RELATIONAL COORDINATION IN ONLINE EDUCATION

María del Carmen Gallego Sánchez, Carmen De Pablos Heredero and José Amelio Medina Merodio

SUMMARY

Online education is an alternative methodology to traditional education, overcoming schedule problems and providing flexibility, among other features. Relational coordination (RC) is a validated tool for measuring and analyzing communication networks and relationships, considering functional organizational boundaries. The application of ICT in higher education online systems produces higher degrees of coordination and integration of processes by improving the competitiveness and research capacity of the institutions. RC can capture coordination among lecturers (RC) and students (relational coproduction) in online education. The goal is to study the relationship between the relational co-ordination and the quality of online education at universities. This situation can be diagnosed through a series of questions distributed and answered by the participants (students and lecturers) of the organizations. A questionnaire was designed and applied, consisting of the following blocks: coordination, general quality and methodology, technical quality on design and ease of use, technical quality of multimedia resources. The questionnaires were distributed in two Spanish universities and one American university. Comparative factor analysis was carried out. The results show that RC is relevant to achieve better quality and efficiency in online university education.

Introduction

E-learning programs are increasing in higher education. Online education is consolidating with a growth of 30% on average (Euroinnova, 2013). The application of information and communication technologies (ICTs) in higher education e-learning systems can lead to higher degrees of coordination and processes integration, improving the competitiveness and research capacity of the institutions. A good coordination of the processes involved in teaching and learning practices reinforces the enabling role of the technology and allows to reach dynamic capabilities that can improve the position of universities in their competitive environments (De Pablos et al., 2012c). At the university level, when implementing a suitable model of online education, apart from the technology itself, three factors should be taken into account: education and educational models, technology and technological models, and organization and organizational models (De Pablos et al., 2012b).

The quality and efficiency of data management services is very important in the so-called 'knowledge society'. Organizations have understood that ICTs are tools that facilitate and permit the efficient management of little resources; thus, their influence has been extended to practically all areas of business and all kinds of relationships (De Pablos et al., 2014). Gittell (2002) developed a model of relational coordination that emphasizes the importance of coordinating the relationships and dynamics of communication in organizations to achieve better results.

In addition, a number of critical success factors in the design and implementation of online methodology must be considered, such as: the participant's motivation, learning methodologies, instructional design, graphic design and multimedia, tracking online courses, the e-learning technology platform and content. E-learning standards can make the best of the ICT implementation per se.

Besides, relational coordination is defined as a process of mutual reinforcement of the interaction between communication and relationships conducted with the purpose of integrating tasks (Gittel, 2009). It is the coordination of work across functional and organizational boundaries, through relationships of shared goals, shared knowledge and mutual respect, supporting frequent, timely, accurate and problem solving communication.

The aim of this paper is to analyze whether relational coordination is relevant in online education quality. A questionnaire was designed, to be completed by students and lecturers in online learning. Finally, the data obtained through the questionnaires was analyzed. Taking into consideration the arguments supported by different authors, it is apparent that efficient mechanisms of communication and relationships may lead to higher levels of quality in higher education.

Literature Review

Gittel (2009, 2010) and De Pablos et al., (2012a, b, c, 2013, 2014) have demonstrated that relational coordination is an important factor to reach the best organizational results and, therefore, it appears to be the most appropriate model for online education. Relational coordination ensures the quality of online education in the university educational system.

Online education

E-learning is presented as an alternative to traditional learning (MECD, 2013) for those who wish to study at a distance, for training people who want to upgrade their

María del Carmen Gallego Sánchez. Telecommunications Engineer and Ph.D. student in Engineering Information and Knowledge, Polytechnic School, Universidad de Alcalá, Spain. Address: Department of Business Economics, Universidad Rey Juan Carlos. Paseo de los Artilleros s/n, 28032 Madrid, Spain. e-mail: mcarmen.gallego@edu.uah.es

Carmen De Pablos Heredero. Ph.D. in Economics and Business Administration, Universidad Complutense de Madrid, Spain. Professor, Universidad Rey Juan Carlos, España. e-mail: carmen.depablos@urjc.es

José Amelio Medina Merodio. Professor, Universidad de Alcalá, Spain. e-mail: josea.medina@uah.es

COORDINACIÓN RELACIONAL EN LA EDUCACIÓN EN LÍNEA

María del Carmen Gallego Sánchez, Carmen De Pablos Heredero y José Amelio Medina Merodio

RESUMEN

La educación en línea (online) es una metodología alternativa a la educación tradicional, que resuelve problemas de horario y proporciona flexibilidad, entre otras características. La coordinación relacional (CR) es una herramienta validada para la medición y análisis de las redes de comunicación y relaciones considerando los límites organizativos funcionales. La aplicación de las TIC en los sistemas de educación superior online produce un mayor grado de coordinación e integración de los procesos de mejora de la competitividad y capacidad de investigación de las instituciones. La CR puede capturar la coordinación entre profesores (CR) y estudiantes (coproducción relacional) en la educación online. Se estudió la relación entre la CR y la calidad de la educación online en la Universidad. El modelo de CR implica incluir elementos enriquecedores del trabajo en equipo a través de metas y conocimiento compartidos y el respeto mutuo, el apoyo comunicativo frecuente, oportuno, preciso y orientado a la solución a problemas. Algunas organizaciones presentan un estado más consolidado de CR que otras. Esto se aprecia con una serie de preguntas distribuidas y contestadas por los participantes (alumnos y profesores). Se aplicó un cuestionario compuesto por los siguientes bloques: coordinación, calidad, metodología general, calidad técnica en el diseño y facilidad de uso, y calidad técnica de recursos multimedia. Se distribuyeron cuestionarios en dos universidades españolas y una norteamericana, y se llevó a cabo un análisis factorial comparativo. Los resultados muestran que la coordinación relacional es relevante para tener mejor calidad y eficiencia en la educación online universitaria.

COORDENAÇÃO RELATIONAL DE EDUCAÇÃO EM LINEA

María del Carmen Gallego Sánchez, Carmen De Pablos Heredero e José Amelio Medina Merodio

RESUMO

Educação em linea (online) é uma alternativa à metodologia de ensino tradicional, completando problemas de agendamento e fornecer flexibilidade e outras características. A coordenação relacional (CR) é um instrumento validado para medição, análise de redes de comunicação e relações, tendo em conta as fronteiras organizacionais funcionais. A aplicação das TIC nos sistemas de ensino superior agora produzem um maior grau de coordenação e integração dos processos de melhoria da capacidade de competitividade e pesquisa das instituições. A CR pode capturar a coordenação entre professores (CR) e estudantes (coprodução relacional) na educação online. O objetivo foi estudar a relação entre a CR ea qualidade da educação online relacional na Universidade. A coordenação envolve modelo relacional incluir alguns elementos que melhoram o trabalho em equipe através de objetivos comuns, conhecimentos partilhados e respeito mútuo, suporte de comunicação freqüente, oportuna, precisa, e orientados a resolver problemas. Algumas organizações têm se consolidado uma CR mais consolodadas. Esta situação pode ser visto através de uma série de perguntas distribuídas e respondidas pelos participantes (alunos e professores). O questionário é composto dos seguintes grupos: coordenação, qualidade e metodologia geral, qualidade técnica em design e usabilidade, e qualidade técnica de recursos multimídia. A distribuição dos questionários foi em duas universidades espanholas e uma norteamericana. Realizou-se uma análise fatorial comparativa. Os resultados mostram que a CR é relevante para ter uma melhor qualidade e eficiência na educação online universitaria.

profession in the knowledge society, constantly updating itself via ICTs tools. It also implies, apart from evolution, saving money and time, and it may be useful for all subjects that can be taught in college.

The integration of ICTs by the institutions of higher education increases the competitive results. The alignment of strategic with technological possibilities can position educational institutions in more competitive standards in a global context.

E-learning implies the provision of educational programs and learning systems through electronic media. It covers a broad suite of applications and processes, such as web-based learning, computer-based training, virtual classrooms and digital collaboration (González et al., 2011).

Online learning is supported by e-learning platforms. Some of them, which are of free distribution (virtual campus free software) are: Moodle, Sakai, Claroline, Docebo, Dokeos. Software is necessary in online learning. Some private softwares for e-learning practices are: Ecollege, Edoceo, Desire2Learn, Blackboard, Prometheus, WebCT.

At university level, for a suitable model of e-learning to be implemented, three factors should be taken into account (De Pablos et al., 2012a, b, c, 2013, 2014; Salinas, 2014):

a) *Education and educational models*. One dimension that determines the quality of education and should consequently be evaluated is the educational model that is developed in response to an educational policy, on the basis of social needs (Socarras et al., 2008).

b) *Technology and technological models*. Morin and Seurat (1998) show that innovation is not only the result of research, but it is the assimilation of a technology developed, dominated and eventually applied in other fields of activity, but whose implementation in their organizational, cultural, technical or commercial context is new.

c) *Organization and organizational models*. Morgan (1986), Von Bertalanffy (1993) and Nonaka et al. (1996) are organizational theorists that have shown how conflicts are more likely to occur in the presence of high levels of interdependence or tasks and when there are high degrees of diversity among participants.

In addition, a number of critical success factors influence in the design and implementation of e-learning, such as: participant's motivation, learning methodologies, instructional design, graphic design and multimedia, tracking online courses, the e-learning technology platform and contents on e-learning standards.

Relational coordination and its importance in online education

Relational coordination provides quality performance and

efficiency, as well as customer's and employee's satisfaction (Gittel, 2009). The relational model of coordination is of interest for achieving good results at universities or processes that require a high degree of organization (Nonaka and Takeuchi, 1995). Several authors have studied the role of relational coordination in different areas, such as in final teacher satisfaction in e-learning (Margalina *et al.*, 2014) or healthcare management in lung cancer (Vinagre *et al.*, 2014). A different topic pertains to business outcomes: the application of relational coordination to practices of cloud computing (De Pablos *et al.*, 2014), or to the Spanish system of transplants, a system of excellence, where part of its success is a quality coordination between a volunteer`s organization and hospital coordinators (De Pablos *et al.*, 2012a).

Coordinating work takes place across functional and organizational boundaries, through relationships of shared goals, shared knowledge and mutual respect, frequent, timely, accurate and troubleshooting communication. Figure 1 shows the two groups of elements that compose relational coordination: relationships and communication (Gittell, 2009).

In general terms, the present work attempts to demonstrate how relational coordination makes a difference in online education at universities. In other words, an organization that shows high degrees of relational coordination, offers better quality in education than one that lacks them.

Relational coordination is a validated tool for measuring and analyzing communication networks and relationships through which work is coordinated considering functional and organizational boundaries. In this research it is shown that coordination can capture relational coordination among teachers (relational coordination) and between students (relational coproduction) in the online education model of e-learning. The relational coordination model implies the putting into practice of some elements that enrich teamwork.

Methodology

A model has been developed from the review of the literature, the hypotheses proposed, tabulating and analyzing data from a questionnaire that was designed to test the following hypotheses: a) Relational coordination is good; the best results are achieved in terms of university quality. b) People share objectives and knowledge; the best results are achieved in teaching. c) If there is mutual respect between teachers and students, better results will be achieved. d) There are mechanisms that make information flow on time and properly, the best results are achieved when taking correct decisions.

The questionnaire was used to collect anonymous data. Its design was laborious and based on a mixed quantitative and qualitative methodology, in accord to relevant criteria of online education. The questions included pertained to relational coordination, general quality and teaching methodology, technical quality in terms of navigation, design and multimedia, including personal and professional data. The part about relational coordination was based on Gitell's original questionnaire (Gittel, 2009). The empirical study was mcarried out at three universities, two Spanish ones located in Madrid,

Universidad Alcalá de Henares (UAH) and Universidad Rey Juan Carlos University (URJC) and one institution in the USA, Norwich University.

The questionnaires were distributed to students and lecturers. Of the students, 24% were from URJC, 33% from UAH, and 43% from Norwich University. Of the lecturers, 30% were from each of the two former institutions and 40% from Norwich University. A Likert scale from 1 to 5 was used for the answers: 1 (never), 2 (rarely), 3 (occasionally), 4 (often) and 5 (constantly). This scale has been considered the most appropriated for this study (William, 2006).

The questions included in the questionnaire are those considered to be relevant to the feature variables, characteristics or the object of study (Walter , 2000). They were of the following five types:

a) Questions about relational coordination, centered on the mechanisms involved in the practices in the respective organization (P1_1), lecturer's selection (P1_2), measuring the performance of teachers (P1_3), reward of teaching optimal performance (P1_4), proactive conflict resolution (P1_5), teacher training (P1_6), goal oriented job design (P1_7), exchange jobs (P1_8), information sharing (P1_9), on sharing information with outsiders (P2), communication (P3), conflict resolution (P4), sharing knowledge (P5), mutual respect (P6), and shared goals (P7).

b) Questions about quality in general (P8, P9): Is attention to the process of teaching and learning on line provided? Does the quality of the course compensates for the economic investment? Is divergent thinking used? Is there discussion and debate? Teachers motivate students? Are students are involved in activities individually or in groups? Is communication appropriate? The course provides a comprehensive content for development with introduction, objectives, schemes, development of

themes, activities, summary, glossary, suggestions for work and participation in forums, expanded content? The course presents accuracy and clarity in the content, uses assessment tools, didactic quality, positive activities? and evaluation of the university in the last 5 years.

c) Questions that refer to the technical quality, navigation and design (P10) are included: Course organization, easy use of navigation tools on the online platform, structure and design of virtual links, technical and quality tools in the platform for operation and programming.

d) Questions that refer to the technical quality and multimedia resources (P11): Does the course present a variety of integrated multimedia resources and combines different types of information, educational multimedia adequacy, videoconference sessions and other utilities on line? Applications offer the students and lecturers contents and experiences based on the real world?

Results

Analysis of relational coordination

Figure 2 shows the evaluation of relational coordination mechanisms established at the three universities, making use of the χ^2 test with the SPSS program. The areas of study at the three institutions were: engineering (UAH), social and legal science (URJC) and MBA (, Norwich University).

The different mechanisms described above were evaluated
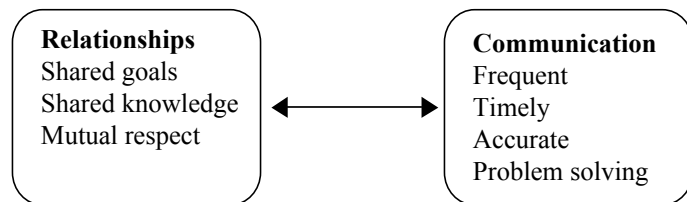

Figure 2. Mechanisms involved in relational coordination.

Figure 1

Relationships
Shared goals
Shared knowledge
Mutual respect

Communication
Frequent
Timely
Accurate
Problem solving
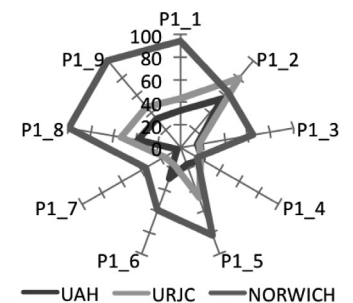
Figure 1. Elements in relational coordination.

using the percentages of the results obtained in the χ^2 test. The relational coordination varies greatly between organizations; some have a strong, steady process in terms of relational coordination, while others are weaker. Norwich University shows the higher scores in all mechanisms, it is exceeded only in the performance of lecturers (P1_2) by URJC.

Factorial analysis

An empirical analysis was based on observation of the different data obtained from the factorial analysis performed with the program SPSS 15.0. The Bartlett test of sphericity and the Kaiser-Meyer-Olkin rate were used to show that these tests are suitable in the case of students (0.631 about relational coordination and 0.922 for general quality, technical quality: navigation, design and tools, types of media assets), as well as in the case of lecturers (0.566 about relational coordination and 0.503 for general quality, technical quality: navigation, design and tools, types of media assets).

Students questionnaires

Table I shows factors and variances about relational

TABLE I
FACTORS AND VARIANCES ABOUT RELATIONAL COORDINATION AND GENERAL QUALITY IN STUDENTS QUESTIONNAIRES

Factors and variances about relational coordination	
Factors	Variance
Teamwork	23.780%
Sharing goals	12.803%
Information	8.842%
Motivation	7.145%
Self-confidence	5.794%
Mutual respect	5.447%
Conflict resolution	4.932%
Interrelation	4.471%

Factors and variances about general quality	
Factors	Variance
General quality	58.194%
Technical quality	9.610%

coordination and general quality in students questionnaires. Norwich University presents the highest levels in all of these factors. The different factors dealing with general quality are 1) General quality (environment and methodology); this factor explains 58.194% of the variance. 2) Technical quality: navigation, design and tools; this factor explains 9.610% of the variance. 3) Types of media assets (video, animations, simulations...); this factor explains 6.932% of variance.

Table II shows the component matrix about students questionnaires. The different components are 1: Teamwork, 2: Shared goals, 3: Information, 4: Motivation, 5: Self confidence, 6: Mutual respect, 7: Solving skills, and 8: Interrelation.

Table III shows component matrix about quality in general in students questionnaires. The variables are grouped into two main groups, 1: General quality, and 2: Teaching - learning methology.

The scree plot about relational coordination in students questionnaires, indicates that the number of factors is 8, so that eight components are extracted. The scree plot about quality in general in students questionnaires, indicates that the number of factors is 3, so that three components are extracted.

Professors questionnaires

The different factors that have been obtained in the case of professors about relational coordination are 1: Teamwork; this factor explains 41.442% of the variance. 2: Teaching -learning process; this factor explains 26.362% of the variance. 3: Objectives sharing; this factor explains 15.394% of the variance. Some variables were eliminated so as to obtain a determinant different from zero. Norwich University stands in all of these factors, but it is overcome by UAH in the teamwork factor.

Table IV shows factors and variances about relational coordination and quality in

professors questionnaires. The different factors about general quality are 1: Technical quality; this factor explains a 58.418% variance. 2: Quality and methodology; this factor explains 14.025% of the variance. 3: Considering quality in front of the cost of the course, this factor explains 9.643% of the variance. Norwich University stands in all of these factors.

Table V shows component matrix about relational coordination in professors questionnaires. The variables are grouped into three main groups, 1: Teamwork, 2: Teaching-learning process, 3. Sharing goals.

Table VI shows component matrix about quality in general in professors' questionnaires. The variables are grouped into three main groups: 1.Technical quality, 2: Methodological quality, and 3: Whether the online course is enough good to pay the cost.

The scree plot about relational coordination in professors questionnaires, giving the number of factors is 3, so that three components are extracted. The scree plot about quality in general in

students questionnaires, giving the number of factors is 3, so that three components are extracted.

Discussion

Based on the results derived from the processing of information obtained from the questionnaires about relational coordination, it can be confirmed

TABLE II
COMPONENT MATRIX ABOUT RELATIONAL COORDINATION IN STUDENTS QUESTIONNAIRES

	Components							
	1	2	3	4	5	6	7	8
P2_1	-0.117	-0.067	0.760	0.013	0.084	-0.033	0.127	0.149
P2_2	-0.050	0.025	0.832	0.124	0.063	0.018	0.107	-0.024
P2_3	0.178	0.039	0.869	-0.091	-0.017	-0.138	-0.124	0.002
P3_1	0.182	0.061	0.439	-0.275	0.210	0.153	0.299	0.432
P3_2	0.625	0.053	0.399	-0.306	0.031	0.223	0.102	0.044
P3_3	0.595	0.039	0.132	-0.416	-0.118	-0.115	0.273	-0.286
P4_1	0.081	0.082	0.177	-0.065	0.166	0.058	0.828	0.111
P4_2	0.169	0.034	0.162	0.095	0.187	0.104	0.106	0.771
P4_3	0.356	-0.148	-0.056	0.281	0.534	0.051	0.450	-0.308
P4_4	0.741	0.010	-0.112	0.105	0.259	-0.012	0.076	-0.048
P4_5	0.293	0.163	0.121	-0.001	0.804	0.019	0.149	0.091
P5_1	0.551	0.161	0.033	0.246	0.186	0.287	0.049	0.101
P5_2	0.041	0.226	-0.015	0.150	0.682	0.087	0.006	0.501
P5_3	0.091	0.066	0.033	0.699	0.107	0.440	-0.046	-0.097
P5_4	0.773	0.007	-0.084	0.253	0.185	-0.062	-0.097	0.142
P5_5	0.221	0.233	0.114	0.022	0.791	0.067	-0.016	0.058
P6_1	0.016	0.044	-0.043	0.147	-0.003	0.828	0.150	0.089
P6_2	-0.130	0.492	0.047	0.113	0.307	0.622	0.050	-0.035
P6_3	0.055	-0.063	-0.034	0.575	-0.067	0.640	0.138	-0.022
P6_4	0.326	0.176	-0.179	0.160	0.054	0.650	-0.307	0.213
P6_5	-0.034	0.708	0.190	-0.039	0.238	0.379	-0.129	-0.156
P7_1	0.162	0.463	0.048	0.375	-0.051	0.177	0.520	0.270
P7_2	0.095	0.709	-0.230	0.045	0.034	0.019	0.170	0.114
P7_3	0.108	0.191	-0.011	0.806	0.086	0.143	0.056	0.074
P7_4	0.432	0.459	0.083	0.541	0.011	-0.033	-0.155	0.148
P7_5	0.081	0.834	0.081	0.184	0.235	-0.006	0.013	0.012

TABLE III
COMPONENT MATRIX ABOUT QUALITY IN GENERAL IN STUDENTS QUESTIONNAIRES

	Components	
	1	2
P9_1	0.837	-0.129
P9_2	0.832	0.021
P9_3	0.875	-0.099
P9_4	0.820	-0.086
P9_5	0.743	-0.155
P9_6	0.808	-0.070
P9_7	0.779	0.130
P9_8	0.877	0.063
P10_1	0.718	0.400
P10_2	0.431	0.772
P10_3	0.500	0.655
P10_4	0.575	0.604
P11_1	0.756	0.193
P11_2	0.809	0.247
P11_3	0.702	-0.132
P11_4	0.765	0.319

TABLE IV
FACTORS AND VARIANCES ABOUT RELATIONAL COORDINATION AND QUALITY IN PROFESSORS QUESTIONNAIRES

Factors and variances about relational coordination	
Teamwork	41.442%
Teaching-learning process	26.362%
Objectives sharing	15.394%

Factors and variances about quality	
Technical quality	58.418%
Quality and methodology	14.025%
Considering quality in front of the cost of the course	9.643%

TABLE V
COMPONENT MATRIX ABOUT RELATIONAL COORDINATION IN PROFESSORS QUESTIONNAIRES

	Components		
	1	2	3
P2_3	0.727	0.055	0.539
P2_2	0.564	0.605	-0.015
P3_1	0.487	0.766	0.285
P4_1	0.574	0.643	-0.329
P5_1	-0.827	0.356	0.311
P6_1	-0.867	0.299	0.197
P7_5	0.030	0.797	-0.447
P4_5	0.037	-0.368	-0.747
P3_3	0.702	-0.426	0.380
P7_1	0.894	-0.315	-0.146

TABLE VI
COMPONENT MATRIX ABOUT QUALITY IN GENERAL IN PROFESSORS QUESTIONNAIRES

	Components		
	1	2	3
P9_1	0.832	0.210	0.075
P9_2	0.662	0.262	0.667
P9_4	0.105	0.876	0.042
P9_7	0.156	0.837	-0.052
P10_1	0.864	0.156	0.306
P10_2	0.734	0.078	-0.559
P11_1	0.786	0.463	-0.156
P11_2	0.701	0.506	-0.142
P10_4	0.758	0.110	0.113
P11_4	0.190	0.881	0.036
P9_8	0.281	0.825	0.130
P11_3	0.587	0.713	0.301
P10_3	0.847	0.256	-0.349
P9_3	0.162	0.797	-0.257
P9_5	0.340	0.506	0.084

that a quality and efficiency performance, as well as customer and employee satisfaction, in this case student and lecturers, have been reached. Besides, there is a process of mutual reinforcement in the interaction between communication and relationships carried out for the purpose of integrating tasks, which is consistent with the work of Gittell (2009).

The need for coordination is a prerequisite to achieve success in business or educational institutions. This recommendation is in agreement with the results shown in Gittell's (2009), where the importance of effective coordination among interdependent tasks is described. The results are also aligned with the results from research by De Pablos *et al*. (2012) and Haider (2013), who state that mutual adjustment produces an improvement in the organizational coordination mechanisms such as routines, schedules, advance planning and standardization of chores.

In general, people teach values, attitudes and learn them in the society. This recommendation agrees with the results derived in Flores Crespo (2004).

In addition, higher degrees of good relational coordination offer better organizational results. This is consistent with the results obtained by De Pablos *et al*. (2013). This is probably explained by the fact that all organizations that are part of the university environment present an individual competition that needs to be properly organized and converge at a common goal to ensure a good education.

Although communication mechanisms are not an important problem at the university level, the lack of common goals and mutual respect can be a barrier in the search of excellence Torres-Salinas *et al*., (2012). This fact is also reaffirmed in the present work.

Education is a very complex phenomenon because of its multipurpose character and dependence on the cultural and social context in which it occurs. According to the results obtained, education permits the exchange of knowledge between generations, and people teach values and attitudes, and learn them, in society. This fact reinforces Flores Crespo (2004) arguments.

Conclusion

As it is shown throughout the article, relational coordination is very important to reach a better performance and efficiency in a methodology based on online education or e-learning. That is, relational coordination leads to quality and efficiency in online education. Higher levels of relational coordination improve the efficiency and quality at University standards. Some educational organizations have a more consolidated situation in terms of relational coordination than others; this can be seen through the distribution of the previously developed quantitative study by obtaining the key information from the questionnaires distributed to the participants of the organizations and developing a quantitative study with the information obtained.

The American university (Norwich) presents the best relational coordination, this point is reflected in the quality of the environment, teaching methods, technical quality navigation and design, technical quality multimedia online education resources.

There are more coordination mechanisms in Norwich University than in the two Spanish Universities because Norwich University implemented online education many years ago and online education is more recent in Alcala and Rey Juan Carlos universities. For this reason, participants are more motivated in Norwich. The three universities have been restructured, they are consolidated, have new buildings and facilities and online education new platforms.

REFERENCES

Añel Cabanelas E (2008). Online education at University. *Pixel-Bit. Media Educ. Magaz. 33*: 155-163.

De Pablos C, Haider S (2012) Determinants of R&D cooperation: an institutional perspective. *Econ. Mundial 32*: 239-257.

De Pablos Heredero C, López D (2012a) The Spanish system of transplants: A system of excellence. *Interciencia 37*: 333-339.

De Pablos Heredero C, López-Hermoso Agius JJ, Martí-Romo Romero S, Medina Salgado S (2012b) *Organization and Transformation of Information Systems in the Enterprise*. ESIC. Madrid, Spain. 366 pp.

De Pablos Heredero C, Montes Botella JL, Soret Los Santos I, Damm R, García Martinez A (2012c) The importance of relational coordination in final teaching and learning results at universities. *Proc. EDULEARN12*. pp. 2835-2843.

De Pablos Heredero C, Ramos Gómez L, García Martínez A (2013). How students value a good coordination at universities. *ICERI Conf*. (18-20/11/2013). Sevilla, Spain.

De Pablos C, Montes J, Soret I (2014) Relational coordination and business outcomes: Application to the practices of cloud computing. *Interciencia 39*: 76-84.

Euroinnova (2013) *Euroinnova Report*. www.euroinnova.edu.es/blog/11-4-7/la-formacion online-se-consolida-con-un-crecimiento-del-30. (Cons. 08/04/2013).

Flores Crespo P (2004) ¿Puede la educación generar desarrollo? *Rev. Electr. Invest. Educ. 6* (2). http://redie.uabc.mx/vol6no2/contenido-flores.html (Cons. 01/14/2014).

Gittell JH (2002) Coordinating mechanisms in care provider groups: relational coordination as a mediator and input uncertainty as a moderator of performance effects. *Manag. Sci. 48*: 1408-1426.

Gittel J (2009) *High Performance Healthcare, Using the Power of Relationships to Achieve Quality, Efficiency and Resilience*. Mc Graw Hill. 335 pp.

Gittell J (2010) *Relational Coordination: Guidelines for Theory, Measurement and Analysis*. www.jodyhoffergittell.info/content/rc.html (Cons. 04/20/2013).

González R, López D (2011) *E-learning y Teleinmersión*. CUN. Bogota, Colombia. 14 pp.

Haider S (2013) *An Organizational Framework for the Implementation of Evidence Based Practices to Reduce Door to Balloon Time in Patients Undergoing Primary Angioplasty.* Tesis. Universidad Rey Juan Carlos. Spain.

Margalina V, De Pablos C, Montes J, Garcia A (2014) The role of relational coordination in final teacher satisfaction in e-learning. *Procedia Technol. 16*: 365-375.

MECD (2013) Ministry of Education, Culture and Sport. http://recursostic.educacion.es/ observatorio/web/ca/internet/recursos-online/ 1089-icomo-implementar-el-e-learning-en-los-procesos-de-ensenanza-aprendizaje. (Cons. 03/03/2013).

Morgan G (1986) *Images of Organization*. Sage. Newbury Park, CA, USA. 485 pp.

Morin J, Seurat R (1998) *Management of Technology Resources.* COTEC. Madrid, Spain. 221 pp.

Nonaka I, Takeuchi H, Umemoto KA (1996), Theory of organizational knowledge creation. Int. J. Technol. Manag. *11*: 833-845.

Salinas J (2014) Teaching innovation and use of ICT in university education. *J. Coll. Knowl. Soc. (RUSC).* UOC. www.uoc.edu/rusc/ dt/esp/salinas1104.pdf (Cons. 02/02/2014).

Socarrás V, Herrera, SF, Sánchez, SM (2008) What way care, is the essence of nursing care? *Intercult. Educ. 14* (1): 17-30.

Torres-Salinas D, Moreno-Torres J, Robinson N, Delgado E, Herrera F (2012) *Spanish University Rankings According to Different Scientific Areas.* http://rankinguniversidades.es (Cons. 04/30/2013).

Vinagre J, Del Llano J, De Pablos C, Nuijten M (2014) Relational coordination and healthcare management in lung cancer. *World J. Clin. Cases 16*: 757-768.

Von Bertalanffy LK (1993) *General Systems Theory: Foundations, Development, Applications.* 9ª ed. FCE. México. pp. 30-37.

Walter W (2000) *Education and Development: Measuring the Social Benefits.* Oxford University Press. Oxford, UK. 302 pp.

William MK (2006) Likert Scaling. www.socialresearchmethods.net/ kb/scallik.php. (Cons. 02/02/2013).