MANAGEMENT OF VIRTUAL TEAMS IN WORK ORGANIZATIONS: SOME INPUTS FROM RESEARCH

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Actualmente, los equipos virtuales se están convirtiendo en un elemento clave en la estrategia de la organización, el desarrollo del trabajo y la gestión de las organizaciones. Con frecuencia esos equipos utilizan diversas tecnologías de la información y la comunicación. El presente trabajo analiza algunos aspectos importantes implicados en el funcionamiento de los equipos virtuales. En concreto, se analizan las relaciones interpersonales y sociales entre sus miembros, la estructuración y coordinación del trabajo, y la potencia y la confianza del equipo. Estos factores son relevantes en el proceso de creación de equipos virtuales en las organizaciones. También se ofrecen algunas directrices para la gestión y dirección de estos equipos.
Palabras clave: equipos virtuales, procesos de colaboración, dinámicas sociales y relacionales, estrategias de intervención.

Actually, virtual teams are becoming a key strategy in organizations. The aim of this paper consists of reviewing some relevant issues involved in virtual team functioning such as the interpersonal and social dimensions, coordination and work structure and potency and team trust. These factors need to be taken into account in virtual team building and process development in organizations. In this vein, we offer several guidelines in order to manage virtual teams in organizations.
Key words: virtual teams, collaborative processes, social and relational dynamics, intervention strategies.

THE ROLE OF VIRTUAL TEAMS IN ORGANIZATIONS

Distributed work supported by New Information and Communication Technologies (NICTs) is a relevant element in many organizations for the achievement of their goals. Actually, an important number of companies require electronic collaboration - among coworkers, providers, clients, "partners", etc. - for the development of their activities both in the production and the service sectors. In recent times, the expansion of the limits of cooperative and/or team work is a reality (Marrone, 2010) that favors the practice of *virtual teaming* or virtual teams. These become suitable strategies that allow companies to behave more competitively in a clearly decentralized and globalized market (Vartianien and Andriessen, 2008) overcoming temporal, spatial and organizational constraints, which, until the present time, were unavoidable limitations.

 Virtual teams (VTs) are conceived as groups of people who, despite being geographically dispersed, pursue a

shared goal, which becomes more achievable if information technologies are used for communication and cooperation across time and space (Bell and Kozlowski, 2002; DeSanctis and Monge, 1999; Javenpaa and Leidner, 1999; Hertel, Geister and Konradt, 2005). Furthermore, a wide range of technological possibilities is available nowadays that can be used and/or be combined in multiple ways to facilitate team work depending on the requirements (e.g., the type of tasks to be performed, the team members´ competencies, the synchronicity requirements of communication, etc.). For this reason, *virtuality* is conceived as a potential characteristic that in a certain way can be present in all teams in a greater or lesser degree (Griffith, Sawyer and Neale, 2003; Martins, Gilson and Maynard, 2004). Thus, *virtuality* can be considered a continuum in function of the degree of geographical dispersion and technological dependence present in the team (Cohen and Gibson, 2003; Munkvold and Zigurs, 2007).

 Virtual work provides numerous advantages for organizations as well as for users at an individual level (Geister, Konradt and Hertel, 2006; Bergiel, Bergiel and Balsmeier, 2008). Among these, the reduction of temporal and spatial costs have been mentioned; greater flexibility (e.g., member "multifunctionality" in different projects at the same time), team diversity which favors

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individual creativity and entrepreneur innovation, decision making agility, outcome improvement, resource combination and integration (e.g., knowledge, competencies, strategies), etc. On the other hand, other problems and difficulties in virtual teams have been pointed out: greater frequency of misunderstandings, coordination problems, lack of trust, negative conflict management, loss of control with respect to work activity, negative emotion management and motivation loss, among others.

In this regard, the greater the degree of team virtuality, the greater the context complexity that will have to be managed by users themselves, professionals and the companies´ managers (Vartiainen and Andriessen, 2008). This poses the necessity of improving our knowledge of collaboration and management processes in these contexts, which is shown in the research on this topic and in the development of the theoretical models that follow. In fact, in the last decade, there has been several reviews on work teams that have paid special attention to the functioning of VTs (Kozlowski and Ilgen, 2006; Mathieu, Maynard, Rapp and Gilson, 2008) and also specific reviews regarding these (Maznevski and Chudoba, 2000; Axel, Fleck and Turner, 2004; Martins et al., 2004; Powell, Piccoli and Ives, 2004; Hertel, Geister and Kondradt, 2005; Rice, Davidson, Dannenhoffer, and Gay, 2007; Bergiel et al, 2008; Lin, Standing and Liu, 2008; Ebrahim, Ahmed and Taha, 2009). Likewise, there are a good number of empirical studies that analyze diverse relevant aspects of these teams in the organizational context. In the present paper, we will first focus our attention on the analysis of diverse basic premises on which current VTs research is based, then later delve into some relevant aspects for their management.

MAIN CHARACTERISTICS OF VIRTUAL TEAM WORK

In order to understand the impact of technologically mediated communication on virtual team work, different theoretical approximations developed through research in the field can be followed. These approximations can be grouped into two broad perspectives. First, those that Leung and Peterson (2011) recently denominated *"functional perspective"*, which emphasize the limitations technologies offer to transmit information, also known as *"filter of information cues"* or approximations based on the limited *"media richness"*. Second, those emphasizing

the active role of the user in the adaptation and appropriation of the characteristics of technology (Schiller and Mindviwalla, 2007), also denominated *"psycho-social perspective"* (Leung y Paterson, 2011).

The *functional perspective* based on "media richness" (Daft and Lengel, 1986; Siegel et al.1986) and on the filtering of cues proposes that technology has certain objective characteristics which determine its capacity for transmitting rich information, that is, nonverbal social information and feedback. The "narrower" the channel is, the more limited is the quantity and complexity of the information transmitted, and therefore, the more the uncertainty and ambiguity created in the group, which can hinder its social and interpersonal processes. Most of the investigation on team work across different communication contexts has followed this approximation to formulate the models and predictions.

Nevertheless, the results obtained from this approximation have been inconsistent. Other aspects need to be taken into account, such as the active role played by the group when appropriating this information for adaptation to the characteristics of the technology employed. Thus, several approximations based on these concepts emerge (DeSanctis and Poole, 1994): the channel expansion theory (Carlson and Zmud, 1999); the Social Information Processing Theory (SIP, Walther, 1992); the Social Identity and Deindividualism Effect theory (SIDE, Lea and Spears, 1992) and the Hyperpersonal Hypothesis by Walther (1996). All these theories state that the technology used by the group for working does not have a deterministic effect on the results. The users can "expand" the richness of the media used with experience or can "exaggerate" its personal characteristics with the aim of increasing the social presence of their colleagues who are not physically proximate.

Another important element in all these theories is that of "time". Teams need time to adapt and optimize the characteristics of the technology they are going to use. Thus, paradoxically, technological mediation can create perceived proximity if the proper team work strategies are developed and if a group of adequate personal and team competencies are present to work in this context.

In this regard, in the last few years, the investigation on virtual team functioning in the organizational context has been developed parallel to the investigation on face-to-face work teams or those with a low level of technological

mediation or geographical dispersion. In this field, the main objective of the first research studies was the identification of those components that contributed to their efficacy. However, those orientations and perspectives have been progressively changing. As several recent reviews point out (Ilgen, Hollenbeck, Jhonson and Jundt, 2005; Marks et al., 2001; Mathieu et al., 2008), the IPO popular models have been evolving toward the IMO/IMOP models leaving evidence of the bases and criteria that guide the more recent research in teams in general and also in the VTs.

In the case of the VTs, the variety in the offer of ICTs in companies along with their idiosyncratic structure has also influenced the evolution of the conceptual models that have guided their study. Hence, the studies based on lineal and comprehensive conceptual models, with transversal designs and oriented toward team results, are giving way to cyclical or recurrent models, with longitudinal designs, and oriented toward the development of different types of processes and/or emergent states as key team aspects (Martins et al. 2004; Cuevas, Fiore, Salas and Bowers, 2004; Powell Piccolli and Piccolli, 2004; Leung and Peterson, 2011).

The results obtained in the previous literature specifically show the difficulties encountered by VTs in achieving their objectives due to their characteristics of dispersion and technological mediation. These difficulties or "challenges" can be grouped into two great areas: the interpersonal processes or of team "construction" and the processes related to the coordination and combination of resources among the members (Cuevas et al. 2004; Rosen et al. 2006). Nevertheless, there are two constructs with a very relevant role for the efficacy of VTs: trust and potency. Both constructs, characterized as "emergent states" (Marks et al 2001; Kozlowski and Ilgen, 2006) play a facilitating role in interpersonal processes and team integration as well as in management processes and group resource combination.

In the research group Group-NIT[2], presently integrated in the Instituto de Psicología de los Recursos Humanos, Desarrollo Organizacional y Calidad de Vida Laboral (IDOCAL) [Institute of the Psychology of Human Resources, Organizational Development and Quality of Labor Life], research on diverse relevant aspects of virtual teams have been carried out for more than two decades (Zornoza, Ripoll and Peiró, 2002, Zornoza, Orengo, Gosálvez and González-Navarro, 2002). In the present paper, we offer a synthesis of the analysis conducted on interpersonal, coordination and resource-combination processes and also of the emergent states mentioned above. The relevance of the obtained results for the design of interventions that will facilitate the adequate and effective management of current virtual teams is also highlighted.

Social and interpersonal relationships in VTs

The activity performed in work teams has been an object of interest for more than half a century (Bales, 1950), and today it continuous to be one of the main areas of the study of teams, both in conventional and virtual work contexts (Marks, Mathieu and Zaccaro, 2001; Martins et al., 2004; Kozlowski and Ilgen, 2006; Rousseau, Aubé and Savoie, 2006; LePine, Piccolo, Jackson, Mathieu and Saul, 2008; Mathieu et al., 2008).

The review of the literature allows us to identify an important percentage of studies conducted in virtual teams where it is confirmed that these teams, compared to face-to face teams, are more oriented toward certain aspects of the task (e.g., coordination, communications and/or task-technology adjustment) than toward the socio-emotional aspects that are produced among their members. This is often explained by the limitations of the communication media employed to transmit nonverbal information (cues-filtered-out perspective and limited social presence) (Burke and Chidambaram, 1999; Bordia, 1997; Lipnack and Stamps, 2000). According to these models, as the contextual information is not available among team members, these tend to search for meanings based on the available cues, and therefore, are focused on the development of the task (Cramton, 2001; Leung and Peterson, 2011). Perhaps due to the lack of attention on social aspects, a tendency to behave in a more impersonal, hostile and uninhibited manner is stimulated (Orengo, Zornoza, Prieto and Peiró, 2000).

However, studies conducted from interactionist perspectives, which pay more attention to the

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development of team processes, confirm that aspects such as the evolution of interaction throughout time, the previous familiarity among team members, the development of some relevant social processes, the experience in the use of the media and/or the learning of competencies for virtual team work, can mitigate the constrictions initially attributed to the communication medium (Walther, 1992, 1996; Carlson and Zmud, 1999; Beranek and Martz, 2005; Walther and Bunz, 2005). As can be observed next, the investigation conducted by our research group is coherent with this approach contributing to the identification and/or clarification of some central processes for the functioning of VTs.

Relational Communication is an ample process which facilitates the management of interpersonal identities and their relationships within the group (Walther, 1995) and positively influences VT outcomes. Their multidimensional nature has been studied by Zornoza, Orengo, Ripoll and González-Navarro (2003) in VTs using the categorization processes of the information exchanged during group interactions (social management of information, integrative and supportive communication, and uninhibited behavior). Teams that work using computer-mediated communication (CMC), as opposed to teams that work face-to-face (FtF), are capable of developing interactions of support and integration while also maintaining a greater degree of negative and uninhibited socio-emotional messages.

Once again, these results prove the importance of learning and the use of social information management strategies (information regarding the task which is socially shared by the team, the team´s view on objectives, procedures, etc.) in virtual work contexts. However, these strategies, which are developed with greater difficulty and more slowly in mediated contexts, allow VTs to adapt their information exchanges of a socio-emotional nature without increasing their negative behavior. As Beranek (2005) indicates, the effect that technology has on the development of relational communication is not static but rather it can depend on the temporal course and/or the training the team has received for the development of said relational links.

In this framework, *within-team conflict* is another process that can have different effects according to the communication medium (face-to-face FtF, videoconference VC and Computer-Mediated Communication CMC) and the group's length of

experience. Thus, Martínez-Moreno, González-Navarro, Zornoza and Ripoll (2009) analyze the effects of task, process and relationship conflict on decision quality. The results show that while task and process conflict are determinant for team effectiveness at the beginning of the interaction in "rich" environments capable of transmitting a lot of information and of a more complex character (FtF and videoconference-VC), process and relationships conflict are those that are negatively associated with the performance of CMC groups as the group acquires work experience. This way, efficient conflict management in VTs will require that these work teams learn and clarify the possible disagreements about the procedures of task resolution as well as their way of relating to each other from the beginning of their interactions.

Recently, Gonzalez-Navarro, Orengo, Zornoza, Ripoll and Peiró (2010) analyzed the tendency to use *different styles of interaction in VTs,* as well as their incidence on team effectiveness. The obtained results indicate that while VC teams prefer to use a constructive style (which promotes trust and support among members), CMC teams develop an aggressive (hostile or imperative comments) and/or passive style (low participation and use of short sentences, without argumentation). However, although these differences do not diminish with experience in the use of technology and group development, they have important effects on team effectiveness. Thus, it is indicated that the constructive style improves the perceived efficacy in VC teams and worsens it in CMC teams. On the other hand, the passive style is positively associated with both performance and self-efficacy results in CMC teams. This last result suggests a probable strategic and intentional use of anonymity in CMC of adaptation to technology; that is, lower intervention frequency but more protocolized, the promotion of equality in participation and the elimination of status. Hence, a functional interaction style at low levels of virtuality ceases to be so when the communication context becomes virtual and viceversa.

Therefore, with sufficient time, VTs can exchange information and/or manage their interpersonal processes in an efficient manner to construct interpersonal relationships similar to those of FtF teams, which favors the development of other processes and/or states necessary for the team (e.g., trust, commitment, satisfaction and/or cohesion) (Jarvenpaa and Leidner, 1999; Chidambaram, 1996). The use of strategies that allow teams to adapt to technology and develop richer

social relationships can positively affect their performance. Moreover, according to the results obtained by Lin, Standing and Liu (2008) when trying to identify the critical interaction processes for VT effectiveness, social dimension not only complements but also, paradoxically, empowers and improves the activity relative to the team task in a very important way, with the former even being a "prerequisite" for task efficacy. Thus, the early development of social relationships among team members contributes to improving task aspects and the obtained results.

Structuring and coordination of work processes in virtual teams

The flexibility that can be achieved by VTs nowadays in terms of managing space, time and ways of cooperation has provided a resource without precedents for the development of work activity, especially taking into consideration the numerous advantages they provide at the individual, organizational and social levels (Powell, Piccoli and Ives, 2004). However, the authors quickly point out that the implementation and use of these VTs in organizations requires an adequate integration in each case and special attention to the structuring and development of team work processes. As Maruping and Agarwal (2004) indicate, the existing theory and results of work teams that communicate face-to-face cannot be directly applied to VTs. In this regard, in our research context different studies have been carried out showing the idiosyncrasy of VTs (Peñarroja, Orengo, Zornoza and Lira, 2007; Zornoza, Ripoll, Orengo, González-Navarro and Peiró, 2008) and, thus, offer important clues for their management.

Hence, when the influence of the virtuality level of the teams on *the coordination and planning processes* is analyzed, it is found that teams that use CMC show lower levels in these processes, and in addition, this tendency is maintained over time. However, this negative relationship, which would offer support to the theory of cues filtered out, disappears when the team´s trust is considered as a mediating variable in said relationship (Peñarroja et al., 2007). Likewise, it is also observed that teams with intermediate levels of virtuality (VC) develop their processes in a similar manner to teams who communicate face to face (FtF).

Virtual teams as socio-cognitive systems require information processing and the transformation of a series of resources into specific outputs. Social interaction processes, especially, determine the manner in which this process is carried out (Curseu, Schalk, and Wessel 2008). In this regard, Zornoza et al., (2008), provide relevant data with respect to the processes of group influence and their effect on the results. The obtained results show that VTs adapt to technology using different styles of influence depending on the communication medium. In CMC groups, a normative style predominates (expression of preferences and regulating norms) in comparison to VC groups who prefer an informative style (based on the use of arguments and information in order to reach agreements) for task performance. Furthermore, the differential function of each style of influence in each communication medium for predicting and improving the task results as well as the wellbeing of the team has also been verified. Thus, for example, when team members suffer from greater constraints (CMC), they use a normative style to shorten the time needed to reach an agreement and favor a greater intervention exchange among the team members. Nevertheless, when the teams are dispersed but maintain the presence of visual contact (VC), it is more effective to exchange and contrast different arguments and opinions.

Finally, it is worth mentioning that when VTs are required to face complex tasks (Zornoza, Ripoll and Peiró, 2002; Ripoll, González-Navarro, Zornoza, Orengo and Peiró, 2004) and/or achieve effectiveness under temporal constraints (Peñarroja, Lira, Ripoll and Zornoza, 2005), the interaction processes and/or styles in general, and of course, the structuring and coordination of team work acquires much greater relevance as intervening mechanisms in team performance. Likewise, it seems convenient to use synchronic media when VTs perform tasks with high interdependence with a view to improving their efficacy (Rico, Cohen and Gil, 2006).

In short, although VTs provide very flexible solutions for companies and workers, the adoption of formal procedures or protocols is essential to structure the work of team members (e.g., to know how to manage and direct, establish clear expectancies, integrate information and transform it into proposal or solution). Thus, developing a shared view, formalizing and coordinating work processes has been positively associated with cohesion, commitment, collaboration, trust and decision-making quality in virtual teams (Warkentin and Beranek, 1999; Lurey and Raisinghani, 2001; Martins et al., 2004; Rice et al., 2007).

Relevant emergent states relevant in VTs: potency and trust

Emergent states are defined as those that have a cognitive, motivational and/or affective nature, that are dynamic and that can vary as a function of other aspects such as the team´s context, antecedents or inputs, processes and outcomes (Mark et al., 2001; Mathieu et al., 2008). Thus, potency and trust are emergent states that, due to their nature, can play different roles in team work processes and interaction. In general, the studies carried out by our research group show the potential and benefits that these processes have and their positive contributions to the development of virtual teams.

Team potency in virtual contexts has revealed itself as a key ingredient in the functioning of these groups. According to Guzzo, Yost, Campbell and Shea (1993), potency is defined as "the collective belief in a group that it can be effective" (p. 87) and has been positively associated with the effectiveness of teams in conventional communication contexts (Pearce, Gallagher and Ensley, 2002). According to Gibson (1999), this relationship can vary according to contextual variables. The studies that are presented next incorporate technology as an important intervening variable.

The findings obtained by Lira, Ripoll, Peiró and Zornona (2008) contribute in clarifying the pattern of team potency development as a function of the communication medium used (FtF vs. CMC), and also the influence that the perception of effectiveness has on its later performance. On the one hand, it is observed that potency increases over the course of time in FtF groups whereas it remains stable in CMC groups, possibly because they require more time to adapt to the technology and to develop said belief in the team. On the other hand, it has been found that the team´s perception of effectiveness is determinant in increasing potency in CMC groups in comparison to FtF groups. According to this, it is suggested that potency can be modified with interventions that allow the group to be informed of the results in a continuous manner.

Furthermore, potency has been linked to other team processes such as within-group conflict. The importance of conflict in VTs has been gaining strength in the last few years. It seems clear that the greater the limitations of the communication medium are (lack of social, contextual and non-verbal communication cues) and/or the necessities of adaptation to technology, the greater the importance acquired by the exchanges among team members oriented toward showing points of view, making critical evaluations, and dedicating time to relational aspects. In this context, Lira, Ripoll, Peiró and Orengo (2008) have analyzed the relationship between "within-group conflict" (task and relationship conflict) and "potency" constructs, and found that this is more difficult and complex when groups use computer-mediated communication (CMC) in comparison to face-to-face communication (FtF). However, in another study carried out by Lira, Ripoll, Peiró and González-Navarro (2007), the modulating role that potency can play in the relationship between task conflict and team outcomes (performance and cohesion) has been shown. Thus, when potency is high, conflict contributes positively to improving both the quality of team results and the cohesion perceived by members.

In conclusion, the collective belief that the team can be effective favors the achievement of satisfactory results and this can be improved if the team is provided with resources that allow them to adequately manage conflict within the group (time management, disagreement resolution, facilitation of opinion sharing, critical evaluations, etc.).

Team trust in virtual contexts. Virtual teams are especially vulnerable to mistrust (Rosen, Furst and Blackburn, 2007) due to the limitations associated with communication media. The difficulties in establishing an initial *rapport*, identifying and/or recognizing information relative to the other members (e.g., roles, experiences, knowledge, competencies) and the limited presence of interpersonal relationships hamper, slow down or hinder the first stages of the development of team trust.

On many occasions, the behavioral control mechanisms that teams usually use to obtain information (e.g., intervention frequency, frequent reports, and periodic task evaluations) generate uncertainty and mistrust. According to Piccoli and Ives (2003), this is usually produced by the emergence of incongruities among team members, which makes them more vigilant. For this reason, the need for information about others and the environment itself make us seek collaboration and trust in the team. In fact, aspects such as benevolence, capacity and integrity are positively associated with team trust (Jarvenpaa, Knoll and Leidner, 1998). Thus, initial mistrust, which often generates greater control over others, can serve as a base for the development of expectancies of trust among team members.

Team trust requires the development of a set of attitudes and predispositions on the part of each team member with respect to the others regarding the relationship that is established. It supposes that the actions of others are necessary (team members are interdependent) and favorable, and that these members will not take advantage of expressed vulnerability to harm the person who admits it (Rousseau, Sitkin, Burt and Camerer, 1998). These attitudes are developed from the experiences that individuals have as much on the cognitive sphere as on the affective and behavioral spheres (Jones and George, 1998). Thus, the building of trust in a virtual environment becomes more relevant as it inhibits the adverse effects that factors such as geographical dispersion, the lack of non-verbal cues and the uncertainty generated by technology can exert (Walter, 1994; Jarvenpaa and Leidner, 1999; Krebs, Hobman and Bordia, 2006). In fact, this emergent state (Marks et al., 2001) has been widely studied in VTs focusing on its determinants as well as its consequents and its relationship with other processes and/or states (e.g., mediating and/or modulating role).

With respect to the antecedents, a first study conducted by Zornoza, Orengo Ripoll, González-Navarro and Peiró (2007) broadens previous research on the antecedents of team trust (Jarvenpaa et al., 1998; Aubert and Kelsey, 2003). To analyze this phenomenon, two task-related processes are considered (team potency and task commitment) and their influence on the development of trust is studied according to the different level of virtuality (FtF, VC, and CMC). The results show that both processes, being committed to the task and believing that the group can be effective, over time improve the development of trust in teams that work with computer mediated communication (CMC). On the other hand, the perception of potency is positively associated with trust in groups that work with VC although only at the beginning of the interaction among team members. Hence, if we attend to the temporal dimension of trust in VTs, the evidence shows that, although its development requires more time than is required in FtF teams, it can emerge and develop until it reaches similar levels (Wilson, Strauss and McEvily, 2006).

In general, trust is considered one of the most important factors in determining the success of VTs (Kanawattanachai and Yo, 2002). The effects that the development of a climate of trust can have on team effectiveness according to the different level of virtuality have recently been studied by Zornoza, Orengo and Peñarroja (2009). The obtained results confirm at the same time as they broaden previous research. The development of a climate of trust can eliminate losses during team interaction processes (Aubert and Kelsey, 2003; Jarvenpaa, Shaw and Staples, 2004) and especially improve affect-related results such as team satisfaction and cohesion in communication contexts with a high level of virtuality (CMC) (Zornoza, Orengo and Peñarroja, 2009).

Taking into consideration the previous results, the role of potency and trust in VTs as relevant emergent states for efficacy can be confirmed. Both constructs of a dynamic character are developed over the course of time and can be influenced by other interaction factors, at the same time as they can influence those processes and team results (Ilgen et al., 2005 and Kozlowki and Ilgen, 2006; Mathieu et al., 2008).

RELEVANT ACTIONS IN THE EFFECTIVE MANAGEMENT OF VIRTUAL TEAMS

The studies analyzed in the previous sections about the functioning of VTs show the importance of developing efficient intervention strategies for their management in organizations.

A factor to be taken into account is the promotion of the active role that the user has in the process of appropriation and adaptation to technology. Teams change the structure of their relationships and norms in a constant dynamic interaction with technology. Bjorn and Ngwenyama (2011) highlight the importance of the *technological alignment* process in the optimum development of VT activity. It consists of a continuous and iterative process that remains active throughout the team´s entire life, and in which technology and collaboration processes (e.g., socioemotional and task-oriented) are mutually transformed. In order to do this, it is necessary to develop knowledge and skills in the team members that allow the adequate use of technology.

In the previous section, the relevance of actions oriented toward the development and the strengthening of two key areas in the functioning of VTs was shown: *the construction of relationships among team members and work coordination processes and structuring.*

There is empirical evidence that shows the facilitating role of good social relationships on the exchange of information and group performance (Beranek and Martz, 2005). In this regard, the results obtained in the studies presented in the previous section offer evidence that the

development of an open and personal communication, the team´s accessibility to the necessary resources for the development of a climate of mutual trust, the training of the team in the adequate management of within-group conflict (expression of disagreements, points of view, relationships) and its preparation in the detection of others' the strong points are all necessary aspects for a VT to function adequately and efficiently owing to the contributions of its members.

On the other hand, the results suggest that although VTs provide very flexible solutions for companies and workers, the adoption of formal procedures or protocols that structure the work of team members as well as the training in their application, are essential. There are elements that facilitate this coordination and cooperation, such as the election of a coordinator, the establishment of specific objectives that provide the group with feedback on their achievements, the formulation of formal work procedures and the development of explicit communication strategies that allow sharing information and knowledge among team members.

In addition, the literature proposes a variety of strategies to improve the efficacy of VTs that focus on two differential areas of functioning in this work: interpersonal relationships and structure and coordination processes (Priest, Stagl, Klein and Salas, 2005; Rosen et al, 2006). Some of these will be briefly described next, due to their easy development and also their proven effectiveness.

A strategy that facilitates work in VTs is the *prevision and availability of sufficient time* for the group to achieve its goal. Virtual teams work at a different rhythm than FtF groups or groups with a lower level of virtuality. Teams that interact mainly through written communication need approximately four times more time than those who interact verbally.

Another strategy that favors the integration of team members, cohesion and trust is to develop an "initial encounter" on-site, face to face. Different authors have shown the importance of direct contact for the development of key variables in the success of VTs. On the one hand, it can promote trust and cohesion in teams (Curseu, Schalk and Wessel, 2008) as well as coordination processes (Lipnack and Stamps, 2000; Rosen et al., 2006; Zheng, Bos, Olson and Olson, 2001).

The third strategy of a global nature is *training*. It consists of training team members in a set of techniques directed at the improvement of the general functioning of the VT. Training in the work processes of VTs contributes

to adapting the technology to the team needs and tasks, overcoming its limitations and avoiding losses due to the group work process (Kozlowski & Ilgen, 2006; Rosen, Furst & Blackburn, 2006). *Communication processes training* in the team is positively associated with participation (Saviki et al, 2002) and the improvement of relational aspects, which at the same time positively influences the shared exchange of information (Warkentin and Beranek, 1999). Furthermore, those teams who have received training in the management of relationships and trust improve their perceptions of the interaction process and achieve more cohesion and trust among its members (Beranek, 2005).

However, the literature on the subject is still scarce, the guides and procedures that exist on training systems and the construction of virtual teams being very few and limited (Gibson and Cohen, 2003; Rosen et al. 2006).

In this context, our research team (Group.NIT, IDOCAL) has designed and carried out a training program for VTs based on the "initiatives and good practices" of the virtual context itself, following the investigation previously conducted. It is a self-guided training program where team members analyze and review their interaction processes and the obtained results on the task (e.g., performance), with the support of a facilitator, receiving feedback and developing improvement strategies. The basic contents of the program include strategies for developing trust, written communication strategies (e.g., use of emoticons, short sentences, etc.) and strategies for coordination and the use of shared information.

The results obtained to date show that training generates beneficial effects on the team in a direct or indirect manner: a) it accelerates the consolidation of the team as it activates and stimulates the perceptions of cohesion, cooperation and satisfaction with it; b) it positively affects innovation, possibly because its members manage information more efficiently; and, finally, c) it intensifies positive relationships between interaction processes (communication, cooperation, identification and shared information management) and team outcomes (potency, learning, team satisfaction).

CONCLUSION

There is no doubt that work in VTs through the use of information and communication technologies in today´s organizations is in need of reflection and new approaches regarding the way of managing social capital in general, and more specifically work teams.

Throughout this article, we have offered information and research results regarding relevant aspects in the functioning of virtual teams that are efficient in the organizational sphere. For this, it is important to train managers and professionals in the necessary competencies to successfully face this new way of working as a team. Thus, we have reviewed the key components for the optimal functioning of VTs from the main theoretical-conceptual frameworks and we have also provided the main empirical findings regarding these types of models. Finally, in view of all this, and from a positive approach that seeks to improve VT functioning, some of the principal work strategies in VTs have been reviewed, among which training stands out as one of the most efficient practices for its management in companies.

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