

The importance of coordination of quality at Universities: an intercontinental comparison in Science Faculties

La importancia de una coordinación de calidad en las Universidades: Una comparación intercontinental en Facultades de Ciencias

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Abstract

This research proves how a good coordination in the relationship of university academics explain best results in two veterinarian faculties, one located in Córdoba University, Madrid, Spain and the other one in la Pampa, Argentina. The perception of quality, the factors explaining the degree of relational coordination in the Institution (factorial analysis) and the differences between both Faculties (logistic regression) is analysed. The variability in the dimensions of the relational coordination is explained in a 53% by three different factors: the relationships that exist in the work groups (19%), the relationships that exist between the lecturers and the Institution (13%) and finally, the relationships established in the Departments (11%). The results recommend a deep revision of the role of Departments in improving the quality. They must promote the mutual respect, the sharing of objectives and knowledge in a proper organizational climate that allows reaching levels of excellence in University contexts.

Resumen

Este trabajo muestra que una buena coordinación relacional explica mejores resultados en dos facultades de veterinaria, en la Universidad de Córdoba, España y en la Pampa, Argentina. Se analiza cómo influyen en la percepción de la calidad los factores que explican coordinación relacional en la institución (análisis factorial) y las diferencias existentes entre ambas facultades de veterinaria (regresión logística). La variabilidad en las dimensiones de la coordinación relacional se explican en un 53% por tres factores: las relaciones entre los grupos de trabajo (19%), las relaciones entre los profesores y la Institución (13%) y finalmente, las relaciones con el Departamento (11%). A partir de los resultados se recomienda una revisión en profundidad del papel los Departamentos en la mejora de la calidad. Deben favorecer el respeto mutuo, la compartición de objetivos y de conocimiento en un clima organizativo adecuado que permita alcanzar niveles de excelencia en los contextos Universitarios.

1. INTRODUCTION AND OBJECTIVES

The quality of the University education system is a key factor for the creation of value of modern societies and has been paid lots of attention by policy makers worldwide in the last decade (Lord Brown Report, 2010; Horizon Report, 2012). The application of coordination

mechanisms in the work processes at Universities can offer a better performance and therefore offer an explanation about higher degrees of Academic Quality.

Although communication mechanisms are not a big problem at University ecosystems, the lack of shared objectives and mutual respect may be a barrier in the search of excellence (Torres Salinas et al., 2012).

Education is a very complex phenomenon due to its polyvalent character and its dependence from the cultural and social context where it takes place. Education allows the sharing of knowledge amongst generations. Society teaches and in society we learn values, and attitudes (Flores Crespo, 2004).

Teaching and learning processes are service activities that demand clear objectives based on a shared vision. The text included in the sections or subsections must begin one line after the section or subsection title. Do not use hard tabs and limit the use of hard returns to one return at the end of a paragraph. Please, do not number manually the sections and subsections; the template will do it automatically.

The effectiveness of the processes of teaching and learning depend on the ability to properly coordinate different agents in the sharing of ideas, knowledge, objectives and respecting one to each other.

The need of coordination is a pre-requisite to reach good results at firms. Thompson (1967) Describes the importance of an effective coordination amongst highly interdependent tasks. De Pablos and Haider (2013) observe that the mutual adjustment produces improvement in organizational coordination mechanisms such as routines, timetables, previous planning and task normalization.

Coordination is the integration of organizational work in conditions of task and uncertain interdependence (Faraj and Xiao, 2006). Lawrence and Lorsch (1967) and De Pablos et al., (2013) have studied the relationship between the coordination and the final firm's results and found that coordination was positively related with organizational results. Different types of coordination have been developed from the Organization theory. For example, programming and feedback (Argote, 1982, March, 1991), impersonal versus mutual adjustment (Van de Ven et al., 1976) and formal versus informal fit (Kraut, 1998). Programming and feedback have frequently been applied to the role of information and communication technologies, ICT (López et al., 2011).

The model of relational coordination puts emphasis in understanding the importance of coordinating the relationships and the dynamics of communication in organizations to reach best results (Gittell, 2010). It has been applied to different types of firms reaching promising results (De Pablos and López, 2012; López and de Pablos, 2012).

From the model we can affirm that relational coordination is produced by providing a frequent communication of high quality, supported in shared objectives and knowledge and mutual respect. Gittell (2010) and De Pablos and Haider (2013) has proofed the model in Health services.

Gittell (2002) offers the model as a way to investigate relational dynamics based in previous analysis and under the fundamentals of the mutual adjustment (Thompson, 1967; Van de Ven et al., 1976; Tushman et Adler, 1978; Argote, 1982; Kogut and Zander, 1996) and the focus of coordination based on relationships (Weick, 1993; Quinn and Dutton, 2005; Faraj and Xiao, 2006; Heckscher and Adler, 2007, Heckscher et al., 2009) in corporate environments of high/low interdependence/uncertainty. In this sense, she defines her model as “a mutual process of reinforcement in the interaction between the communication and the relations developed with the main purpose of reaching task integration”. Besides, she explains that her model differs from others. While in other theories the importance of shared knowledge is important, the relational coordination model arguments that although this is a necessary premise, it is not sufficient. To reach an

effective coordination, the stakeholders must be connected through sharing goals and mutual respect (Gittell, 2010).

The relational coordination model can be of interest to reach good results in organizations or organizational processes where high levels of task interdependence (Thompson, 1967) uncertainty (Argote, 1982), time restrictions (Adler et al., 1999), and tacit knowledge (Nonaka and Takeuchi, 1995) are required. In University teaching and researching practices, these circumstances appear. These are the characteristics that have inspired us to apply the relational coordination model to Upper Education teaching.

The main objective of this research is to proof if the application of coordination mechanisms (Gittell, 2009, 2011) amongst team members at the University departments explains excellence in upper education systems.

The research may be of interest for Universities and policy makers in a framework of high competition where the search of excellence is a must.

2. METHOD

We have developed a study of the relational coordination in the teaching styles of veterinary schools and we have found the differences between two disperse geographically systems the Cordoba University (Spain) and the Pampa National University (Argentina).

The Veterinary Schools of the Córdoba University (Spain) the Pampa National University (Argentina) are two Public Institutions immersed in active processes of quality improvement and with a high agro-food vocation. The Cordoba Veterinary School is 160 years old, and composed by 1.200 students and 134 lecturers. The Pampa Veterinary School is a young Institution, created in 1957, composed by 250 students and 60 lecturers.

The database we have used comes from a survey performed in 2012 to 75 lecturers of both Universities, 40 from the Cordoba University (UCO) and 35 from the Pampa National University (UNL). It means a 29,85 % of lecturers in the UCO University and 58,33% from the UNL Pampa.

The survey is composed by aspects related to the Institutions (5 items) and 32 questions related to six communication and relation dimensions graded by using likert scales (1 to 5). Cronbach alpha has been used as the reliability standard, and shows the following percentages for each group of variables

- 1. Relationships and coordination with the team work: 0.876.
- 2. Institutional Coordination: 0.854.
- 3. Department coordination: 0.812.
- 4. Information opportunity: 0.765.
- 5. Hierarchical relationships: 0.743.
- 6. Conflict resolution: 0.731.

For the data processing a factor analysis has been applied to identify the factors from the existent inter-relations amongst different variables. Quartimax orthogonal rotation has been applied to reduce the number of variables required to explain each dimension.

To establish the main differences between the compared systems (Cordoba versus Pampa) according to the relational coordination model a logistic regression model has been developed. Faculty is the dependent variable and the factors are the independent ones. Previous analyses have agreed with this same methodology in previous analysis. For the processing of data SPSS version 15.0 has been applied.

3. RESULTS AND DISCUSSION

According to the results, the Chi-squared suggest a non random data distribution (figure 1). By having a look at the distribution curves, we can appreciate that both universities behave in a different way when asking for quality perceptions. While Pampa perceives an increasing quality over time, Cordoba perceives a quality maintained over time.

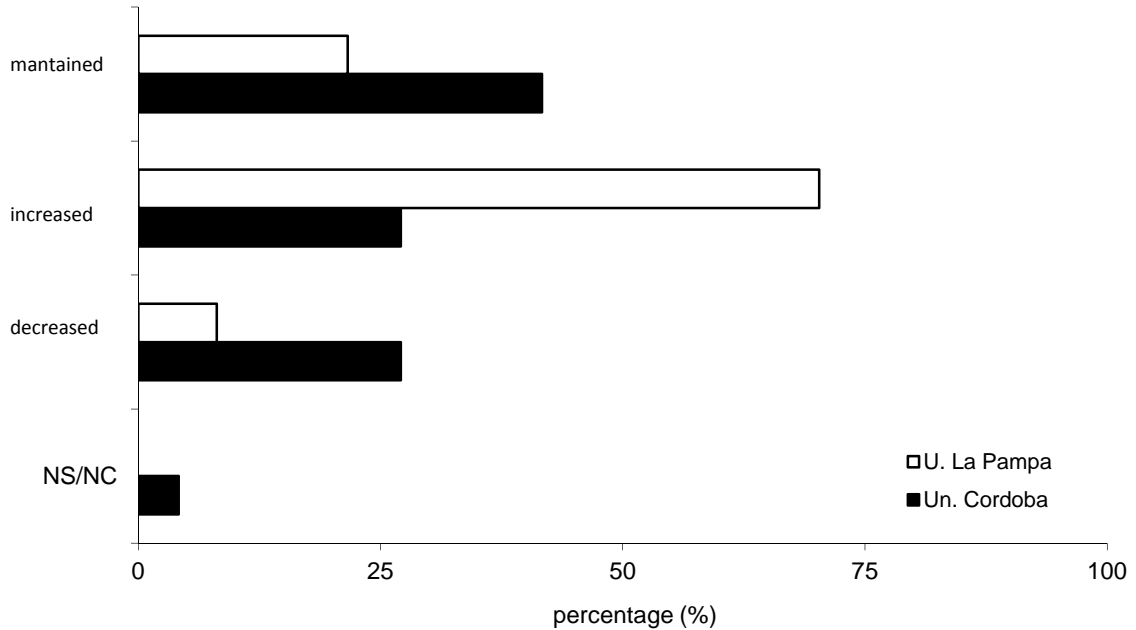


Figure 1. Perception of quality in both Universities (Cordoba vs Pampa)

Relational coordination

The KMO test of sampling adequacy showed a value of 0.7 while the Bartlett's sphericity test showed a satisfactory probability value ($p < 0.001$), indicating the suitability of the analysis. The first six factors that accounted for 74.2% of the original variability were selected as indicated by other studies.

Table 1. Factorial Analysis results.

Factor	Explained variance	Eigenvalue	Items	Loading
F1	28.6	6.3	P8_4	0.77
			P9_4	0.89
			P10_4	0.80
			P6_1	0.63
			P6_2	0.57
			P6_3	0.58
			P9_1	0.62
F2	13.3	2.9	P8_5	0.86
			P9_5	0.73
			P10_5	0.91
F3	11.2	2.5	P8_2	0.73
			P9_2	0.77

			P10_2	0.66
F4	8.2	1.8	P5_1	0.72
			P5_3	0.83
			P7_3	0.71
F5	7.7	1.7	P8_1	0.88
			P10_1	0.79
F6	5.5	1.2	P7_1	0.54
	=		P7_2	0.63
			P7_4	0.80
			P7_5	0.65

Factor 1 explains a 28.6% of the variance and is composed by 6 variables; the first three (P8_4;P9_4;P10_4) are related to the relational dimensions dealing with team work (share goals, share knowledge y mutual respect). Afterwards 3 variables related to frequent communication (P6_1, P6_2 y P6_3) and another one related to solving communication (P9_1) appear. This is Factor 1 of relational coordination inside work team and this group receives environmental feed-back.

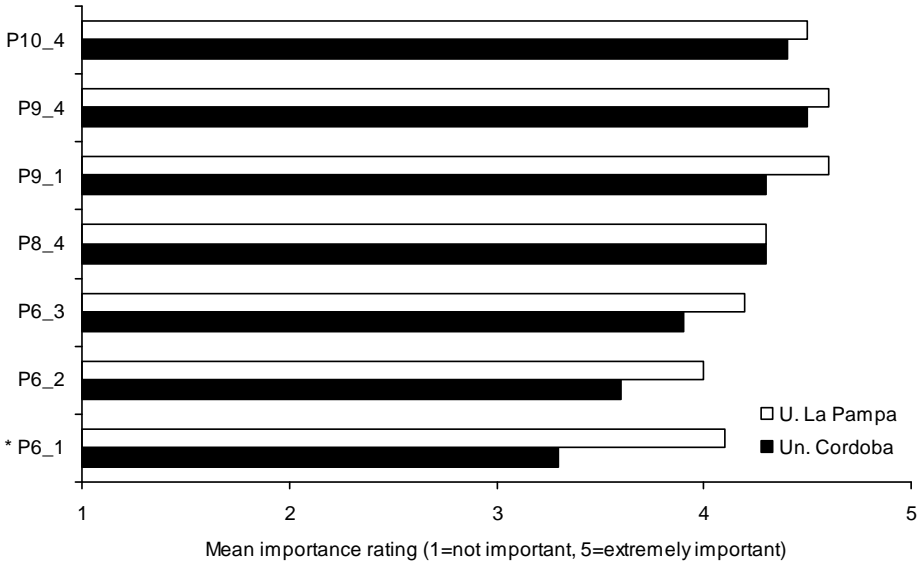


Figure 2. Distribution of variables from Factor 1 according to both Universities (Cordoba vs La Pampa)

By comparing both Institutions in factor 1 we find upper values in Pampa than in Cordoba for all variables. Most important differences are appreciated in frequent communication and we have found significant differences in the communication established with Institution administrative staff (P6_1: $p < 0,05$).

Factor 2, composed by three variables (P8_5;P9_5 y P10_5) explains a 13,3 of the existent variability in the organizational structure. The three variables refer to the relational dimension (share goals, share knowledge y mutual respect) with the human resources at the Institution. Therefore we name it Factor 2 as Institutional Coordination.

In Figure 3 results from both Institutions are compared for Factor 2. We find higher values in the Pampa for each of the variables being the differences highly shown in the Institutional knowledge of the work performed by lecturers.

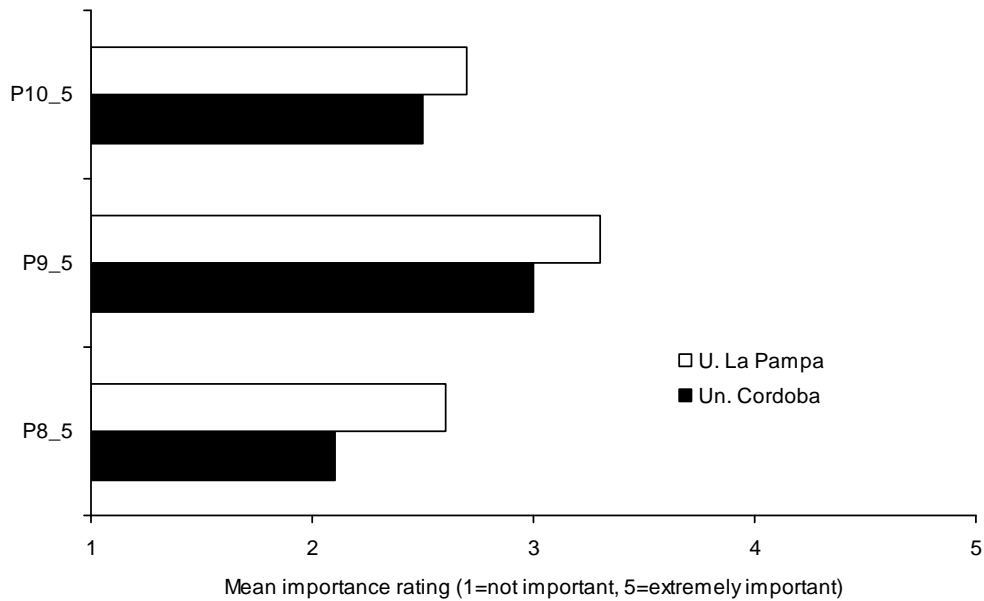


Figure 3. Distribution of variables from Factor 2 according to both Universities (Cordoba vs La Pampa)

Factor 3 explains a 11,2% of the variance, and it is composed by three variables (P8_2;P9_2 y P10_2) related to the relational dimension (share goals, share knowledge and mutual respect) with the Department management. Therefore we name it Factor 3 as Department Coordination.

Pampa shows upper values for each variable (figure 4) in comparison to Cordoba. However we can stress the fact that there are significant differences ($P < 0,05$) related to the fact that departments do not know their own lecturers' learning and research activities.

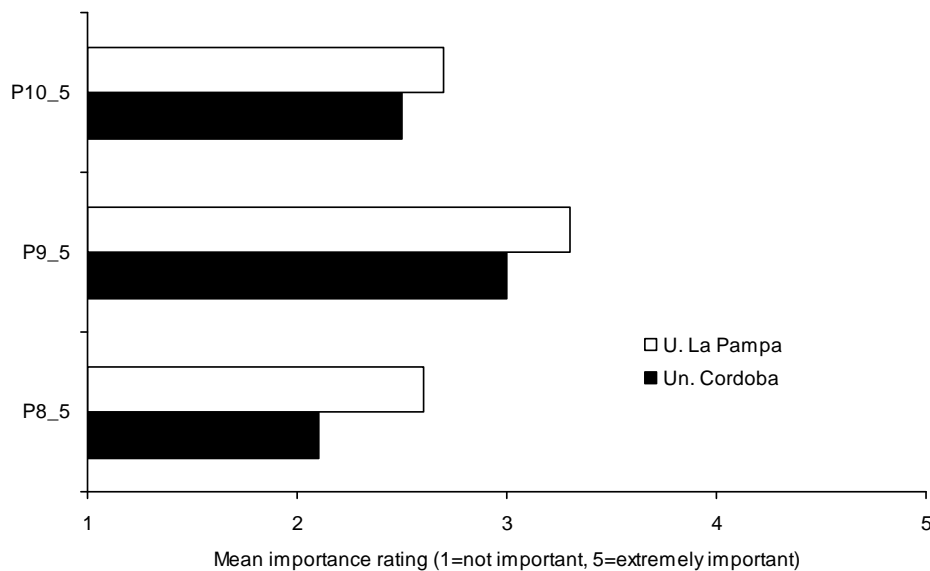


Figure 4. Distribution of variables from Factor 3 according to both Universities (Cordoba vs La Pampa)

Factor 4 explains an 8,2% of the variability and it is related to timely communication and problem-solving communication. The results of these variables are partly explained by the high lecturer's self-resolution.

Figure 5 shows significant differences for both variables explaining timely communication. Pampa offers upper levels for both variables. We find that in the Pampa there are organizational mechanisms that favourite an accurate and timely communication for the success of organizational goals as Waller explains (1999).

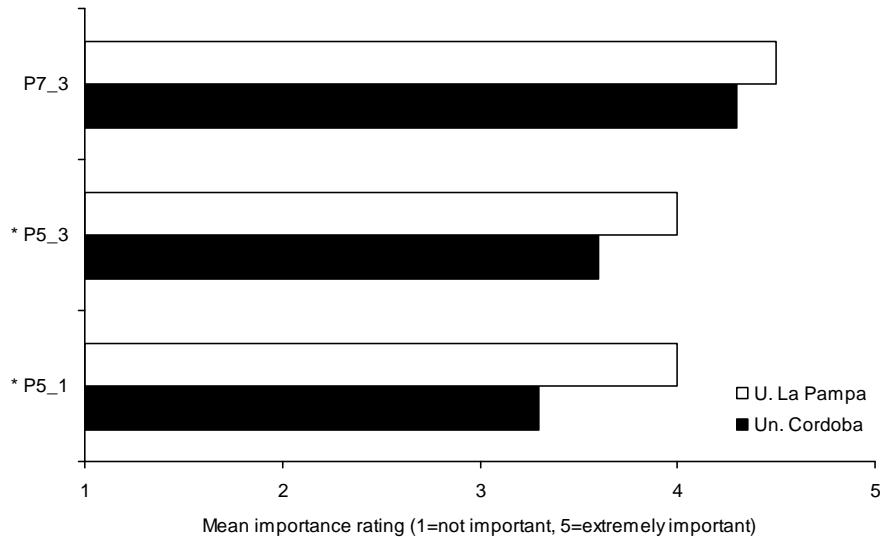


Figure 5. Distribution of variables from Factor 4 according to both Universities (Cordoba vs La Pampa)

Factor 5 is built from two variables (P8_1 y P10_1) related to sharing of goals and knowledge with the boss in the process. We name it Factor 5 of relational coordination with the supervisor and it explains a 7,7% of the variance. Figure 6 shows differences between both Universities.

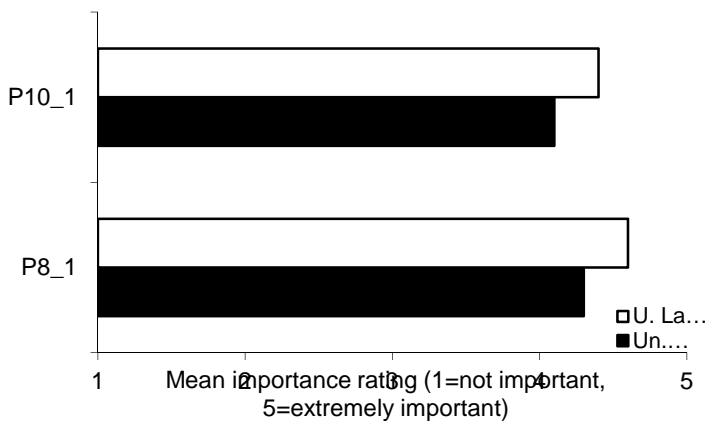


Figure 6. Distribution of variables from Factor 5 according to both Universities (Cordoba vs La Pampa)

Factor 6, explains a 5,5% of the variance and is composed by 4 profiles related to conflict resolution (P7_1; P7_2; P7_4 y P7_5). The lecturer has been excluded from this factor since it has considered in the previous factor as self-conflict solver.

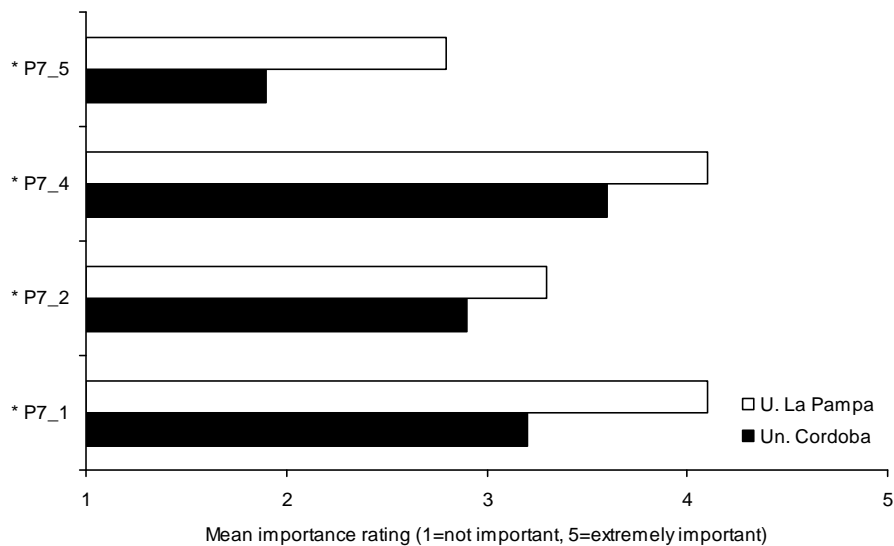


Figure 7. Distribution of variables from Factor 6 according to both Universities (Cordoba vs La Pampa)

Figure 7 shows how for each of the variables there are significant differences. This implies that in the Pampa the conflict resolution profiles are better defined; no matter if it is the boss, the Institution or my work group, etc.

The three first factors explain a 53,1% of the variance and they indicate in the first place that the significant differences in the organizational structure come from the relationships in the work group. In the second place they are explained by the relationships of lecturers with the Institution and finally with the Department.

The rest of factors explain a 19% of the variance and are linked to the timely communication, supervisor coordination and the definition of profiles solving conflicts in the Institution.

Logistic regression

In a second stage a logistic regression that explains the factors that make a difference for both universities is provided. The results are indicated in table 2.

Table 2. Logistic regression results

Factor	Regression coefficient	Significance
F1	-0.07	0.581
F2*	-0.44	0.010
F3*	0.68	0.014
F4	0.18	0.549
F5	0.14	0.668
F6**	0.76	0.000
Constant	-15.14	0.212
Chi-square/sign.	24.82	0.000

The store for factors were treated as continuous variables; Scores between 0 y 1 (UCO=0; La Pampa=1)

* p value <0,05; ** P value <0,001

Factors 2, 3 and 6 explain significant differences ($p < 0,05$) in the organizational structures between both Institutions; factor 2 takes negative values. In one hand Institutional

coordination is higher in the case of Cordoba than in the Pampa. In the other hand, the Pampa shows higher levels of Department coordination and besides, the profiles that take part in conflict resolution are clearly identified in comparison to Cordoba. Use as many sections and subsections as you need (e.g. Introduction, Methodology, Results, Conclusions, etc.) and end the paper with the list of references.

4. CONCLUSIONS

This study has made contributions to the knowledge and the discriminate factors of relational coordination in both Veterinary Faculties. It also explores how relational coordination can enrich the teaching purposes of veterinary schools. The implications of this study are discussed below.

The quality was differently perceived by both Faculties. The evaluation reports (certification and accreditation) indicate that both have been restructured, consolidated and the new buildings and facilities have been transformed into two modern Faculties. Many changes have been introduced, in education programmes and strategies and in organization and equipment to promote the inter-organizational coordination (Marengo y Dosi, 2005; Gang et al., 2008).

The lower degrees in quality perception that shows of Cordoba could be explained by external and internal factors. Spain faces a huge economic crisis (2007-2012) that is materialized in the population uncertainty and in the perception of quality in education services, compared to the economic welfare that Argentina has shown until May 2012. Internally differences coming from the Institutional organization were observed. While Cordoba has prioritized the generation of scientific knowledge (Oakley, 2009), the Pampa has promoted the lecturing and the transfer of technology to sector (Brunner, 2011). The inter-facultative structure presents operative advantages in Cordoba; a higher rate of a rational consumption of resources, the use of economies of scale, an interdisciplinary vision of the raw materials, the promotion of the transversal interaction amongst lecturers, etc. However also presents some disadvantages, as for example the loss of the strong identity and the loss of common goals amongst lecturers and the concrete objectives of studies (Oakley, 2009).

Finally, the fact that the governance system differs in both centers contributes to promote different quality perceptions (García-Morales et al., 2006 and Garcia-Herrera et al., 2011). According to Brunner (2011) the change from a traditional and Institutional self-governed bureaucratized system (La Pampa) to another one showing higher rates of entrepreneurship spirit (Cordoba), generates conflicts that are shown in the indicators of quality.

In relation to the relational coordination mechanisms that have been implemented in both faculties, the positive evaluation of the routines that enable the recruitment and training of lecturers contrasts with the lack of agreement on the mechanisms used to measure lecturer's performance, rewards and conflict resolution. Cordoba presents upper values in lecturer's rewards that can be explained by the system of incentives for the research activity in Spain, where the recognition of a researcher is provided by an external evaluation mechanism (ANECA).

Both Institutions present high values in the communication of knowledge although differently. La Pampa option implies sharing the information amongst the lecturers and their fast implementation in the agro-food industry. Cordoba bets on basic research *versus*

the transfer of knowledge (Oakley, 2009). An integrative vision is highly recommended, where a new focus of the University function will be assumed in the era of intangible values (Bermejo, 2012).

By considering the results obtained in the first part of the study, to increase the degree of collaboration amongst the Departments and the Faculty is highly recommended, and the faculty staff should promote the sharing of knowledge (Yang, 2008 and Law y Ngai, 2008). The objectives of the programs must be clarified, assumed and included in a more pro-active way in the lecturers' programs through a new open model of collaboration where the dynamic capabilities and the co-creation of value are promoted (Medlin et al., 2005; Garcia-Morales, 2006).

Dimensions of the relational coordination. The results show that a 53.1% of the existent variability in both Universities is explained by the ties of lecturers in the work group, with the Institution and finally with the Department. Surprisingly the main relational coordination, no matter if it is a routinely or a conflict resolution process, takes place inside the work group (Factor 1); being the University environment where the lecturer perceives that his work is known, positively evaluated and where he establishes shared goals. From this group the required communication relationships are established with the environment. These groups are self-governed and they show different names; In Cordoba they are called Andalusian Research Groups (PAI) and in La Pampa Chairs and they mainly orient their activities to the lecturing and the transfer of technology to the industry. These groups, from a dynamic perspective, are the ones in charge of the creation of a knowledge management leadership (Bermejo, 2012).

The second level, that establishes a direct relation with the lecturers and determines the differences is the Institutional authority (Factor 2) and represent a classic model of centralized university (Brunner, 2011). From the legal perspective although lecturers report to the Department, in terms of relational coordination, a lack of knowledge about lecturers' production and results is paradoxically produced. In both Institutions, Department does not seem to respect lecturers' work and shows absence of shared objectives. Contrary to the legal systems indications, lecturers first report to their group, second to the Institution and last to the Department. This reality should make us think about the reason of being of the University departments and consider if they are acting in a proactive and co-operative way for pursuing the improvement of the quality.

By comparing the Departments with the internal groups (research groups or chairs) we find structural differences that can support the best results found in the empirical analysis. In the internal groups, the objectives are shared, similar human points of view are positively valued and the lecturers own the freedom to belong to one or another group. Groups are dynamic, flexible and show a pre-defined hierarchy based in quality external indexes (publications, projects). The group becomes an active element in search of the external competitive resources and in the promotion of their members. Besides, when the group is positively evaluated or rewarded, all the members of the group benefit from it. They usually maintain reduced structures between 5 and 7 members, and often present family managed models where the conflicts are internally solved.

Lecturers are ascribed to Departments mainly according to their lecturing affinity and less according to their research and transfer of research objectives. In general, Departments are slow in the decision making process and lack of efficient mechanisms for conflict resolution and rewards (Chang et al. 2010). As Glisson et al. (1998) state, in this context, the efforts should focus on creating positive organizational climates, including low conflict, cooperation, role clarity, and personalization. Hoffmann et al. (2010) indicate the

need to develop actions which in turn can enhance co-created value and propose models for managing the relational coordination and positive promote attitudes, avoidance behavior, and relational trust to promote a pro-social motivation work (Morelli et al., 2012).

Coordination into Department must be improved and refined for both cases. The departments must act as ecosystems that facilitate the coexistence and mutual support amongst their members (De Pablos et al., 2012). The change of the classical structure towards more cooperative and collaborative environments is highly recommended to promote the connections between the department and work group.

The type of communication and the conflict resolution (Factors 4 and 5) are the other two significant factors. In both veterinary schools a lack of information on the profiles responsible for the conflict resolution, the shared knowledge and the establishment of common goals appears as previously proofed in previous analyses (Marengo and Dosi, 2005; Garcia-Morales et al., 2006; and Lopez et al., 2012). An improvement in the quality of the information that the lecturer receives is proposed (García-Herrera y Piña Stranger, 2011).

Comparative relational coordination. The organizational structure is different in both Centers; in Cordoba we find a dual structure: Departments-Teaching and Research Groups where both are directly independently linked to the Institution (F2: 0.44). Instead, in the Pampa lecturers are grouped around the Faculty and located in the Departments. These organs, define in a corporative way the objectives of the Degree, the working areas, the financing and the promotions of lecturer's positions (F3: 0.68).

In health science areas it exists a high vocational component and high degrees of altruism determining teaching excellence and a strong professional identity (WFME). This reality motivates and encourages the grouping of clinical lecturers (Departments intra-facultative) and drives them to get involved in a process of permanent improvement and updating. When the professional character is diluted the motivation decreases and therefore the perception of quality too (Marengo and Dosi, 2005). In times of economic restrictions and great social changes; it would be suitable to redesign a governance model for the teaching-learning system at a University level and update the alignment of the system to the social demand, to the professional objectives of the studies and to the lecturer's vocation (Bermejo, 2012).

The conflict resolution profiles in La Pampa are better defined than in Cordoba. In La Pampa are simple in the application of procedures which generate trust, implies agility and effectiveness in the lecturer's decision making process. To the contrary, in Cordoba these profiles keep unclear and promote uncertainty, slows the decision making process and decreases the perception of quality.

To recover the professional objectives from the faculty studies and to transform them in an element of cohesion, motivation that promotes the collaborative spirit of the lecturers is recommended.

This study presents also certain limitations. First, the research design is cross-sectional in nature. Second, the study has been developed in a group of lecturers and it should be completed in the future by including the rest of agents in the system (administrative staff, employers, students, etc.). Finally, we are dealing with an exploratory analysis of the relational coordination inter-relations to establish a work framework for future projects. The results of this work constitute a point of start in the development of models that can

explain the interactions that exist, similar to the ones developed by De Pablos and Haider (2013), De Pablos and Lopez (2012), and Gittell (2009) in human healthcare.

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