Achieving quality in e-Learning through relational coordination

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In this research, the relational coordination model has been applied to prove learners’ and instructors’ high levels of satisfaction in e-learning. According to the model, organizations can obtain better results in terms of satisfaction by providing shared knowledge, shared goals and mutual respect mechanisms, supported by a frequent, timely and problem-solving communication. Online courses learners and instructors from Spanish universities and private companies have been surveyed on these particular issues. By using structural equation model analysis, it is shown that high standards in terms of relational coordination amongst learners and instructors explain higher degrees of satisfaction. This research contributes to the literature by validating from an empirical point of view the effects of the use of the relational coordination model in e-learning. The results should be considered by universities and private companies when they evaluate the results of their actual e-learning systems and search for the improvement of quality.

Keywords: coordination; e-learning; relational coordination; shared knowledge; shared goals; communication

1. Introduction

Globalization and worldwide Internet establishment have invaded almost all areas of our society (Stracke 2013). With over three billion people using the Internet around the world (ITU 2014) and almost all companies in OECD being connected to Internet (OECD 2012), information and communication technologies (ICT) become part of the way people interact, work and trade. These two factors are radically changing the landscape of education (Stracke 2013; European Commission 2014). But the area where Internet, globalization and digital technologies have brought a more radical change is distance education and e-learning.

Online and distance education is the fastest growing area of education in both developed and developing countries (Simpsons 2012). The increasing use of ICT as a teaching and learning tool and the appearance of phenomena as massive open online courses (MOOCS) is pushing for globalization of educational markets (European Commission 2014). More and more institutions have now a global reach, with students in many places of the world apart from their home countries and traditional importers of education, such as China, are now becoming exporters of education (Simpsons 2012). The increase of international competition, together with the low employment rate

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amongst graduates and the mismatch of their skills according to labor market demands (European Commission 2014) is putting pressure on institutions to increase performance and the quality of education.

The enrollments in online education are continually growing. In 2012, the online enrollment rate in the United States was 6.1%, reaching the total of number of 7.1 million students taking at least one online course (Allen and Seaman 2014). In Europe, the enrollments increased 15–20%, while the offer grew 40% in 2011 (Study-Portals 2012). E-learning use in workplace training is also increasing for both large and small companies all over the world (Docebo 2014).

Additionally to all the challenges that educational institutions must face nowadays, e-learning must also cope with its image of offering lower levels of quality than conventional education and maintaining lower graduation rates too (Simpsons 2012). As a consequence of this situation, institutions must develop mechanisms in order to achieve better results in terms of performance and quality.

Learner’s and instructor’s satisfaction are considered to be key elements of quality in online education by the Sloan Consortium (Moore 2005) together with learning effectiveness, access and cost efficiency, and institutional commitment. The main objective of this research is to prove that the utilization of coordination mechanisms can explain better results in terms of satisfaction for both learners and instructors. For the analysis, the relational coordination model proposed by Gittell (2009) has been applied. In her theory, Gittell explains that the process of interaction between relational dimensions (shared knowledge, shared goals and mutual respect) and communication dimensions (frequent, timely and problem-solving communication), in contexts of high interdependence, uncertainty and time constraints, explain better results in terms of efficiency and satisfaction in organizations.

2. The importance of satisfaction for the quality of e-learning

Quality is an important competitiveness indicator for education and it is one of the main issues examined by modern scholars and practitioners from the international education market (Grifoll et al. 2010). E-learning quality has also been extensively discussed by European institutions (Dondi and Moretti 2007; Stracke 2013) and other international organizations (Moore 2003; FLAG 2012).

Learner satisfaction is increasingly seen as a prime determinant in e-learning programs in competitive markets (Lee 2010). If e-learning institutions fail to meet the needs of their learners, they risk losing them for one of their competitors (Sallis 2002). But, in order to achieve performance, e-learning institutions need to meet not only learner’s satisfaction, but also instructor’s satisfaction with his job. Thompson (2002) and Bolliger and Wasilik (2009) have shown that the success of e-learning programs is related to instructor’s personal and professional satisfaction.

E-learning quality is a complex concept, as its measures rely on tangible and intangible dimensions (Stracke 2013). The quality of education is the result of the relationship between learning and the demands, goals, standards and requirements set by individuals, businesses and other types of institutions and agents (Grifoll et al. 2010). And, e-learning programs make no exception, as they have to consider the perspective of stakeholders (Ehlers 2012) if they want to achieve quality. Brunner (2011), De-Pablos-Herederetto et al. (2013), and De-Pablos-Heredero, García-Martínez, and Perea Muñoz (2013) found that the application of coordination mechanisms in the
internal work processes at educational institutions can explain higher degrees of quality.

2.1. The importance of coordination for quality in e-learning

Coordination is the act of integrating the organizational work in conditions of task uncertainty and interdependence (Faraj and Xiao 2006). Coordination has been positively related in previous studies with organizational results (Argote 1982), performance (Lawrence and Lorsch 1967) and with the overcome of failures in organizations (Brandts and Cooper 2006). The importance of properly coordinated processes has also been positively related to quality in higher education (Van Vught and Westeheijden 1994; Balderston 1995; Cummings and Kiesler 2007; Andras 2011; Astin 2012).

The different tasks usually performed during an e-learning process, such as the creation and delivery of educational content, student support and assessment, are highly interdependent. Empirical studies (Trigwell, Prosser, and Waterhouse 1999; Selim 2007; Sun et al. 2008) have also found that lecturer’s attitude is a critical factor for learner’s satisfaction in e-learning contexts, as teaching and learning processes are interdependent. De-Pablos-Heredero, Perea and Garcia (2012) found that educational organizations can achieve performance in contexts of task interdependence by using coordination mechanisms. Therefore, the objective of this study is to prove that the application of coordination mechanisms can explain better results in terms of satisfaction in e-learning.

2.2. The relational coordination model applied to e-learning contexts

Gittell (2009) proposed a model of relational coordination that proved to be a power driver for quality and efficiency outcomes in different sectors, such as airlines and healthcare. Gittell (2002b, 2009) has applied it to different medical units inside hospitals and found that those units showing higher degrees in terms of relational coordination also show better results in different medical outputs. Later, De-Pablos-Heredero et al. (2013), De-Pablos-Heredero, Garcia-Martínez, and Perea Muñoz (2013), De-Pablos-Heredero, Montes-Botella, and Soret-los-Santos (2013) have proved that higher degrees of relational coordination at universities ensure greater degrees of satisfaction in lectures and students.

Bond and Gittell (2010) define the model as a mutually reinforcing process of interaction between communication and relationships carried out for the purpose of task integration. Relational coordination differs from the technical process of coordination, because it does not focus on the management of interdependencies between tasks, but on the management of interdependencies between the people who perform those tasks (Gittell 2009).

The relational coordination model is based on previous analysis of mutual adjustment (Thompson 1967; Argote 1982; Kogut and Zander 1996), teamwork (Van de Ven, Delbecq, and Koenig 1976) and the focus of coordination based on relationships (Weick 1993; Faraj and Xiao 2006; Heckscher et al. 2009) in corporate environments of task interdependence and uncertainty. Bond and Gittell (2010) explain that relational coordination theory differs from other ones. While in other theories shared knowledge is important, the relational coordination model arguments that shared knowledge also needs a context of shared goals and mutual respect for an effective coordination.
According to the model of relational coordination, coordination processes take place through a network of relationship and communication dimensions. The three relational dimensions, represented by shared knowledge, shared goals and mutual respect are supported by frequent, timely and problem-solving communication (Gittell, Edmonson, and Schein 2011).

Frequent communication improves relationships by the closeness generated as a consequence of a repetitive interaction (Gittell 2011). Song et al. (2004) have identified that learners are concerned about the delay of communication in online courses. And, delay communication can have a negative impact on e-learning results. Therefore, a fluent communication is important in the precise moment for organizational performance (Waller 1999) in e-learning contexts too. Problem solving communication leads to the optimization of processes with highly interdependent tasks (Gittell, Edmonson, and Schein 2011).

But the ability of coordinating work also depends on the quality of relationships, based on shared goals, shared knowledge and mutual respect. Shared goals play a critical role in the coordination of highly interdependent tasks (Wageman 1995). Through shared goals, the stakeholders can more easily come to compatible conclusions with different ways of thinking and acting, as new pieces of information are available (Gittell, Edmonson, and Schein 2011). Dougherty (1992) has shown that the differences in training, socialization and expertise create obstacles to effective communication and therefore can erode the effective coordination of work. This can also be met in e-learning, as learners and instructors usually have different knowledge backgrounds. Through shared knowledge a dynamic, in which everyone knows about the consequences of changes in each task and role, is developed. Mutual respect generates an effective coordination, because participants in a work process value the contribution of others and consider the impact of their actions in others (Gittell 2002a).

Together, these relational and communication dynamics provide the basis to coordinate collective action in order to achieve outcomes of value in organizations (Gittell, Edmonson, and Schein 2011), where high levels of tasks interdependence, uncertainty, time restrictions and tacit knowledge exist (De-Pablos-Heredero et al. 2013). In e-learning these circumstances appear:

- **Task interdependence**: the final result in e-learning, the knowledge acquired by the learner, depends on the tasks performed by both instructors and learners. For example, the instructor must use the right educational resources and present the content in a way that it is easy for the learner to understand and acquire the knowledge. But, the result of the learning process also depends on the learner’s efforts to understand the content, his interaction with the instructor and other participants in the process.

- **Uncertainty**: teaching and learning processes in e-learning present certain degree of uncertainty. For example, the lack of information about learner’s digital literacy and the quality of his Internet connection creates uncertainty for the instructor and the institution regarding the resources they can use in teaching and administrative processes. Certain degrees of uncertainty are also produced by the lack of non-verbal communication (Willis and Dickinson 1997). Learner’s need to wait for instructor response and feedback (Song et al. 2004) leads to uncertainty regarding their learning tasks.

- **Time restrictions**: an online course usually takes place in a pre-established period of time, which leads to time restriction in the performance of tasks for all the
participants in the process (Song et al. 2004). The time factor has been addressed in several research studies, as Gros et al. (2010) have shown in their literature review about this issue.

- **Tacit knowledge**: in teaching and learning processes, instructors and learners always maintain certain degree of tacit knowledge that is difficult to make explicit.

These circumstances, together with the results of studies that have shown the importance of the quality of communication (Arbaugh 2002; Song et al. 2004; Lee 2010), the knowledge sharing (Liaw, Huang, and Chen 2007) and social respect (Sung and Mayer 2012) for e-learning success, make us think that the application of the relational coordination model can explain best results. In this study the relational coordination model has been applied to evaluate learner’s satisfaction with online courses and instructor’s satisfaction with his job. Analysing learner and instructor satisfaction have been considered as they are recognized to be pillars of quality in online education together with learning effectiveness, access, cost effectiveness and institutional commitment (Moore 2005).

3. **Research methodology and hypotheses**

To determine the influence of relational coordination on learners’ and instructors’ final satisfaction, an empirical analysis over two representative samples of learners and instructors who participate in online courses in Spanish universities and companies has been performed.

For the empirical study the structural equation model (SEM) analysis, structural equations containing latent variables and errors of measurement have been applied. The two samples have been analyzed separately. The models are similar, as in both models it has been considered that satisfaction is achieved through high-quality relationships (SR), supported by the three relational dimensions, shared goals (SG), shared knowledge (SK) and mutual respect (MR), and the three communication dimensions, frequent (FC), timely (TC) and problem-solving (PS) communication, and an online platform of quality (SP). The only difference is that the final variable measured is different. In the case of learners, the final result measured is their satisfaction with the online course, while in the case of instructors their satisfaction with their teaching work in online courses is measured.

As it has been previously mentioned, we support that the application of relational coordination mechanisms in learning and teaching processes in e-learning contexts produces benefits. With the main objectives to evaluate the impact of relational coordination on learners’ and instructor’ final satisfaction, we propose the following hypotheses (Figure 1):

**Hypothesis 1 (H1)**: Frequent (FC), timely (TC) and problem-solving (PS) communication will positively influence shared knowledge (SK), shared goals (SG) and mutual respect (MR).

The adjustment between communication and relational dimensions is considered to be the basis of the relational coordination model (Bond and Gittell 2010). Sung and Mayer (2012) have identified timely communication as an indicator of social respect in
Frequent communication is considered to be a source for the improvement of relationships (Gittell 2011). Therefore, the main objective of this hypothesis is to test if the relationships between the three dimensions of communication (FC, TC and PS) have a positive impact on the three relational dimensions (SK, SG and MR). As the efficiency of communication in e-learning depends on its frequency and timeliness (Thompson 2003), the relationships between FC and TC and TC-PS have also been tested.

**Hypothesis 2 (H2):** Problem-solving communication (PS) increases learners’ and instructors’ satisfaction with the work (SR) of others profiles involved in the e-learning process.

Problem-solving communication plays a critical role on the optimization of a work process, as the communication between the persons will be oriented to solve the problems that appear during the process, rather than on blaming when the things go wrong (Deming 1986; Gittell, Edmonson, and Schein 2011; De-Pablos-Heredero, Perea and Garcia 2012). For this reason, it has been tested if this communication dimension has an impact on the quality of relationships between the participants in the e-learning process.

**Hypothesis 3 (H3):** Relationships based on shared knowledge (SK), shared goals (SG) and mutual respect increase learners’ and instructors’ satisfaction with the work (SR) of the other profiles involved in the e-learning process.

Relationships based on shared knowledge, shared goals and mutual respect enable the interaction of participants in a work process to achieve a better coordination of their tasks (Gittell 2002b). Through shared goals stakeholders can come to more compatible conclusions. Therefore, shared goals play a key role in e-learning, as its quality depends on the requirements set by different stakeholders (Ehlers 2012). Shared knowledge is also important for the coordination of tasks in e-learning, as the final aim of an e-learning process is that learners acquire certain knowledge. Effective coordination of highly interdependent work also depends on the respect for the competences of others (Gittell 2011). Therefore, it has been tested if these three relational dimensions increase learners’ and instructors’ satisfaction with the work of other participants in the e-learning process.
process. For this hypothesis, if mutual respect (MR) has a positive relationship with shared goals (SG) and shared knowledge (SK), and if shared goals increases shared knowledge have also been tested.

Hypothesis 4 (H4): High-quality relationships (SR) have a positive impact on learners’ and instructors’ satisfaction with the online platform (SP).

The most used online platforms for e-learning are the so-called learning management systems (LMS). An LMS is a software application running on a server connected to a computer network and its purpose is to facilitate access to learning materials and communication between the participants in the learning process (Coll and Monereo 2008).

Several researchers in the field (Kirwood and Price 2006; Johnson, Hornik, and Salas 2008; Zhan and Mei 2013) affirm that the quality of educational processes in e-Learning does not depend so much on the technology, but on the quality of the learner–instructor interaction. Hence, in this hypothesis we test if high-quality relationships (SR) have a positive impact on learners’ and instructors’ satisfaction with the LMS.

Hypothesis 5 (H5): Learners’ and instructors’ satisfaction with the online platform (SP) increase their final satisfaction (FS).

As, the quality of technology used in the e-learning process is considered to be important (Piccolli, Ahmad, and Ives 2001; Liaw, Huang, and Chen 2007; Islam 2013) for learners’ and instructors’ satisfaction, its impact on learners’ and instructors’ final satisfaction has been tested.

H6: High-quality relationships (SR) increase learners’ and instructors’ final satisfaction (FS) in e-learning.

Learner and instructor satisfaction are considered to be two basic pillars of quality in online education (Moore 2005). Satisfaction ratings by learners are also a common measure of quality in e-learning (Anderson 2008). Gittell (2009) describes that relational coordination can be a source of satisfaction for the people involved in a work process, as it makes easier for them to access the resources needed to accomplish the work. Relational coordination increases also job satisfaction by increasing employees’ ability to accomplish their job (Gittell, Edmonson, and Schein 2011). In this hypothesis, the relationship between the quality of relationships (SR), measured by the communication and relational dimensions of the relational coordination model in the previous hypotheses, and final learner and instructor satisfaction in e-learning has been tested.

3.1. Methodology used in the empirical study

In this research, characteristics of organizational behavior have been considered. As structured data bases have not been found, the chosen methodology to collect information was the questionnaire. Two questionnaires adapted from Gittell (2011) and De-Pablos-Heredero et al. (2013), De-Pablos-Heredero, García-Martínez, and Perea Muñoz (2013) to the e-learning environment have been used.

The questionnaires have been sent to two universities, one public and the other one private, and to five e-learning companies from Spain. These organizations have been chosen because they are representative for the Spanish e-learning market. Learners
and instructors were asked to complete an online questionnaire using Google Docs. The total number of learners and instructors who received the questionnaires is unknown, as they were sent not only directly to the respondents but, also to managers of organizations who send them to their colleagues and learners. One hundred and thirty-four answers from learners have been received, from which 63% were university learners and 37% were doing the course with an e-learning private company. In the case of instructors, 38 answers have been collected, 76% of them were teaching at universities and 24% at e-learning private companies. Learners’ sample has an error of ±8% \( (P = Q = 0.5) \) and a 95.5% (2 sigma) level of trust. In the case of instructors, sample’s error is ±15.82% \( (P = Q = 0.5) \) and the level of trust is 95.5% (2 sigma).

The questions regarding relational coordination were measured following Gittell’s guidelines (Gittell 2011), using a five-point, equally spaced, Likert scale (Likert 1974). The answers’ choices ranged from ‘never = 1’ to ‘constantly = 5’. Whereas the questions regarding satisfaction were measured using a four-point Likert scale, from ‘very dissatisfied = 1’ to ‘very satisfied = 4’. In the questionnaire, questions regarding the following variables are included:

- **General information**: sex, age, country, previous experience with e-learning.
- **The course characteristics**: duration of course, type of institution and method of course (synchronous, asynchronous and mixed).
- **Technology**: the online platform used in the learning process.
- **Communication dimensions**: the frequency of communication with each profile involved in the process, the real need that different profiles have to offer information at certain time and the frequency of the communication for the solving of problems.
- **Shared knowledge**: the need that different profiles involved in the learning process have to share information and knowledge.
- **Sharing of goals**: the perception that learners and instructors have about sharing goals with the different profiles they are interacting with.
- **Mutual respect**: the perception that learners and instructors have about how others respect their work.

The profiles included in the questionnaires, besides the learner and the instructor, are the *administration staff* and *technical support staff*. These profiles are the most frequently met at e-learning institutions and companies.

### 4. Results

For this research, the model has been evaluated and the hypotheses have been tested by using SEM. The model was estimated applying the partial least square (PLS) procedure using the Smart PLS 2.0 M3 Software (Ringle, Wende, and Will 2005). Model parameters estimation has made bootstrapping to minimize their standard errors (Efron and Gong 1983; Efron and Tibshirani 1993).

The model has been estimated by using PLS because the phenomenon is relatively new and its modeling is at a developing stage. Also, minimal recommendations exist concerning the sample size. The PLS algorithm converges in most of the cases achieving high statistic power even with reduced samples and it is robust against missing data (Joreskog and Wold 1982; Henseler, Ringle, and Sinkovics 2009).
Discriminant validity was evaluated according to the Fornell and Larcker criterion (Fornell and Larcker 1981). Correlations between latent variables should be lower than the square root of the corresponding AVE. As it can be observed in the main diagonal of Tables 1 and 2, where they have been inserted, this is the case for all variables.

Internal consistency was measured by Cronbach’s alpha and by composite reliability (Table 3). Cronbach’s alphas are above 0.5, the value indicated by Nunnally and Bernstein (1994) is acceptable for the internal reliability, with the exception of frequent (FC) and problem-solving (PS) communication in the case of instructors (FC = 0.35 and PS = 0.39). Composite reliability takes the recommended value of 0.7 for all variables in both cases for learners and instructors. All the AVE values exceed the threshold recommended by Fornell and Larcker (1981) in the case of learners. For instructors, AVE values also reach the recommended 0.5, with the exception of problem-solving communication (PS), which takes a value of 0.47. Table 3 shows all the values taken by all the variables in the analysis made for learners (L) and instructors (I).

Statistical significance was sized up by means of 500 resampling bootstrap to minimize the estimator of standard errors (Efron and Gong 1983; Efron and Tibshirani 1993). The significance of the path coefficients was determined with the help of the pseudo \( t \)-statistics from the bootstrapping procedure. In Table 4 the results of the bootstrapping for the two samples of learners (L) and instructor (I) are presented.

The hypothesized relationships, in the case of learners, are statistically significant with a \( p \) value < .05. All \( t \)-values are over the 1.96 limit value (5% confidence interval). Therefore, the six proposed hypothesis are validated.

### Table 1. Latent variable correlations students.

<table>
<thead>
<tr>
<th></th>
<th>FC</th>
<th>MR</th>
<th>FS</th>
<th>PS</th>
<th>SG</th>
<th>SK</th>
<th>SP</th>
<th>SR</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
<td>0.76</td>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS</td>
<td>0.27</td>
<td>0.39</td>
<td>0.84</td>
<td></td>
<td></td>
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<tr>
<td>PS</td>
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<td>0.28</td>
<td>0.71</td>
<td></td>
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<td></td>
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<tr>
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<td>0.84</td>
<td></td>
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<tr>
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<td>0.41</td>
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<td>0.19</td>
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<td>0.77</td>
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</table>

Note: The bold values are the square root of the corresponding AVE.

### Table 2. Latent variable correlations teachers.

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Note: The bold values are the square root of the corresponding AVE.
Table 3. Quality criteria overview.

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<td>S</td>
<td>T</td>
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</tr>
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<td>SK</td>
<td>0.62</td>
<td>0.80</td>
<td>0.83</td>
<td>0.92</td>
<td>0.71</td>
<td>0.58</td>
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<tr>
<td>SG</td>
<td>0.71</td>
<td>0.62</td>
<td>0.83</td>
<td>0.83</td>
<td>0.50</td>
<td>0.34</td>
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<tr>
<td>MR</td>
<td>0.70</td>
<td>0.78</td>
<td>0.88</td>
<td>0.91</td>
<td>0.39</td>
<td>0.34</td>
</tr>
<tr>
<td>SP</td>
<td>0.63</td>
<td>0.78</td>
<td>0.87</td>
<td>0.94</td>
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<td>0.17</td>
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<tr>
<td>SR</td>
<td>0.71</td>
<td>0.64</td>
<td>0.88</td>
<td>0.84</td>
<td>0.53</td>
<td>0.36</td>
</tr>
<tr>
<td>FS</td>
<td>0.71</td>
<td>1.00</td>
<td>0.94</td>
<td>1.00</td>
<td>0.71</td>
<td>0.07</td>
</tr>
</tbody>
</table>
The results of instructors’ sample showed some differences to those of learners. From hypothesis 1, the relationships between frequent communication (FC) and shared goals (SG), FC and mutual respect (MR), FC and timely communication (TC), TC and problem-solving communication (PS) are statistically significant \((p < .05)\). But, it is not demonstrated that TC increases shared knowledge (SK) \((p = .63)\). And PS does not have a statistical significant effect on SK \((p = .21)\). As a conclusion, hypothesis 1 is partially validated in the case of instructors. The analysis of hypothesis 1 for both samples, learners and instructors, confirms that relationships’ dimensions are reinforced by communication dimensions (Bond and Gittell 2010).

Hypothesis 2 could not be validated \((p = .40)\). In the case of this sample, it seems that problem-solving communication does not increase instructor’s satisfaction with the work of others. That does not mean that the work of others is not important in e-learning for instructors, but the knowledge they have to share with other profile is different from the one shared in the case of learners. This is an aspect that we will have to investigate further.

All the tested relationships in hypothesis 3 are validated for both samples, with \(p\) values < .05. Therefore, the results of the analysis of this hypothesis prove that the quality of work relationships at e-learning institutions can be achieved through

<table>
<thead>
<tr>
<th>Hypothesis 4</th>
<th>SR → SP</th>
<th>0.51</th>
<th>0.42</th>
<th>0.53</th>
<th>0.44</th>
<th>0.06</th>
<th>0.15</th>
<th>0.06</th>
<th>0.15</th>
<th>8.37</th>
<th>2.81</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 5</td>
<td>SP → FS</td>
<td>0.41</td>
<td>0.007</td>
<td>0.41</td>
<td>0.05</td>
<td>0.07</td>
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<td>0.07</td>
<td>0.25</td>
<td>5.78</td>
<td>0.03</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>SR → FS</td>
<td>0.76</td>
<td>0.26</td>
<td>0.77</td>
<td>0.26</td>
<td>0.04</td>
<td>0.15</td>
<td>0.04</td>
<td>0.15</td>
<td>20.34</td>
<td>1.70</td>
</tr>
</tbody>
</table>

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All the tested relationships in hypothesis 3 are validated for both samples, with \(p\) values < .05. Therefore, the results of the analysis of this hypothesis prove that the quality of work relationships at e-learning institutions can be achieved through
mechanisms of shared goals, shared knowledge and mutual respect (Wageman 1995; Gittell, Edmonson, and Schein 2011).

There was no relationship found between the perceived quality of technology (SP) and final instructor’s satisfaction with his job (hypothesis 5: \( p = .97 \)), but the quality of relationships (SR) increases instructor’s satisfaction with the online platform (hypothesis 4: \( p = .00 \)).

Hypothesis 6 shows a \( p \) value of .09, therefore this hypothesis is not validated. Hence, the results of hypothesis 6 prove that relational coordination has an impact on final satisfaction with e-learning only in the case of learners. But, this is an aspect that we must further investigate with bigger sample sizes in the case of instructors.

Conclusions

The increase of international competition in e-learning market, an image of lower quality and lower graduation rates compared with conventional education (Simpsons 2012) put pressure on institutions to increase the quality of their supply and performance. E-learning is also characterized by task interdependence, uncertainty, time constraints and tacit knowledge. In order to face all the challenges, e-learning institutions must develop mechanisms to reach better results in terms of quality and performance. In addition to other factors, quality in e-learning institutions is met if learner’s and instructor’s satisfaction (Sloan Consortium 2005) are taken into consideration.

In this research, the relational coordination model has been applied to prove high levels of satisfaction amongst learners and instructors in e-learning contexts. The study contributes to the evaluation of coordination mechanisms in e-learning.

There are few studies that analyze the organizational impact of the use of the relational coordination model in educational processes, especially in e-learning. This study contributes to the literature by putting in relation and validating from an empirical point of view the effects of the relational coordination in the case of e-learning.

The main conclusions of this research from the hypotheses validated so far are the following:

- Communication dimensions of the relational coordination model have an impact on the relational dimensions. But the impact in the case of learners is different from the one of instructors and this must be taken into consideration (H1).
- A problem-solving communication increases the quality of relationships in the case of learners (H2).
- Mutual respect has a positive effect on the quality of relationships for both learners and instructors. (H3).
- Satisfactory relationships increase learners’ and instructors’ satisfaction with the LMS used in the learning process (H4).
- A high level of satisfaction with the LMS increases final learner satisfaction with the online course (H5).
- High-quality relationships have a positive impact on learners’ final satisfaction with online courses (H6).

In this research it is proved that the use of the relational coordination model can help public and private institutions to improve learners’ final satisfaction with e-learning, learners’ and instructors’ satisfaction with the LMS and the quality of relationships
amongst their employees. Therefore, the improvement of quality in e-learning must also be oriented to the establishment of coordination amongst interdependently tasks, the coordination of different agents, making them sharing ideas, knowledge, objectives and to maintain relationships based on mutual respect.

When developing relational coordination mechanisms, educational institutions must consider e-learning as a process that connects all the participants. Educational institutions have to identify and map the e-learning processes that are taking place and clarify the roles of the participants. It is also important to create a space of psychological safety, as learners and instructors need it for finding the best way of communicating and relating. Relational coordination must also be measured and assessed in order to find variations and areas of improvement.

Although the results of this research are important for the improvement of the e-learning education quality, the study presents some limitations. Samples of learners from both higher education institutions and e-learning private companies have been analyzed as we consider that in both cases work processes are characterized by task interdependence, uncertainty, time restrictions and tacit knowledge. But, in further researches samples of learners and instructors from each type of institutions should be analyzed separately and compared to identify potential differences. The internal organization of institutions can affect the relationships between the profiles that are working in each of them and their relationship with learners. And, they can also affect the nature of communication. Secondly, the study should be extended to higher samples of learners and instructors to see if other factors have an impact on relational coordination too, such as the personal and geographical context. The study should be also extended to other profiles involved in the e-learning process, to other quality measures and to a larger geographic area.

Disclosure statement
No potential conflict of interest was reported by the authors.

References


Simpsons, O. 2012. Supporting Students in Online, Open and Distance Learning. New York: Routhledge.


