

2002

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Recommended Citation

de Mio, Ruggero Rossi, "On Defining Virtual Emotion Intelligence" (2002). *ECIS 2002 Proceedings*. 149.
<http://aisel.aisnet.org/ecis2002/149>

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ON DEFINING VIRTUAL EMOTIONAL INTELLIGENCE

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ABSTRACT

In this paper virtual teams are defined as living systems and as such made up of people with different needs and characteristics. Groups generally perform better when they are able to establish a high level of group cohesion. According to Druskat and Wolff [2001] this status can be reached by establishing group emotional intelligence. Group emotional intelligence is reached via interactions among members and the interactions are allowed through the disposable linking factors. Virtual linking factors differ from traditional linking factors; therefore, the concept of Virtual Emotional Intelligence is here introduced in order to distinguish the group cohesion reaching process in virtual teams.

1. INTRODUCTION

In the past two decades as a response to the competitive challenges, enterprises are moving toward a rapid adoption of teamwork and virtual teamwork as main organisational frameworks, and in the 90' even researches have strongly focused on teamwork as a main research area [Lipnack and Stamps, 1997]. Researches have mainly been focused on defining common patterns that make teams work efficiently [Druskat and Wolff, 2001]. The assumption is that applying successful processes to other teams would make them also successful. According to Lipnack and Stamps [1997] virtual teams are defined as living organisms and as such made of people with different characteristics and needs. It is here therefore argued that applying successful processes to team of every kind is not a sufficient answer in order to investigate team effectiveness and performance.

According to Stott and Walker [1995] investigating team effectiveness is an unclear and fuzzy task. Different types of teams might be considered effective or non-effective depending on the applied criteria. The literature is filled with attempts to define team effectiveness [Anantaraman, 1984], to list the most crucial criteria [Margerison and McCann, 1985; Huszczo, 1990] or the attributes of a productive team [Hit, 1988]. For example, according to Anantaraman [1984] a definition of team effectiveness is: "An effective team would have clear cooperative goals to which every member is committed; *accurate and effective communication of ideas and feelings*; distributed participation and leadership; appropriate and effective decision making procedures; *productive controversies*; a high level of trust, acceptance and support among members; *a high level of cohesion*; constructive management of power and conflict; and adequate problem solving procedures". Many approaches are available in order to evaluate team performance as well [Francis and Young, 1979; Johnson and Johnson, 1991; Stott and Walker, 1992]. Hellriegel et al. [1989] identified the following factors that influence group performance: group size, member composition and roles, group norms, goals, *cohesiveness*, leadership and external environment. On the other hand, Thamhain [1990] focused more on: clear objectives, stimulating work, professional growth potential, direction and leadership, mutual

trust and *good interpersonal relations*, proper plans, *good communication within and outside the team*, organizational stability and security, adequate resources, and management involvement. Group cohesion can be therefore chosen as a leading variable for the establishment of high-performance teams, but evaluating group cohesion is certainly a hard task. Many factors can be addressed as critical for achieving group cohesion. It is commonly accepted that group cohesion is achieved when group members create affective interactions with each other and these interactions are available through the disposable communication channels such as words, images, etc. [Scott and Townsend, 1994; Katzenbach and Smith, 1993; Druskat and Wolff, 2001]. According to Druskat and Wolff [2001] group cohesion is achieved when establishing a high level of emotional intelligence and it is here suggested that characteristics of emotional intelligence may be different when working traditionally or virtually due to the different disposable communication channels. Differences between traditional and virtual linking factors are here therefore discussed and a novel definition of Virtual Emotional Intelligence is proposed in order to distinguish the group cohesion reaching process in virtual teams.

In section 2 a definition of virtual teams is suggested. Words, body language and place are identified as the linking factors in traditional teams; whereas virtual words, virtual body language and the virtual space as the linking factors in virtual teams. Differences and similarities are outlined in order to identify the cohesion process in virtual teams. In section 3 a novel definition of Virtual Emotional Intelligence is proposed. It is suggested that Virtual Emotional Intelligence is reached creating group awareness and exploiting the virtual communication channels in the virtual space. In section 4, it is argued that group cohesion in virtual teams is reached obtaining Virtual Emotional Intelligence and that this process has unique characteristics. Finally, in section 5 the research in progress is described.

2. DEFINING VIRTUAL TEAMS AS LIVING ORGANISMS

Virtual teams can be defined as groups of distributed people working together to achieve a common goal or solve a shared problem through the use of electronic communication means linking them across time, space and cultural barriers [Loughran, 2000]. This is rather a precise and accurate definition, but it doesn't outline the *essence* of virtual teams especially considering that a group of people does not necessarily make a team [Katzenbach and Smith, 1997]. The word *essence* is used here to identify the nature of the team; in other words, is the virtual team more an aggregation of "bits and bytes" that connects people together or more people that are connected together through electronic channels? In order to answer this question, the following definition of virtual teams is taken into consideration,

"Virtual teams are living systems not machines. Made up of people with interdependent roles and a web of relationships aligned through shared purpose, everything about them is organic. As living systems, they are not biological organisms but rather social organisms, which have both a pulse and a life cycle" [Lipnack and Stamps, 1997].

This definition stresses the importance of personal and psychological relations among virtual members and it will be used as reference for the future analysis. Following this approach allows studying virtual teams as unique entities and as such distinctive in each of their representation. In other words, it is here suggested that virtual teams should be studied as living systems and that as living systems they are different with regard to the people that form the team. Thus, virtual members interact with each other as human beings and as such they create a web of relationships in different ways. Creating relationships is the starting point for the establishment of group cohesion, which is generally considered a pivotal issue for building top-performance teams. Group cohesion is built via interactions among members and interactions are allowed via the disposable linking factors. Traditional and virtual linking factors have different characteristics. Therefore, in the next paragraphs these differences will be analysed in order to identify the linking factors that lead toward the establishment of group cohesion in virtual teams.

2.1. On Communication in Collaborative Work

As previously discussed group cohesion is regarded as a leading variable for the establishment of high performance teams and it is here suggested that group cohesion is achieved creating effective communications among members. According to Snyder [1988] “the ability of a group to accomplish its purpose depends largely on the capability of its members to communicate with each other effectively. Interpersonal communications are the cornerstone for effective team planning, problem solving, action, reflection, and evaluation”. On the same track are other studies stating that communication among members is the vital aspect for achieving group performance [Wynn and Guditus, 1984; Rees, 1988]. According to Guest [1962] the higher the lateral communication the better teams perform. Other studies tried to identify the most important factors [Ends and Page, 1977] or skills [Snyder, 1988; Adair, 1986; Margerison and McCann, 1985] that lead toward the establishment of effective communication among members. Anantaraman [1984] proposed few rules that should be followed in order to enhance communication: frank expression of feelings, *reconsider ideas and feelings when emotions are running high*, self-disclosing past experiences, giving support, listening and not evaluating, confronting, self-examine behaviour, making the past relevant to the present, use examples. According to Stott and Walker [1995] the communication factors can be summarised by the following five main activities: listening, feedback, coaching, *interpersonal relationships*, trust and openness. Other studies claim the importance of both the communication and the working skills [Schrage, 1990]. But despite more or less importance that previous studies gave to the communication, interaction is an essential action in teamwork and group performance is strongly influenced by its nature and quality. According to DeSanctis and Gallupe [1987], for example, group decisions result from interpersonal communication among its members and the better the information is exchanged the more likely is that the consequent decision is effective.

When discussing the effectiveness of communication in virtual teams the richness of the computer medium used should be taken into consideration. According to Carletta et al. [2000] there are two effects of communication technology related to group interaction: the social presence effect and the turn-taking effect. The social presence theory regards social presence as quality inherent in a communication medium [Short et al., 1976]. In other words the theory claims that the more cues a communication media provides the higher the level of the social presence is. Therefore, rich virtual communication channels as video conferencing provide a higher level of social presence than lean channels as only-audio communication. On the other hand, the turn-taking effect is related to the possibility and freedom of replaying somebody’s statement. In a conversation or debate the talkers have to be able to intervene whenever they feel it is appropriate in order to leave a relevant comment [Boden, 1994]. Using synchronous computer text conferencing, audio or video channels creates different levels of turn-taking effects. Many studies tried to determine differences between the application of richer/leaner computer mediated channels and the traditional communication but often providing contrasting results. For example, according to [Anderson et al., 1996; Doherty-Sneddon et al., 1997; Sellen, 1995; Anderson et al., 1997; O’Conaill et al., 1993] even the best video links are not as clear as the face-to-face communication. On the other hand, other studies [Lim and Benbasat, 1997; Berger et al., 1980; Silver et al., 1994; Olson et al., 1995] found that computer mediated communication may increase the group communication. In the next section characteristics of the virtual linking factors will be therefore discussed more into details.

2.2. The Virtual Linking Factors

Three words capture the essence of virtual and traditional teamwork: *people, purpose, and links* [Lipnack and Stamps, 1997]. People populate small groups and teams of every kind at every level, and they are held together by the purpose of the team’s goal; whereas, links are the channels, interactions, and relationships that weave the living fabric of a team unfolding over time [Lipnack and Stamps, 1997]. This definition suits both face-to-face and virtual teams. But whereas people and purpose are

the same in both team approaches, the definition of links is different. Linking factors in all kind of teams are *words, body language and places*, but in virtual teams they have different characteristics. More precisely, in the virtual communication words become *virtual words* in the written (electronic mail, electronic messages, ect.) and oral form (phone calls, voice mail, ect.), the body language becomes the *virtual body language* obtainable via video technology and the physical place becomes the *virtual space*. Teams are made of people; therefore in order to analyse the linking factors not only words are crucial in the communication but also body language and places [McCaskey, 1979]. Words, places and body language are the links that determine who will be the leader of the group or who will be considered the most brilliant member, etc., and all these factors influence the group cohesion process. Indeed, imagery, place, and body language rarely provide definitive information; but they do provide a way of knowing that is not available through other message channels [McCaskey, 1979].

Few differences are identifiable comparing words and body language with virtual words and virtual body language. Implications in the virtual use of written, oral and body language are the same as the implications of words and body language in traditional communications. The tendency of using the same kind of language (scientific vs. popular or technical vs. general) or to behave in a certain way (looking into interlocutor' eyes vs. looking away or acting vs. non-acting) leads toward a better level of understanding among members. For example, an abstract talker that uses many “-ism” and “-ion” can be considered uninteresting for a more concrete talker or although in some communities the eye contact is considered a sign of arrogance it is a sign of least attention in others [McCaskey, 1979]. These are all hidden messages present in the traditional and virtual communication.

The difference is that in virtual teams the hidden messages are less likely to be visible [Barner, 2001; Kelley, 2001; Lipnack and Stamps, 1997; Loughran, 2000]. They are hard to be interpreted and categorised when filtered through the technology, but they all affect people opinions and behaviours. Enhancing communication technology allows reducing the gap between traditional and virtual communication. But recent studies have proved that enhanced communication technologies such as video conferencing might only increase socialisation among members instead of increasing group performance.

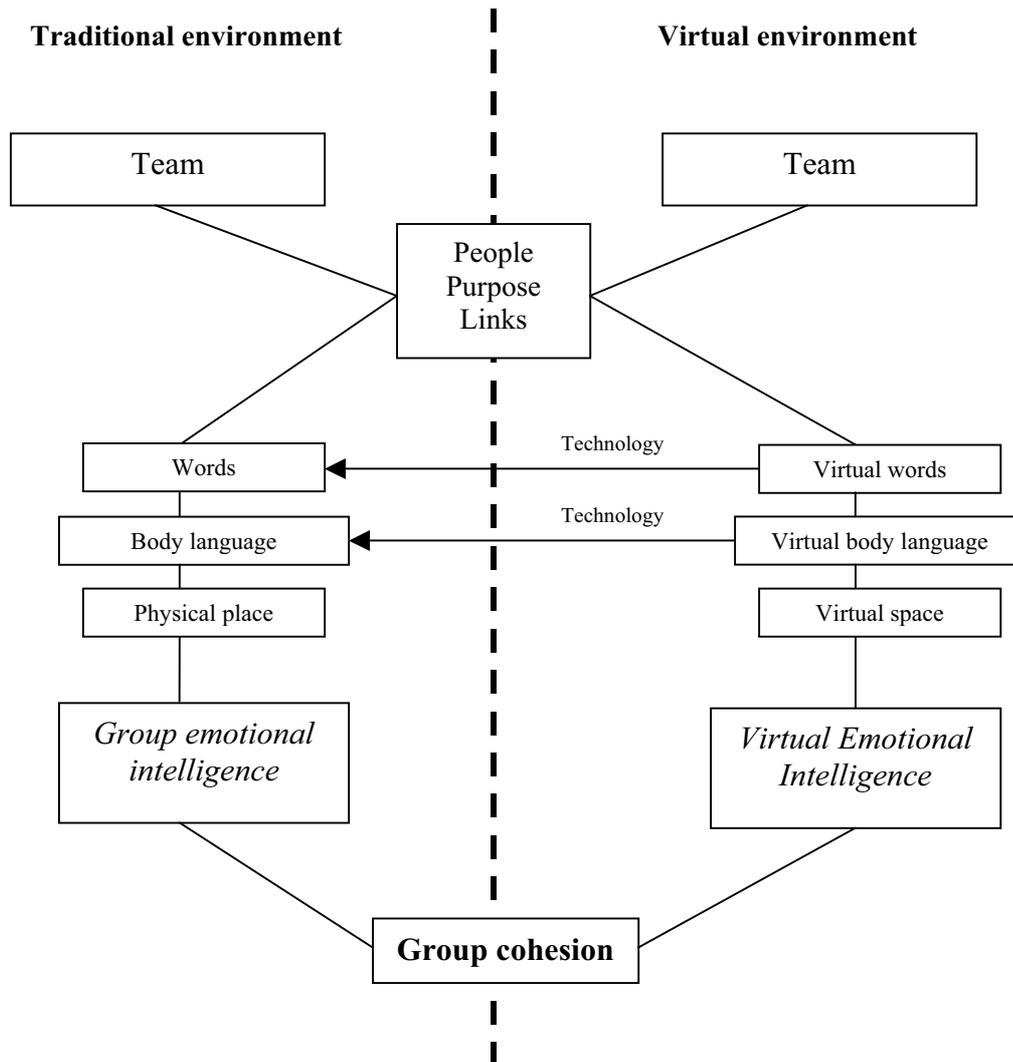
The other unique characteristic of virtual teams is the place where the interactions occur, that is the virtual space. In fact, despite communication technologies might be enhanced the allocation of the virtual meeting remains the virtual space. In groups of every kind the location of the meeting is rather relevant for the development of the interactions among members [McCaskey, 1979]. For example, if a meeting is settled down to be held in a member's working place, it is more likely that he or she will play a leadership role in the group; indeed, “Animals mark off the range of territory and defend it against intruders, and so does the human animal” [McCaskey, 1979]. The allocation of the meeting in one's office gives security and comfort, let the other members feel more insecure and would therefore probably influence group performance.

In virtual teamwork the location of the meeting is the *virtual space* where everybody feels equally either secure or insecure depending on members attitude. The virtual space creates hurdles and fences and depending on members' characteristics they feel more or less comfortable when working in it. For example, previous researches found that when interacting within hurdles and fences people might be more talkative and secure [McCaskey, 1979]. R. Forst's famous line “Good fences make good neighbours” is an exemplary case. This status of protection and security is achievable in the virtual space where members are located behind their fences (physical working place) and interact in the virtual space (network environment). The crucial issue is whether the virtual member feels comfortable with the electronic mean or not. Social presence can therefore improve the communication among members, but the virtual space is an inalienable condition.

Written, oral and body language are the links that allow virtual members to establish group cohesion in the virtual space. As stated before virtual communication channels provide fewer cues to the

members than traditional links, and the virtual space has different characteristics compared to the physical place. These factors distinguish virtual teams to allocated ones and it is here argued that group cohesion in virtual teams is reached in a unique way (figure 1). In the next section the definition of Virtual Emotional Intelligence will be proposed in order to describe the group cohesion reaching process in virtual teams. According to Druskat's and Wolff's [2001] approach Virtual Emotional Intelligence will be regarded as the crucial factor for achieving group cohesion in virtual teams.

Figure 1. Group consensus reaching process in traditional and virtual teams



3. ON DEFINING VIRTUAL EMOTIONAL INTELLIGENCE

Many studies have shown that teams are more creative and productive when able to achieve high level of participation, cooperation and collaboration [Grundy, 1998; Parker, 2000; Lipnack and Stamps, 1997; Druskat and Wolff, 2001; Scott and Townsend, 1994; Katzenbach and Smith, 1993]. Participation, cooperation and collaboration identify group cohesion and, as stated before, group cohesion is generally regarded as a crucial issue when working on virtual teams. Druskat and Wolff [2001] claimed that group cohesion is reached establishing a high level of group emotional

intelligence. Group emotional intelligence is defined following original Goleman's definition of individual emotional intelligence [Goleman, 1995] but with regard to groups. In fact, they claim that *groups are aware of emotions and able to regulate them and this awareness and regulation both inward to and outward*. They assume that groups as well as individuals must establish a high level of emotional intelligence in order to generate high performances [Druskat and Wolff, 2001]. Following this approach it is here suggested that since virtual teams are made of people they perform better when reaching a high level of emotional intelligence. Emotional intelligence is obtained via the interaction among members and since virtual linking factors are different compared to traditional linking factors, we introduce here the definition of *Virtual Emotional Intelligence*:

Virtual teams are aware of emotions and able to regulate them and this awareness and regulation both inward and outward via the virtual channels in the virtual space.

According to previous studies [Grundy, 1998; Kelley, 2001; Parker, 2000; Barner, 2001; Loughran, 2000; Jarvenpaa and Leidner, 1998] virtual teams performance is hard to achieve due to the little cues delivered via virtual communication. Virtual Emotional Intelligence is obtained reaching trust among members [Grundy, 1998; Parker, 2000; Lipnack and Stamps, 1997], a sense of group identity, a sense of group efficacy [Wolff and Druskat, 2001] and exploiting the virtual communication channels (virtual words and virtual body language) in the virtual space.

A first attempt to creating Virtual Emotional Intelligence is enhancing the virtual communication among members in order to obtain warmer and thorough interactions. In other words, warmer interactions are achieved developing richer media able to deliver more cues when communicating via virtual words and virtual body language. The hypothesis is that richer media create trust among members, a sense of group identity and a sense of group efficacy, allowing the members to exploit the virtual communication channels. This is achievable increasing the level of social presence. But although some studies have found that enhancing social presence leads to more effective interactions among virtual members [Abel, 1990; Valacich et al., 1994], others found no significant relevance in using richer media as video technology [Alavi et al., 1995; Dennis and Kinney, 1998; Meader, 1995; Eggert, 2001]. For example, studies found that the video channel lowered participation by group members and on the other hand that group cohesion improved it [Yoo and Alavi, 2001]. Therefore, whereas some researches showed that lean media increase the level of social loafing among members because of a lack of communication, other studies showed that with richer communication channels this status could be obtained due to socialisation.

Following previous argumentation it is assumed that lean as well as rich media might lead toward high level of Virtual Emotional Intelligence. In fact, enhancing social presence in the virtual communication leads toward a reduction of the gap between traditional and virtual interaction, concerning the visibility of hidden messages. But this would not align the two approaches. The inalienable factor present in the virtual interaction is the virtual space. In fact, the enhancement of virtual media does not create another working place but it modifies its characteristics. It is here argued that enhancing the virtual communication would be the equivalent of creating more effective working environment, but it would not change its virtual nature. For example, the arrangement of a round table in a meeting room facilitates interactions among members, but it does not change the location of the meeting. Similarly, the enhancement of social presence in the virtual communication facilitates the communication among members, but the location of the meeting remains the virtual space. Therefore the definition of Virtual Emotional Intelligence has been introduced in order to identify the unique cohesion reaching process in virtual teams.

Virtual Emotional Intelligence is obtained reaching team awareness. This status is achieved via the virtual communication channels in the virtual space. Due to the less cues visible in the virtual communication and the unique characteristics of the virtual space, the concept of Virtual Emotional Intelligence has been introduced. In fact, advanced technologies might close the gap between traditional and virtual communication, but the location of the virtual meeting will always be the virtual space.

4. CONCLUSION

Following previous argumentation, other researches and field experts it was assessed that groups perform better when they are able to establish group cohesion among members. The definition of group emotional intelligence was taken into consideration as the crucial factor for building group cohesion. Analysing traditional and virtual linking factors led toward the definition of Virtual Emotional Intelligence. In order to reach group cohesion virtual members should establish a high level of Virtual Emotional Intelligence and this status is achievable exploiting the virtual communication channels in the virtual space. This seems to make the group consensus reaching process in virtual teams unique. In fact, although the gap between traditional and virtual communication can be reduced, the virtual space remains the only available location for the virtual meetings.

From a more general point of view it is here argued that Virtual Emotional Intelligence is a status achievable when perceiving the outer world via the virtual channels. According to Goleman's [1995] definition, an individual has a high level of emotional intelligence when he or she is aware of being emotional and able to regulate these emotions and awareness both inward and outward. According to LeDoux [1996] individuals feel emotional when an external factor stimulates the amygdala, an almond-shaped clustered structure of the brain perched above the brainstem near the bottom of the limbic ring. External stimulations of the amygdala trigger therefore emotional reactions. The ability of regulate and control these reactions determine different levels of emotional intelligence. It is here argued that the perception of external factors occurs differently when filtered through the technology. For example, the perception of a team member's rude answer may trigger emotions like rage, indifference, fear, etc. On the other hand, when the same rude answer is filtered through the technology each member may handle the resulting emotions differently. Another more extreme example may be the view of a snake when walking in the forest (fear, numbness, etc.) or when working with a computer interface (indifference, courage, etc.). According to Goleman [1995] the level of emotional intelligence and of Intelligence Quotient (IQ) are not always related to each other and achieving a high level of emotional intelligence is more important than having a high level of IQ. According to the same approach, Druskat and Wolff [2001] suggested that this holds for groups and in this paper it was suggested that the virtual channels create a unique status of emotional intelligence that was here defined as Virtual Emotional Intelligence.

According to a four-years study carried out by the HayGroup [Hackman and Wageman, 2001] two third of top-management teams fail in reaching their goals. According to Sweetman [2001] top-management teams fail when they experience a lack of communication and group cohesion due to members' inability of handling emotions. When interacting with each other these members are not able to regulate their emotions and therefore fail in creating effective communication. The perception of messages (words, images, etc.) delivered by other members provokes negative emotional reactions that lead toward reluctance in the collaboration. This status according to Druskat and Wolff [2001] is equivalent of a low level of group emotional intelligence. It is here therefore proposed that defining Virtual Emotional Intelligence as a unique process may extend the possibility of managing employees effectively. In fact, the same messages filtered through the technology may have a different impact on the members and not trigger negative emotional reactions.

5. RESEARCH IN PROGRESS

In this paper Virtual Emotional Intelligence has been defined with different characteristics compared to classical [Goleman, 1995] and group emotional intelligence [Druskat and Wolff, 2001]. The potential effects and consequences of Virtual Emotional Intelligence in virtual teams will be therefore proved and tested. According to Druskat and Wolff [2001] three levels of emotional intelligence contribute to create a general level of group emotional intelligence: the individual level, the group level and the cross-boundary level. The ability of exhibit virtual intelligent emotions will be therefore sought at an individual, group and cross-boundary level as well. The processes leading toward the establishment of emotional intelligence in virtual teams will be analysed and compared to the processes of allocated teams. Differences and similarities will be analysed in order to test and validate the definition of Virtual Emotional Intelligence. Different virtual communication channels characterised by different level of social presence (only-audio channels, video channels, etc.) will be applied. The research aims to verify and validate Virtual Emotional Intelligence as a unique process.

REFERENCES

- Abel, M. J. (1990). Experiences in an Exploratory Distributed Organization. *Intellectual Teamwork: The Sociological and Technical Bases of Collaborative Work*, Lawrence Erlbaum, Hilldale, 489-510.
- Adair, J. (1986). *Effective Teambuilding*. Gower, Aldershot.
- Alavi, M., B. C. Wheeler and J. S. Valacich (1995). Using IT Reengineering Business Education: An Exploratory Investigation of Collaborative Telelearning. *MIS Quarterly*, (19), 3, 293-312.
- Anantaraman, V. (1984). Teambuilding. In *Human Resource Management: Concepts and Perspective*. Singapore University Press, Singapore.
- Anderson, A. H., A. Newlands, J. Mullin, A. M. Fleming, G. Doherty-Sneddon and J. Van der Velden (1996). Impact of Video Mediated Communication on Simulated Service Encounters. *Interacting with Computers*, 8, 193-206.
- Anderson, A. H., C. O'Malley, G. Doherty-Sneddon., S. Langton, A. Newlands, J. Mullin, A. Fleming and J. Van der Velden (1997). The Impact of VMC on Collaborative Problem Solving. In *Video Mediated Communication*, Lawrence Erlbaum, New Jersey, 133-156.
- Barner, R. (2001). Planning With Teams. *Future Times*, Summer, A11.
- Berger, J., S. J. Rosenholtz and M. Zelditch (1980). Status Organising Processes. *Annual Review of Sociology*, 6, 479-508.
- Boden, D. (1994). *The Business of Talk: Organizations in Action*. Oxford, London.
- Carletta, J., A. H. Anderson and R. McEwan (2000). The effects of multimedia communication technology on non-collocated teams: a case study. *Ergonomics*, 43(8), 1237-1251.
- Dennis, A. R. and S. T Kinney (1998). Testing Media Richness Theory in the New Media: The Effects of Cues, Feedback, and Task Equivocality. *Information Systems Research*, 9 (3), 256-274.
- DeSanctis, G. and R. B. Gallupe (1987). A Foundation for the Study of Group Decision Support Systems. *Management Science*, 33(2), 589-609.
- Doherty-Sneddon, G., A. H. Anderson, C. O'Malley, S. Langton, S. Garrod and V. Bruce (1997). Face-to-Face and Video Mediated Communication: A Comparison of Dialogue Structure and Task Performance. *Journal of Experimental Psychology: Applied*, 3, 105-125.
- Druskat, V.U. and S. B. Wolff (2001). Building the Emotional Intelligence of Groups. *Harvard Business Review*, March, 81-90
- Eggert, A. (2001). The Role of Communication in Virtual Teams. *Virtual Organization Net*, (3), 2.
- Ends, E. and C. Page (1977). *Organisational Team Building*. Winthrop, Cambridge.
- Francis, D. and D. Young (1979). *Improving Work Groups: A Practical Manual for Teambuilding*. University Associates, California.
- Goleman, D. (1995). *Emotional Intelligence*. Bantam Books, New York.
- Grundy, J. (1998). Trust in Virtual Teams. *Harvard Business Review*, November/December, 180.

- Guest, R. H. (1962). *Organizational Change: The Effect of Successful Leadership*. Tavistock Publications, New York.
- Hackman, R. and R. Wageman (2001). Top Teams: Why Some Work and Some Do Not. Five Things the Best CEOs Do To Create Outstanding Executive Teams. HayGroup, Inc.
- Hellriegel, D., J. Slocum and R. Woodman (1989). *Organisational Behavior*. West, Minnesota.
- Hit, W. (1988). *The Leader-manager: Guidelines for Action*. Battelle, Columbus, Ohio.
- Huszczko, G. (1990). Training for Team Building. *Training and Development Journal*, 44 (2), 37-43.
- Jarvenpaa, S. L. and D. E. Leidner (1998). Communication and Trust in Global Virtual Teams. *Journal of Computer-Mediated Communication*, 3 (4), 1-38.
- Johnson, D. and F. Johnson (1991). *Joining Together: Group Theory and Group Skills*. Prentice Hall, New Jersey.
- Katzenbach, J. R. and D. K. Smith (1993). The Discipline of Teams. *Harvard Business Review*, March/April, 111-120.
- Katzenbach, J. R. and D. K. Smith (1997). *The Wisdom of Teams*. Harper Business, Boston.
- Kelley, E. (2001). Keys to Effective Virtual Global Teams. *Academy of Management Executive*, May, 132-133.
- LeDoux, J. E. (1996). *The Emotional Brain*. Simon&Schuster, New York.
- Lim, L. H. and I. Benbasat (1997). The Debiasing Role of Group Support Systems: An Experimental Investigation of the Representativeness Bias. *International Journal of Human-Computer Studies*, 47, 453-471.
- Lipnack, J. and J. Stamps (1997). *Virtual teams, Reaching Across Space, Time, and Organizations with Technology*. Wiley, New York.
- Loughran, J. (2000). Working Together Virtually: The Care and Feeding of Global Virtual Teams. In *Proceedings of the 5th International Command and Control Research and Technology Symposium*, Canberra, ACT, Australia.
- Margerison, M. and D. McCann (1985). *How to Lead a Winning Team*. MCB University Press, Bradford, England.
- McCaskey, M. B. (1979). The Hidden Messages Managers Send. *Harvard Business Review*. November/December, 135-148.
- Meader, D. K. (1995). Supporting Distributed, Design Discussion: A Study of the Effects of Video on Engagement and Critical Discussion in Desktop, Multimedia Conferencing, Unpublished Doctoral Dissertation, University of Michigan.
- O'Conaill, B., S. Whittaker and S. Wilbur (1993). Conversation over Video Conference: An Evaluation of the Spoken Aspects of Video-Mediated Communication. *Human-Computer Interaction*, 8, 389-428.
- Olson, J. S., G. M. Olson and D. K. Meader (1995). What Mix of Video and Audio is Useful for Small Groups Doing remote Real-time Design Work?. In *Proceedings of CHI '95, ACM SIGCHI*, p. 362-368.
- Parker, G. (2000). Success Strategies for Virtual Team. *Consulting Today*, Reprinted with permission of the publisher, 1-2.
- Rees, W. (1988). *The Skills of Management*. Routledge, London.
- Schrage, M. (1990). *Shared Minds*. Random House, New York.
- Scott, D. and A. Townsend (1994). Teams: Why Some Succeed and Others Fail. *Human Resource Magazine*, (Yoder-Heneman Research award winner), 62-67.
- Sellen, A. J. (1995). Remote Conversation: The Effects of Mediating Talk with Technology. *Human-Computer Interaction*, 10, 401-444.
- Short, J., E. Williams and B. Christie (1976). *The social psychology of telecommunications*. John Wiley, London.
- Silver, S. D., B. P. Cohen and J. H. Crutchfield (1994). Status Differentiation and Information Exchange in face-to-face and Computer Mediated Idea Generation. *Social Psychology Quarterly*, 57, 108-334.
- Snyder, K. (1988). *Competency Training for Managing Productive Schools*. Harcourt Brace Jovanovich, San Diego.
- Stott, K. and A. Walker (1992). *Making Management Work: A Practical Approach*. Prentice Hall, Singapore.
- Stott, K. and A. Walker (1995). *Teams, Teamwork and Teambuilding*. Prentice Hall, Singapore.

Sweetman, K. (2001). Don't Worry Be Happy When Members of a Top Team Share Outlook on Life, The Company's Bottom Line is Also Likely to be Positive. *MIT Sloan Management*, 43, 10.

Thamhain, H. (1990). Managing together: A Practical Look at Teambuilding. *Management Solutions*, 31 (October).

Valacich, J. S., B. E. Mennecke, R. M. Watcher and B. C. Wheeler (1994). Extension to Media Richness Theory: a Test of the Task-media Fit Hypothesis. In *Proceedings of the Hawaii International Conference on Systems Science*, pp. 11-20, Maui.

Wynn, R. and C. Guditus (1984). *Team Management: Leadership by Consensus*. Charles E Merrill, Ohio.

Yoo, Y. and M. Alavi (2001). Media and Group Cohesion Relative Influence on Social Presence, Task, Participation, and Group Cohesiveness, *MIS Quarterly*, (25), 3, 371-390.