Coordination and university results: an evaluation model

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Abstract

The quality of the relationships at Universities can explain best results. In this research the relational coordination model has been applied to prove higher degrees of academics satisfaction. According to the model, organizations by providing frequent, timely and accurate communication mechanisms to support shared objectives in a context of knowledge sharing and mutual respect can reach best results. We have surveyed academics of different University profiles on these particular issues. By using Structural Equation Model analysis we have shown that higher standards in terms of relational coordination amongst lecturers and researchers at the University context explain higher degrees of satisfaction. The conclusions should be considered by policy makers when evaluating the results of the lecturing and researching initiatives at Universities.

Keywords: coordination; shared objectives; mutual respect; University evaluation, knowledge sharing.

1. Introduction

The search of academic excellence is a key issue for Educational Institutions (Lord Brown Report 2010; Education Framework Report MECD, 2013) and it is also a theme that highly interests to citizens and policy makers worldwide (Horizon Report 2012; Byrne et al., 2013). The application of coordination mechanisms in the internal work processes at Universities can improve final results and explain higher degrees of Academic Excellence (Marengo and Dosi, 2005; Brunner, 2011, De Pablos et al., 2012, 2013).

Although communication mechanisms seem not to be a big problem at University, we find some differences amongst different Educational Institutions worldwide. The lack of shared objectives and mutual respect may be a barrier in the search of excellence (Torres-Salinas et al. 2012). Therefore, the improvement in the quality of education and research must also be oriented to the increase in the degree of the lecturer’s and researcher’s coordination, the internal organization and the learning objectives.

The need of coordination is a pre-requisite to reach good results at organizations. De Pablos and López (2012) described the importance of an effective coordination amongst highly interdependent tasks. It has been observed that the mutual adjustment produces improvement in organizational coordination mechanisms such as routines, timetables, previous planning and task normalization. Medlin et al. (2005), Gittell (2009), and López et al. (2011) have applied models of relational coordination in different sectors; as health services, national transplant system, teaching and learning, transport services, etc. Apart from this, Gittell (2011) indicates that the stakeholders must be connected through the sharing of goals and
mutual respect. In the same way this same author indicates that to reach best results it is necessary to consider both dimensions: communication (frequent, timely, accurate and problem solving) and relation membership (shared goals, shared knowledge and mutual respect). The application of the relational coordination concept could be interesting to reach good results in organizational processes where high levels of task interdependence, uncertainty, time restrictions, and tacit knowledge are required. For these reasons, in this research the relational coordination model has been applied to explain best results in University environments.

Then, the application of coordination mechanisms in the work processes at Universities could explain a better performance and therefore offer an explanation about higher degrees of academic quality. Therefore, the main objective of this research is to proof if the relational coordination (Gittell 2009, 2011) amongst lecturers and researchers at the University context explains higher degrees of satisfaction.

We understand that the research may be of interest for Universities’ policy makers. In Universities the lecturers and researchers’ vocation and their sense of responsibility are very important, but we find some restrictions in the way they establish relationships that might be best explained in terms of relational coordination.

2. Theory

2.1. The importance of a coordination of quality in higher education

The quality and efficiency of Higher Education Institutions are of key importance in the knowledge society. Societies have understood that an educational system of quality creates value in their particular context.

Flores-Crespo (2004) recognizes that 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.

Teaching and learning processes count on with the typical characteristics of service activities, where rules and procedures are important. This vision in processes demands the establishing of education objectives that must be properly defined and measured.

The processes of teaching and doing research are above all social ones: they are permeable to the influences coming from abroad and effective methods have much to do with the ability to properly coordinate different agents, making them sharing ideas, knowledge, objectives and respecting amongst them.

The importance of coordination at organizations has longer been studied. Thompson (1967) describes how the effective coordination amongst highly interdependent tasks is characterized by the mutual adjustment amongst participants. Later on, Faraj and Xiao (2006) observed that the mutual adjustment performs a limited role at organizations since it produces a high cost, and we must consider that coordination takes place through mechanisms such as routines, timetables, previous planning and task normalization.

Coordination has much to do with the integration of organizational work in conditions of task and uncertain interdependence (Lawrence and Lorsch 1967). The relationship between the coordination and the final firm’s results has early been studied by Argote (1982) in a representative sample of manufacturing firms. This study shows that the coordination is positively related with organizational results. Brandts and Cooper (2006) explain how a good coordination can overcome failures at the organizations and Sanders and Premus (2011) explain how IT can improve final firm’s organization capability.

From the Organization theory, different types of coordination have been developed along time. For example, programming and feedback (Van de Ven et al. 1976; March 1991; Lewis 2009), impersonal versus mutual adjustment (Van de Ven et al., 1991; Faraj and Xiao 2006; Santamaria-Sanchez et al. 2010) and formal versus informal fit (Kraut, 1998; Penuel et al. 2010).
The importance of properly coordinating processes in the teaching and researching activities has a great number of followers in the academic literature (Drucker 1988; Scott Morton 1991; Senge 1992; Leonard-Barton 1995; Toffler and Toffler 1995; Davenport and Prusak 1998; Earl 2001; Biggs and Tang 2011) and has been positively related to quality in University education (Van Vught y Westerheijden, 1994; Balderston 1995, Cummings and Kiesler 2007, Andras, 2011, Astin, 2012).

2.2. The importance of relational coordination in higher education

Gittell (2009) has offered a model for relational coordination that put emphasis in understanding the importance of coordinating the relationships and the dynamics of communication in organizations to reach best results. The model has been applied to different types of firms reaching promising results (Gittell 2010, 2011).

The model affirms that relational coordination is produced by providing a frequent communication of high quality, supported in shared objectives and knowledge and mutual respect. This kind of coordination is the one that allows firms reach the best results, as it is described in figure 1.

Based in previous analysis and under the fundamentals of the mutual adjustment (Thompson 1967; Van de Ven et al. 1976; Tushman and Adler 1978; Argote 1982; Kogut and Zander 1996) and the focus of coordination based on relationships (Weick 1993; Liang et al. 1995; Quinn and Dutton, 2005; Faraj and Xiao 2006; Heckscher and Adler, 2007; Heckscher et al., 2009) in corporate environments of high/low interdependence/uncertainty, Gittell (2002) builds her model as an approach for the study of relational dynamics. In this sense, her model is defined 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 theory 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. According to this, for an effective coordination, the stakeholders must be connected through sharing goals and mutual respect (Gittell 2010).

The relational coordination model puts the emphasis in the relations that exists between different roles in a process, more than in the relationships that some profiles maintain with other ones in their daily functions. According to the author, the role based coordination presents some advantages over the coordination built around personal linkages. If the first one can require a higher investment for the implementation that the second one, the coordination based in roles proposes an exchange that stimulates the corporate flexibility to get adapted to changing environments in a framework of high uncertainty and interdependency along time.

The model is shaped around two types of dimensions that will be further evaluated: the communication and relation dimensions.

From the communication dimensions we find:
Frequent communication: the frequent communication helps to establish the relations amongst roles by the closeness generated as a consequence of a repetitive interaction (Gittell 2010).

Timely communication: the communication delayed can have negative implications for organizational results. So a fluent communication is important in the precise moment to achieve best results (Waller 1999).

Accurate communication: a precise communication in the relevant information plays a critical role in the performance of group tasks (O’Reilly and Roberts 1977).

Problem solving communication: an effective coordination requires that the professionals involved in some tasks are compromised in a communication oriented to solve the problems that appear in a group performance characterized for a high interdependence instead of blaming others or elude own responsibilities, which drives to negative consequences that affect final results (Deming 1986).

Amongst the relational dimensions included in the model, we have:

Shared goals: this aspect plays a key role on the coordination of highly interdependent tasks (Saavedra et al. 1993; Wageman 1995). By means of shared goals, the stakeholders develop links that allow them reaching compatible conclusions with the different ways of thinking and acting, as the new information is available (Gittell 2010).

Shared knowledge: although Dougherty (1992) shows that the communication amongst different profiles in a firm may not always be effective, due to the social and training antecedents, Gittell (2011) manifest that as far as some profiles know how their work is related with the rest of the work of other profiles in the same process, a dynamic in which everyone knows about the consequences of changes in each task or role.

Mutual respect: the respect for the competence of other workers implied in the process establish a powerful link that can be applied in an integral way to the whole process, by generating, as a consequence, an effective coordination (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) and time restrictions (Adler et al. 1999), and tacit knowledge (Nonaka and Takeuchi 1995) are required. In University teaching and researching practices, these circumstances appear:

- Task interdependence: two tasks are considered interdependent for this model as far as each of them depends on the other for final purposes. The professor teaches classes and performs research by managing tasks in a shared way with one or various professors.
- Uncertainty: the communication and links that compose the relational coordination process provides the information by making use of the relations and communications amongst the workers. Therefore the relational coordination will highly impact in organizations containing high degrees of uncertainty. Upper Education presents today a group of obstacles, for example and in some contexts the high ratio professor per student (Horizon Report 2012).
- Time restrictions: they have an amplified effect in the interdependence of tasks and the uncertainty, so that relational coordination will have a higher impact as time restrictions become wider. Organizations operate under time restrictions to manage and process information. Depending on the business, the strategy and priorities that appear each moment, time restrictions vary. When an organization performs education and research, in some cases they do not count on with mechanisms to control time restrictions.
- Tacit knowledge: in the teaching and researching processes, the professor maintains certain degree of tacit knowledge that it is difficult to make explicit.

These are the characteristics that have inspired us to apply the relational coordination model to the evaluation of Upper Education.

3. Material and methods

With the main objective to know the influence of the relational coordination in final lecturers and researchers satisfaction over their teaching and researching efforts, we have performed an empirical analysis over a representative sample of lecturers and researchers.
The technique for the analysis applied to the empirical study is based in the use of structural equations containing latent variables and errors of measure, SEM analysis. In the proposed model we consider that the results reached (QUALITY) are a consequence of a series of factors that appeared measured through organizational practices (ORG_PRACT), and indicators of the relational coordination model, mutual respect (MUT_RESP), shared goals (OBJ_SHARING), frequent communication (EFF_COM) and the sharing of knowledge (KNOW_MANAG).

As it has been previously explained, we support that the application of relational coordination in the teaching and researching processes produces benefits. The putting into action of organizational practices improves the satisfaction in University lecturers and researchers (H1), mutual respect improves the satisfaction in University lecturers and researchers (H2), the sharing of goals in University contexts improves the satisfaction in lecturers and researchers (H3), frequent, accurate and timely communication at University improves the satisfaction in lecturers and researchers (H4), and the sharing of knowledge at University improves the satisfaction in lecturers and researchers (H5).

3.1. Methodology applied to the empirical study

The data base applied in this research comes from a survey realized in a representative sample of University lecturers. In next figure we offer the most important attributes that we have taken into account: the universe, el geographic area, the sample size and other characteristics that constitute the technical fiche (figure 2).

<table>
<thead>
<tr>
<th>TECHNICAL FICHE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIVERSE:</strong> Spanish private or public Universities</td>
</tr>
<tr>
<td><strong>GEOGRAPHIC AREA:</strong> all the national territory</td>
</tr>
<tr>
<td><strong>DESIGN OF THE SURVEY:</strong> The researchers by making use of deep interviews.</td>
</tr>
<tr>
<td><strong>SAMPLE SIZE:</strong> 126 lecturers</td>
</tr>
<tr>
<td><strong>SAMPLE ERROR:</strong> +/- 10% (P=Q=50)</td>
</tr>
<tr>
<td><strong>LEVEL OF TRUST:</strong> 95.5% (2 sigma)</td>
</tr>
<tr>
<td><strong>SAMPLE DESIGN:</strong> A survey by person</td>
</tr>
<tr>
<td><strong>WORK OF FIELD:</strong> The researchers</td>
</tr>
<tr>
<td><strong>DATES:</strong> March 2012</td>
</tr>
</tbody>
</table>

Figure 2. The technical fiche

1) **Survey**, in the questionnaire questions related to the following variables are included
   - **General information**, Type of university and size.
   - **Organizational benefits**, Data related to the increase in organizational satisfaction.
   - **Work practices**, Work practices oriented to reach final objectives.
   - **Communication mechanisms**, The frequency in the use of teaching and researching tools, the real need that different departments at the Universities have to offer information at certain times.
   - **Shared knowledge**, The need that different profiles at the Universities have to share information and knowledge
- **Mutual respect.** The profiles solving problems when they appear, the perception that lecturers and researchers have about how others respect their work.
- **Sharing of goals.** The perception that different professors have about the sharing of goals in their departments.

4. **The results**

For obtaining the sample framework, we attended an educational meeting in The Complutense University in Madrid with different lecturers/researchers coming from different Universities in Spain.

From the meeting we have got 126 surveys completed by lecturers and researchers coming from different areas, Social Sciences (30%), Sciences (20%), Engineering (30%), Humanities (20%). The data have been processed by using Structural Equation Models, SEM models. Model estimation was made using SmartPLS 2.0 software. The significance levels calculation was made bootstrapping to minimize their standard errors (Efron and Gong 1983; Efron and Tibshirni 1993).

The estimated model is presented in figure 3. All the latent variables indicators were based on previous research (see above and references) and tested for validity and reliability with satisfactory results. Thorough results are not presented here due to space limitations.

Figure 3. Structural equation model

Table 1 shows the reliability and validity of the items measures used to represent each construct including convergent and discriminate validities.

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>p</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUT_RESP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJ_SHARING</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>KNOW_MANAG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJ_SHARING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORG_PRACT</td>
<td>.959</td>
<td>.157</td>
<td>6.089</td>
<td>***</td>
<td>H11</td>
</tr>
<tr>
<td>ORG_PRACT</td>
<td>.183</td>
<td>.055</td>
<td>3.323</td>
<td>***</td>
<td>H10</td>
</tr>
<tr>
<td>ORG_PRACT</td>
<td>1.521</td>
<td>.262</td>
<td>5.797</td>
<td>***</td>
<td>H8</td>
</tr>
<tr>
<td>MUT_RESP</td>
<td>1.203</td>
<td>.168</td>
<td>7.181</td>
<td>***</td>
<td>H2</td>
</tr>
</tbody>
</table>

Table 1
Table 1. Reliability and validity of the items measures used to represent each construct: convergent and discriminate validities

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>p</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFF_COM</td>
<td>2.032</td>
<td>.255</td>
<td>7.957</td>
<td>***</td>
<td>H9</td>
</tr>
<tr>
<td>EFF_COM</td>
<td>.081</td>
<td>.018</td>
<td>4.490</td>
<td>***</td>
<td>H7</td>
</tr>
<tr>
<td>EFF_COM</td>
<td>.015</td>
<td>.006</td>
<td>2.391</td>
<td>.017</td>
<td>H12</td>
</tr>
<tr>
<td>QUALITY</td>
<td>.588</td>
<td>.294</td>
<td>1.998</td>
<td>.046</td>
<td>H1</td>
</tr>
<tr>
<td>QUALITY</td>
<td>.008</td>
<td>.003</td>
<td>2.465</td>
<td>.014</td>
<td>H3</td>
</tr>
<tr>
<td>QUALITY</td>
<td>.007</td>
<td>.004</td>
<td>1.936</td>
<td>.053</td>
<td>H4</td>
</tr>
<tr>
<td>QUALITY</td>
<td>.203</td>
<td>.148</td>
<td>1.370</td>
<td>.171</td>
<td>H5</td>
</tr>
<tr>
<td>QUALITY</td>
<td>.026</td>
<td>.015</td>
<td>1.759</td>
<td>.079</td>
<td>H6</td>
</tr>
</tbody>
</table>

Parameter estimates (Estimate) which their corresponding standard errors (S.E) are presented in table 1. C.R. is the critical ratio (quotient between the estimate and its S.E.) and p corresponds to the parameter p-value.

Modeling results, although provisional, are encouraging (Table 1) being most of the tested hypothesis significant at the 0.05 significance level (p-values lower than 0.05). With the only exceptions of the relationship between communication efficiency (EFF_COM) and QUALITY which presents a 0.171 p-value and knowledge management (KNOW_MANAG) and QUALITY (p=0.171).

To evaluate the reflective construct indicators were taking into account the customary, in the literature, quality criteria: Indicators loads should have a minimum value of 0.60 (Herrmann, Huber and Kressmann 2006) and t values greater than 1.66 corresponding to a 95% confidence level. All the results satisfy this requirement.

The model constructs are reflective being of interest their values and significance levels.

Concerning the convergence criteria evaluation, the average explained variance (AVE) and the constructs reliability. AVE indicates the relationship between the variance explained by a factor and the variance not explained is around the required minimum value of 0.50.

The constructs composite reliability, as a measure of a factor capability to explain the reflective indicators, that is the extent to which the set of indicators is consistent in what it is intended to measure, have all a value greater than the required minimum of 0.70 (Table 1).

Cronbach’s Alpha takes values greater than the required 0.7. Communality the amount of variance an original variable shares with all other variables included in the analysis. Although no statistical guidelines indicate exactly what is an appropriate communality practical considerations dictate a lower level of 0.40 for this analysis.

To conclude the redundancy, measuring the variance in the construct that is shared by two or more predictors is extremely low, being the highest 0.028122, as required.

Most of the hypothesized relationships between the latent variables are, statistically, highly significant

5. Conclusions

For obtaining best results, Universities must orient and, many times, change their organizational routines to the proper processes. However, this is a necessary but not sufficient condition. In University teaching a researching practices a series of circumstances appear that show task interdependence, tacit knowledge uncertainty, and time restrictions. Universities need to develop mechanisms in order to face them all. This is the reason why much of the final results that organizations can reach when implementing new educational methods have to do with the need to coordinate efforts that allow the sharing of goals and knowledge, mutual respecting other professional labor and counting on with frequent, timely and accurate communication mechanisms.
In this research the relational coordination model has been applied in the university context at a lecturer and researcher level. This study contributes to the evaluation of the coordination mechanisms at Universities.

In this analysis an exploratory model has been built by making use of the relational coordination model that tries to offer an explanation of best results in the case of upper education practices. Our research tries to empirically explore and validate if the use of relational coordination in upper education Institutions explains a better performance in terms of lecturers and researchers final satisfaction.

This kind of analysis is important since there are not concrete pieces of research that put into relation and validate from an empirical point of view the effects of the relational coordination model in the case of education.

The results of the analysis in this research show empirical evidence that are congruent with the hypotheses related to the different dimensions of the relational coordination model, mutual respect, sharing goals, frequent, timely and accurate communication mechanisms and the sharing of knowledge.

The results in this research are important for upper education Institutions, since they support and justify the complementary of human beings and organizational dimensions when searching for better performance.

The basic conclusions for this study, supported in different kinds of hypotheses, are the following ones:

- Organizational practices at Universities increases the degree of satisfaction in lecturers and researchers.
- Mutual respect at Universities increases the degree of satisfaction in lecturers and researchers.
- The sharing of goals at Universities increases the degree of satisfaction in lecturers and researchers.
- Frequent, timely and accurate communication mechanisms at Universities increase the degree of satisfaction in lecturers and researchers.
- The sharing of knowledge at Universities increases the degree of satisfaction in lecturers and researchers.

In this research it is proofed that the relational coordination model can help to create a proper organizational climate to reach quality and effectiveness in the University System. Evaluating the results of Universities coordination is therefore important. Results show that these different dimensions of the relational coordination model: mutual respect, the sharing of goals, frequent, timely and accurate mechanism for communication and the sharing of knowledge explain best results at Universities in terms of lecturers and researchers final satisfaction.

Accordingly, for obtaining best results, Universities must orient, and many times change their organizational routines. Final results that organizations can reach when implementing new educational methods have to do with the need to coordinate efforts that allow the sharing of goals and knowledge, the mutual respecting amongst each other professional labor and counting with frequent communication mechanisms.

Although the findings are important, the study presents some limitations. First, 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.). Second, the study has been developed in a geographic context, that could be extended to a wider area and third an exploratory analysis has been developed that can serve as a point of start for future projects.

Acknowledgements

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