

# Academic networks and knowledge construction

by **María Soledad RÁMIREZ MONTOYA**

*Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM)*

## 1. Introduction to academic networks

People are immersed in a network of relations through different aspects like work, family, and community. The correlations we have with colleagues, friends, and members of an organization or community are countless. Due to the social relations, people are directly and indirectly linked through the interconnection bonds. The daily life is made up of social structures that include the interaction of people with different connections among themselves, in addition to people that establish the connection with other groups through a common member or link.

From a conceptual overview, we understand that each network has the following basic components: individual units (nodes) and connections among themselves. Thus, in a social network, a node is a person and a connection is the existing relation, whether it is to give information, advices for decision making and solving problems, or specific actions of different dimensions. It is important for the groups of networks that the people join together through some ob-

jective, and it is in these unions that the creation of new contacts emerges. Anklam (2005, 333) lists some terms of networks:

- Cohesion (also called density). It is the relative force of the network based on the connections' percentage.
- Centrality. The extension in which a network is concentrated around a person, and the potential risk for the organization of losing that person.
- Distance (also called proximity). The number of nodes between two persons in a network (also called degree of separation).
- Connection. The intersection in which a person is "between" other nodes of the network and can, therefore, control the information.

In the academic field, the networking is a constant. In the teaching, research

and management functions, several kinds of networks (formal and informal), with different temporality or timeless, with varied objectives (directly related with the job or with indirect activities), and with individuals in different disciplines (from a same area or multidisciplinary) are carried out. It is in this bonds where many people can socialize, the collaboration and the generation of new knowledge is possible, and therefore, the people and the institutions can be favored by the creation of a new value through the joining forces and experiences.

Historically, the communication was based on face-to-face relationships, but at the end of the 20<sup>th</sup> century and beginning of the 21<sup>st</sup> century, the revolutionary transformation of the media has impacted in new ways of establishing contacts. These changes have allow the influence of technology be notable in all communication scenarios. In this way, the information and communication technologies (ICTs) as a communication channel, appear as a support for the academic networking. However, there are some conditions that should be considered to transform them into an allied in the concretion of contacts. This call to action is based on the need of evaluating the convenience and/or the good use of the ICTs when starting new relations. Tourón and Tourón (2008) stress how important is the simplicity (the “usability”) the extreme sophistication demands; state-of-the-art machines and connections, sometimes too fast, are not always available for all of us. In the same sense, but now from the standpoint of the ICTs’ “users”, Tejedor and García-Valcárcel (2006) an-

alyzed the professors’ competencies for integrating the TICs in the educational environment, taking as a relevant element the need of training professors in its use; also, they mention that it is important to work with the professors’ attitudes while the abilities are worked or even before.

In light of these comments it is important to take into account the importance of the previous analysis of the specific spaces where the practices, the evaluation of channels that make possible the interaction, and the education of the people who will use the ICTs to avoid future problems in the networks’ conformation will be carried out.

The objective of this article is focused on sharing some analysis of the networks’ participation in different studies, where technologies have been an important mean to carry out the educational research activities and the knowledge construction. If the work of several persons interrelated towards the achievement of an objective is linked, the strengths of the individuals are boosted, the objectives in research are achieved, and the goals are transferred to other directions.

The article is divided into three sections; first, the presentation of a conceptual framework of the meanings in the internal and external networks; second, several experiences of academic networks supported by ICTs for the knowledge construction are described; and in third place, some reflections and analysis are presented as a conclusion.

## 2. Conceptual framework of networking: internal and external connections that bring relevance

In its widest sense, a network is a group of bodies, centers, institutions, interconnected individuals with a common objective. The purpose could be to share information, resources, to make some work or achieve a common goal. An academic network conceives the interconnection of social actors linked to the teaching-learning process (management, research, and teaching).

The network's potential is materialized in the permanent participation of a group of people focused in an objective. Lieberman (2000) proposes the creation of new professional learning networks to extend the common learning purposes; networks that involve shared objectives, psychological support, voluntary involvement, and a facilitator. The learning can be possible just like this, through a collaborative construction of a shared knowledge through a contextualized discourse in a worried community.

There is a relevant aspect in the academic networks: the value they generate for the development of social actors and their environment. In that sense, it is important to point out that the social capital of the institutions, which we understand as the potential the people's internal and external networks have and that is translated into value for the institution, is a fundamental element so the institutional management can achieve the goals it has, and therefore, to improve the educational processes to which it owes its labor.

A study that gives relevant information regarding the theories supporting the use of networks in organizations of several kinds and use of ICTs for creating social capital is that presented by Cummings, Heeks, and Huysman (2006, p.571). They mention that the associations under development are usually more conscious about how they use the knowledge internally, and also how the knowledge should be shared with other associations and individuals: "The main point of knowledge is not in itself but in the development of initiatives promoting practices based on knowledge... The key of this process is to learn in groups and organizations. The social learning (or collective learning) is fundamental for improving practices, and this happens in formal and informal networks. Since the increase of ICTs' use, many of this development interconnection happens online."

In this sense, the networking is conceptualized from two perspectives and a main core through virtual communities, where the use of the ICTs has been a support point: a) the institutions' internal networks, b) the external networks (those that cross the educational centers), and c) the virtual communities (as a main core in networking.)

a) *Internal networks.* Groups formed inside a center in which the individuals of an institution participate in some purpose or objective. In the professors-researchers work area, sometimes these groups are formed in research centers, and some other times, they are joined by the university or department where a particular knowledge area or a specific research project is worked.

Inside these institutions several internal networks can be formed, some of them in a free manner, without these persons being necessarily connected by some particular objective. These “natural” integrations can lead them to participate in more formal actions or projects linked with the institutions’ activities.

The affinities can be political, social, cultural, religious and even labor. The groups sharing a labor affinity inside an institution are considered a professional community. Kuit, Reay and Freeman (2001) define it as groups of collaborators where the interaction between them is frequent and whose actions are governed by shared standards focused on the own practice and its improvement.

In other occasions, the networks inside the institutions are “forced” from the same institutional management. This is when the groups arise because of some specific professional activity; for example, the professors, disciplines, and knowledge areas academies respectively, the program’s staff and the curricular committees, where the tasks are those that connect the groups of professionals.

Whether forced or spontaneous, for the networks to create value, Crow and Pounder (2000) consider that three organizational conditions should exist to achieve effective teaching groups inside the educational institutions: awards to the good group performance (instead of the individual performance), training and consultancy in communication competencies and projects development, and clearness in the possibilities of development and the

scope in their decision making. In the same sense, Little (2003) identifies three fundamental objectives the professional communities need to achieve: the participant’s development as a result of the community work, the change in the practice as an achievement obtained by the group regarding the way in which they carry out their activity, the group’s capacity of development obtained through the social interaction, which is defined as the interest the members of the group have in the other participants’ welfare.

The time and space factors are elements in which the management should invest when promoting the networking. Carriego (2005, 32) says that “it is worth to discover and boost the school space as a learning space, not only for the students but also for teachers and directors.” If the organization knows how to collect this knowledge and transmit it, first to the group and then to the rest of the structure, it will be broadened through several processes, contributing to the organizational learning.

The groups of people, induced or spontaneous, can turn into “learning communities.” Wenger (2001) describes them as groups where the teamwork arises; the interpretation and exchange of information, the shared knowledge, and new ideas, and also where the members work to learn together.

The research made by Somech (2005) confirms that the professors who work together with their colleagues with the appropriate motivation will have an effective operation. So, we have to recognize

two key elements facilitating the appearance of learning communities: the availability of the parties, and the easiness given by the institution for its formation.

b) *External networks crossing the school centers.* This is referred to the groups composed of people of different educational institutions, or people who are not linked to the educational institutions but to some aim or objective.

As it was mentioned before, the personnel inside an institution can be connected to other groups in this kind of external networks in a “natural” or an “institutional” way.

The personnel of an institution can be connected with these external networks through a professional interest, a discipline, or a project in which the interest is to create and share. These connections can be favored by congresses, meetings or reunions where the groups of people exchange activities and interests.

When we think about participating in external networks in a “natural” way, we easily can associate it to the practical communities. This kind of communities has three features appropriate to its structure: domain, community, and practice (Wegner, McDermott, Snyder, 2002): a) the domain is referred to the common area handled by the community members; the participants of a community of practice who know the domain of the same can distinguish between the things that will be important to share and the things that won't; the domain of a community of practice allows it to know its areas of interest,

the focus of attention; b) the community is a group of people connected to some interest in common; and c) the practice is the group of ideas, tools, information, stiles, language, symbols, etc. that are shared by the community; it is the group of specific common activities, and also the reflect of an achievement's search shared by it.

A study that is in line with the communities of practice, networks, and knowledge construction is presented by Fairbanks and LaGrone, (2006). They analyze the professors-researchers' discourse in the framework of the community of practice and research. They found that the purpose of these communities was not only to improve the educational practices, but to modify the theories that guide such educational practice. The learning and research communities allow the interaction between the novice teachers and the experienced teachers. The discourse analysis of the professors-researchers in the community allows knowing the different expressions which guide or contribute to the knowledge construction.

Sometimes, the connections with external networks are more “institutional” because the institution is affiliated to bodies where the participation with other institutions or groups of people is required. Here, the objectives and aims are stipulated by these bodies and the activities are subjected to achieve these purposes.

In the educational institutions management, the boosting of external networking can give them a different view, a professional enrichment, and extent of knowledge, not only for individuals but for

the institution itself. Participating with external groups gives the personnel an added value in knowledge, which will return through the impact in the educational, management, and research processes.

The creation of networks exceeding the walls of the institutions allows to analyze the practices in light of the experience and to visualize solutions to internal problems. For example, in general, the Latin-American institutions have a poor research and publication development, and from this perspective, they look for establishing connections with institutions that stand out in training and research to look for alliances that allows them to improve their opportunity areas.

Through its participation with external networks, the institution can promote projects for its improvement. It is also important to promote the participation with multidisciplinary networks which allow the professional human resources complement among the institutions. In this professional exchange through external networks a competitive advantage can be obtained because of the individuals' intellectual capital sharing.

c) *Virtual communities.* With the ICTs' support, the networking has been favored by the internal and external networks to construct knowledge through the virtual communities. They are conceptualized as the interaction of groups of individuals with a common interest through the cyberspace, where the communication and interaction opportunities have been favored with the use of the ICTs.

Virtual communities have been studied linking them with the information management. For example, Cadima, Ferreira, Monguet, Ojeda and Fernández (2010) were focused to analyze the working of a researchers community of different disciplines, located in several countries, and they proposed a monitoring system (KIWI system) which allowed to the participants of a researchers community to visualize and know the contributions of each member. Results showed that the KIWI system facilitates the collection of information about interactions, allowing having a feedback which showed to have a positive impact in the knowledge construction of group members.

Inside the same tendency of analyzing elements which to make possible the identification of aspects that favor the knowledge construction work of virtual communities, is the Pohl's, Rist's, Zimmermann's, Fry's and other works (2010). Authors were focused in the analysis of roles and necessary attitudes for the correct working in knowledge virtual communities, as result of the researcher's virtual community's experience in Kenya, Switzerland, Bolivia and Nepal. Authors found that participants shall adopt different roles for the sustainability of community, such as: reflexive scientific, intermediary and facilitator of Knowledge collective construction's process.

A research which contributes with relevant data concerning to factors such as the context, single motivations and group motivation, and the interactions type that determine the productivity and success of tasks and the products carried out in the

context of virtual community is shown by Fu-ren, Sheng-cheng and Tzu-ping (2008). The study illustrates the experience of a teacher's virtual community, in schools of basic education (elementary and secondary) in Taiwan, where the knowledge is constructed through of connecting the knowledge transfer through socialization, externalization, and the combination of activities.

The possible works through virtual communities for work on networks provide new organization forms, interaction and communication, where the ICTs promote the efforts in the knowledge transfer and construction. Next, practical cases of work on networks, internal and external, where virtual communities appear in transverse form, will be analyzed.

### 3. Making knowledge through academic networks supported in technologies

This section shows practical cases of academic networkings in Latin American

context. Characteristics from context, objective of network, and work strategies using ICTs are described, and they are closed with scopes and challenges for knowledge construction.

*Innovation Chair on Technology and Education case: internal network to promote the knowledge based on research.* On November 2002, the Tecnológico de Monterrey, private institution with 32 campus in México, starts the research chair training as strategic area of this institution to support the postgraduate course programs and develop studies in strategic areas for the country.

Chairs are research groups supported by a capital provided by the institution, and to carry out their research projects, chairs complement this capital with external resources obtained from companies, consultancies, research projects organized by national and international public bodies. Figure 1 shows the organization model of chairs for knowledge production.

FIGURE 1: *Development model based on knowledge* (Cantú, Bustani, Molina, and Moreira, 2009)



The main objectives of chairs are:

“Support the performance of Mission 2015, developing research and making a knowledge base in topics that the Tecnológico de Monterrey has established as strategies for development of the country. Generate a research culture, patents, licenses and publications between academic people and students. Make bases for the creation of technological companies. Impact in the Tecnológico de Monterrey’s educational model” (web page <http://www.itesm.edu/>).

Chairs are composed by teachers, researchers and students of bachelor’s degree and postgraduate. The organization model of a chair is composed by: a teacher as chair’s permanent teacher; associated researcher teachers; adscribed researcher teachers, and professional students (bachelor’s degree) and postgraduate (master’s degree and PhD), performing researches.

According to subject matters of research group, chairs are classified in three types: Technology, Social Sciences and Humanities. In 2011, there are 85 research chairs. To monitor them, it is working with an evaluation system where each month the permanent teacher of chair shall inform about the results of 52 indicators (publications, human resources training, teaching linking, entrepreneurship, acknowledgements, finances and other activities as presentations in conferences, contributions to scientific community, committees) and researchers shall register these indicators in the Postgraduate and Research Information System (web page: [ESM/Tecnologico+de+Monterrey/Investigacion/\).](http://www.itesm.edu/wps/wcm/connect/IT</a></p></div><div data-bbox=)

Additional to this monthly registration, chairs are evaluated by a committee each three and five years to review their advances and give feedback in areas which are considered as appropriate, according to the main objectives of chairs.

On July 2007, the Chair whose objective is to contribute, through of several activities and researches, with the making of scientific knowledge in the innovation area on technology and education, from its theoretical basis to the analysis of concrete experiences on several environments, the evaluation of social impact and proposals that can be carried out to improve the training requirements and the quality on education, was started.

In this chair participates 16 researcher teachers (7 of them PhD), 16 PhD’s students and 116 master’s students, geographically located in different region around the world, mainly in Latin America.

The operation’s strategies of this group are mainly through of two interaction nodes: on site and distance learning. On site node, teachers have meetings to propose common objectives, projects, evaluation indicators and conceptual training through Exchange of presentations about researches carried out. In distance learning node, the researcher teachers and postgraduate’s dissertator students work to distance in research projects (regarding to qualifications projects or financed researches).



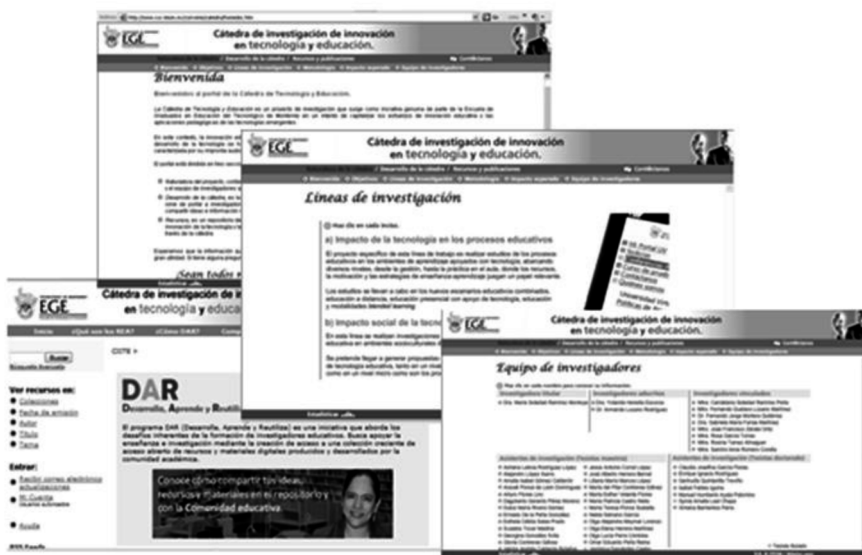
This network, considered internal, works with other internal networks of the institution (with other research's chair) and with other external networks to the institution, to perform studies or projects.

In works of group, the ICTs constitute a study's and support's central point:

(a) of support because they are used for communication, interaction, the methodological processes of projects, the interaction processes of researchers, students and

information sources, consultancy and developments of distance researcher's work and the diffusion of results. Technologies used for interaction and construction are multiple: videoconferences, web page as informative media and resources repository (Figure 2), mobile and open educative resources, learning objects, *Blackboard* platform for students training, multimodal classrooms with technological equipments for training and research, *Itunes U*, social networks, *Webex*, *Google docs*, *Tablets*, *Hootcourse* (room that gets together social networks).

FIGURE 2: Web page of Innovation Chair on Technology and Education (<http://www.ruv.itesm.mx/convenio/catedra>)



(b) Of study because through of three research lines: development and research of impact about innovative educative proposals mediated with technology; management for technological and educative innovation, and socio-cultural context about use of digital technology. Projects are located in the study of mobile learning,

remote and virtual laboratories, simulators, open educative resources, several environments with technologies (environments of multimodal learning, *blended learning*, *elearning*, *mlearning*), environments of social and collaborative learning (*Google Apps* and social networks), wireless and mobile learning (*PodCast* with

*iTunes U*, mobile learning) and models for transfer of courses and knowledge.

During the function period of this chair (2007-2011), the following results were gotten: human resources training: 16 researcher teachers updating themselves (3 of them in the Researchers National System), qualifications of 7 PhD's students and 77 master's students; 31 articles on magazines, 88 conferences on international congresses, 13 books, 19 professional courses and 40 linked postgraduate courses. Research in the technology's and innovation's area has been encouraged, projects of teachers based on study lines have been focused, results of projects in academic programs of institution have been carried out, and teachers and students training has been provided, promoting the enrichment of social capital.

Challenges in this chair were confirmed in results of the evaluation performed in its first three years: increase the publication level in high impact magazines, and deepen in studies carried out to get a major institutional and national impact (objectives of chairs).

*A network whose future is the present.*

*Regional Open Latin American Community of Educational and Social Research (CLARISE): external network to promote the knowledge in the Open Educational Movement's area.* The Open Educational Movement appeared at the beginning of last decade, with the premise of sharing information to decrease the breach between communities with access to information and communities without access. This

way, universities such as Massachusetts Institute of Technology (MIT) appeared in USA, and they offered their study programs through Internet with use freedom characteristic, named *OpenCourseware*. As result, the open movement was creating, being the Open Educational Resources (OER) one of its manifestations and characterized to offer digitalized materials in open and free way to teachers, students and autodidactic people to use and re-use in teaching, learning and research (UNESCO, 2002).

Due to participations in knowledge's democratization, the Open Educational Movement is a project which has been developed and analyzed, mainly in European countries and in USA, but not in emergent countries like México and Latin American countries, where its development is so recent. However, due to the importance that is to our country having materials, courses and quality resources, it was considered as relevant to work in this subject matter, and this has been understood by academic people and researchers who have focused their studies to give follow up to the experiences in the use area, re-use and transfer of knowledge, in the free access area.

CLARISE was created in 2011, having as background researcher teachers connected to national networks of their countries and has as objective to attend the Latin American regional necessity of contributing with efforts through the making of learning and collaboration networks to give visibility and free access to the cultural production, scientific production, and academic production of authors and insti-

tutions in Latin America for consultation of worldwide society. The main research topic is referenced to the open educational movement, focused to Open Educational Resources.

This network is considered as external because goes beyond of limits in schools. In fact, the previous works started as an internal network with a project named *Knowledge Hub*. In 2009, the first group with an inter-institutional work among six high education institutes which worked with basic education's teachers to promote the use of open educational resources was created. After, in 2010, a second group with a project of six high education Mexican institutions which worked in the making of OER for training of educational researchers was integrated. In 2011, a third group with five institutions was created. It had as objective sharing its OER through of a metarepository as result of experience in the participation on three projects (financed by University Corporation for Internet Development –CUDI– and by the National Council of Science and Technology –CONACYT–), and issued publications in magazines and books (Burgos and Ramírez, 2011; Mortera and Burgos, 2010; Ramírez and Burgos, 2010 –Coords.–).

This background helped to extend the network toward Latin American fields, and this way, in 2011 was approved an international project during the COMCLARA announcement 2011 for making the research community, named CLARISE (web page <https://sites.google.com/site/redclarise/>), which was formed by 27 researchers from five countries: Argentina, Costa Rica, Uruguay, Colombia and México. CLARISE

has the support of Latin American Cooperation Network of Advanced Networks (CLARA) in the COMCLARA2011 program and the ALICE2 Project. Red-CLARA, the Latin American advanced network, for science, research, education and innovation, interconnects the national academic networks of 13 regional countries and links them to the advanced networks in Europe, North America, Asia and Oceania.

The operation's strategies of this group are mainly through of two interaction nodes: site and distance learning. On site node, teachers of each institution (by country) have meetings to propose common objectives, projects, evaluation indicators and activities which will be performed on base to the work plan. In distance learning node, the researcher teachers are connected through the main network CLARA (through network of each country) to work in the conceptual training and the operation of network's activities, with the objective of filling objectives and indicators described in CLARISE.

The developed activities are based on objectives these:

1. Making of projects with international financial beings. Tasks of search and identification about programs and announcements (some considered institutions are EuropeAid, European Commission, ALFA project, CREFAL, AECID, Educational Departments and Secretaries of participating countries, CONACYT, The William and Flora Hewlett Foundation, the Development Inter-American Bank); collaborative work with members of com-

munity to integrate a proposal of viable project in the interest subject matter and, the integration of projects' proposals.

2. Intensive use of main network CLARA. With network's activities through videoconference (VC) that includes transmission of video/audio by Internet (*streaming*), considering that no all members have infrastructure to VC; collaboration applications on Internet (*Google sites/Google Docs*; use of group community's RedCLARA, publications of events, announcements and interaction with members) and training through a seminar called "Open Educational Movement" transmitted to distance through Internet, supported in RedCLARA for its diffusion; with subject matter's cycles using RedCLARA (SIVIC/Streaming) with massive groups of participants (600 participants connected by Internet), and work with instruments for research about community group's works (which show data about perception of community members concerning the Open Movement, to the management, use, and transfer of OER's, name of community and research's lines).

3. Consolidation of community. With identification actions of possible interested people who have access to advanced networks and sending of invitation to participate in the community, preparation and integration of reports with integration evidences, interaction statistics in community's web site (analytics), and collaboration networks integration, and over all, with publications and conferences about presentations of community works.

4. Visibility of community. With tasks toward production of articles, as well dif-

fusion in conferences and councils; attendance to councils and reading of materials about subject matter; publication of a book in open and electronic format, and diffusion of CLARISE through associated networks such as RedCLARA, Alice2 Project: Latin America interconnected with Europe, CUDI: University Corporation for Internet Development, RENATA: Academic National Network of Advanced Technology, INNOVA|RED: Research National Network in Argentina, RAU2: Uruguayan Academic Network, as well in bulletins and diffusion portals of participating institutions.

ICTs acquires notable importance in the performance of CLARISE's activities, some of them (previously mentioned) are collaboration applications on Internet (*Google Docs, Wikis*), possibilities offered through CLARA (portal, *blogs*), multi-point videoconferences, base services (news, alerts, internal messages), VCE-spresso and SIVIC (Videoconference).

The obtained results have been presentations on international councils, adhesion of participants from external countries to those that created the network, publications and web portal as diffusion media and information repository (Figure 3).

Challenges visualized in this network are given in terms of group cohesion, to advance toward knowledge construction in the Open Educational Movement. Research's subject matters to be worked by CLARISE show plurality of theoretical perspectives, disciplinary perspectives and subject matters of topic to be analyzed:

FIGURE 3 : CLARISE Portal (Web page <https://sites.google.com/site/redclarise/>)



- Studies about legality and author's rights (aspects about intellectual property, registered trademark, use license as *creative commons*, *open access initiative*).
- Analysis of appropriation process and the knowledge transfer.
- Studies about collaboration culture and the fact of sharing resources in the high education institutions.
- Analysis of technologies for production and publication of educational resources (audit software identification and digital resources design in different platforms).
- Studies about the impact of open educational resources in different educational levels.
- Studies about communities of practice and research in the open educational movement.
- Studies about sustainability to long period of open education projects (studies about the experience on institutions that consider the open education).
- Learned classes from open learning and distance learning for open educational movement (knowledge movement, experience on inter-institutional projects for design, production and use of Open Educational Resources).
- Analysis about the impact of *OpenCourseWare* (portal Web <http://www.ocwconsortium.org/>) (increase about use in México, Latin America and other countries, integration of OCW with existing academic programs).
- Study about next open learning generation (use of OER, open learning objects, open university).

The contribution to the discussion of contemporary educational problems and the potentiality that offers the fact of participating in the open educational movement, mainly in Latin America, are so important to direct us toward a society based on knowledge. Since the access to technological resources or connectivity resources, the adoption of knowledge on innovative educational practices, the transformation and generation of new knowledge, the competence for use of ICTs, the disposition or skills to participate in research and practice communities, are all aspects that characterize the open educational movement, and are object to be studied and analyzed.

#### **4. Meetings and disagreements in the contribution to academic networks for knowledge construction**

We can define “Meetings” as the contact or beginning of relationships in different parts (institutions, people) which will form a whole (the NETWORK). It would be easier to define the “disagreements” that would be something like all non-fulfillment proposals of initial promises in the “Meeting”. Beyond the word game, the term “contribution” (which appears in the title of this section) is the most significant part at the moment of thinking in the optimization of products; we talk about the “MEETINGS time”.

The construction of a NETWORK supposes the possibility of contacts between people or institutions, and the resultant products. Along years, we have seen “Networks” that survive exchanging texts or information without having specific weight products. The productivity of a network

shall not be only limited to relationships, it's clear that we understand them as the start point, but this can't finish in these actions.

Disagreements in networks can emerge when members don't find an added value to the works carried out inside the network. The effort and time applied in activities shall be profitable to a contribution for people's training, for its work center or for knowledge production in the area which is being worked.

Moreover, ICTs can play a role diametrically opposite (in favor or against) in the work on networks. The communication potentials and interaction potentials have been previously mentioned, but it is missing to mention the reality that is shown in the work of virtual communities, where the lack of infrastructure, technological ability, and over all, the lack of training in the use of ICTs, constitute factors that discourage the conceptual work inside the network.

Critical aspects to promote the meetings in the network is the fact of showing mechanisms and strategies (conceptual as logistics) to get the cohesion, integration and interaction to this way they convert themselves in the motor of connections. Network nodes are shown as neuralgic points for this network's activity and connections (intersections); they are as veins in which shall flow the information and activities for construction.

We understand as substantial specific lines to stress the importance of compromise and the responsibility which takes

to the maintenance to a network. It's substantial to all social actors to understand that time is needed to perform in good terms the practices carried out in a network.

The training on networks work is other value substantial point for all its members. On the one hand, it is the intellectual contribution between network's members with subject matters which are being analyzed, and on the other hand, it is the learning that is the result of a joint work, of learning's community or practice's community. Both training's aspects constitute an added value to activities carried out inside the networks.

Some strategies that have resulted positive for work on internal and external networks, where virtual communities carry out their works supported by ICTs, have been the documentation of work's sessions on video or *Podcast* which subsequently fulfill a double function: documentation of sessions for analysis of network's members and formative material to study the network's relationships.

Other meeting point consists that in the networks work, the institutional works to perform research in context are promoted, it means, start from a subject matter in network, where all members work in this subject matter, but at the same time each body (with all its members) performs a project applied on its context, where information is obtained, analyzed and issued through publications. It means, it is part of a great project, but also works in little nodes projects.

The network work meetings cross the democratization in the knowledge society. The purpose is that by means of collaboration between professional's and researcher's communities, supported in the use of ICTs, the knowledge is shared between a major number of people, postulating this way by a reduction of scientific breach between countries. The fact of providing the access to the shared knowledge, will contribute in the training of able human beings to learn in an independent way and along all life. In the network's center is the simple and powerful idea about the fact of the knowledge can be built and re-built (according to each context), and that the technology in general and the *World Wide Web*, in particular, have a extraordinary opportunity to share, use and build the knowledge.

**Address of the author:** María Soledad Ramírez Montoya.  
Escuela de Graduados en Educación. Tecnológico de Monterrey. Edificio CEDES, sótano 1 EGE, oficina CD-S1003-30. Avda. Garza Sada 2501 sur; col. Tecnológico Monterrey, N. L. México; CP64849.  
E-mail: solramirez@itesm.mx.

Received: 25.VII.2011

## References

- ANKLAM, P. (2005) Social Network Analysis in the KM Toolkit, in RAO, M. (ed.) *Knowledge Management Tools and Techniques* (MA, EEUU, Elsevier, Inc.).
- BURGOS, J. V. and RAMÍREZ, M. S. (2011) Innovative experiences of Open Educational Resources towards academic knowledge mobilization: Latin-American context. In *Proceedings of OpenCourseWare Consortium Global 2011: Celebrating 10 Years of OpenCourseWare* (Cambridge, MA., EEUU).
- CADIMA, R.; FERREIRA, C.; MONGUET, J.; OJEDA, J. and FERNÁNDEZ, J. (2010) Promoting social network awareness: A social network monitoring system, *Computers & Education*, 54:4, pp. 1233-1240.

- CANTÚ, F. J.; BUSTANI, A.; MOLINA, A. and MOREIRA, H. (2009) A knowledge-based development model: the research chair strateg, *Journal of knowledge management*, 13:1, pp. 154-170.
- CARRIEGO, C. (2005) *Mejorar la escuela. Una introducción a la gestión pedagógica en la educación básica* (Buenos Aires, Fondo de Cultura Económica).
- CROW, G. M. and POUNDER, D. G. (2000) Interdisciplinary Teacher Teams: Context, Design, and Process, *Educational Administration Quarterly*, 36:2, pp. 216-254.
- CUMMINGS, S.; HEEKS, R. and HUYSMAN, M. (2006) Knowledge and learning in online networks in development: a social-capital perspective, *Development in Practice*, 16:6, pp. 570-587. Recuperado el 23 de mayo de 2011, de la base de datos EBSCO Academic Search Premier.
- FAIRBANKS, C. M. and LAGRONE, D. (2006) Learning Together: Constructing Knowledge in a Teacher Research Group, *Teacher Education Quarterly*, 33:3, pp. 7-25. Recuperado el 23 de mayo de 2011, de la base de datos ProQuest.
- FU-REN, L.; SHENG-CHENG, L. and TZU-PING, H. (2008) Knowledge sharing and creation in a teachers' professional virtual community, *Computers & Education*, 50, pp. 742-756. Recuperado el 16 de mayo de 2011, de la base de datos ScienceDirect.
- KUIT, J.; REAY, G. and FREEMAN, R. (2001) Experiences of reflective teaching, *Active Learning in Higher Education*, 2:2, pp. 128-142.
- LIEBERMAN, A. (2000) Networks as learning communities. Shaping the future of teacher development, *Journal of Teacher Education*, 513, pp. 221-227.
- LITTLE, J. W. (2003) Inside teacher community: Representations of Classroom Practice, *Teachers College Record*, 105:6, pp. 913-945.
- MORTERA, F. J. and BURGOS, J. V. (2010) Innovative Applications Using New Technology: The Case of the Knowledge Hub Search Engine and Open Educational Resources Building Communities of Practice, *Education and Research Technology (ERT) Forum* (section 2, Supporting research with new technology and emerging technologies) (California, EEUU).
- POHL, C.; RIST, S.; ZIMMERMANN, A.; FRY, P. et al. (2010) Researchers' roles in knowledge co-production: experience from sustainability research in Kenya, Switzerland, Bolivia and Nepal, *Science and Public Policy*, 37:4, pp. 267-281.
- RAMÍREZ, M. S. and BURGOS, J. V. (Coords.) (2010) Recursos educativos abiertos en ambientes enriquecidos con tecnología: Innovación en la práctica educativa (México, ITESM).
- SOMECH, A. (2005) Teacher's personal and team empowerment and their relations to organizational outcomes: contradictory or compatible constructs?, *Educational Administration Quarterly*, 42:2, pp. 237-266.
- TEJEDOR, F. J. and GARCÍA-VALCÁRCEL, A. (2006) Competencia de los profesores para el uso de las TIC en la enseñanza. Análisis de sus conocimientos y actitudes, **revista española de pedagogía**, LXIV: 233, pp. 21-44.
- TOURÓN, J. and TOURÓN, M. (2008) La enseñanza a distancia: posibilidades para la atención individualizada de los alumnos de alta capacidad en la escuela y la familia, **revista española de pedagogía**, LXVI:240, pp. 297-314.
- UNESCO (2002) *Open Educational Resources*. Recuperado el día 31 de mayo de 2011 de [http://portal.unesco.org/ci/en/ev.php-URL\\_ID=30822&URL\\_DO=-DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=30822&URL_DO=-DO_TOPIC&URL_SECTION=201.html)
- WENGER, E. (2001) *Comunidades de práctica: aprendizaje, significado e identidad* (Barcelona, Paidós).
- WENGER, E.; MCDERMOTT, R. and SNYDER, W. (2002) *Cultivating communities of practice: a guide to managing knowledge* (Boston, EE.UU., Harvard Business School Press).

## Summary: Academic networks and knowledge construction

The main purpose of the article consists of analyzing the role of networks through studies and cases, where technologies have demonstrated to be an important tool as a way to enhance educational research. It is discussed that when people



work collaboratively to achieve a goal, it is possible to foster individuals' strengths, accomplish the research proposed objectives and transfer goals to other directions. The analysis was mainly focused on technology based networks in Latin-American countries. We discuss the effectiveness of networks for knowledge generation, as well as the challenges to enhance collaborative work through networks as a mean to contribute to institutions' social capital growth.

**Key Words:** academic networks, knowledge generation, social capital, use of technologies.

### Resumen:

### Redes académicas y construcción de conocimiento

El objetivo de este artículo se centra en el análisis de la participación de redes dentro de estudios y casos, donde las tecnologías han resultado un medio importante para llevar a cabo las actividades de investigación educativa. Se expone la premisa principal de que, vinculando el trabajo conjunto de varias personas interrelacionadas hacia el logro de un objetivo, se potencian las fortalezas de los sujetos, se logran los objetivos planteados en la investigación y se traspasan las metas en otras direcciones. El encuadre contextual se ubica en casos de redes que se apoyan en tecnología, principalmente en el ámbito latinoamericano. Se presentan fortalezas en la generación de conocimiento y retos para potenciar el trabajo en redes, como aporte al capital social de las instituciones.

**Descriptores:** redes académicas, generación de conocimiento, capital social, uso de tecnologías.

