Managerial action and sensemaking in e-learning implementation in Brazilian business schools

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A B S T R A C T

The existing literature on e-learning implementation is either descriptive or normative and falls short on explaining how managers act in introducing and disseminating e-learning projects in school settings. In this paper, we follow a symbolic approach in order to offer a grounded model for explaining how managerial framing of the introduction of e-learning gives rise to different patterns of action and intended outcomes. Our model is grounded in the study of seven business schools in Brazil, where the competitive and institutional settings offer significant variety for formulating propositions through the grounded theory methodology. We conclude that managers act to integrate e-learning using cultural incongruity reduction strategies when they perceive e-learning as a way of improving existing teaching practices. They may also aim at insulating e-learning through incongruity avoidance when they perceive e-learning in economic terms. These results offer new empirical evidence and fresh explanations when the phenomenon of managerial action in e-learning implementation is looked at in symbolic terms.

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1. Introduction

E-learning has become increasingly common in educational institutions worldwide. The existing literature considers e-learning as an advanced pedagogy that makes use of digital technology (Nichols, 2008), and involves the use of the Internet and other information-related communication technologies (ICT) to create experiences that foster and support the learning process (Bose, 2003). However, we argue here that the organization of the environment for e-learning applications goes beyond understanding the technology from a merely instrumental and objective perspective (Pollock & Cornford, 2003). In this sense, we align ourselves with Orlikowski's (1992) arguments about technology that:

"The concept of interpretative flexibility with respect to technology is particularly pertinent in the light of increased deployment of computer-based technologies in organizations (…). The ongoing interaction of technology with organizations must be understood dialectically, as involving reciprocal causation, where the specific institutional context and the actions of knowledgeable, reflexive humans always mediate the relationship. This view of technology encourages investigations of the interaction between technology and organizations that seek patterns across certain contexts and certain types of technology, rather than abstract, deterministic relationships that transcend settings, technologies, and intentions" (Orlikowski, 1992, p. 421 and p. 427).

From this symbolic perspective of technology, we learn that the local context and the individual experiences and perceptions about technology should be taken into consideration in e-learning technology implementation. We agree with Pollock and Cornford (2003) that e-learning technology implementation is a complex, socio-technical phenomenon, largely characterized by a high degree of uncertainty. As Heilesen and Josephsen (2008) argue, it involves not only rational and instrumental motives, or economic and technical aspects, but also the feelings and the framing of individuals interacting with the information technology systems. Additionally, managers are able to create a positive culture that will support others as they learn and adapt to new technologies (Robinson, 2000). Managers also have the potential to

greatly affect the effectiveness of this type of project by influencing potential participants, securing resources (McAlister, Rivera, & Hallam, 2001), supporting the changes, and implementing processes that will overcome the barriers that affect instructors and students (Berge, 1998).

While the role of sensemaking in general (Maitllis, 2005; Weick, 1995; Weick, Sutcliffe, & Obstfeld, 2005) and the symbolic meanings of technology have been extensively studied in the broader information system literature (Bansler & Havn, 2004; Faraj, Kwon, & Watts, 2004; Gopal & Prasad, 2000; Henfridsson, 2000; Hsiao, Wu, & Hou, 2005; Hsieh, Rai, & Xu, 2011; Orlikowski & Gash, 1994; Prasad, 1993), explanations based on how managerial sensemaking affects managerial action within the domain of the implementation of ICT-based learning projects have not yet been addressed.

In order to fill this gap, we developed in-depth case studies of seven e-learning implementation projects. We aligned ourselves with the view that e-learning technology does not "stand alone", but can only be comprehended within its context of application, where it helps shaping interactions between individuals and their socially constructed reality. This epistemology indicates that the symbolic meanings individuals attribute to the role of technology and how they make sense of it, as well as their interaction with the world around them, must be brought to the fore in order to understand e-learning implementation and how it unfolds within organizations.

We aimed at answering how project managers' perceptions of e-learning influenced their actions and subsequently led to different patterns of e-learning being appropriated by the organization. To fulfill our objective, we chose the grounded theory methodology (Corbin & Strauss, 2008) to generate a conceptual framework to explain how managerial perception of technology drives managerial action. Following a social constructivist perspective (Griffith, 1999; Orlikowski, 1992), managers may have the flexibility to interpret, yet at the same time are tied and restricted by the objective aspects surrounding them. This symbolic approach goes beyond comprehending e-learning implementation in solely economic and rational terms and helps reveal the expressive world of organization members (Turner, 1986).

The seven case studies are all Brazilian business schools. Three reasons make this context important to our contribution. First, e-learning technology has been promoted by the government as a way of overcoming the country's continental distances and facilitating the population's access to higher education through distance education models. Second, e-learning is an important competitive strategy for both private and non-private schools. Third, since federal government agencies impose strong regulatory restrictions on e-learning applications in Brazil, the way they are implemented and internally appropriated by the organization are central to their success (Litto, 2002). Therefore, the context of Brazilian business schools offers a good opportunity to explain managerial action in e-learning implementation projects.

The rest of the paper is organized as follows. First, we discuss the importance of generating empirical explanations based on managerial sensemaking and on the shared meanings of technology in order to better grasp the phenomenon of e-learning implementation. Second, we describe in detail how we developed our grounded theory work. Third, we present our findings and an explanation of the phenomenon. Finally, we ask what we learn about this Brazilian experience that is theoretically relevant to other contexts.

2. Managerial sensemaking in e-learning implementation

Framing a situation helps individuals organize the world around them. This organizing process turns circumstances into a situation that is comprehended explicitly by individuals. It is an action response from individuals when they perceive the current state of the world to be different from their expected state of the world, or when there is no obvious way to comprehend it (Weick, 1995; Weick et al., 2005). Individuals use frames of reference as implicit guidelines that facilitate the process of shaping, attributing meaning, and organizing their interpretation of organizational events around them. The idea of frames comes from cognitive psychology research (Bartlett, 1995; Neisser, 1976). It can be described as shared cognitive structures or mental models that help individuals interpret their world when there is a significant overlap of cognitive categories and content confusing them (Moch & Bartunek, 1990; Weick, 1979). Gioia (1986, p. 56) describes frames as "a built-up repertoire of tacit knowledge that is used to impose structure upon, and impart meaning to, otherwise ambiguous social and situational information to facilitate understanding". Frames serve as a vehicle for understanding and acting upon organizing the perceived reality, allowing interpretation of ambiguous situations, reducing uncertainty in complex and changing conditions, and providing a basis for taking action (Gioia, 1986, pp. 49–74).

The use of frames triggers what Weick et al. (2005) describe as a sensemaking process. Individuals ask themselves whether "it is the same or different" when experiencing discrepancy and trying to interpret this discrepancy in a way that makes sense to them. Sensemaking is an action process of organizing the world around us, and "unfolds as a sequence in which people concerned with identity in the social context of other actors engage ongoing circumstances from which they extract cues and make plausible sense retrospectively, while enacting more or less order into those ongoing circumstances" (Weick et al., 2005, p. 409). The sensemaking process implies the interplay between interpretation and action that constantly redrafts an up-and-coming story that becomes more and more comprehensible as it incorporates more of the observed data. Individuals construct their stories from frames of reference such as organizational premises, institutional constraints, plans, expectations, personal beliefs, acceptable justifications, and traditions inherited from predecessors. Sensemaking is neither about truth, or getting the story right, nor is it an evaluation of choice, but rather how individuals make sense of equivocal inputs, enacting this sense back into the world to make it more logical to their assumptions. This is the central argument in both organizing and sensemaking. When action is the central focus, interpretation, not choice, is the core phenomenon (Laroche, 1995; Weick, 1993).

The idea of sensemaking has been extensively applied to research on information system technology. In order to understand how individuals deal with technology, Orlikowski and Gash (1994, p.178) developed the concept of the technological frame in order to ""identify that subset of members' organizational frames that concern the assumptions, expectations, and knowledge they use to understand technology in organizations. This includes not only the nature and role of technology itself, but the specific conditions, applications and consequences of that technology in particular contexts of use". In this sense, technological frames exert strong effects on beliefs, expectations and knowledge about the purpose, context and role of technology, influencing the choices made concerning the design, implementation, organizing and use of those technologies (Orlikowski, 1992).

Literature on technology sensemaking has emphasized the importance of shifting the analysis of technology away from a "technocentric" approach, in other words, to focus on how the interaction between technology, environment and individuals shapes the interpretation of technology in a broader sense, beyond its functional aspect. For example, Faraj et al. (2004) found that the internet browser technology development phenomenon he studied could only be explained by how actors negotiated power to pursue their interests and translated

them into technical or social arrangements. Prasad (1993) focused on the symbolic and nontechnical aspects of the process of computerization of a hospital workplace. He claims that human beings possess images of themselves that are shaped by meaningful social interaction that influences how they cope with technology. He concluded that technology adoption is affected by the local interpretation of symbolic realities which have no "intrinsic meaning separate from the meanings people assign to them in the course of everyday social interaction" (Prasad, 1993, p. 1403). Finally, Hsiao et al. (2005) used a sensemaking approach to understand how work practices influence the adoption patterns of GPS technology over time. He argued that work practices and the underlying enacted knowledge affect sensemaking and the multiple patterns of technology adoption among different social groups, including such adoption patterns as efficient, aggressive, risk-avoidance, and conservative.

While technology sensemaking has been studied elsewhere, it has not yet been used to explain managerial action in e-learning implementation projects. The literature on managerial action in e-learning implementation can be roughly grouped into two streams: a) the descriptive literature (Barak, 2007; Bell & Bell, 2005; Brown, 2002; Care & Scanlan, 2001; Donnelly, McGarr, & O'Reilly, 2011; Gabriel & Longman, 2004; Hergert, 2003; Herson et al., 2000; Mooij & Emeets, 2001; Nachmias, Mioduser, Cohen, Tubin, & Forkosh-Baruch, 2004; Polyakova-Norwood, Johnston, Christensen, & Loquist, 2003; Sellani & Harrington, 2002; Siritongthaworn, Krairit, Dimmitt, & Paul, 2006; Smith, Richter, Watkins, & Usdan, 2005; Tearle, 2003); and b) the normative literature (Compora, 2003; Escoffery et al., 2005; Govindasamy, 2001; Hansen & Salter, 2001; Jimoyiannis, 2010; Khan & Joshi, 2006; Melle & Cimellaro, 2003; Pisel, 2008).

There are, however, two gaps in these corpuses of literature on e-learning implementation. First, managerial action is only implicitly considered in both streams, and it is not the core of the investigations. While the descriptive literature addresses how the process itself unfolds, the normative stream serves as a guide to managerial action. Second, neither of them takes a symbolic approach. We argue that the symbolic approach is important to understand how the process of e-learning implementation unfolds. In this respect, we should define e-learning in terms of both its objective and subjective aspects. E-learning technology as a physical artifact can be depicted as a clear construct, consisting of its formal and functional characteristics. E-learning technology as beliefs is based on its representation as knowledge, and the activity of knowing includes the cognitive elements that emerge as the technology is brought into play, acted out and translated (Weick, 1990). In these terms, e-learning technology is social in nature (Pollock & Cornford, 2003). The outcomes of its implementation within organizations are a function of how affected individuals make sense of it within their context, particularly on a powerful actor: the project manager.

In the symbolic approach, the managers in charge of the project have a great impact factor on the outcome (Dooley, 1999; Robinson, 2000; Sherry, 1998; Sherry, Billig, Tavalin, & Gibson, 2000). These managers have decision power and the necessary resources (McAlister et al., 2001) for project success (or failure). Managers not only react to external conditions but also create and enact internal conditions to accomplish their tasks, based on interpretative schemas that guide their actions toward e-learning implementation. How the process unfolds is a consequence of how they sense the reality around them, influence other organizational members' perceptions, and act as sense-givers (Agarwal & Karahanna, 2000; Thayer, 1988; Weick, 1995). Implementation of ICT influences the entire school system (Tondeur, Keer, Braak, & Valcke, 2008), and how leaders who are responsible for introducing ICT-based learning within educational organizations make sense of the process is a question to be answered.

3. Data and methods

We adopted a multiple case study research design using the grounded theory methodology (GTM) (Corbin & Strauss, 2008) to interpret and analyze data from seven cases of e-learning implementation in Brazilian business schools. We sought to identify the conditions and consequences associated with the specific strategies that managers deployed in order to introduce e-learning in the school environment. The focal group in our research is the project managers. We tried to grasp how they perceived the environment, their actions and the reactions of others. We did not set out to explain how users, such as the teachers and students involved in the process, give meaning to and react to managerial action. Rather, we consider how managers perceived teacher and student reactions and, hence, acted upon them.

3.1. Case selection

It is important to understand case selection within the institutional context of the Brazilian educational system. Educational organizations are highly diverse. According to Brazilian law, these organizations are either regulated by the Federal or State Boards of Education. Government-owned schools are financed by the government treasury, and their courses are free of tuition or any other fee. Private schools, whether for-profit or philanthropic, are financed by registration and tuition fees, and through the selling of other products (Litto, 2002).

In the last twenty years, despite being the most traditional educational institutions, government-owned schools have experienced a severe shortage of funds which has forced them to find alternative solutions, such as selling courses through private foundations. The legislation passed in 1996 opened the market to the economic exploitation of higher education teaching services. This led to a plethora of for-profit organizations. As a consequence, existing philanthropic organizations faced increasing competition. These new for-profit institutions served a suppressed demand that was not supplied by the stagnant, non-private and philanthropic schools. Moreover, distance education, leveraged by e-learning technology in Brazil, has become an important government instrument for implementing public policy on education in order to increase population access to free higher education and also a revenue opportunity for business schools.

The cases selected for this research are the most traditional business schools in Brazil and fairly represent the most powerful players in education. Specific schools were selected in order to increase sample variation in the process of e-learning implementation. It was possible to choose school candidates upfront since there was plenty of documentation about each school's initiative in e-learning. This documentation was available in historical records, advertisements and registration in government agencies. We initially selected schools in different stages of the project, as well as those that had adopted different strategies toward e-learning introduction. Following theoretical sampling, we entered each new school as we conducted and analyzed interviews, allowing for constant comparison of different sites.

Table 1 presents the main differences between the cases. Case variation is important for analyzing different instances of e-learning, allowing our results to have greater explanatory power. In our sample of cases there are pioneers and late e-learning adopters; new and old established schools; government-owned, for-profit and philanthropic institutions. It also accounts for schools that have undergone different

Table 1
Case descriptions.

School	School description and number of interviews	E-learning orientation		E-learning dissemination	
		Type	Proof quote	Type	Proof quote
{1}	Private school. 60 years old. It entered e-learning in 1993. Four interviews.	Teaching-process improvement orientation	*Our focus was always to try and understand how people could use technology for helping in traditional teaching [face-to-face] (Interviewee A2{1}).*	Strong	*In 2008, the school offered over 600 courses, including undergrad, graduate and extension courses. Of this total, more than 500 were using e-learning. This meant that teachers were motivated and the students more than accustomed to it (Interviewee J1{1}).*
{2}	Private school. 60 years old. It has had an e-learning experience since 1998. Two interviews.	Market orientation	*For distance education via the internet, the school created its market. And in that it was lucky, because the market was emerging; there was a demand (Interviewee F2{2}).*	Poor	*No, e-learning has not yet been disseminated. Within the school the use of technology is restricted (Interviewee F1{2}).*
{3}	Private school. It is also 60 year old and went into e-learning in 2004. Two interviews.	Market orientation	*So that was it, e-learning began because of an in-company course (Interviewee D1{3}).*	Poor	*There was no internal acceptance. The ideal thing would have been for the teachers to start using the tools in their face-to-face courses. (Interviewee O1{3}).*
{4}	Government-owned school. It is 89 years old, but it has only one year of e-learning experience. One interview.	Market orientation	*We had the first contact with e-learning in 2006, through a proposal that came for us to get involved in an in-company course for the biggest Brazilian bank. Before that there was never any e-learning (Interviewee C1{4}).*	Poor	*We have just one, very recent, project (Interviewee D1{4}).*
{5}	Private school. It is 29 years old and it began e-learning projects in 2000. One interview.	Teaching process improvement orientation	*But I think that the focus is really this: improving the course, having a more up-to-date course. You then have a complement of this lesson (Interviewee E1{5}).*	Middle	*So we sometimes use it as support in face-to-face teaching in small activities (Interviewee E1{5}).*
{6}	Government-owned school. It is the oldest school in the sample (104 years old) and has 10 years of e-learning experience. Three interviews.	Teaching process improvement orientation	*It was free. There was no obligation to use it. Whoever wanted went into it, but Prof. K. always had a more positive side, saying that it would be an opportunity to improve teaching. (Interviewee M1{6}).*	Strong	*We often use e-learning tools; 50 out of 70 teachers, the size of our faculty, use it as a support for traditional teaching. This happens mostly because this tool complements on-site teaching (Interviewee G1{6}).*
{7}	Private school. 58 years old. It has had an e-learning experience since 2001. One interview.	Market orientation	*Distance education in the school began with a business opportunity to put together a graduate program, an MBA for the telephone company in 2001 (Interviewee H1{7}).*	Poor	*No, there was no internal impact whatsoever. Once again, here it's a separate business. It was an in-company project, like any other project (Interviewee H1{7}).*

stages in their e-learning implementation. Table 1 also shows two other case features that proved to be important for explaining differences in managerial action in e-learning implementation. The first is the orientation of e-learning use, which indicates the main reason why the school decides to implement the project. Basically, two orientations emerged: for the purposes of teaching improvement and to supply a market demand. The second case feature is the degree of e-learning dissemination in the school, ranging from poor to strong. Table 1 presents proof quotes (Pratt, 2009) for these two features. In the Section 4.2 we give a brief description of each case.

3.2. Data collection

GTM is very open to what constitutes data. "When we say 'data', we mean interviews, observational field notes, videos, journals, memos, manuals, catalogs, and other forms of written or pictorial materials" (Strauss & Corbin, 1998, p. 58). Several GTM applications use only one or many forms of data (Strauss & Corbin, 1997). In our research, we used a combination of three data sources: interviews, field notes and existing documents. Field notes were taken on several occasions: particularly in one of the schools of the sample where one of the researchers was able to observe the entire implementation process, participating in meetings with the managers and staff involved with the process and observing people's reactions toward technology (teachers, students and administrative staff). In two other schools we were allowed to observe the entire process and how the school deals with e-learning technology in their environment. These observations generated the field notes that were used subsequently as data. Existing documents which we used were: the technical and non-technical literature, school advertisements, and internal documents, such as reports and catalogs.

Interviews were, in fact, the main source of data since our main objective was to understand how managers made sense of their work in implementing e-learning projects. In our cases, the project managers were the school dean, an assigned faculty member, or both. These persons were decision-makers in charge of conducting the e-learning implementation process. In the early stages of our investigation, interviews were broader in scope and became more specific as we proposed relevant categories. We began the first interviews based on our knowledge of the field taken mostly from document analysis and from the professional experience of one of our team members. Some specific topics we investigated in our interviews included e-learning technology, attitudes toward change, cultural impact, internal technology dissemination, internal impact of technology, e-learning strategy, managerial commitment, personal perception of technology, and IT structure. Interviews were meaning-centered and the focus was on the managers' experiences with e-learning computerization in each organization. Almost all of the interviews were conducted on school premises. Others were conducted using videoconferencing. All interviews were recorded and transcribed. Data collection and analysis occurred from May 2008 to April 2009 and were assisted by the use of the ATLAS/ti® version 5.0 software.

It was impossible to define *a priori* how much data was needed and whom was to be interviewed. We ended up choosing seven schools and interviewing 14 decision-makers, with a total of 16 interviews, representing 18 h and 31 min of digital recording time. Each interview

lasted an average of 1 h and 12 min. Interviewers are identified by letters A to O, followed by a sequence number for the interviewee (for each person), and by a number, from one to seven, representing the school.

3.3. Analytical procedures

We chose the Straussian view of grounded theory because it offers a structured method and a set of tools that helps sensitize the researcher toward the discovery of emerging concepts (Corbin & Strauss, 2008). This version of GTM uses the traditional analyzing steps of open, axial, and selective coding. The final result of open coding is the definition and validation of categories. The generation and validation of category relationships occurs during axial coding. Finally, the aggregation and synthesis of all produced elements during selective coding give rise to the final theoretical schema. During this process, the core analytical procedures are done using the method of constant comparison. Constant comparison means looking for incidents, the sampling unit representing manifestations of possible relevant categories, and comparing them with each other or to other facts, such as those found in the existing literature or in the researcher's experience. Two types of comparison are central to this method. Theoretical comparisons, which have the purpose of sensitizing the researcher toward the discovery of categories and properties, and incident–incident comparisons, aiming at systematically verifying, in the empirical material, whether a researcher's guesses are coherent. We defined each category in terms of its properties and dimensions. The crisscrossing of the properties of a category, in terms of their dimensional variations, forms types, or manifestations of that category. Properties and dimensions are necessary to allow for comparisons between new, incoming data and the emerging concepts and relationships already under development. Category robustness and saturation were indicated by the small marginal contribution of new incoming incidents (Strauss & Corbin, 1998).

The two types of comparison, theoretical and incident–incident, refer to the "artistic" and creative side of interpreting, and to the empirical verification of these creative guesses, respectively. This ongoing iterative movement is reproduced in the abductive inferential logic (Haig, 1995), according to which there should be an interplay between concepts and data to find possible explanations for the occurrence of phenomena. In order to achieve the right balance between objectivity and subjectivity, we used several sensitizing and communicational tools, such as memos, diagrams, microanalysis, storylines and network views (Corbin & Strauss, 2008). In the next section, we detail how we used GTM techniques in order to ensure the quality of our findings.

3.4. Quality assessment

As in any other qualitative research, reconstituting the research process so readers can assess the quality of the results is always a cumbersome activity. A good reconstitution makes it possible to track back the researcher's decisions, as well as to assess the rigor and legitimacy of the findings. What we mean by rigorous research is that produced by an interpretive process that has internal process validity. Process internal validity is verified in Strauss and Corbin's version through a set of criteria that should be provided to the readers. As Strauss and Corbin (1998) note, "readers are not actually present during the actual analytic sessions, and the monograph does not necessarily help them imagine these sessions or their sequence. To remedy this, it would be useful for readers to be given certain types of information bearing on the criteria to follow".

The use of multiple sources of data (interviews, field notes, and existing documents) allowed us to use triangulation. However, triangulation in GTM does not imply its traditional positivistic purpose of finding the "concrete" or "external" truth, to which managers react. Instead, triangulation helped us to uncover different interpretation paths, as well as to further verify them. According to this reasoning, when two pieces of data seemed in contradiction to each other, instead of falsifying the emerging theory, we questioned our interpretation path in order to accommodate this discrepancy and to increase the explanatory power as new variations were taken into account. Furthermore, new contradicting evidence helped to increase our theoretical sensitivity, as the "red flag" called our attention to potential latent categories (Strauss & Corbin, 1998).

Our main categories emerged in the course of analysis. They initially were identified as themes. Only those which were sufficiently grounded and abstract to account for observed variation in all cases were kept and defined as a category. Some of these themes were simply discarded, while others were grouped into broader categories. The process of going from themes to categories is not linear and generated several provisionary categories until the final categories were integrated during selective coding. However, it was important that all categories were robust. We rechecked their definitions using an initial sample of three schools, and then we verified their consistency and saturation in a sample of four other schools. At the end of selective coding, four categories, which we describe here, appeared to take into account the major variations found in our data.

Our theoretical schema is composed of five grounded theoretical propositions, generated through axial coding. Despite the fact that open, axial, and selective coding are often presented in a linear fashion, the analytical process occurs in a much more circular progression. During open coding, as long as categories were identified, we wrote a series of "memos" to keep track of possible relationships. Even in initial phases of open coding, when microanalyses were more frequent, "memoing" allowed us for thickly describing the context for possible relationships. The "memoing" process was a key instrument to further developing our propositions.

Verification is a key feature in Strauss and Corbin's version of GTM. However, it does not mean falsifying a proposition. As in the case of triangulation, discrepancies in fact are more than welcome in GTM. We were not looking for average-like patterns, but instead we were trying to uncover latent categories and relationships. Then every time a discrepancy occurred, it was a chance for us to reflect upon it and to think about "third variables", to use mainstream research jargon. Discrepancies may indicate new properties, refine existing dimensions, or suggest new categories or relationships.

Finally, our findings possess legitimacy to the extent to which they made sense to managers actually involved in the process. In our checking sessions with them, when we had the opportunity to tell their stories using our developed constructs, they were happy to see that what they did could be explained systematically using the concept of cultural incongruity, an idea they had not thought of before. The resulting substantive theory is also a social construction for the individuals in the analyzed group, a consensus between researchers and individuals, a non-obvious way to explain their story, and a product of conscious and coherent researcher creativity. We followed a structured method to facilitate public scrutiny, not of the theory itself, which should be convincing, but of the research process.

4. The research context

4.1. The Brazilian higher education institutional environment

Managerial action is embedded in substantive institutional environments (Oliver, 1997). In the case of Brazil, there are some distinctive aspects in the Brazilian context that make it relevant to this research. First, due to its continental size, government policies push schools to adopt distance education programs, using new information and communication technologies. Secondly, the government exerts strong regulatory pressures on educational institutions, in both face-to-face and distance education models. Paradoxically, this strong regulatory environment limits the ability of schools to fully exploit the enormous potential of using e-learning as a tool for improving the teaching environment in Brazil. For instance, current Brazilian regulations force schools to adopt a model that, pedagogically speaking, is a virtual replica of the traditional face-to-face model. This model has been heavily criticized and seriously affects the way technology is perceived and used in the educational environment. Thirdly, the adoption of e-learning has increased competition among business schools (INEP, 2007).

The combination of these institutional features gives special importance to managerial action in implementing e-learning in business schools. Since the choice is restricted by existing regulations, it is how managers implement the project that matters for school success or failure in disseminating e-learning. The tension between isomorphic pressures from the regulatory environment and the need to differentiate in order to beat the competition confers a central role on managers in charge of the project (Deephouse, 1999).

4.2. Case descriptions

a) School {1}

School {1} is a private school located in São Paulo. It entered e-learning as a result of its experiences with the use of technology in the teaching process at the beginning of the 1990s. It started with small projects. Since the beginning, the school's objective has been to use technology for improving the teaching-learning process. As a result of these experiences, it created a distance teaching center in 1998. This center helped expand the use of technology for distance education and to execute management policies for technology use. Internally, the school has built the entire infrastructure needed for supporting the use of technology, with designated people being responsible for looking after the function of and forming part of the school's organizational structure.

There is no compulsory use policy, the decision being left up to the teacher, but the school has a strong in-house training and organizational learning policy, which suggests that it is one of the factors that facilitated internal acceptance of the use of technology in the organization. Internally, e-learning has been disseminated in both the face-to-face and distance education models.

> I'd say the following to you: today we'd not fail to give a course due to the lack of teachers. Today we have teachers in sufficient numbers to plan, develop and handle programs like this (Interviewee B1{1}).

b) School {2}

School {2} is a private school located in Rio de Janeiro. It started its experience with e-learning around 1998–1999 due to a market stimulus.

> The e-learning program we offered to *Caixa Econômica* [savings and loan bank] was the first program that began it [e-learning]. It was a big project to serve 17 cities and 280 trainees. That's when e-learning emerged (Interviewee F1{2}).

The relationship of this school with technology is different from that of school {1}. The process began because of an in-house perception that distance education was an important market opportunity. In this sense the meaning of e-learning arises as a project for exploiting the opportunities of the outside environment. E-learning was structured and grew outside the school structure. However, it uses school resources (mainly teachers) in the form of hiring services for producing the content needed for preparing the courses that are distributed independently but under the seal of the school. The objective behind using technology was to serve a perception that there was a supposed market demand. In the perception of the manager in charge of the project, it was never the intention to spread the use of technology internally in the school. Despite this non-dissemination, the school became a great supplier to the market for technology-mediated educational services.

c) School {3}

School {3} is a private school located in Rio de Janeiro. Its experience with e-learning can be divided into two periods. In 1994 there was a request from the market, leading it to promote its first distance education courses. This model was designed following the traditional distance education model (Moore & Kearsley, 2005), with no ICT tools or an almost complete absence of them. These were short courses, though not considered to be technology-based for purposes of supporting the teaching process, in which the pedagogical project was based on the independence of the student (Wedemeyer, 1981), mainly using print content and the telephone at specific times for teacher–student interaction. Over the years, despite the advance of new ICT, very little has been added to the model in force, which has maintained its structural roots in the way in which it was conceived. Internally, there has been no change in the processes in the school environment as far as concerns the use of technology in the face-to-face teaching process.

In 2004, the school was once again stimulated by the market, which asked it for a major, heavily technology-based project to supply distance education for a large number of students widespread throughout the center-northeast part of Brazil.

> So that's the way the process worked until 2004, when a financial institution approached us and we set up a project (…). The requirement of this customer was that everything should happen via e-learning, including the teaching material (Interviewee D1{3}).

The project required an internal restructuring to adjust to the use of technology. The school created a large, independent support area to offer the technological infrastructure needed and to deal with a large number of people enrolling in the program. It also offered basic training in the use of technology, but it did not make any effort to change the values of the school community toward this new technology. Despite the fact that the teaching process occurred at a distance, the pedagogical model adopted is a virtual replica of the face-to-face model, thereby generating a lot of internal frustration in users who proved not to be prepared. There has been virtually no integration of technology in the internal environment, since technology has not been used in face-to-face teaching.

d) School {4}

School {4} is a public school located in Rio de Janeiro. Its experience with e-learning is fairly recent and also began due to a request from the market in 2007. Before this there had been no initiative or project related to the use of technology in the teaching process. In the same way as School {3}, a large project required that a unit be created to support the process. Much of the structure has been outsourced, particularly the technological support. Because of the fact that at the time of this investigation the project was still in its initial stages, acceptance of the technology in the internal environment could not be assessed. However, in the view of the manager, the use of e-learning opens the way to the possibility of new products, which points to a market-driven view of the use of technology for the school.

> That's where I see a great relationship [use of technology in the teaching process]. The relationship [he meant] is the development of products (…). So that's what I see: I'm not going to go further than that [concerning the use of e-learning] (Interviewee C1{4}).

e) School {5}

School {5} is a private school located in São Paulo. It went into e-learning around the year 2000, starting with small projects in the use of technology. The school chose to go into e-learning gradually to avoid causing a large internal impact. The objective of using technology is to improve existing courses.

> I see that the interest of people in implementing this is because they see this as an opportunity. People in a teaching institution have this concern with improving; we're always studying. I think this is something that is a little part of what we do, just as we test new lessons and new teaching techniques. I think this is a strength, despite always having those who are resistant. So, it's an environment ripe for you to use new forms of teaching and learning (Interviewee E1{5}).

> Like School {1} there is no compulsory use policy; the decision is left up to the teacher. The school does not invest heavily in in-house training, but it does have an e-learning use incentive and encouragement policy that forms part of the school's objectives. There is a help and support area that facilitates use of the technology available to the teachers. There is a perceptible but moderate integration of this technology within the school, and there is a concern at the management level that this technology should form part of the process. In the opinion of the manager in charge, demand for use of the technology is growing among teachers, indicating that it is gradually being disseminated internally.

f) School {6}

School {6} is a public school located in Porto Alegre, in the south of Brazil. It went into e-learning at the end of the 1990s as the result of small internal initiatives in the use of technology as a tool for improving the teaching process. From these experiences and over the years a fairly strong technology structure has been created for providing help and support dedicated to sustaining the internal experiences of the teachers. This structure enables the school to offer distance education programs. In 2005 the school was invited to take part in a major project to serve a large number of students who were geographically widespread throughout the south of Brazil. Despite this market-driven demand having arisen, internally there is concern about ensuring that the use of technology means improving the teaching process. This perception keeps actions directed toward the objective of integrating ICT internally. In the opinion of those interviewed, the school finds itself in an advanced process of internal technology integration.

> It has permeated the organization as a whole. There is a structure, which is the virtual learning center, that provides support for all these initiatives (Interviewee L1 {6}).

g) School {7}

School {7} is a private school located in Rio de Janeiro. It went into e-learning at the request of the market around 2001. Before this it had had no previous experience in this sense within the school environment. Because of a lack of experience in the use of technology, it outsources the whole of the technology part, staying away from IT management. The whole of the training and development process focused on the project itself, with no concern for internalizing the use of ICT tools in the school. From this project the school expanded its offer of courses along these lines, with all successive projects being cast in the same mold.

Despite this growth, over time there has been no transfer of the knowledge acquired from using technology to the school's in-house environment. There is no institutional support for this, and there is no compulsory use policy, with the decision being left up to the teacher. Internally, few teachers have started using technology. In the perception of the school manager, the school has lost a great opportunity to disseminate the use of technology in the school's culture and this has made internal acceptance difficult.

> We tried using it, but to my mind it's a too unstructured experiment, because it is a tool, a means (…). But it's not an institutional decision. As it's not an institutional decision, it is what it is: the project has no owner, no sponsor and it got somewhat abandoned half way (Interviewee H1{7}).

5. Proposed categories

We first initiated open coding in the interviews we conducted for the first school. The final analytical process resulted in around 70 different codes. The main themes in the first encounter with the interviews revealed to us the managers' concern toward how the role of the faculty in this new environment would be perceived, and how this perception might generate resistance.

The bottom line is, just to give you a broader picture, the bottleneck generated by the required changes to alter the way faculty members perceive the new pedagogy. This is a hell! (Interviewee A1{1})

We continued open coding in the second school in search of new incidents that might corroborate or expand this bottleneck metaphor. Around 32 new codes emerged. The following quote caught our attention:

How is the e-learning pedagogy? How does it change the relationship of the teacher and student with the school? What is the underlying teaching process? In the beginning it was a painful process. I was lost. This was the initial impact....What is the role of the teacher?! (Interviewee C1{4}).

In the course of these two initial analyses we began to memo intensively. One theme that arose from our reflection was the issue of how managers cope with the cultural conflict between the incoming technology and the traditional school setting. We decided to pursue this path by theoretically sampling incidents of cultural incongruity and the way managers cope with them in order to advance their e-learning projects. This interpretative path led us to propose four relevant categories: a) cultural incongruity; b) e-learning orientation; c) e-learning acculturation; and d) e-learning dissemination. Table 2 summarizes the categories and their properties, along with their manifestations

Table 2
Proposed categories, their properties and manifestations.

Category	Category manifestations and their property descriptions	Proof quotes
Cultural incongruity	High incongruence: negative attitude and poorly adapted mental model.	*The question is breaking down internal resistance, of which there's a lot, and in a business school, the greater the prestige it has the greater this resistance (…). My experience is that 99% of the people initially said that it was a mistake, that the school could not take part in that, and that it would be the end, that now they were going to destroy the school, all that kind of thing* (Interviewee F1{2}). *I think the teachers are still very stuck in the past, which is the format we learned and we were satisfied with* (Interviewee J1{1}). *But some teachers, comprising fairly old teachers, who were very accustomed to using a blackboard and chalk, proved not to be very interested [in e-learning]* (Interviewee O1{3}).
	Low incongruence: positive attitude and adapted mental model.	*I didn't felt adverse reaction, such as people thinking that the project was a waste of time* (Interviewee A2{1}). *I am not sure it was a negative reaction. Let's say difficulties* (Interviewee M1{6}). *With positive experiences happening, together with good technological support, the faculty was convinced this was a feasible system* (Interviewee G1{6}).
E-learning orientation	Teaching process improvement orientation: internal stimulus, small projects in early stages, and pedagogical orientation.	*And again, the objective was always technology for leveraging traditional teaching* (Interviewee A1{1}). *Então na verdade, foi uma visão meramente de um líder, sentindo que aquilo ali podia trazer mais qualidade como complemento e enriquecimento para a sala de aula* (Interviewee N1{6}).
	Market orientation: market stimulus, medium-large-scale projects and profit orientation.	*So that was it; e-learning began via an in-company course* (Interviewee C1{4}). *A financial institution approached us to set up a teaching project in which our school would have 1000 students at different regional centers throughout the country* (Interviewee D1{4}). *We had to pay an account. So it was a market path we went after* (Interviewee F1{2}).
E-learning acculturation strategies	Reduce cultural incongruity: they targeted convincing and facilitating organizational learning, and adapting both the internal processes and the environment to accommodate the new technology. Managers tried to reduce cultural incongruity.	*What we can do and that's in our own hands, which is training the teacher, adapting the teacher, that's what we're doing* (Interviewee B1{1}). *Professor C. and I visited more than forty places worldwide that were using technology in learning* (Interviewee A1{1}). *I think the structural support of the school; we have an already established support center in IT services. This was important. We didn't go into it as an adventure* (Interviewee M1{6}).
	Avoid cultural incongruity: managers perceived that was not worthy to investing in incongruity reduction.	*It was not our intention to train teachers in a pedagogical way and on e-learning practice. They had some training in how to use the LMS (Learning management system). That's it!* (Interviewee C1{4}).
E-learning dissemination	Integration: managers perceive that the continuous sustained use of e-learning in the traditional face-to-face teaching environment is a measure of technology dissemination.	*You see that even people who were shy, wary about presenting themselves and exploring a little more the resources, you see that over the course of the program they bought into it and started using technology in their face-to-face courses, which shows how it is spreading internally* (Interviewee M1{6}). *There's not a lot to do. You have to give it time for people to adapt to it. Obviously, a part of this adaptation is under your control, but not all of it* (Interviewee I1{1}).
	Insulation: the organizational structure separated from the traditional teaching structure was devised to host e-learning projects.	*The point is that the school did not embrace e-learning as a way to improve teaching practices (...) Again, it was a separate business. It began with in company programs that used this tool* (Interviewee H1{7}).

and a sample of proof quotes. Table 2 summarizes the categories and their properties, along with their manifestations and a sample of proof quotes.

5.1. Cultural incongruity

We found that the introduction of e-learning in the school environment causes a tension or a disharmony between two distinct cultures that begin to co-exist: the traditional culture of on-site teaching/learning vs. the technological culture of e-learning (as described by Anohina (2005)). What we call culture is defined as the pattern of basic assumptions that a group has created or discovered and developed for dealing with its problems of external adaptation and internal integration, and which has worked well enough to be considered valid and, therefore, to be taught to other group members as the correct way to understand thinking and feeling about them (Schein, 2004). In this sense, the introduction of e-learning challenged the internal status quo and created an internal tension. Managers in all seven schools perceived this cultural tension. It manifested itself through the reaction and resistance of the school members in the early stages of the project. We called this disharmony *cultural incongruity*.

The school was always very resistant to technological models, despite being a school that deals with technology. It's something confusing and there's resistance (Interviewee H1{7}).

It was very difficult to change the mind of a teacher; how he should teach his subject. It's a huge challenge (Interviewee D1{3}).

As this idea of perceived disharmony attracted our attention, we started looking for incidents of occurrence of this tension in the stories told by the managers. We realized that different manifestations of this incongruity could be discriminated by two properties: the attitude of individuals toward e-learning and the extent to which the users' framing of the situation generates discrepancies. In some cases, managers perceived a bad attitude toward e-learning use, which led to resistance to its adoption.

They [individuals] knew the tool and all its possibilities. But, they started spreading rumors that it would not work and the technology became perceived as something bad. So, at first, the teachers were reluctant to use the technology (Interviewee J1{1}).

As for the other property of cultural incongruity, the framing of the situation generated some relevant discrepancies. The degree of discrepancy refers to the difference between the actual framing and the optimum framing while using e-learning in the teaching process. This is mostly because the use of technology in the teaching process requires new capabilities and competences (Jung, 2005; Williams, 2003). Managers stated that faculty members were less prone to change the way they were accustomed to teach, which affected how they perceived any benefits from using e-learning. The greater the discrepancy, the greater the mental effort the users need to make. This mental effort is part of the concept of technology frame (Orlikowski & Gash, 1994). As a consequence, the way managers assessed the degree of discrepancy influenced the way they "feel" the internal cultural incongruity.

In my experience, 80% [of the faculty] is 'using a hammer to put a screw in the wall' […] they've not yet perceived that it's not a 'nail' but a 'screw'! [the hammer is traditional teaching] Why? Because it requires maturity to perceive the possibilities of the tool, and maturity is a thing the faculty doesn't have (Interviewee A1{1}).

5.2. E-Learning orientation

According to Table 1, the seven cases can be organized into two groups according to how managers made sense of the reasons behind the introduction of e-learning technology in the school environment. Managers from schools {2}, {3}, {4} and {7} perceived that the incoming technology served only for economic purposes. It was perceived as a reaction to external pressures and an opportunity to enter new markets and to develop customized products for medium-large clients. We called this market orientation.

My experience with e-learning began with a business opportunity for the school to run a graduate program, an MBA, for a large telephone company in 2001 (Interviewee H1{7}).

On the other hand, managers from schools {1}, {5}, {6} made sense of e-learning as something that would help school members improve their teaching activities. We called this teaching process improvement orientation.

Our focus was always to try and understand how we could use technology to help in traditional [face-to-face] teaching (Interviewee A2{1}).

We propose two properties that help in discriminating between these two orientation types. The first is the locus of the stimulus to introduce e-learning, whether it comes from external pressures (market opportunity), or whether it arises internally. The following describes the latter.

So in fact, it was merely an individual vision of a leader, Prof. R., who felt that it could bring better quality to complement and enrich the classroom (Interviewee N1{6}).

The second property is the size of the first projects.

We started initially exploring short courses. Only in 2001, 2002, did we start trying to have a larger course approved (Interviewee G1{6}).

The market orientation introduction had a market stimulus (e.g., a demand from a medium-large client), medium-large-scale projects, while the teaching orientation introduction was the result of an internal stimulus, and is initiated through small projects.

5.3. E-Learning acculturation strategies

What we mean by e-learning acculturation is the pattern of actions project managers deployed in order to cope with cultural incongruity. These strategies had three main properties. The first is what we call 'Sunday school' tactics, an *in vivo* analogy that refers to the efforts

managers made to convince school members of the benefits to be had from using e-learning, specifically related to the improvement of existing teaching processes.

> So we had this instruction process. I think it's still going on today; we still have to enlighten a lot of people who don't know the differences between the Internet, learning space, learning objects and class-management infrastructure (Interviewee A2{1}).

The second property is the effort project leaders went through to promote technological learning at the organizational level.

> I spent a month and a half pressured by the school, which wanted me to spend a period abroad studying this [e-learning] at the Open University, where I carried out all my PhD research (Interviewee J1{1}).

The third property is the effort to adapt the internal processes in order to provide technological support to users.

> Today, there's a guy from the IT department who works for supporting e-learning. There's the administrative work that supports e-learning, and there's the e-learning coordination (Interviewee D1{3}).

The crisscrossing of these properties along their dimensions gives rise to two ways of coping with cultural incongruity. The first is a pattern of action based on strong acculturation efforts in order to reduce cultural incongruity, which is characterized by efforts for convincing others, internal learning and process adaptation. The second pattern is radically different. Instead of trying to acculturate e-learning, managers act to avoid cultural incongruity. This means they were not willing to put efforts into convincing others or in supporting school members. The following citations are examples of incongruity reduction and avoidance, respectively.

> The other thing that's different is that as a teaching tool I see no other alternative but to heavily prepare the teachers. How? With seminars, courses and training, to experience abroad where there are schools that are used to using this process; in short, training, training, training. Sort of how we do here (Interviewee B1{1}).

> We had a short training program for tutors and some simulations; like a chat to see the time, how the thing works, but it was very little. I know there are other schools out there that do courses of two or three months, but that's not our style. We never had this here with our teachers, of giving advanced training (Interviewee C1{4}).

5.4. E-Learning dissemination

The last category reflects the extent to which the consequences of managerial action were related to e-learning dissemination. Managers measured dissemination by the extent to which e-learning was continuously adopted together with existing traditional on-site teaching practices and by the continuity of investments in e-learning projects. Managers from schools {1}, {5} and {6}, for example, perceived that e-learning became a part of the school's regular activities because of the amount of time that was invested in this idea. They believed that e-learning should be really integrated into existing practices.

> More than 80% of the school population adopts this technology in traditional, on-site courses. This was a tremendous success for us (Interviewee J1{1}).

> Six years was sufficient for the people to start assimilating this idea better (Interviewee I1{1}).

On the other hand, managers from schools {2}, {3}, {4} and {7} perceived that only a few people, who were dedicated to this kind of job, were willing to use the technology in a large but sporadic way in projects.

> As we stopped the projects, only a few people continued accompanying the very latest developments in this technology (Interviewee O1{3}).

By separating e-learning from the existing organizational structure and personnel, they were able to implement e-learning without integrating but rather by insulating it within the school. It is important to note that integration is not the only possible desired outcome. Little dissemination through insulation was also an option for implementing e-learning. The perceived conditions that led to specific managerial patterns of action and consequences are presented in the next section.

6. What can we learn from the seven schools

> In reality, we had a miserable job in managing conflict. Sometimes, the faculty just did not agree with it [with the technology itself or with the way it was introduced] (Interviewee F2{2}).

We realized that implementing e-learning for our managers was a matter of coping with cultural incongruity. Managers may either act to reduce or avoid cultural incongruity. We present in this section our grounded model of coping with incongruity that explains the conditions driving specific coping strategies and their consequences on the implementation of e-learning. Fig. 1 is a diagram that connects our proposed categories. By comparing Cases {1}, {5} and {6}, in the upper right area of the diagram, to Cases {2}, {3}, {4} and {7}, in the lower left area, we may infer important propositions.

Weick et al. (2005) points out that sensemaking starts with chaos. The introduction of e-learning technology in the organization engenders uncertainty and ambiguity in the environment, disturbing the internal status quo. The primary condition of managerial action refers to how managers frame the purposes behind e-learning introduction; in other words, the condition of managerial action depends on whether they perceive this initiative as something that adds value to existing teaching practices and should be carried out incrementally in small projects or something that adds value to the business of the school, responding to market pressures. While the former is the teaching orientation, perceived by the first group of schools, the latter is the market orientation. Weick et al. (2005) postulates that the way in which
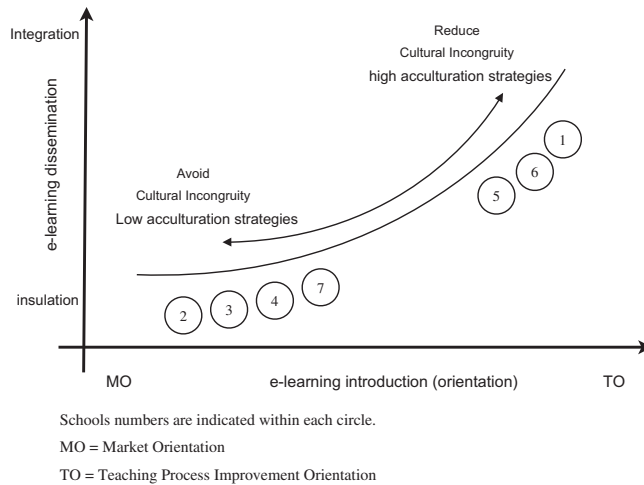
Schools numbers are indicated within each circle.

MO = Market Orientation

TO = Teaching Process Improvement Orientation

Fig. 1. E-Learning implementation in business schools: coping with cultural incongruity.

events are primarily envisioned immediately initiates the process of organizing: events are bracketed and labeled to predispose people to finding a common ground. The importance of how e-learning is framed in its introduction is represented in our first proposition.

Proposition 1. *The managerial framing of e-learning introduction defines how managers will cope with the cultural incongruity.*

During the process of reorganizing their world, managers trigger the mechanism of sensemaking according to their interpretations of the technology, so the disorder caused by this internal misalignment can be resolved. They then employ different strategies depending on how the situation was initially framed. These strategies function as sense-giver guidelines of what e-learning is for organizational members and how the implementation should evolve. Managers that frame e-learning introduction as teaching-oriented adopt strong e-learning acculturation strategies in order to reduce cultural incongruity. They make sense of the incoming technology as something that will improve existing teaching practices and can benefit and improve the way organizational members do their work. They become willing to put efforts into convincing others and adapting internal processes to accommodate the technology internally.

So, I was precisely concerned with not using distance teaching as a mechanism for earning money. I wanted to internalize more educational technology in other programs (...). Our objective is to not stop using technology as a mechanism for improving knowledge delivery (Interviewee A2{1}).

Our final evaluation [of a training course for e-learning tools] showed that teachers loved it. Around 93% of the initially enrolled faculty finished the course. Some 70% felt more prepared for using the new resources because the course not only focused on using its features, but focused strongly on teaching methodology. They understood that with this technology they could be better prepared to teach. About 80% indicated they wanted more workshops in teaching methodologies and all of them approved the 'Blackboard' [the e-learning tool] (Interviewee J1{1}).

We then state Proposition 2.

Proposition 2. *If e-learning is framed as a teaching process improvement technology, managers will act to reduce cultural incongruity.*

Managers that frame e-learning introduction in purely market economic terms are not willing to act to convince and promote learning for school members or make internal adjustments. In this situation, managers become skeptical of doing otherwise because they do not believe that e-learning should be integrated, or they feel that there is too much incongruity to be reduced, or they may even feel that the current status quo should not be disturbed. As a consequence, managerial action insulates e-learning projects from the school structure and personnel, avoids tough negotiations with the school community, and focuses primarily on delivering what was commissioned by external customers. Cultural incongruity remains high, while managers avoid to reduce it.

With the idea of remaining independent and effective, we isolated ourselves from the school. We 'hired' the school, but didn't form part of it. Looking at it from the aspect of internalizing, we never had that objective (Interviewee F1{2}).

Then, we present Proposition 3.

Proposition 3. *If e-learning is framed in market economic terms, managers will act to avoid cultural incongruity.*

The differentiation between the two ways of coping with incongruity indicates that large dissemination of e-learning technology should not be viewed as the only perceived criterion for success. Another intended criterion is e-learning insulation rather than dissemination. Indeed, either insulation or integration through incongruity reduction strategies are reasonable ways of achieving managerial ends.

And then what's cool about this "pioneer" project is that for the first time we managed to put together a workshop in which the teachers played an active part. It was carried out in small stages and they had homework to do. The objective was not only to place the final content on the platform system but to rethink and redo the design of its discipline (...). I was in charge until the end of 2007. As a result the school has 600 face-to-face disciplines, counting all the undergraduate, Master's and Ph.D. courses. Of these, more than 500 were already in the system. This means that there were trained teachers and students very accustomed to using it *en masse.* So more than 80% of the school population was using this technology in the face-to-face courses, which for us is a tremendous success (Interviewee J1{1}).

Some teachers were not very collaborative; they worked and collaborated but seemed not to be convinced that this would be an important thing for the school. To a certain extent we were comfortable giving our course and earning our money without having to worry about what more should have been done, or at least what should have been invested in the future (Interviewee O1{3}).

Finally, we present our fourth and fifth propositions.

Proposition 4. *E-learning insulation is intended when managers use incongruity avoidance strategies*.

Proposition 5. *E-learning integration is intended when managers use incongruity reduction strategies*.

7. Conclusions

These propositions that form our grounded model are evidence of how the sensemaking process affects the implementation of computer technology in school settings. According to Weick et al. (2005), sensemaking and organization constitute the same thing. Organization is an attempt to order an intrinsic flux of human action in order to organize the world to make it more comprehensible. Organization neither precedes sensemaking nor is sensemaking produced by the organization. They both happen concurrently. In our cases, through e-learning technology sensemaking, two specific images of the organization emerge that have consequences on how managers will act to either reduce cultural incongruity and integrate e-learning or avoid incongruity and insulate e-learning within the school.

Cultural incongruity as a critical factor that affects the implementation and dissemination of e-learning technology resonates with existing existing information systems literature (Leidner & Kayworth, 2006) and also e-learning literature (William van Rooji, 2011). However, our symbolic approach to the phenomenon of e-learning makes some interesting contributions.

First, the major contribution of our work is our proposed grounded theory for understanding, from a symbolic perspective, the managerial action toward e-learning introduction into the school environment. As pointed out by Turner (1986, p.103), the symbolic perspective "promises to provide a new view of how organizations really work, which managers should learn about in order to begin to manipulate their own cultural environment". In this sense, our final theoretical schema is not about the implementation process itself, but how individuals, in our case the managers, act to interpret the e-learning technology. By incorporating a symbolic perspective approach for analyzing the managerial action, we were able to identify the major condition during the initial phases of project development which affects how managers make sense of technology and how they generate the coping strategies used for implementing the technology. Our theoretical proposition increases our comprehension of the introduction of technology into educational organizations and fills a gap not covered by the descriptive literature stream, which depicts how e-learning is implemented, or by the normative literature, intended to guide managerial action. Indeed, our theoretical schema states that under specific conditions we are able to predict the consequences of each strategy taken into account.

Also, our view allows us to explain and anticipate the outcomes of the introduction and dissemination of e-learning technology that are not captured by other perspectives, such as general technology acceptance models (TAM). For example, while the TAM perspective (Hong, Hwang, Hsu, Wong, & Chen, 2011; Sanchez-Franco, 2010; Teo & Noyes, 2011) anticipates the intention of the use of a particular technology and addresses how user behaviors and attitudes influence technology acceptance, it fails to explain contradictory outcomes due to different interpretations of the technology, such as teaching/market oriented, reduction/avoidance, and integration/insulation.

Second, our approach offers a multifaceted picture of the interface between computers and education. Literature on technology sensemaking has emphasized the importance of the individual sensemaking mechanism to an understanding of how people deal with the complexity of accepting (or not) the introduction of new technologies (Gopal & Prasad, 2000; Griffith, 1999; Hinds, Roberts, & Jones, 2004; Hsiao et al., 2005; Orlikowski & Gash, 1994; Prasad, 1993); However, except for Heilesen & Josephsen (2008), who suggest that appropriation of e-learning technology is a function of sensemaking, existing literature has not yet offered empirical evidence of sensemaking in a context of e-learning technology implementation. Our research offers an explanation centered on managerial action. In this situation, managerial action is important to understanding different implementation patterns and outcomes, since project managers act as sense-givers in their organizations (Thayer, 1988; Weick, 1995).

Third, it is not our intention to provide generalizable predictions. However, our empirical analysis provides context features that help transfer these results to other contexts. The symbolic approach adopted in this research is concerned with how particular events and situations are interpreted by people's sensemaking mechanism. The grounded model presented in this article is based on the idea that events and objects have no intrinsic meaning separate from the meanings individuals ascribe to them in the course of their daily social interactions. In order to understand e-learning implementation, we should be sensitive to how users make sense of technology in accordance with their local conditions in order to understand its dissemination. Nevertheless, despite the particular conditions associated with these cases, the results found here can serve as first impressions and be considered in other contexts. With the intention of searching for a broader generalization of our results, the occurrence of patterns of technology appropriation can be checked both in similar situations and in situations other than those found here.

Finally, our results also inform practice. They highlight a trade-off between integrating or insulating e-learning as two possible intended outcomes. Either one can be successfully pursued if managers use the right managerial strategies. If the school does not take this trade-off into account, for instance, initiatives to integrate the technology by convincing others may be inefficient when e-learning is framed by individuals as being market-oriented. Inefficiency may lead to an unnecessary struggle between constituents of the school community. The problem is that when business schools decide to introduce e-learning, they have little knowledge about how individuals frame the related impacts of new technologies on current practices. Business school administrators should take this trade-off into account in order to be efficient when adopting e-learning in their organizations.

References

Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: cognitive absorption and beliefs about information technology usage. *MIS Quarterly, 24*(4), 665–694.
Anohina, A. (2005). Analysis of the terminology used in the field of virtual learning. *Educational Technology & Society, 8*(3), 91–102.
Bansler, P., & Havn, E. (2004). Technology-use mediation: making sense of electronic communication in an organizational context. *The Scandinavian Journal of Information Systems, 16*, 57–84.
Barak, M. (2007). Transition from traditional to ICT-enhanced learning environments in undergraduate chemistry courses. *Computers & Education, 48*(1), 30–43.

Bartlett, F. (1995). *Remembering: A study in experimental and social psychology*. London: Cambridge University Press.
Bell, M., & Bell, W. (2005). It's installed. now get on with it! Looking beyond the *software* to the cultural change. *British Journal of Educational Technology, 36*(4), 643–659.
Berge, Z. L. (1998). Barriers to online teaching in post-secondary institutions: can policy changes fix it? *Online Journal of Distance Learning Administration, 1*(2).
Bose, K. (2003). An eLearning experience – a written analysis based on my experience in an eLearning pilot project. *Campus-Wide Information System, 20*(5), 193–199.
Brown, S. (2002). Re-engineering the university. *Open Learning, 17*(3), 231–243.
Care, W., & Scanlan, J. (2001). Planning and managing the development of courses for distance delivery: results from a qualitative study. *Online Journal of Distance Learning Administration, 4*(2).
Compora, D. (2003). Current trends in distance education: an administrative model. *Online Journal of Distance Learning Administration, 6*(2).
Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Newbury Park, CA: Sage.
Deephouse, D. L. (1999). To be different, or to be the same? It's a question (and theory) of strategic balance. *Strategic Management Journal, 20*(2), 147–166.
Donnelly, D., McGarr, O., & O'Reilly, J. (2011). A framework for teachers' integration of ICT into their classroom practice. *Computers & Education, 57*(2), 1469–1483.
Dooley, K. (1999). Towards a holistic model for the diffusion of educational technologies: an integrative review of educational innovation studies. *Educational Technology & Society, 2*(4), 35–45.
Escoffery, C., Leppke, A., Robinson, K., Mettler, E., Miner, K., & Smith, I. (2005). Planning and implementing a public health professional distance learning program. *Online Journal of Distance Learning Administration, 8*(1).
Faraj, S., Kwon, D., & Watts, S. (2004). Contested artifact: technology sensemaking, actor networks, and the shaping of the Web browser. *Information Technology & People, 17*(2), 186–209.
Gabriel, M., & Longman, S. (2004). Staff perceptions of *E-learning* in a community health care organization. *Online Journal of Distance Learning Administration, 7*(3).
Gioia, D. A. (1986). *Symbols, scripts, and sensemaking: Creating meaning in the organizational experience in the thinking organization*. San Francisco, CA: Jossey-Bass.
Gopal, A., & Prasad, P. (2000). Understanding GDSS in symbolic context: shifting the focus from technology to interaction. *MIS Quarterly, 24*(3), 509–546.
Govindasamy, T. (2001). Successful implementation of e-learning pedagogical considerations. *Internet and Higher Education, 4*(3–4), 287–299.
Griffith, T. (1999). Technology features as triggers for sensemaking. *Academy of Management Review, 24*(3), 472–488.
Haig, B. (1995). *Grounded theory as scientific method*. Philosophy of Education Society.
Hansen, S., & Salter, G. (2001). The adoption and diffusion of web technologies into mainstream teaching. *Journal of Interactive Learning Research*281, Summer–fall.
Heilesen, S. B., & Josephsen, J. (2008). E-learning: between augmentation and disruption? *Computers & Education, 50*(2), 525–534.
Henfridsson, O. (2000). Ambiguity in IT adaptation: making sense of first class in a social work setting. *Information Systems Journal, 10*, 87–104.
Hergert, M. (2003). Lessons from launching an *online* MBA program. *Online Journal of Distance Learning Administration, 6*(4).
Herson, K., Sosabowski, M., Lloyd, A., Flowers, S., Paine, C., & Newton, B. (2000). Implementation strategies for educational intranet resources. *British Journal of Educational Technology, 31*(1), 47–55.
Hinds, P. J., Roberts, T. L., & Jones, H. (2004). Whose job is it anyway? A study of human-robot interaction in a collaborative task. *Human–Computer Interaction, 19*(1/2), 151–181.
Hong, J., Hwang, M., Hsu, H., Wong, W., & Chen, M. (2011). Applying the technology acceptance model in a study of the factors affecting usage of the Taiwan digital archives system. *Computers & Education, 57*(3), 2086–2094.
Hsiao, R. L., Wu, S. H., & Hou, S. H. (2005). Technology sensemaking: local knowledge and patters of technology adoption. In *Proceedings of academy of management conference*, Honolulu, USA.
Hsieh, J. J., Rai, A., & Xu, S. X. (2011). Extracting business value from IT: a sensemaking perspective of post-adoptive use. *Management Science*1–22, Articles in Advance.
INEP. (2007). *Statistical synopsis of higher education*. National Institute of Higher Educational Studies Anísio Teixeira-Higher Education Statistics. http://www.inep.gov.br First accessed November 2008.
Jimoyiannis, A. (2010). Designing and implementing an integrated technological pedagogical science knowledge framework for science teachers professional development. *Computers & Education, 55*(3), 1259–1269.
Jung, I. (2005). ICT-pedagogy integration in teacher training: application cases worldwide. *Educational Technology & Society, 8*(2), 94–101.
Khan, B. H., & Joshi, V. (2006). E-learning: who, what and how? *Journal of Creative Communications, 1*(1), 61–74.
Laroche, H. (1995). From decision to action in organizations: decision making as a social representation. *Organization Science, 6*(1), 62–75.
Leidner, D., & Kayworth, T. (2006). A review of culture in information systems research: toward a theory of information technology culture conflict. *MIS Quarterly, 30*(2), 357–399.
Litto, M. (2002). The hybridization of distance learning in Brazil: an approach imposed by culture. *International Review of Research in Open and Distance Learning, 2*(2).
Maitllis, S. (2005). The social processes of organizational sensemaking. *Academy of Management Journal, 48*(1), 21–49.
McAlister, M. K., Rivera, J. C., & Hallam, S. F. (2001). Twelve important questions to answer before you offer a web based curriculum. *Online Journal of Distance Learning Administration, 4*(2).
Melle, E. van, & Cimellaro, L. (2003). A dynamic framework to guide the implementation and evaluation of educational technologies. *Education and Information Technologies, 8*(3), 267–285.
Moch, M., & Bartunek, J. (1990). *Creating alternative realities at work: The quality of work life experiment at FoodCom* (1st ed.). New York: Harper Business.
Mooij, T., & Emeets, E. (2001). Modelling and supporting ICT implementation in secondary Schools. *Computers & Education, 36*(3), 265–281.
Moore, M., & Kearsley, G. (2005). *Distance education: A systems view* (2nd ed.). Belmont (USA): Wadsworth Publishing Company.
Nachmias, R., Mioduser, D., Cohen, A., Tubin, D., & Forkosh-Baruch, A. (2004). Factors involved in the implementation of pedagogical innovations using technology. *Education and Information Technologies, 9*(3), 291–308.
Neisser, U. (1976). *Cognition and reality: Principles and implications of cognitive psychology* (1st ed.). San Francisco, CA: W.H. Freeman and Co.
Nichols, M. (2008). *E-primer series – E-learning in context*. New Zealand: Laidlaw College. http://akoaotearoa.ac.nz/project/eprimerseries/resources/files/e-learning-context-1-eprimer-series First accessed September 2009.
Oliver, C. (1997). Sustainable competitive advantage: combining institutional and resource-based views. *Strategic Management Journal, 18*(9), 697–713.
Orlikowski, W. J. (1992). The duality of technology: rethinking the concept of technology in organizations. *Organization Science, 3*(3), 398–427.
Orlikowski, W. J., & Gash, D. C. (1994). Technology frames: making sense of information technology in organizations. *ACM Transactions on Information Systems, 12*(2), 174–207.
Pisel, K. P. (2008). A strategic planning process model for distance education. *Online Journal of Distance Learning Administration, 11*(2).
Pollock, N., & Cornford, J. (2003). *Putting the university online: Information, technology and organisational change* (1st ed.). Milton Keynes, UK: Open University Press.
Polyakova-Norwood, V., Johnston, L. W., Christensen, P., & Loquist, R. S. (2003). Collaborative development and evaluation of an online nursing course. *Distance Education, 24*(1), 41–56.
Prasad, P. (1993). Symbolic processes in the implementation of technological change: a symbolic interactionist study of work computerization. *Academy of Management Journal, 36*(6), 1400–1429.
Pratt, M. G. (2009). For the lack of a boilerplate: tips on writing up (and reviewing) qualitative research. *Academy of Management Journal, 52*(5), 856–862.
Robinson, E. T. (2000). Strategic planning for technological change: the human component. *Syllabus: New Directions in Education Technology, 14*(4).
Sanchez-Franco, M. J. (2010). WebCT – the quasimoderating effect of perceived affective quality on an extending technology acceptance model. *Computers & Education, 54*(1), 37–46.
Schein, E. H. (2004). *Organizational culture and leadership* (3rd ed.). San Francisco: Jossey-Bass.
Sellani, R. J., & Harrington, W. (2002). Addressing administrator/faculty conflict in an academic online environment. *Internet and Higher Education, 5*(2), 131–145.
Sherry, L. (1998). *Diffusion of the Internet within a graduate school of education*. Unpublished doctoral dissertation, University of Colorado at Denver. Available at http://carbon.cudenver.edu/-lsherry/dissertation/defense/ First accessed June 2009.
Sherry, L., Billig, S., Tavalin, F., & Gibson, D. (2000). New insights on technology adoption in schools. *THE Journal, 27*(7), 43–46.
Siritongthaworn, S., Krairit, D., Dimmitt, N. J., & Paul, H. (2006). The study of *e-learning* technology implementation: a preliminary investigation of universities in Thailand. *Education and Information Technologies, 11*(2), 137–160.
Smith, L. U., Richter, D. L., Watkins, K., & Usdan, S. (2005). An organizational diffusion study on distance education. *Online Journal of Distance Learning Administration, 8*(4).
Strauss, A., & Corbin, J. (1997). *Grounded theory in practice*. Thousand Oaks: Sage.
Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, California: Sage Publications.
Tearle, P. (2003). ICT implementation: what makes the difference? *British Journal of Educational Technology, 34*(5), 567–583.
Teo, T., & Noyes, J. (2011). An assessment of the influence of perceived enjoyment and attitude on the intention to use technology among pre-service teachers: a structural equation modeling approach. *Computers & Education, 57*(2), 1645–1653.
Thayer, L. (1988). Leadership/communication: a critical review and a modest proposal. In G. M. Goldbar, & G. A. Barnett (Eds.), *Handbook of organizational communication* (pp. 70–97).

Tondeur, J., Keer, H. van, Braak, J. van, & Valcke, M. (2008). ICT integration in the classroom: challenging the potential of a school policy. *Computers & Education, 51*(1), 212–223.

Turner, B. A. (1986). Sociological aspects of organizational symbolism. *Organization Studies, 7*(2), 101–115.

Wedemeyer, C. A. (1981). *Learning at the back door* (1st ed.). Madison, Wisconsin: The University of Wisconsin Press.

Weick, K. E. (1979). Cognitive processes in organizations. *Research in Organizational Behavior, 1*, 41–74.

Weick, K. E. (1990). Technology as equivoque: sensemaking in new technologies. In P. S. Goodman, et al. (Eds.), *Technology and organizations*. San Francisco, CA: Jossey-Bass.

Weick, K. E. (1993). The collapse of sensemaking in organizations: the Mann Gulch disaster. *Administrative Science Quarterly, 38*(4), 628–652.

Weick, K. E. (1995). *Sensemaking in organizations* (1st ed.). Thousand Oaks, CA: Sage.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science, 16*(4), 409–425.

Williams, P. (2003). Roles and competencies for distance education programs in higher education institutions. *American Journal of Distance Education, 17*(1), 45–57.

William van Rooij, S. (2011). Higher education sub-cultures and open source adoption. *Computers & Education, 57*(1), 1171–1183.