

## GOOD PRACTICES IN VIRTUAL LEADERSHIP – THE E-3Cs RULE (COMMUNICATION, TRUST AND COORDINATION)

S MOHANTY  
KISD, BHUBANESWAR

**Abstract:** Studies conducted under a doctorate programme, aiming at designing a Skills and Good Practices Model in e-leadership, clearly identified, from literature review, *eDelphi* study and further analysis of the results obtained from an interview *Focus Group*, a set of items linked to *e-Leaders* specific skills and good practices required in the process of collaborative learning within virtual teams (*e- Teams*): “ 11 – Effective e-leader communication”, “ 5 - e-leader skills to building trust”, “12- Operating coordination of the Virtual Team”; and “4 – E-leader behaviours to promote effectiveness”.

Since these items are considered of utmost importance in the *e-Delphi* study and in the *Focus Group*, they validate the areas of the *Skill Model MOODO COMPETE E-LEADER*, namely the Operational Coordination, Training and Education, Architecture and Technological Infrastructures. For each of these areas a set of guidelines is presented that provide the *e-Leader* a series of good practices that facilitate the making of a *Global Environment, Virtual*, to build *High Levels of Trust* within the *e-Team* and the spread of the *Creation and Sharing of Knowledge*. This environment must be supported by an appropriate structure of empowered leadership.

The article show also a model for understanding the specific skills and characteristics of *e-leadership* in *Learning Management Systems (LMS)*, used for implementation of virtual teams. A framework was done, to identify skills and characteristics of the *e-leaders*, based on the review of literature about the *e-leadership* paradigm and its relationship with the virtual teams.

**Keywords:** virtual leadership, virtual teams, Competency Model, Good Practices, Understanding model of e-leadership, Skills Model of good practices in e-leadership.

## 1. INTRODUCTION

It is common knowledge that the emerging paradigm of e-leadership arises in a context of economic global changes, which organizations and leaders have been facing during the last decade, characterized by the transformation of the business model. The survival of current organizations is directly connected to the ability to promote change and being able to adapt, evolve and not be stuck in time and space.

This new paradigm forces organizations to defy the conventional business models and leaders to adapt and expand the leadership and virtual communications, (Colfax *et al*, 2009). Organizations and their leaders must be ready to deal with globalization and with the exponential explosion of *Information and Communication Technology (ICT)*, (Zaccaro and Bader, 2003), having to learn how to surpass the limitations of space and time, as well as the cultural boundaries, (Kerfoot, 2010).

The present article frames a perspective of exploration of collaborative virtual environments, supported by a tool MODO COMPETE-E-LÍDER which identifies the e-leader set of intervention areas concerning the teams and virtual projects. Simultaneously it shows a set of three success critical factors common to all areas and that represent the importance of communication, trust and coordination in virtual collaborative environments.

The point 2 of the article shows the framework that justifies the need for models that can be referred as the paradigm of e-leadership founded on the scientific community opinion.

The point 3 shows in brief the Skills Model for Good Practices in e-leadership MODO COMPETE E\_LIDER that identifies the e-3Cs rule as transversal to the areas of intervention it identifies.

The Point 4 shows the concept of Golden Rule (e-3Cs) whose premises are justified by the studies' findings, and Point 5 has the explanation of each of the items considered critical in the areas of communication, trust and coordination.

Lastly, the conclusions are shown that, in addition to referring the e-leader's need to understand and be able to face the new leadership ways, remind the relevance of the e-3Cs in these collaborative virtual environments.

## 2. FRAMEWORK

According to Avolio *et al*. (2009, p. 439), «*leading virtual involves leading people from different departments, organizations, countries, and sometimes even competitor companies*». The authors define e-leadership as ways of leadership in which «*individuals or groups are geographically dispersed and interactions are mediated by technology*», (Avolio *et al*, 2009, p. 440). Weisband (2008), refers that the e-leader and the virtual teams have a higher probability of occurrence of challenges “*when distributed work occurs in different time zones, when local communication and human infrastructures fail, when team members' hardware and software platforms are different, or when local work demands require the immediate attention of collocated managers and workers, thereby creating pressure to pursue local priorities over the objectives of distant collaborators*” (p. 6).

Some authors maintain that the objectives of leadership have not changed; they keep focusing on problems as vision, direction, motivation, inspiration, trust. However, the e-leader started feeling the need of implementing those goals electronically, in an atmosphere where he/she can mediate the virtual teams scattered both geographically and in time, (DasGupta, 2011; Jonhson, 2010; Avolio and Kahai, 2003; Avolio *et al*, 2000).

This new leadership is definitely connected to the global economic changes and to the transformation of the organizational business model – that has been adjusting to the new realities of the global market, and time and space dimensions – only possible with the understanding of the emergence of the ICT that are the technological link in this paradigm of organizational leadership and condition sine qua non for the link, for establishing communication between e-leaders and e-teams. In this framework, the need of the virtual leaders for technical and human support systems able to sustain the team synergy is generally accepted by most authors, (DasGupta, 2011; Jonhson, 2010; Avolio *et al*, 2009; Shriberg, 2009; Malhotra *et al*, 2007).

It is clear that e-leadership will force the e-leader to acquire particular skills and it is fundamental that he can identify them. It is the only way for the e-leader to realize if he/she is able to lead the virtual teams and/or if he/she needs training. Even because the «*lack of the degree of fitness that people with responsibility for the management of change processes possess, represents one limitation to the possibility of designing training activities / development of these persons to enable them with the necessary skills (leadership skills)*», (Faria, 2012, p.4). Increasingly the virtual leaders became to depend on training instead of «*supervision*», (Kerfoot, 2010, p.115; Colfax *et al*, 2009; Malhotra *et al*, 2007).

At the same time there is a need to understand the virtual teams through approaches addressed to the structure, ways of communication, multicultural and ethical issues, the building of trust between the leader and the team members, as well as the need to discuss the technological models that can sustain e-leadership and the virtual teams, (Lee, 2010; Avolio *et al*, 2009; Shriberg, 2009; Hambley *et al*, 2007).

The shortage of models that might act as a reference for the new paradigm of e-leadership and help the e-leaders to maximize both their performance and the teams' they lead, is closely related to the recognition by most authors that current studies are still insufficient and further research is needed for a better understanding of the e-leadership paradigm, (DasGupta, 2011; Sutanto *et al*, 2011; Lee, 2010; Avolio *et al*, 2009; Carreno, 2008; Hambley *et al*, 2007; Hanna, 2007; Gurr, 2004).

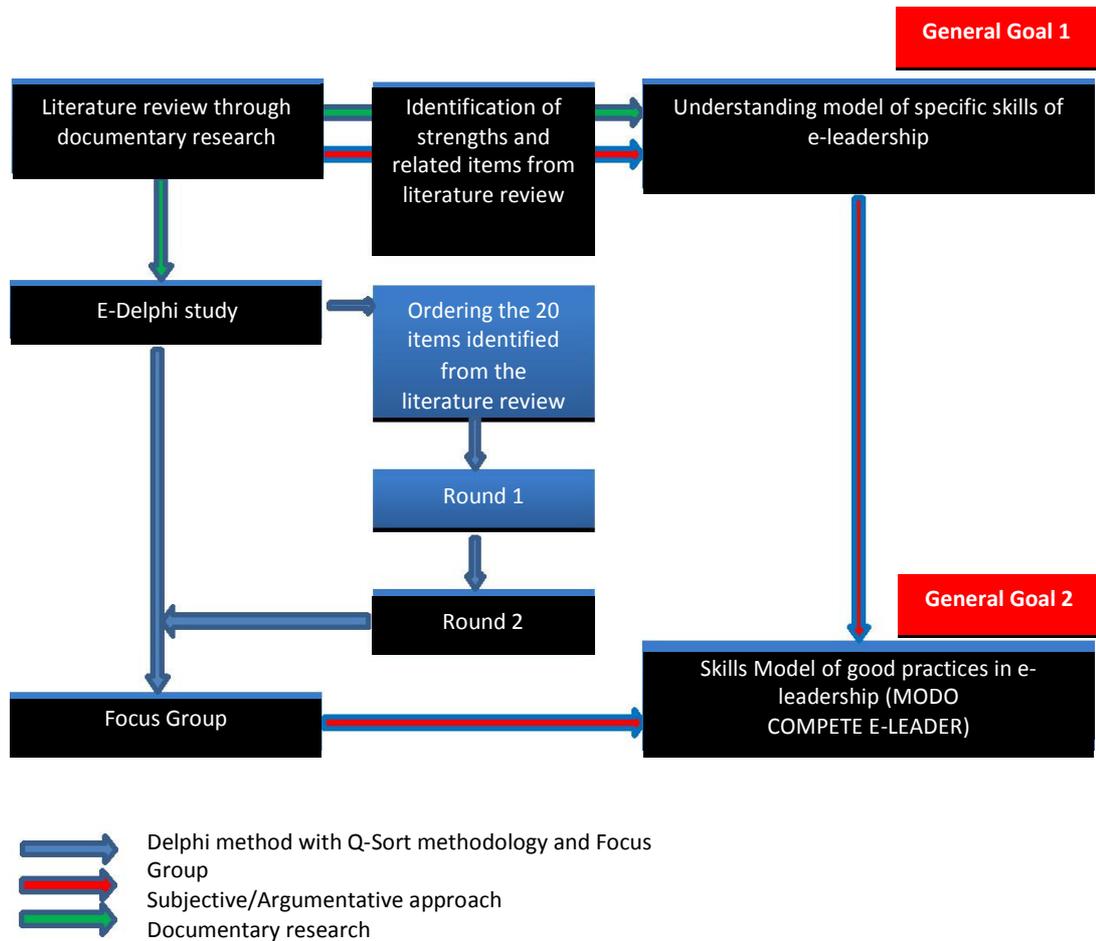
In recent years, with the development of emerging technologies and the emergence of collaborative learning management systems, some studies have come to light addressed for the role of social structuring of leadership relationships in virtual contexts, as collaborative communities online, that integrate collaborative tools, (Dias, 2012; Sutanto *et al*, 2011; Luther and Bruckman, 2010). In these environments, the search and the maintenance of knowledge networks is achieved by the social and cognitive engagement of the members of the community, (Dias, 2012). These studies suggest that the traditional models of leadership should be rethought and that a new form of leadership – team leadership - emerges from the network of motivated people, who can share and participate in the definition of the paths to follow, face the challenges, and take on commitments, (Pulley and Sessa, 2001). These models, able to sustain and focused on social collaborative dynamics, are revealed by their characteristics of promoting the creativity and innovation in collaborative innovation networks, build and share knowledge in a network, (Dias, 2012), but also with the ability to quickly adapt to the constant change and organizational complexity, (Sutanto *et al*, 2011; Jonhson, 2010; Luther and Bruckman, 2010; Malhotra *et al*, 2007).

### **3. THE SKILLS AND GOOD PRACTICES MODEL IN E-LEADERSHIP**

Under a doctoral project, a research work was conducted whose main purpose was the conception and drawing of a tool addressed to e-leaders and their e-teams, able to ease the training, the skills acquisition, the management and maximize the participation and performance of the teams in collaborative virtual environments, in which the use of technology is key to the communication process and knowledge sharing inside the organization. The adopted methodology is shown in figure 1.

The tool MODO COMPETE E-LEADER is able to provide the e-leader an effective and up-to-date Good-Practices Guide to perform leadership tasks, identifying the activity areas and the intervention areas appropriate to operate and potentiate the exploration of virtual environments.

Our intention is not to describe and debate the aspects related to the tool and its good practices guide, but highlight the importance of the Golden Rule of the Model, the e-3Cs rule, transversal to the areas in the Model (Table 1), namely the Operative Coordination, Training and Education, Architecture and Technological Infrastructures.



**Figure 1:** The adopted methodology research

The construction of the Skills Model MODO COMPETE E-LEADER helped identify the e-leader activity/intervention areas in collaborative virtual environments (Operational coordination, Training and Education, Architecture and Technological Infrastructures) thus giving rise, around each of them, and under the table/guide of good practices, to a set of guidelines and recommendations that, when adopted by a virtual leader, in an organization, may help maximize collaborative virtual environments and implement high performance levels within the virtual teams he leads.

**Table1:** Intervention areas of the MODO COMPETE E-LEADER Model

<i>MODO COMPETE E-LEADER</i>	
<i>Rule e-3Cs – Coordination, Communication, Trust)</i> <i>(Transversal to all intervention areas)</i>	
<i>Areas MODO COMPETE E-LEADER</i>	<i>Sub areas of intervention</i> <i>(Good practices guide)</i>
Operational coordination	Control and Management
	Control
	Skills
	Personal abilities
	Leadership style
	Evolution/change
Training/Education	Training and Education
	Evaluation
	Building trust
	Performance management
	Multicultural environment
	Multifunctional teams relationship
	Motivation
	Evolution
Architecture and Technological Infrastructures	Technology
	Control and Virtual Environment
	Complexity/Evolution/Change
Collaborative Virtual Environments  <i>versus</i>  Horizontal leadership	Global Environment
	Virtual Environment
	Organizational change

#### **4. THE GOLDEN RULE e-3Cs (COMMUNICATION, TRUST AND COORDINATION)**

The intervention areas of the Skills Model of e-Leadership Abilities and Good-Practices (MODO COMPETE E-LEADER) presented in Table 1 can be subject to a high or low interference on the part of the virtual leader who will have some guidelines, described in the good-practices guides, that may help to plan, implement and develop his activities.

Thus, more than describe characteristics, abilities or technical aspects of platforms or tools, the important is to identify each procedure, each functionality, each behaviour that the e-leader must adopt to improve and explore the model, so that it may be a real Good Practices guide.

Transversal to all intervention areas, therefore taken as a global rule in all the virtual leadership process, it is the e-3Cs rule, that we named Golden Rule, that is an intrinsic part of the Model and must be followed by the e-leader, either in learning collaborative environments or in environments of virtual projects development. The Rule is, objectively, founded on the premises:

Premise 1: Communication must be effective

Premise 2: trust must be built

Premise 3: The coordination must guarantee the alignment and integration of the e-teams considering the relationship levels (social) amid the members, exploring the collaborative environment as well as the creation and sharing of knowledge.

These three premises transversal to all Intervention areas of the MODO COMPETE E-LEADER have been clearly identified as the main critical factors for success, particularly:

-In the Delphi study with Q-Sort on the understanding of specific and characteristic skills in e-leadership, confirmed by the magazine Focus Group, the most relevant items are associated to communication, trust and coordination, (Samartinho, 2013).

Table II shows the list of the seven most important items in the process after the interview session Focus Group.

**Table 2:** Reordered list of the 7 most important items – Pós Focus Group (pointing the percentage of each item in the group of the 7<sup>+</sup>, in the group of the neutral 6 and in the group of the 7<sup>-</sup>)

Item	Item description	%group 7+	% neutral group	%group 7-
Item 11	e-Leader effective communication	79.71 %	14.49%	5.80%
Item 5	e-leader qualities to build trust	65.22%	24.64%	10.14%
Item 12	Operational coordination of the virtual team	60.87%	28.99%	11.59%
Item 4	e-leader behaviour to promote effectiveness	57.97%	30.43%	11.59%
Item 16	Participation of top leadership in the change process	55.07%	18.84%	26.09%
Item 9	e-leader communication skills with members of different cultures and/or dealing with geographic relocation	43.48	39.13%	17.39 %
Item 2	Training and development (e-leader): support, evaluation and correction of e-leader's faults	42.03%	33.33%	24.64%

Colours of percent values: red>40%; blue [30%-40%]; black <30%

In the *Model of Specific skills and e-leadership characteristics*, Samartinho et al. (2013), typical of collaborative virtual environments, constructed from the group of 19 strengths identified in documentary research (Table III, Annex I) built on the paradigm of e-leadership, considering of utmost importance the contributions of the “most relevant items”, namely:

*Item 11 – e-leader effective communication;*

*Item 12- Operational coordination of the virtual team;*

*Item 5 – e-leader qualities to building trust*

*Item 4 – e-leader behaviour to promote effectiveness;*

It is important to mention that all the 20 items had already been considered in the relationship with the 19 strengths shown in the model.

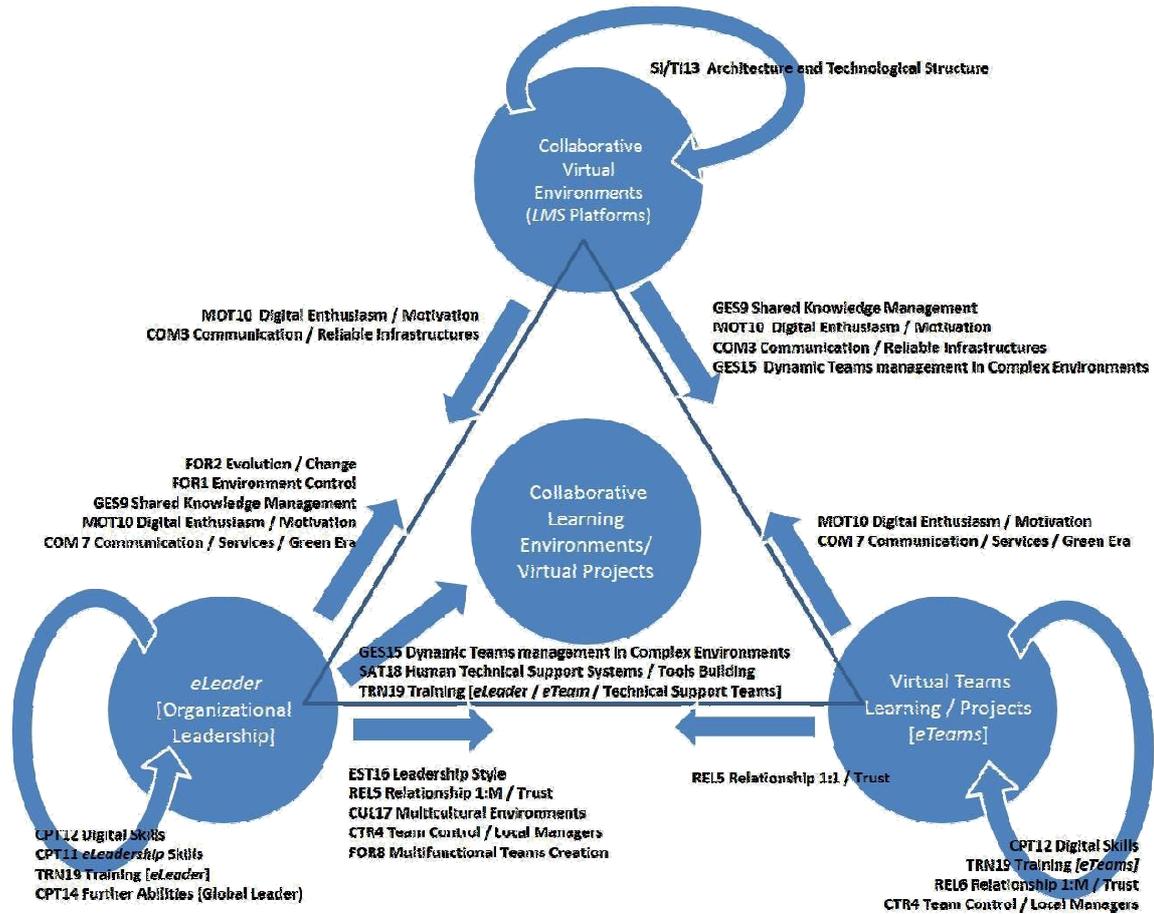


Figure 2: Model for Specific Skills and Characteristics in e-Leadership, in (Samarinho *et al*, 2013)

- Therefore, the cornerstones of the Model MODO COMPETE E-LEADER are the e-3Cs (Communication, Trust and Coordination) implied in the Golden Rule and representing the approach e-leaders versus e-teams that are made operational by means of technology but ingrained in such aspects as the building of trust, the understanding of communication, the social side of the team, the sharing of information and knowledge, multiculturalism and ethics, among others, in which, to guarantee the success, the e-leaders must be able for the function and open to learn and intervene in collaborative virtual and multicultural environments, in a two-dimensional framework of space and time.

**COMMUNICATION:** the e-leader must be able to communicate the vision, the path, the direction, the purpose of each action in line with the aims of the project.

**TRUST:** the need for trust among the work team is evident. This trust takes on, in collaborative virtual environments, the statute of a critical success factor, as the studies proved that trust is fundamental to overcome the lack of “richness” the e-teams face in the relationships and communication within traditional teams, but, due to the relocation and ways of relating in virtual environments, the e-teams are unable to reproduce.

**COORDINATION:** the e-leader must ensure that his virtual teams are ready to develop projects or tasks and share information and create knowledge, thus widening the historical heritage of the organization and participating, actively and in community, in its evolution to new stages of development in line with the organizational changes imposed by a globalized and globalizing society.

## 5. SOME CONSIDERATIONS ON THE ITEMS ASSOCIATED TO THE COMMUNICATION, TRUST AND COORDINATION TO KNOWLEDGE AND GOOD PRACTICES

This point presents a set of considerations and guidelines linked to the identified items that act as recommendations to the e-leaders, whatever the Virtual Leadership Model(s) adopted. These considerations highlight the crucial importance of the 4 identified items and their transversality in the whole process.

### Item 4 – E-leader's behaviour to promote effectiveness

The collaborative virtual environments demand the e-leader to be able to communicate with the virtual teams' members through technological means, in which his physical presence is not noticed. The importance of a global and multicultural spirit, the promotion of social relationships amid the e-Team members, making his presence regularly felt on the WEB, are mandatory features to promote effectiveness, (DasGupta, 2011). The e-leader can promote effectiveness by developing methods or strategies able to excel his emotional traits before his followers, (Goleman, 2000). The transformational leadership style has been adequate to high levels of performance of the e-teams, (Purvanova and Bono, 2009), as transformational leadership is more strongly felt in teams that only communicate through the computer. This aspect shows the need for the e-leader to guarantee collaborative virtual environments, that can allow the use of tools to share and create knowledge. Among the components needed by the e-leadership to promote effectiveness, (McCuiston *et al*, 2004), stand out: the need for the e-leader to know the members of his team; his ability to make the resources that can promote a better quality of life available to the e-team members; the ability to freely talk about the cultural differences of the e-team members; the ability to implement strategies to maximize the benefits of labour; and the ability to manage and align his personal life with the demands of managing an e-team 24x7.

*E-leader's behaviour to promote effectiveness:* avoid arrogance, shyness; promote technology integration; be a good listener; control technology through the choice or improvement and development of tools to share the project and real time information; promote regular online meetings to control the project and strengthen trust and relationships within the group.

### Item 5 – e-leader qualities to building trust

A challenge for the e-leader in virtual leadership environments, is his ability to build reliable relationships with his e-Teams members, who may not even know him in person. The e-leader has to create alternatives, through electronic means, such as the suitable tools to promoting trust within the team, (DasGupta, 2011). Therefore, the process of building trust implies, collaterally, to learn how to explore and potentiate the collaborative tools by all the e-Team members. Smits (2010) by mentioning the need of learning and leadership to go *hand-in-hand*, considers that the practice of apprenticeships establishes a relation of team identity, (Dias, 2012), that facilitates the process of knowledge sharing and necessary to create trust amid peers. It is the e-leader's job to guide the team, by creating a common goal of positive sympathy that shapes the e-team perceptions, includes motivational factors and helps the development of coherent and integrated work teams, (Johnson, 2010).

Zaccaro and Bader (2003) suggest a three phases model in order to implement trust, (Samartinho *et al*, 2012): a first phase, implying the recognition of the beneficial aspects of team work as it generates synergies that may hold the work team together; a second phase, based on knowledge, since knowledge sharing within the team promotes natural trust amid the members and makes them able to foresee actions or behaviours; a third phase representing a deeper reliance, when each team member starts sharing the same values, goals and intentions. This phase is only reached after a three to nine months period, (Oertig and Buerji, 2006).

*E-leader qualities to building trust:* the process of building trust is fundamental to any leader, especially in diversity and distance. It embodies such qualities as honesty, open mind, cultural insight, optimism. Being aware of the team dynamics and its context are crucial to understand how to build trust.

### Item 11 – e-Leader effective communication

Effectively communicate with a work team, means to objectively and clearly transmit what we want. It is a hard task for organizational leaders, demanding a huge effort and to know each one of the team members, to

spread the message and ensure it is understood. In virtual environments, with no physical presence, the e-leaders must be very careful and skilful at communicating, relating and inspiring trust, so that the message is received and the team members get involved in the project, in the exploration of technological means, in knowledge sharing and in creating team spirit.

Showing pride for a well done work and tell what has happened inside the organization, by e-mail or other communication tools (Avolio and Kahai, 2003), may be the facilitators to motivate and build the team spirit. However these tools imply attention on the part of the e-leader, as unpleasant situations may occur, e.g., the discomfort felt by any team member. These reactions may be shown in real time, thus making the leader to immediately act on them, clarifying his position and not allowing a counterproductive atmosphere to develop that may compromise the work and the trust of the e-team members. The virtual means of communication interact with the emotional stability and personality traits of the e-team members, (Balthazard *et al*, 2009). It is thus fundamental to understand and prepare the e-team members and, according to Lee(2010), the ability of the e-leader to move to leadership styles appropriate to virtual project environments is an important factor for the success of the project and human resources management. Johnson (2010) and Linkow (2008) agree that an e-leader must possess a set of “remote” skills linked to the ways of acting and communicating with the e-teams.

The featuring and the framing of the e-teams, in virtual environments, is also a relevant aspect. The e-leader must ensure the regular training of the e-teams, delegate and promote an inclusive and lasting communication amid their members, (Colfax *et al*, 2009). The e-leader is responsible to promote the self-management skills on the team members, (Johnson, 2010).

*E-leader effective communication* - it means the e-leader ability to promote the virtual team’s efficiency through such actions as: motivate the virtual team to enthusiastically discuss the project; establish different technological means to communicate and prepare the team members to use that technology before hand; help the team members to understand the technical language whenever they don’t feel at ease; and, mainly, create an effective e-team trust, (Zigurs, 2003).

#### Item 12 – Operational coordination of the virtual team

Some challenges the e-leader has to face are connected, in literature, to his need to fit to new leadership ways, (Lee, 2010). Manage and guide virtual teams, means, for the e-leader, a unique challenge, (DasGupta, 2011).

Holland *et al* (2009), refer that, in virtual leadership environments, the great e-leader challenges are: the ability to deal with loneliness, which means lead or motivate someone who is physically distant and alone; the ability to work in technological environments subject to malfunctions; the ability to act in culturally different environments and even with language restraints.

To overcome these challenges, the authors mention some practical guidelines, in order to help the e-leader to get the best performance from the e-teams. They are: positive thinking, smart use of multicultural knowledge, focus on the person and guide each team member, anticipate or predict and ability to maintain an accurate communication that conveys trust.

It is therefore acknowledged the importance and the need for the e-leader to be able to coordinate and operate the e-teams by means of a close involvement; this may start by selecting and inviting the team members to define/adopt the technological and communication structure in which the virtual teams will work. In this phase, the priorities are: develop work relationships with the e-team members, create a room to share knowledge, build collective skills, develop trust in all team members, so that these feel they are contributing to the success of the team and the project’s goals, (Malhotra *et al*, 2007).

*Operational coordination of the virtual team*: refers to the e-leader ability to be in close connection with his virtual team (e-team); be able to interpret the events in the virtual team; be able to achieve the objectives and ensure that all actions have a specific purpose according to the general goals of the team.

## 6. CONCLUSIONS

It is important to refer that in the current globalization context, where the organizations face the reality of the change of the business model and exponential growth of technologies, there is a positive environment to the evolution of the paradigm of e-leadership. The change of the traditional leadership focus on collaborative environments in online communities, the appearance of collaborative tools to enhance the creation of network knowledge, the need to build models able to provide technical and human support to the organizations, are some of areas to evolve and intervene in the future, linked to e-leadership. The leader, the *e-leader*, will play a crucial role by pursuing new ways and ensuring the success of the organization in an ever-changing world.

Therefore it is crucial that the e-leaders understand and be prepared for a new leadership style, addressed to the virtual management approaches, (Avolio *et al*, 2009) developing a management style that takes advantage from the available technologies and minimize the forced face-to-face environments, (Colfax *et al*, 2009). In these environments, the virtual teams must be ready and able to change. This means that the e-leader must perform tasks that facilitate and promote the success of the e-teams: (i) choosing the members to join the e-Teams; (ii) promoting communication amid the e-teams members; (iii) building an atmosphere of trust within the e-teams; (iv) training the members of the e-teams to work in platforms or systems of learning management or other technological systems, in order to ensure a communication, information and knowledge structure and the operability and compatibility of the systems of the different places where the team members access the project's virtual space.

For that, the Communication must be effective, the trust must be built and the coordination must ensure the alignment and integration of the e-teams considering their relationship, training, sharing of information and construction of knowledge.

## 7. REFERENCES

- Avolio, B. J., Kahai, S. and Dodge, G.E. (2000) "E-leadership: Implications for theory, research, and practice", *The Leadership Quarterly*, Vol. 11, No. 4, pp 615-668.
- Avolio, B. J. and Kahai, S. (2003) "Adding the "e" to e-leadership: How it may impact your leadership", *Organizational Dynamics*, Vol. 31, No. 4, pp 325-338.
- Avolio, B. J., Walumbwa, F.O. and Weber, T.J. (2009) "Leadership: Current theories, research, and future directions", *Annual Review of Psychology*, Vol. 60, No. 1, pp 421-449.
- Balthazard, P.A., Waldman D.A., and Atwater L.E. (2009). Predictors of the emergence of transformational leadership in virtual decision teams. *The Leadership Quarterly*, Vol. 20, No. 5, pp 651-663.
- Carreno, I.G. (2008) "E-mentoring and e-leadership importance in the quality of distance and virtual education Century XXI" [on-line], Paper from m-ICTE (2009): *Research, Reflections and Innovations in Integrating ICT in Education*. <http://www.formatex.org/micte2009/book/728-732.pdf>.
- Colfax, R.S., Santos, A.T. and Diego, J. (2009) "Virtual leadership: A green possibility in critical times but can it really work?", *Journal of International Business research*, Vol.8, No. 2, pp 133-139.
- DasGupta, P. (2011) "Literature Review: e-Leadership", *Emerging Leadership Journey*, Vol.4, no. 1, pp 1-36.
- Dias, P. (2012). "Avaliação das Aprendizagens nas comunidades On-Line", <http://bitly.com/eRRPauloDias>.
- Faria, J. (2012) *Liderança e Gestão Pública em Portugal: características e Implicações no Desempenho Organizacional*, Bubok Publishing, Madrid.
- Goleman, Daniel (2000) "Leadership that get results", *Harvard Business Review*, Vol. 78 No. 2, pp 78-90.
- Gurr, D. (2004) "ICT, leadership in education and e-leadership", *Discourse*, Vol. 25, No.1, pp 113-124.
- Hambley, B.A., O'Neill, T.A. and Kline, T.J.B. (2007) "Virtual team leadership: The effects of leadership style and communication medium on team interaction styles and outcomes", *Organizational Behavior and Human Decision Processes*, Vol. 103, No. 1, pp 1-20.
- Hanna, N.K. (2007) *E-Leadership institutions for the knowledge economy*, The World Bank, Washington D.C.

- Holland, J. B., Malvey, D., and Fottler, M. D. (2009) "Health care globalization: A need for virtual leadership", *The Health Care Manager*, Vol. 28, No. 2, pp 117-123.
- Johnson, K. (2010) "Virtual Leadership: Required Competencies for effective Leaders, on-line", Cornell University, [http://www.ilr.cornell.edu/cahrs/research/whitepapers/upload/spring10Mtn\\_VirtualLeadership.pdf](http://www.ilr.cornell.edu/cahrs/research/whitepapers/upload/spring10Mtn_VirtualLeadership.pdf).
- Kerfoot, K.M. (2010) "Listening to see: The key to virtual leadership", *Nursing Economics*, Vol. 28, No. 2, pp 114-115.
- Lee, M.R. (2010) *E-leadership For Project Managers: A Study Of Situational Leadership And Virtual Projects Success*, Capella University, ProQuest LL.
- Linkow, P. R. (2008) "Meeting the Challenges of a Dispersed Workforce: Managing Across Language, Culture, Time, and Location", Paper at The Conference Board of Canada, Ottawa, November.
- Luther, K. and Bruckman, A. (2010) "Flash collabs: Collaborative innovation networks in online communities of animators", *Procedia - Social and Behavioral Sciences*, Vol. 2, no. 4, pp 6571-6581.
- Malhotra, A., Majchrzak, A. and Rosen, B. (2007) "Leading virtual teams", *Academy of Management Perspective*, Vol. 21, No. 1, pp 60-70.
- McCuiston, V. E., Wooldrige, B.R. and Pierce, C. K. (2004) "Leading the diverse workforce", *Leadership & Organization Development*, Vol. 25, No. 1, pp 73-92.
- Oertig, M., and Buergi, T. (2006) "The Challenges of Managing Cross-Cultural Virtual Project Teams", *Team Performance Management*, Vol. 12, No. (1/2), pp 23-30.
- Pulley, M.L. and Sessa, V.I. (2001) "E-leadership: tackling complex challenges", *Industrial and commercial Training*, Vol. 33, No. 6 pp 225-230.
- Purvanova, R.K. and Bono, J.E. (2009) "Transformational leadership in context: Face-to-face and virtual teams", *The Leadership Quarterly*, Vol. 20, pp 343-357.
- Samartinho, J. , Faria, J and Silva, P. (2012) " e-Liderança: um processo de influência social mediado por tecnologia. O papel do e-Líder na transição das equipas face-to-face (f2f) para equipas virtuais (e-Teams)", *Atas da 12ª Conferência da Associação Portuguesa de Sistemas de Informação*, Universidade do Minho, Guimarães, setembro.
- Samartinho, J., Faria, J. and Silva, P. (2013) "Modelo de Compreensão das Competências Específicas e Características da E-Liderança (E-Leadership) em Ambientes de Gestão de Aprendizagem (LMS – Learning Management System)", Ponencias Libro de resúmenes, XXIII Jornadas Hispano-Lusas de Gestión Científica. Bases para Emprender Y Gestionar com Racionalidad Económica y Transparencia, Universidad Málaga, Málaga, febrero
- Samartinho, J. (2013) "Liderança Virtual (e-Leadership) - MODoCOMPETE e-LÍDER: Estudo Delphi com Q-Sort sobre a compreensão de competências específicas e características em e-Liderança", Paper 7º EIN 2013. Simpósio internacional. Ciberespaço: liderança, segurança e defesa na sociedade em rede, Academia Militar, Amadora, maio.
- Shriberg, A. (2009) "Effectively leading and managing a virtual teams", *The Business Review*, Vol. 12, No. 2, pp 1-2.
- Stolen, J. (1993) "The Development of IS Faculty: Toward a Maturing MIS Field", *Data Base*, Vol. 24, No.3, pp 23-26.
- Smits, S. T. (2010) "Extending the journey: Leadership development beyond the MBA" *The Poznan University of Economics Review*, Vol. 10, No. 1, pp 62-75.
- Sutanto, J., Tan, C., Battistini, B. and Phang, C. (2011) "Emergent Leadership in Virtual collaboration Settings: A Social Network Analysis approach", *Long Range Planning*, Vol. 44, No .5/6. pp 421-439.
- Weisband, A. (2008) "Research challenges for studying leadership at a distance", *Technologically-Supported Work*, pp 3-12, Erlbaum Whittington, New York.

Goodwin, V.L.(2005) "Legacy leadership: the leadership wisdom of the Apostle Paul"., *The leadership Quarterly*, Vol. 16, pp 749-770.

Zaccaro, S.J. and Bader, P. (2003) "E-leadership and the challenges of leading e-Teams: Minimizing the bad and maximizing the good", *Organizational Dynamics*, Vol. 31, No. 4, pp 377-387.

Zigurs, I. (2003) "Leadership in Virtual Teams: Oxymoron or Opportunity?", *Organizational Dynamics*, Vol. 31, No. 4 , pp 339-351.

## ANNEX 1

**Table 3:** Code for the representation of skills and characteristics of e-leaders/ e-teams in the Model for the skills and characteristics in e-leadership

Code Rep.	Mod.	Description of the representation code in the model (Code Mod. Rep.)	Observations
[FOR1]		Environment Control	Global dispersal of divisions and units, customers, stakeholders, organization suppliers.
[FOR2]		Evolution/Change	Exponential explosion of ICT.
[COM3]		Communication/Reliable infrastructures	Crashes in local communication and structures usage of different hardware and software by the team members.
[CTR4]		Team control/Local managers	Local jobs demand immediate attention by managers and local workers.
[REL5]		Relationships 1:M, M:M/Trust	Relationships 1:1 and 1:M between <i>e-leader</i> and e-team members; build trust between <i>e-leader</i> and e-team members.
[REL6]		Relationships 1:M/Trust among e-team members	Relationships 1:M between e-team members; build trust among e-team members
[COM7]		Communication/Services 24x7/Green Era	Ability to communicate in real time; ability to improve customer supply; possibility of cost decrease 24x7 (green era).
[FOR8]		Multifunctional teams creation	Opportunity to improve the organizational performance by creating multifunctional teams.
[GES9]		Shared knowledge management	Ability to better manage shared knowledge.
[MOT10]		Digital enthusiasm/Motivation	Effective communicating by electronic means by transmitting digital enthusiasm; building trust with someone you may not know physically; creation of reliable alternatives of electronic means and tools; inspiring and promoting remote motivation; Managing virtual teams; accompanying and monitoring the team social component by making their presence felt in virtual environment; technical ability not to influence the performance of 24x7 balance.
[CPT11]		Skills and leadership	Writing skills; social skills; global and multicultural mentality; higher awareness concerning team motivation; ability to lead the model based on 24x7; <i>Follow-The-Sun</i> approach.
[CPT12]		Digital abilities	Environment interface; go beyond time and space dimensions; get new abilities to build and maintain high performance virtual teams; innovation.
[SI/TI13]		Technological infrastructure and architecture	Adapt to change; depend on training and organizational vision; architectures should rule the technological infrastructures; management solutions, appropriate to the business model.
[CPT14]		Further abilities (Global leader)	Further abilities linked to the complexity that e-leaders should get; based on the concept that not all leadership roles are connected with complexity; these abilities go beyond the basic functions virtual leaders are demanded to possess, (Zigurs, 2003), in the change of leadership roles whenever virtual environments are used that imply a change in group dynamics.
[GES15]		Management of dynamic groups in complex environments	When building the e-teams, the e-leader must guarantee the development of articulate and functional works units in which team member should acquire self-management abilities; this is done through the development of a team guideline including motivational factors; the e-leader must be able to listen to what cannot be seen, namely team awareness, its mission, its strong and weak points and group dynamics. Thus the dynamics through the development of team awareness.
[EST16]		Leadership style	In a virtual project environment the <i>e-leader</i> may have to apply as many different styles as those needed to a successful outcome.
[CUL17]		Multicultural environments	Achieved the necessary synchronization to build up virtual teams geographically, culturally and technically diverse demands the leader's ability to prioritize and acquire new skills.
[SAT18]		Human technical support/Tools building	Human technical systems to support the virtual team's synergies; support tools building and promotion of team work so that collaboration among the <i>e-teams</i> members may exist.
[TRN19]		Training (e-leader, e-team/ technical support teams)	Lifelong learning; virtual teams insertion; development, management and study of the tools; achieve the necessary synchronization to build up virtual teams geographically, culturally and technically diverse demands the leader's ability to prioritize and acquire new skills, many of these through training.

