some knowledge network and knowledge agent typologies that clearly characterize new Learning Environments. The Chapter has sought to combine a multi-disciplinary perspective of e-learning, Networked Learning and *Knowledge-based Development (KBD)* core processes (notably those of social capital development). The present study has thus attempted to bring and original and fresh understanding of networked e-Learning processes in different settings. It can be affirmed that the KM angle assumed for the chapter is not frequently found in recent specialised literature. Because the research was a response to an existing gap in specialised literature of network facilitation strategies, the chapter eventually included

wider knowledge-based development schemes that have opened a new window into interpreting the e-learning realities in emerging knowledge-intensive contexts.

Indeed, as notions of *network-based learning* continue to be the dominant discourse in e-learning practice, further theoretical aspirations could develop the network forms here presented. The gap in the literature in regards of the understanding of social skill development processes in on-line facilitation is still wide, and additional research awaits. As the challenges and findings of this research are on the table of discussions, further advancements of e-learning in theory and practice is warmly expected.

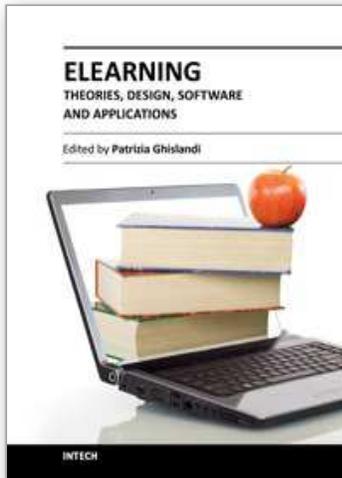
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The term was coined when electronics, with the personal computer, was very popular and internet was still at its dawn. It is a very successful term, by now firmly in schools, universities, and SMEs education and training. Just to give an example 3.5 millions of students were engaged in some online courses in higher education institutions in 2006 in the USA¹. eLearning today refers to the use of the network technologies to design, deliver, select, manage and broaden learning and the possibilities made available by internet to offer to the users synchronous and asynchronous learning, so that they can access the courses content anytime and wherever there is an internet connection.

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