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As an overall conclusion, online education is still far from being fully institutionalised. Though the change has not yet become an integral part of the formal core of the institutions, it has been a great achievement considering the universities’ structure, culture and resources. However, there are still key factors that need to be faced. These factors are of a strategic nature and the way to handle them seems to be more political than technological or pedagogical.
Online Education in Universities

Moving from Individual Adoption to Institutionalisation of an Information Technology Innovation

INÉS CASANOVAS

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Abstract

This thesis describes and analyses the move from individual adoption to institutionalisation of an information technology innovation: online education in universities. The study focuses on the processes that took place within two universities, one in Sweden and the other in Argentina, regarding online education adoption and the organisational changes developed.

The aim is to contribute to the understanding of individual and organisational strategies for the institutionalisation of the innovation. To achieve this aim, three research questions were posed. The first focused on the way in which teachers influence the adoption processes. The next addressed the changes and interactions at the individual and institutional levels resulting from these processes. The third question deepened into the methodological practices that can harmonise stakeholders’ objectives and the conflicting interests regarding online education initiatives. Innovation theory, complemented with organisational theories provided the foundation for the description and analysis of the information technology innovation and the adoption processes.

The results of analysing and interpreting the collected data from the two universities in two different countries (Sweden and Argentina) showed that the adoption processes appeared to be evolutionary rather than revolutionary. The iterative nature of the appropriation and the constant “newness” of the information technology innovation may be plausible explanations for the phenomenon. Though the change has not yet become an integral part of the formal core of the institutions, it has been a great achievement considering the universities’ structure, culture and resources.

The contributions provide complementary and pluralistic insights into the research field of Information Systems, for both theory and practice, as well as into higher education managers’ decision-making. Furthermore, the knowledge contribution of the thesis could be applied to implementation of information technology innovations in other organisations with similar characteristics as the studied higher education institutions. Such characteristics are, for example, to be complex and knowledge intensive.

Interactions at macro and micro organisational levels could be modelled as the cyclic linkage between sensemaking outcomes and institutionalised structures. A higher level of theorization resulted in a meta-theory model to describe and explain the linkage itself within the perspective of adaptive structuration theory.

Regarding practice, scholar-engaged research allowed conflicting interests to be reconciled by changing the existing practices through sensemaking and negotiation among stakeholders in an ongoing implementation. As an overall conclusion, online education is still far from being fully institutionalised. After four years of technological and contextual changes during the research development, a positive shift can be seen in teachers’ attitude towards online
education. They show more confidence in working with constantly improved virtual environments. Nevertheless, there are still key factors that need to be faced regarding online education adoption and institutionalisation. These factors are of a strategic nature and the way to handle them seems to be more political than technological or pedagogical.
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I reserved the closing paragraph to thank the most important persons in my life: my family. They encouraged me to undertake the challenge and for five years, they patiently and lovingly supported my effort. I missed all of you so much when I had to be far from you for so long!

Buenos Aires, November 2012
Inés Casanovas
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Paper II  Professors’ driving and limiting factors for the adoption of E-learning in higher education within the Argentine context

Paper III  Teachers’ perception of institutional strategies in e-learning implementations: a comparative study of an Argentinean and a Swedish university

Paper IV  The impact of national culture on e-learning implementation: a comparative study of an Argentinean and a Swedish university

Paper V  The impact of communicating institutional strategies on teacher’s attitude about adopting online education

Paper VI  Institutional strategies influencing the adoption of online education in universities

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I Introduction

This thesis focuses on the processes that took place within universities regarding online education adoption and the organisational changes it has developed, examining individual and organisational meanings and strategies for the institutionalisation of the innovation.

Online education is understood in this thesis as the use of online technologies in formal higher education for teaching and learning (Allen & Seaman, 2010). Individual adoption can be seen as a definable single decision act, while at organisational level adoption is viewed as a series of complex, continually evolving and contingency decisions process (Frambach & Schillawaert, 2002; Martin & Beimborn, 2007; Rogers, 2003). Following Colyvas and Jonsson (2011) perspective, institutionalisation is considered in this work as a dynamic and ongoing process as well as an outcome state, representing practices and structures across and within organisations.

Although the teachers and the institutions have been studied in Management and Education research domains, this work analyses the relationships that enable the transfer of the adoption of learning innovations between individual teachers and the formal organisational system as interlinked and interacting. Informal networks are important in spreading innovations but they cannot substitute formal organisational structures and priorities (Russell, 2008).

In 2006, a survey was performed to study the individual and institutional factors of online education initiatives in two settings. It was framed in a joint research between the National Technological University of Argentina and Jönköping University, JIBS of Sweden. The initial findings became the basis of this work and motivated a more in-depth study of the adoption of online education and the institutionalisation process in both environments. With an open and integrative research perspective, the interrelated effects of individual, institutional and contextual influences were explored and described.

"Higher education has always been international in scope...". However, the emergence of a global market in higher education “poses a potentially serious threat to the academic mission of institutions” (OECD, 2006, p. 4). The challenge is a Higher Education system serving the whole society more broadly by taking on the responsibility for continuous development. Along the same line, Soares et al. (2007) held that competition in the market of Higher Education has pushed universities towards the adoption of more sophisticated organisational practices including the use of technology, quality and flexibility to ensure effectiveness.

Castells (2001) asserted that ICT’s are the infrastructure of the Knowledge Society and the Internet the convergent technology. The skill to design or redesign education as an answer to these transformations is the key to
positioning in this society (Schiavo, 2006). Educational institutions have to change according to the emerging scenarios of each country.

Online education implementations in university contexts mean new organisational challenges. The transition from on-campus learning to virtual learning evolves new roles, both in the pedagogical and in the administrative domain. Many traditional non-profit institutions are slowly becoming involved in online programmes. They have been defined as extended traditional universities (Latchem & Hanna, 2001), operating as the parent organisations to full virtual programmes or blended modalities.

Furthermore, the European Commission strategic framework for education and training (European Commission, 2006), fostered lifelong learning policies through the promotion of innovation, multilingualism and the adoption of ICT. The Commission stated that embedding ICT in education requires further changes across the technological, organisational, teaching and learning environments by means of innovative organisational approaches. ICT has not yet transformed teaching and learning environments as it has transformed processes in other key sectors such as enterprise or public services (European Commission, 2008). There are many examples of effective learning innovation but there are still concerns about the spreading of newly adopted learning technologies. “There is a continuing need to identify, promote and support good practice and models of change to produce sustainable change [in formal education]” (Underwood, 2009, p. 24)

This new institutional model is unbundling traditional functions and roles as online education rarely fits into the existing university structure (Inoue, 2006). Needs for new management strategies and governance structures are emerging at institutional and departmental levels in addition to clear and comprehensive strategies for the integration of e-learning into their educational processes (Boezerooij, 2006; Perkinson, 2006).

Institutions have recognised the overall impact and the need for change in recent years. The fact that universities need to change in order to accommodate the impact of technology on learning is already known and accepted (Ben Youssef & Dahmani, 2010; Department for Education and Skills, 2003; European University Association, 2003; Jones & O’Shea, 2004; Weller, 2011). However, coping with change still represents a management challenge for universities adopting e-learning.

Salaman and Storey (2002) reported a lack of explanations of the managerial processes contributing to innovativeness and the factors and processes involved in its achievement. Since the time of the reported lack of studies, students and teachers have fostered the use of more technology every day. However, the institutional strategies supporting the adoption need to be considered critically (Woo, 2006) and the complementary organisational design is still slow and differs among institutions (Ben Youssef & Dahmani, 2010).

The evolutionary process of educational innovation that universities are carrying out can be examined as an interlinked whole of actors’ interactions.
I Introduction

The obstacles to organisational change cannot be understood, nor can strategies for implementing change be developed without considering and analysing academic practices and interactions (Jaffee, 1998). Massini and Pettigrew (2004) reinforced the need to identify these interdependencies.

The disconnection between individual and organisational IT (Information Technology) adoption research has been largely remarked by academic researchers (Bohorquez, Lopez & Esteves, 2010; DIGIT, 2004; Greenhalgh et al., 2005, Martin & Beimborn, 2007). Correspondingly, other authors have claimed for a better understanding of this linkage (Jeyaraj et al., 2006; Middlehurst, 2003). In the Sloan National Commission on Online Learning’s report (2009), the disconnection between the strategic level and the current level of utilization of online learning was fully recognised. The Sloan report poses questions about the distance between the individual and the organisational levels, the lack of information about strategies, the imperceptions of faculty attitudes, and the request for studies to help universities managers, among other issues related to online learning implementation.

This reported state of knowledge leads to the belief that teachers’ individual influences in the processes of adoption and institutionalisation as well as the institutional culture and external factors have been understudied within the perspective of cyclic interactions among multiple organisational levels in the particular context of universities. The fragmented models developed do not capture and explain why teachers and managers make different meanings when facing the innovation and the institutional environmental constraints. In addition to a general contribution to online education research in universities and the process involved in its adoption and institutionalisation within the IS field, a literature review was performed to verify the research needs regarding key topics and approaches in the research field (see section 1.3). The systematic exploration allowed Research Question 1 and 2 of this thesis to be formulated.

1.1 Online education and Information Systems (IS) research

Since early on, the focus and scope of the IS research field has been a matter of debate among researchers. Keen (1987) defined its mission as the study of the design, delivery use and impact of information technologies in organisations and society. Since then, new topics have emerged, widening the field scope and the IS field has fully emerged as a discipline in its own right (Baskerville & Myers, 2002). Because of its multidisciplinary base, diversity of problems has been addressed by a pluralistic cumulative literature, helping to shed light regarding what IS is and is not.
This fuzziness of boundaries, according to several authors (see for example Hirschheim & Klein, 2003) flexibilises the inclusion of topics studied in the field. The IS research community moved away from Keen’s technical scope to focus more on behavioural issues. IS studies information technology within an organisational context (Galliers & Wendy, 2011), being receptive to interdisciplinary action and critical research, and embracing diverse research interests (Klein & Hirschheim, 2008).

Moreover, Du Plooy (2003a) suggested that information systems are best understood when viewed as social systems. There is a social responsibility (Du Plooy, 2003b) in IS development because the adoption and use of new technologies change organisations.

Both e-learning and IS are focused on the best use of information technology within a social setting, being online education a particular type of IS used in the specific formal context of higher education institutions.

The integration of the different theoretical perspectives and the interdisciplinary research field of Educational Technology has been challenging IS researchers. IS has changed education. Institutions and students use Internet-based systems for the distribution of material and communication. It has also fostered new structures in higher education institutions realigning strategies in response to changes in technology (Agarval & Lucas, 2005). Along the same line, other researchers recognise the validity of viewing e-learning research within the IS field in the sight of the common goal of harnessing new educational technologies to meet the needs of their users (Holsapple & Lee-Post, 2006).

1.2 The literature review about adoption and institutionalisation of online education in universities

“A review of prior relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge…” (Webster & Watson, 2002, p. xiii) uncovering topics in which research is needed. According to Sandberg and Alvesson (2011), gap-spotting is the predominant way of generating research questions. Researchers pose their questions by identifying specific gaps in the existing literature that need to be filled.

Although the literature is growing, organisational issues regarding the adoption and institutionalisation of e-learning represent a small proportion of the published IS literature. The lack of studies focusing on the analysis of technology-mediated learning adoption at organisational level was noted early on by Alavi and Leidner (2001) and the scarce exploration of the role of organisations in facilitating and supporting organisational knowledge creation.
1 Introduction

has been recently reported by Alipour et al. (2011). Furthermore, in the track IS Curriculum and Education, of the International Conference on Information Systems 2011, the topic Integration of Technology and Education called for research works.

1.2.1 Prior reviews

Dwivedi et al.’s (2008) report listed 134 articles from the period 2005-2007, related to adoption and diffusion in IS are listed. The major number of articles was published in Information and Management, Communication of ACM, Journal of Computer Information Systems, MIS Quarterly, and European Journal of Information Systems (review of top-ranked journals). Conference papers were not included. These journals, according to that study, showed a decreasing tendency in the number of related articles. Agreeing with Dwivedi, most of them focused their analysis on technology acceptance (e.g. Benbasat & Barki, 2007; King & He, 2006; Schwartz & Chin, 2007; Silva, 2007; Venkatesh et al., 2007). None of these articles addressed universities or higher education institutions as the context for the adoption of IT innovations. Palvia and Pinjani (2007) confirmed this orientation.

Hrastinski (2007) and Hrastinski and Keller (2007), remarked on the importance of technology-mediated learning in IS research and Educational Technology as an extension. They reviewed articles published in Computers & Education, Educational Media International, Journal of Educational Computing Research and Journal of Educational Media. According to their findings, most of the articles referred to empirical experiences of projects or courses and e-learning theories and frameworks, mainly relying on quantitative methods measuring learners and teachers’ attitudes towards educational technologies, their impact and their extent of use. The remaining studies fell into qualitative and mixed research approaches focusing on conceptual-analytical design and the evaluation of learning environments.

To the best of my knowledge, the reviews mentioned are the most closely related to this research domain, but they do not focus specifically on it. Initially, educational and organisational journals were included in the review. However, during the data collection it became clear that the latter had published too few relevant articles. Thus, their contribution to enlightening related trends of research was not significant in relation to the effort involved. Therefore, taking into account these previous reviews and the aim of this work, it appeared more fruitful to study conference proceedings and journals specialised in education in which much more relevant articles were published.

1 (Complete list at http://aadref.googlepages.com/home)
1.2.2 Review design

Because literature reviews are time-consuming, and according to Webster and Watson (2002), journal databases accelerate the identification of relevant articles, the following databases were consulted: ABI/INFORM, Business Source Premier, Emerald, JSTOR, Sage Journals, Science Direct, Scirus, Social Science Citation Index, and Springerlink. Webster and Watson also recommended not focusing on small samples of journals and examining selected conference proceedings in addition.

Nevertheless, these researchers argue that sometimes articles are missed, because the keyword sieve does not catch them. Thus, manual indexing and content review were performed as well. Critical analysis to establish differences and convergences of perspectives enabled the confirmation of the emergent research questions for the thesis.

The search period was established as 2005 to 2008. A total of 42 journal articles and 11 international conferences papers were found and their relevance confirmed through crosschecking (results of the search-engine/manual text analysis).

The analysis framework was adapted from Gregor’s (2006) model and it is intended to reveal those research topics addressed in Educational Technology general research. During the examination of the articles, the need for a concept matrix soon arose. “A high quality review focuses on concepts” (Webster & Watson, 2002, p.xv). Accordingly, the review is concept-centric regarding the organizing frame.

Guided by Webster and Watson’s (2002) work, extended concept matrices involving topics, methodologies, methods, and level of analysis were developed. According to Klopper et al. (2007, p. 272), “by using key concepts derived from the problem statement, the problem statement itself becomes the filter that ensures that only literature relevant to the problem under investigation forms part of the review”. The selected terms: online education, universities, adoption and institutionalisation are discussed in depth in Chapter 2.

However, during the initial search phase it could be stated that several terms were used synonymously with online education in the research literature: e-learning, technology-mediated learning, online learning, Internet-based education, web-based learning and virtual learning among others. Consequently, broader consideration was required by including those terms in the search and performing text analysis of the full papers in the set of results to keep the selection of articles on the focus, confirming its relevance.

The same situation led to the broadening of the search terms referring to the processes, and the following terms were considered: adoption/transition/transformation/intention/use/acceptance/dissemination/embedding/institutionalisation/technological innovation/technological change/technological integration/institutional change. Text analysis of the full papers in the result
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The report was also required to maintain the focus of the selection of articles and confirm its relevance.

In Appendix B, the matrix used to summarise the most frequently used terms or constructs to define the innovation object and the structuration processes is detailed.

The results of the literature review were published in the Electronic Journal of E-learning (see Paper I). An earlier version of this article was included in the Proceedings of the 8th, European Conference on E-Learning (ECEL 2009), 124-131.

1.2.3 Summary of the review (Paper I)

In this paper, it is argued that summarising and categorising the recent research in the field of adoption and institutionalisation of online education in universities might be fruitful to identify gaps and uncover priorities, validating the research questions of the thesis.

The findings were classified according to several dimensions (by journal/conference, year, level of analysis, methodological approach, research methods, and frequently used terms). The scope of the review was broader than the findings needed for this work. They are presented in full in paper I. I will focus here on the topics relevant to the research questions.

The figures show that the number of articles on adoption in university contexts published in specialised journals and conferences is constantly increasing, with significant growth between 2006 and 2007 of approximately 90%, revealing the interest of research. Interest in the adoption of e-learning in China, the Far East, the Middle-East and Africa as emergent countries is revealed in the presence of articles and papers in the selected journals and conferences during the explored period and it is still growing. As the e-learning market is demanding investments for new implementations, it is reasonable that theoretical knowledge and reported experiences are required.

Through full text reading and analysis it was possible to identify the level at which adoption has been studied. Adoption at individual level of analysis refers to articles in which perceptions of individuals regarding the attributes of the innovation or benefits, users’ intention of adoption, influence of colleagues, individual drivers and barriers to adoption, e-learning tools informally used by faculty, attitudes, etc. are discussed.

Studies about adoption at individual level but within organisations have analysed the variance of adoption based on institutional characteristics, individual attitudes towards the institutional transformation because of e-learning adoption, individual attitudes towards the quality of institutional e-learning programmes, transformation of teaching practices, faculty’s discussions about institutionalisation, teachers’ perception of institutional strategies, drivers and barriers, etc. At organisational level, studies have referred mainly to reported experiences of implementations in universities, prescribing models of
best practice and critical success factors, or financial and administrative issues of e-learning planning.

None of the articles reviewed explored the entire process from adoption to institutionalisation, confirming the reported disconnection between individual and organisational IT adoption research.

The online education concept appears to have been used often as a research paradigm under the umbrella of the e-learning concept. However, in some works, the term was clearly identified and defined as the use of online technologies in formal higher education for teaching and learning, coinciding with the definition adopted in this thesis.

Regarding the terms related to the process, results showed that in spite of the great variety of terms used interchangeably in the research field, the term most frequently used continues to be adoption, coinciding with Dwivedi et al.’s (2008) findings. This can indicate the focus of researchers on the decision-making and not on the institutional process.

Some limitations have to be considered regarding these findings. The search results belong to a very special domain of journals involved in the theme, so the number and sample of identified and analysed articles can be arguable. To the best of my ability, the review was systematic and comprehensive, involving full text analysis of the papers to identify the relevance of the articles because most frequently, the search terms did not appear in the title or keywords.

The results served for reflection about the current state and further needs of research in general and in particular domains of the review. The fact that the process from online education adoption at individual level to institutionalisation and the linkage between individual and organisational purposes have scarcely been studied encourages the proposal of interpretations to clarify these issues.

In addition, a new and quick run-through the literature published after this review was performed to extend the review in time and detect changes in the topics or perspectives addressed regarding the adoption and institutionalisation of online education in universities. In accordance with Hardaker and Singh (2011, p. 223), “there is a shift in innovation research from solely macro and micro level perspectives towards a more interactive view, which emphasises the interactions and interconnections between individual actions and structural influences…Nevertheless, there is a need for explanatory frameworks that take into account both micro and macro perspectives”. In addition, Graham et al. (2012, p. 8) pointed out that “the boundary between adoption/early implementation and mature implementation/growth is fuzzy. Research could investigate the specific processes and interventions that successful institutions use to institutionalise blended learning”.

1.3 Aim and research questions

A literature review (Paper I) was conducted in the earlier stages of the work, providing an overview of the research approaches and main issues studied in
the field of online education in universities addressing its adoption and institutionalisation. Results led to the perception that online education is still in the initial stages of integration into universities.

The aim of this research is to contribute to the understanding of the current adoption and institutionalisation strategic processes in the Argentinean and Swedish complementary research settings, from the perspectives of both teachers and managers. The study examines the processes that take place within the university domain regarding online education adoption, the interactions among organisational levels, and the resulting organisational changes.

The results from the literature review underlay the two research questions addressing the gap identified between the individual and the organisational level in the adoption of innovations.

The individual factors influencing or shaping the adoption of online education at teachers’ level within the university institutional environment were examined in Research Question 1. Factors such as the attitudes, purposes and perceptions of teachers in two contexts, an Argentinean and a Swedish university, were studied through a double survey, and results were analysed and interpreted.

**Research question 1**: Which factors influence or shape teachers’ adoption of online education in universities? (Papers II, III and IV)

Having stated teachers’ influences in the adoption of online education at individual level, the research connects the individual adoption with the organisational domain, in which institutional influences and changes take place complementarily.

Research question 2 identifies these systemic changes using institutional documentation and interviews with teachers. The results describe the adoption and institutionalisation processes and how they are developed in both research settings as interlinked processes, contributing to the understanding of the disconnection between individual and organisational IT adoption.

**Research question 2**: Which changes at organisational level are developed by online education adoption and institutionalisation in universities and how? (Papers V and VI)

With a complementary perspective, the findings of the two research questions showed the linkage of the mutual influences at multiple organisational levels in a cyclical and intertwined process. The interaction could be modelled with a new pluralistic approach based on sensemaking, institutional and adaptive structuration theories. As an emerging finding, it could be stated that the stakeholders from different organisational levels may envisage different goals of online education implementations. These conflicts act as new barriers (Butterfield et al., 2004; Knight, 1997). The finding motivated a more in-depth
study of the differences in goal envisioning among actors. Research question 3 expands the initial focus of the thesis by identifying these differences in an ongoing online education implementation in the Argentinean setting.

**Research question 3:** How can individuals and institutional purposes be harmonised to facilitate online education implementations? (Papers VII and VIII)

The findings allowed the provision of methodological practices to harmonise actors’ visions in order to reconcile conflicts of interests and facilitate these implementations for university managers. Figure 1 depicts the relations among the research questions and the eight papers.

### 1.4 Structure of the thesis

Although each paper contains a section about the respective theoretical background, the limitation of space for publishing is recognised among researchers. Therefore, in the thesis frame (‘kappa’), significant aspects are developed and discussed more broadly than was possible in the papers.

In this chapter, the scenario for the research is introduced as well as the aim, research questions and key concepts. Chapter 2 presents the theoretical background. In Chapter 3, the research approaches that underlie the design, analysis and interpretation of the studies are detailed. In the following chapter, seven empirical studies (Papers II to VIII) are summarised. The last chapter presents a concluding discussion of the findings, their implications and opportunities for further research, including the limitations of the research.

Related publications, the list of reviewed articles in Paper I, the two distributed questionnaires, the Swedish and Argentinean interview analysis matrices and the document list and analysis template are included in the Appendices section. Finally, the full text versions of the papers are attached.

**Paper I**


The paper reviews the research approaches and topics concerning the individual adoption and institutionalisation of online education in universities. The findings reveal the needs for additional or new contributions to the field that underlie the research questions of the thesis.

An earlier version of this paper was published in the Proceedings of ECEL 2009 (8th, European Conference on E-Learning), 124-131.
Figure 1. Relations among the research questions and the papers
Paper II
The paper identifies and analyses the driving and limiting factors as well as the attitudes, purposes, experiences and perceptions of institutional support directing or shaping online education adoption

Paper III
The paper analyses organisational aspects and institutional strategies for e-learning development in both universities, aiming at a deeper study of the complexity and dependence on cultural, geographical, social and technological aspects influencing e-learning implementation within universities.

Paper IV
The paper explores the significance of national culture factors at individual adoption level in both Argentinean and Swedish settings.
An earlier version of this paper was published in the Proceedings of IADIS International Conference Information Systems 2008, Portugal, 185-192

Paper V
After a comparative study of data gathered between 2006 and 2010 in the Argentinean setting, the findings moved the research approach to a complementary perspective in both settings. Thus, a deepening research, performing interviews with key-persons and collecting of institutional

² In Paper II, III, IV and VII the term e-learning was used instead of ‘online education’, as the former is most common and generically used in Educational Technology conferences and among researchers. Nevertheless, as explained in Chapter 2 the term ‘online education’ was preferred because of the institutional context of the thesis.
documents was developed. Findings concerning the changes of institutional online education strategies in the Argentinean setting are presented in this paper.

**Paper VI**


The same study as in Paper V was performed in the Swedish context. Interviews with key persons interpreted through the sensemaking perspective depict the evolving institutional scenario and strategy changes in this research setting.

**Paper VII**


A pilot experience stated the discordance of stakeholders regarding the goals of an online education implementation. The emerging challenge was to harmonise the process within a collaborative perspective, with the aim of enhancing the results of adopting e-learning for both institution and teachers.

**Paper VIII**


An ongoing online education implementation in an Argentinean engineering university, starting in 2009, confirmed the evidence of the disjunction between the stakeholders’ interests and the disconnection between individual and organisational levels. Applying pluralistic methods for consensus and negotiation based on sensemaking raised the agreement among stakeholders to the intended acceptable level, reconciling stakeholders’ interests.
2 Theoretical background

Although extensive literature about the theories and concepts underpinning the background of this thesis has been published, this chapter briefly introduces and discusses those central concepts and theories underlying the research study. Theoretical references were used as foundations over which the findings provided new or complementary knowledge. They contributed to shedding light on the adoption and institutionalisation of online education as intertwined relations of the technology innovation, the organisational processes and the external and institutional context.

The object of adoption, the geographical and institutional context, and the processes are the dimensions of the theoretical background. Online education, innovation, universities and educational strategic management supporting theories, adoption and diffusion processes, institutionalisation, models and ongoing issues under discussion are examined from a generic perspective to the specific domain of the thesis.

In addition, common features and differences across countries could be discerned. Features such as Higher Education structure, funding, and local and organisational culture, needed to be described for both the Swedish and the Argentinean contexts, to explain the similar and different findings in the two countries.

Section 2.1 introduces the ‘state of the art’ of online education considered the object of adoption. The concept itself, its technological evolution and its future perspectives are discussed. In section 2.2, the models of innovations as well as the concept of online education as innovation are explained. Universities as the institutional context of the research and their complex frame are presented in section 2.3. Sweden and Argentina’s institutional environments for Higher Education are described in section 2.4. In the following section, theories and models framing the processes of adoption at individual and organisational levels are reviewed. In section 2.6, institutionalisation as a multilevel ongoing process is introduced. Section 2.7 describes the theoretical perspectives underlying the study of adoption, organisational learning and institutionalisation in complex organisations, relating the integration of technology at multiple organisational levels. Concluding this chapter, a research scenario representing the forces and actors that shape the adoption of online education in universities is presented.
2 Theoretical background

2.1 Conceptual issues about online education

2.1.1 From e-learning to online education

Prior to developing the theoretical background I will explain why online education is considered the object of adoption and institutionalisation in this study. Several terms are used interchangeably with online education in the research literature: e-learning, technology-mediated learning, online learning, Internet-based education, web-based learning and virtual learning (Birchard, 2001).

Two features of online education make the difference in the selection for this thesis: the technological delivering medium and the contextual domain.

‘Electronic’ involves the use of a computer or any electronic device in some way to provide educational or learning material (Stockley, 2003). The electronic device could be TV, audio/video tapes, CDs, Internet, intranet, or mobile technology. Learning or educational activities can be carried out via networked or standalone electronic devices as on or off-campus modalities, by individuals or by groups working on or off-line, synchronously or asynchronously (Naidu, 2006). The HEFCE (Higher Education Funding Council for England) (2005) and the OECD (Organisation for Economic Co-operation and Development) (2005) adopted the term ICT to enhance the definition, leaving doors open to any new emerging technology.

The term ‘online’ narrows down the generic electronic delivery media used in e-learning. It refers to the use of any electronic device linked to the Internet (e.g. a computer or a mobile unit) in a networked activity, carried out by individuals or groups, synchronously or asynchronously, on or off-campus.

In the contextual domain, education is a formal process by which someone intentionally learns knowledge, values, skills and attitudes under the guidance of a formal educational institution. According to UNESCO-UNEVOC (2007), it is a continuing school-based experience, while learning is an informal and ongoing process that can be guided or not (self-learning), and intentional or not.

According to Paulsen (2003), the term e-learning is often used by researchers as a more generic term. It includes Web-based learning, the delivery of content via the Internet, intranet/extranet, audio and videotape, satellite broadcast, interactive TV and CD-ROM, within on-campus based or distance education. In corporate settings, companies have largely adopted the term as well, referring it to the delivery of content via all electronic media for training purposes (Urdan & Weggen, 2000).

The Sloan Consortium Report defines online education in a broader way as the use of online technologies in formal higher education for teaching and learning (Allen and Seaman, 2010). Urdan and Weggen (2000) define it as a subset of e-learning, describing learning via Internet, intranet or extranet.
The common framework of terms, defined for the Web Education Systems Project (Web-edu, European Leonardo da Vinci Program), guided the adoption of the term ‘online education’ in this work. Paulsen (2003) developed the definition, based on that of Keegan (1988), and it is characterised by:

- The separation of teachers and learners, which distinguishes it from face-to-face education
- The influence of an educational organisation, which distinguishes it from self-study and private tutoring
- The use of a computer network to present or distribute some educational content
- The provision of two-way communication via a computer network so that students may benefit from communication with each other, teachers and staff.

The separation of teachers and learners pinpoints distance education, while the other three features add the differentiation for online education. It can be argued that since 2002, the feature ‘use of a computer network’ has evolved and at present, other new technologies have to be considered in the definition.

Because of the intention in this research to address Internet-supported education as a driver of changes in the university organisational context, the term ‘online education’ was preferred. The term ‘e-learning’ is however maintained when mentioning relevant literature in which it is used by other authors, but only if referred to within the institutional frame. Moreover, in Papers II, III, IV and VII the term ‘e-learning’ was used instead of online education. The reason is that the former is most commonly used in Educational Technology conferences and among researchers. Nevertheless, empirical data were gathered considering the phenomenon within the institutional context of a university and as a subset of e-learning, according to Urdan and Weggen’s (2000) definition.

2.1.2 The status of online education

Online education, as an institutionally framed concept, builds on the long history of the field of distance education (Harasim, 2000) under the umbrella of the e-learning concept. It appears integrated into the existing practices as supplementing traditional teaching practices at undergraduate level (Sharpe et al., 2006). The use of blended modalities has not encouraged the replacement of the classroom by fully online forms (Douglas, 2005).

Therefore, blended-learning, defined as a combination of online and face-to-face education (Ward & LaBranche, 2003; Young, 2002) will be considered here within the focus of online education as the linkage of two historically separated models of teaching: traditional and distributed (Bonk & Graham, 2006).
Initially e-learning, and by extension online education, was technologically based on the delivery of text and static images, with minimal interaction or two-way communication (technology-mediated learning). The next stage using Internet (web-based learning) was also content-centred, relying on the delivery of educational matter under the tutorial guidance of a mentor (Laurillard, 2002; Ryan et al., 2000; Twigg, 2001). This conception relies on the intention of emulating the dominant traditional pedagogy, transposing the same constructs and resources into a digital environment.

According to the OECD (2005), mixed-mode courses began replacing classroom time at the beginning of the 2000s. The availability of Internet environments in educational institutions led to the implementation of individual uncoordinated websites. From individual small scale initiatives, mainly using standard group alternatives (such as Yahoo Groups), some of them evolved into online education, as formalised institutional implementations. The scalability and standardization of interfaces became an important issue. SCORM (Sharable Content Object Reference Model) provided a welcomed e-learning standard for content sharing, course organisation and learning management.

By mid-decade, a new stage of online education could be identified. The so-called emergent e-learning practices (Karrer, 2009), based on networked collaborative concepts, differentiated it from the first wave of one-way and the second wave of two-way modalities. Karrer identified three phases of e-learning that can be transposed to online education if performed in a formal university context:

- eLearning 1.0, characterised by courseware components and top-down one-way communication;
- eLearning 2.0, two-way communication, with discussion groups and top-down but collaborative interaction;
- eLearning 3.0 providing social networking and bottom-up peer interaction.

Meredith and Newton (2003) introduced social aspects in e-learning. They defined these as learning facilitated by Internet and WWW technologies, delivered via end-user computing, to create connectivity between people and information and opportunities for social learning approaches. It is a clear reference to e-learning 2.0. New ideas about e-learning arose, inspired by the emergence of Web 2.0 (Downes, 2005). Anderson (2005) introduced the concept of 'educational social software', as networked tools supporting and encouraging individuals to learn together while retaining their individual control over time, space, presence, activity, identity and relationship.

Social learning is based on Bandura’s (1977) theory referring to the reciprocal interaction between cognitive, behavioural, and environmental influences in the learning process, and the use of blogs, wikis, podcasts and
virtual worlds such as games. Innovative Web 2.0 tools are either synchronous or asynchronous. They depict learning spaces in which students and teachers work together in groups, strengthening their social presence, starting discussions in different web logs or just establishing a community of shared interest in a field.

It stands on collaboration and knowledge as socially constructed. Social learning addresses researchers’ argument that one of the best ways to learn something is to teach it to others (Brown & Adler, 2008). Then, learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community. These features can also help to categorise online education as innovative: learner (student)-centred learning. There is a shift from an educational system built around the institution to a model focused on the student as the centre of the learning process. The term ‘student’ is used deliberately instead of ‘learner’ as it denotes the belonging to an educational institution and a formal educational system.

Educational social software can effectively create a type of overlay network to enhance the more formal institutional network. Social software does not introduce itself as a sharp break with the old style but as the gradual emergence of a new type of practice. “Academia social software implementations are bubbling up. This Web 2.0 movement (or movements) may not supplant Web 1.0, but it has clearly transformed a significant swath of our networked information ecology” (Alexander, 2006, p. 44).

The later phases of e-learning, and online education as its extension, became accelerated by the belief in learning ‘anytime, anywhere’. More recently, the idea moved to ‘anytime, anywhere and on any device’, referring to mobile learning innovation (Keegan, 2005). Synchronous and asynchronous interaction, video conferencing mode, wireless and mobile connections and ubiquitous environments are resulting in the so-called convergence of IT innovations. Synchronous (real-time multiple communication) and media rich technologies support the innovative trend (Hrastinski, 2008; Sykes, 2008) producing explicit, educationally related outcomes in interactive contexts.

Johnson et al. (2009), Lowendahl (2011), Preis (2008), Rosenheck (2008) and Underwood (2009), among other researchers envisage short and medium term emergent technologies entering the educational mainstream. Mobile-advanced technologies, gamification (the use of digital games for non-entertainment use), collaborative environments (communities of learning and practice), geo-coded content (through applications such as Google Earth), semantic-aware applications, smart objects (providing information about a physical object that is in the user’s presence), and ubiquitous computing are current examples of these technological innovations.

"Newness might be a positive aspect – using new things might be fun and exciting, in particular to students. In the same time teachers are more often reluctant to adapting their current methods for teaching” (Lundin et al., 2008, online). Some researchers initially questioned digital technologies’ positive impact on learning (Dunleavy
2 Theoretical background

et al., 2007; Protheroe, 2005). Criticism of the adoption of new educational approaches to e-learning has been also raised. According to Ossianilsson and Creelman (2011), students and teachers focusing their learning on exam results may find the concept of connectivism, defined as knowledge existence in the world rather than in the head of an individual, highly disconcerting. Connectivism, a newly developed concept in Educational Technology that is under debate, focus on connecting specialised information sets (Siemens, 2005). The adoption of open course platforms, such as public wikis or blogs, for sharing knowledge may not be attractive to all teachers and students. There is a move in education from the transfer to the acquisition and construction of knowledge through active dialogues with learners, content and teachers. This new approach may seem to engender a loss of control, which is problematic for teachers and for institutions.

The question of whether the introduction of technology into the classroom has a positive impact on teaching and learning is still under intense debate within the educational community as it has been argued that studies the effects of on technology-mediated-learning (TML) on students’ academic achievement provide inconsistent results about the impact on students’ grades and test scores (Valdez, 2005). However, there is more recent evidence of benefits from their use (Herrington et al., 2009; Underwood, 2009; Underwood et al., 2010; U.S. Department of Education, 2009). Those studies investigating TML impact on facilitating the integration of students into the educational process and the increased level of social interaction with peers through networked activities showed a positive influence. Benefits can be gained from mobile learning through a collaborative online education environment, affording nomadic learners’ opportunities for sharing knowledge among peers (Herrington et al., 2009)

In accordance with the discussed evolution of technologies supporting online education, the survey questionnaire covered a range of alternatives from the most simple and traditional (file loading and e-mail) to the more recent audio/video conferencing and mobile devices to identify teachers preferences/rejection and attitude towards adoption.

Key contributions to the thesis

- online education refers to a distant, two way networked modality of e-learning within a formal educational institution
- e-learning has evolved from traditional one-way teacher-centred practice to student-centred social networking practice and the convergence of technologies (anytime, anywhere, any device)
2.2 Online education as innovation

2.2.1 Reviewing the concept and models of innovation: a historical and theoretical approach

The term innovation is recognised as originating from the Latin expression *in novare* meaning to make something new (Tidd et al., 2001). The existing literature on innovation is indeed very diverse and not well integrated into a coherent theoretical framework. The management literature's approach to innovation is discrete and fragmented (Mutlu & Er, 2003).

Schumpeter explained innovation as the introduction of a new product or a qualitative change to an existing one, a new process in industry, the opening of a new market, and new sources of supply for raw materials or changes in industrial organisation. Lin and Zaltman (1973) extended the definition of innovation to any idea, practice, or artifact perceived to be new by the relevant unit of adoption, or by the staff (Potgieter, 2004). Consequently, to whom the innovation is new has been widely discussed in literature. Rogers (1995) proposed two levels of innovation: organisational and individual. Therefore, Lin and Zaltman's adopting unit could vary from a single individual to any organisation.

Another dimension of innovation is its extent of change. The terms 'innovation' and 'change' are at times used interchangeably throughout the literature (e.g. Bates, 1999; De Freitas & Oliver, 2005; Elton, 2003; Fullan, 1991; Golnik, 2006; Lueddeke, 1999; Trowler, 1998; White, 2006). In fact, Schumpeter established the connection between innovation and radical change as early as 1934. Nord and Tucker (1987) first proposed routine versus radical innovation. The former is the process of introducing something that can be implemented with only minor adaptations of existing organisational routines, fitting the existing norms and values. The latter refers to the process of introducing something that is completely new to the organisation, requiring the development of completely new routines, usually with modifications to the normative beliefs and value systems.

Leifer et al. (2000) held that radical innovation creates dramatic change, transforms existing markets or industries, or creates new ones. Other researchers (Tidd et al., 2001; Westera, 2004) have used the terms 'routine', 'substitution', 'incremental or evolutionary' versus 'radical' to describe small changes or increments to existing products, services or processes as opposed to significant changes that transform practices.

Westera (2004) claimed that in education, the incremental processes prevail over the transformational, since a large group of teachers can continue building on previous practices. It can be added that in several cases, the established stream and the innovation coexist, and radical substitution never happens. This situation was noted by Johnston (2001), who argued that most educational
innovations originate at the periphery of the institution, isolated at the individual or group level, leading in most cases to an informal coexistence with traditional teaching.

The earlier models (Rogers, 1995; Yin, 1979) were sequential and linear approaches of a structured staged adoption, progressing continuously and regularly towards integration, push-pull moved by research and development or the market. They were criticised as being simplistic (Olson & Eoyang, 2001).

Although the later-developed coupling model of the innovation process comprises complex interactions and infrastructures, Tidd et al. (2001) argued that it is based on the same basic framework as the earlier linear models. In 2006, they stated that innovation is a matching process, in which interaction is the critical element (Tidd, 2006). An extensive review of innovation process models can be found in the study by Eveleens (2010).

Within the systemic point of view, innovation was defined as “new ideas that are developed and implemented to achieve desired outcomes by people who engage in transactions (relationships) with others in changing institutional and organisational contexts” (Van der Ven et al., 1999, p. 6).

According to Van der Ven et al. (1999), innovations are not always initiated by a single dramatic incident or by a single entrepreneur. An extended gestation period sets the stage for the initiation of the journey. Gestation refers to a phase in which the innovative effort is prepared by groups who meet, become inspired by each other’s knowledge and start developing novel ideas (Hildrum, 2008). Internal and/or external forces in the organisation initiate this stage, in which ideas and activities follow divergent, parallel or convergent paths. People’s involvement is very diverse and responds to different motivating factors. The implementation generally occurs by integrating the ‘new’ with the ‘old’. This scenario also applies to online education. This perspective is in line with the previous OECD’s Oslo Manual’s (1996) view of innovation as a complex, diversified activity with many interacting components.

Van der Ven et al. (1999) argued that understanding these relations requires looking beyond the individuals to the larger network of organisational relationships involved in the innovation undertaking. This consideration leads to a system composed of interconnected parts that as a whole, exhibits one or more properties or behaviour that are not obvious from the properties of the individual parts. These researchers identified elements in their systemic view of innovation that clearly match the elements of online education. Ideas can be seen as the technological, pedagogical and organisational new product and the related processes of adoption and use. The transformation of traditional into blended or virtual universities is the outcome. Academic staff, students and managers are the people interacting (rejecting, negotiating, learning or adopting) within the university context.

Nevertheless, in one aspect this description does not match online education as seen in this thesis. In Van der Ven’s model, innovations cease when implemented and institutionalised. Online education is also considered “a
collection of technologies, products, processes and services, all in a state of constant evolution” (Morrison, 2003, p. 21). New technologies are constantly emerging, and they flow in new pedagogical perspectives and new organisational strategies. Students develop new expectations and requests in accordance with the technology evolution. Teachers have to change their teaching styles and even their roles in the educational process. Institutions iteratively adapt or transform into new organisations and cultures. As a moving target, the innovation journey never stops, nor does the institutionalisation finish. DeSanctis and Poole (1994) used the term ‘evolution-in-use’ to describe the continuous adaptation of the technology to the ongoing changing needs...

Regarding the outcomes as the result of the innovation journey, researchers starting with Rogers himself (Kimberly, 1981; Rogers & Shoemaker, 1971) have repeatedly reported a pro-innovation bias in the literature. Innovation is most often viewed as a good thing pre-assuming that it is useful and beneficial, and that it should be adopted rapidly. However, the usefulness of an idea can only be determined after the innovation journey has been completed (Van der Ven et al., 1999).

**Key contributions to the thesis**

- Incremental or evolutionary processes of innovation may prevail over radical replacement of traditional forms of education.
- Online education innovation involves not only technological and pedagogical aspects but also complementary organisational aspects.
- Innovation is a complex process in which internal and/or external forces in the organisation may initiate the change. However, involvement is very diverse and responds to different motivating factors.
- Online education can be considered as an open-ended evolutionary innovation system, characterised by a continuing ability to create new properties or to adapt novelties.

### 2.3 The institutional context: universities

“History and political culture make contemporary organisations, and the institutions of which they are a part, peculiar to a nation’s or a locality’s specific conditions” (Douglas Skelley, 2000, p. 112).

This work frames the context of online education adoption and institutionalisation to universities. The term *university* differs from that of Higher Education institutions, in that the former must fulfil higher governmental quality
requirements. However, the literature review performed in this study showed that the two terms are frequently used synonymously.

As a particular type of organisation, universities match the definition of an open system. They interact with the environment by inputs (e.g. students, economical resources, staff, knowledge, technology) and outputs (e.g. graduates, knowledge, services). Thus, they scan, discover and satisfy society needs. They are able to maintain through homeostasis a systemic equilibrium adapting internal structures to internal and external changes. Schools and departments are structural subsystems linked by flows of rules, information, and control feedback. These subsystems include formal and informal structures, cultures and networked relationships among their parts dealing with different levels’ goals.

Universities were defined early on as complex formal organisations, matching the characteristics that define an organisation: goal-orientation, boundaries, social interaction, a structured activity system, culture etc. (Hall, 1991; Mintzberg, 1991), yet, they differ from other organisations in many ways. According to Mintzberg (1983), universities rely on their traditions and on their core concepts of knowledge keepers, freedom and community spirit. Conflict, competing interests and striving for power characterise their diffused decision-making processes. Two parallel structures coexist in universities. A democratic, bottom-up structure for teachers provides them with extensive autonomy, while a bureaucratic, top-down model rules managers and administrative staff.

From Holland’s (2006) perspective, universities can be seen as complex systems, with a large number of components dynamically networked through interactions and relationships, and not as the aggregation of static entities. Their individual and collective behaviour changes overtime, evolving in an open-ended fashion because of experience and feedbacks, in both bottom-up and top-down trends.

Following Mintzberg (1983), the external environment influences organisations’ strategic decision-making. Many variables have been proposed as environmental drivers of change for universities. Boezerooj (2006) categorised them as technological factors (e.g. the Internet, ubiquitous computing), demographic changes (e.g. the increasing rate of students’ enrolment, working students or so-called earner-learners, minorities, internationalisation), governmental policies and economic factors (e.g. governmental funding, competition, cooperation).

In addition, institutional internal factors affect strategic decision-making about innovation. Universities can be seen as organisations in which individuals and workgroups have a high degree of autonomy. The success of such organisations depends on the alignment of the individual goals with the institutional goals as a whole. The existence of relatively autonomous schools and departments leads to a non-clear picture, such as organisations within organisations.
According to Orton and Weick (1990), loose coupling affects this system of autonomous cells. The term was defined by Weick (1976, p. 3) as “a situation in which elements are responsive, but retain evidence of separateness and identity”. Loose coupling suggests that any location in an organisation (top, middle, or bottom) contains interdependent elements that vary in the number and strength of their interdependencies. The fact that these elements are linked and they preserve some degree of determinacy is captured by the term coupled. The modifying word loosely captures the fact that these elements are also subject to spontaneous changes and preserve some degree of independence and indeterminacy.

“The resulting image is a system that is simultaneously open and closed, indeterminate and rational, spontaneous and deliberate” (Orton & Weick, 1990, p. 204). There is a level of operative decision-making at the floor of the institution. Teachers decide on the methods, materials or contents of their own courses according to their own skills and knowledge. In the central administration, the president, secretaries, deans, directors and heads of department organise decision-making in a top-down flow. Boards and committees make collective decisions. Thus, centralised, decentralised and collegiate models of decision-making coexist in universities. More recently, Denis, Lamothé and Langley (2001) observed that loose coupling encourages local incremental adaptation but it does not lead to conscious collective action.

Universities fit all the described models in some way. A bureaucratic model centrally administrated with academic units and sub-units bound together by well-defined regulations cannot be denied but the presence of crosscutting decision structures also leads to a non-pure bureaucratic model.

From this view, a university organisation can be depicted as academically federal and administratively centralised (Atkinson & Gilleland, 2006). The central administration can grant a certain degree of autonomy in the sense that each unit can decide on the local distribution of the budget, assigned to departments by the central administration. This degree of freedom is very important in the adoption process as each school determines the amount of resources assigned to new initiatives.

Although several models have been proposed throughout time, universities still place an extreme emphasis on the educative, research, public responsibility and social role (European University Association, 2003) that differentiates them from other organisations.

Moreover, society’s demands have increased and universities have entered into a developing type of change. A movement from traditional to a business-approach management has been taking place in some countries, mainly due to governmental deregulation policies (Boezerooij, 2006).

The institutions have been suffering from a growing lack of governmental resources, which ironically increases their dependence on them, unless they become able to develop strategies to capture other external resources. As a consequence, their governance has become more centralised, under the
responsibility of professionals who are highly qualified in management, reducing the participation of academic and non-academic staff in strategic decision-making.

Universities as complex systems cannot be analysed one part at a time; it is necessary to understand the interactions that connect each part to the rest of the system. Complexity promotes a relational and processual style of thinking, stressing organisational patterns and networked relationships (Bousquet, 2011). How these university structures formally and/or informally interact and relate, in the light of the impact of online education as innovation, deserves still deeper studies, according to the literature review performed at the beginning of this research. Though a long time has elapsed, new frames of reference regarding specific strategies to cope with universities’ situation are scarce in organisational research, despite the extensive studies in organisational behaviour performed.

2.3.1 Universities as learning organisations

Several researchers have suggested that universities should become learning organisations as a way to obtain benefit from the changes that are transforming the institution itself (Nakpodia, 2009; Pollack et al, 2009).

Mulford (2000) defined learning organisations as organisations that structure, restructure and develop themselves. Its members continuously learn from their experiences, from the group and from the environment. The concept is therefore highly related to organisational change.

The terms ‘organisational learning’ and ‘learning organisation’ have been confusingly used interchangeably. However, several later works have established clear distinctions between the two terms. According to Ortenbald (2001), organisational learning is viewed as a process. It takes place naturally. The focus is on individual learners leading to a systemic adaptation of the whole organisation to change. A learning organisation is instead seen as a form of organisation. It requires effort to be developed. The focus is set on learners at the three levels (individual, group and organisation).

Imai et al. (1985) and Loveridge and Pitt (1990) among others, have examined the relationship between learning and innovation at the strategic management level in response to large organisations’ attempt to be more adaptable to change, particularly because of the impact of technology. Argyris (1999, p. XIII) pointed out that “the more effective organisations are at learning, the more likely they will be at being innovative”. Several authors have found that organisational learning directly affects innovation, increasing and facilitating generative learning. This learning leads to innovation on products, procedures and systems (Perin & Sampaio, 2003).

In his Fifth Discipline book, Senge (1990) wrote that learning organisations are concerned with linking personal visions and mastery to the collective organisational values. A bottom-up systemic process emerging from its
members’ personal visions for effective problem solving characterises them. Prescriptively, he proposed five disciplines (system thinking, personal mastery, mental models, shared vision, and team learning), none of them new, but all powerfully linked together:

- System thinking: as the conceptual cornerstone of Senge’s theory, it focuses on how the object of study interacts with the other components of the system, instead of acting as an isolated part. It recognises organisations as complex systems.

- Personal mastery: this is the commitment of an individual to the process of learning. It does not ensure organisational learning but the latter cannot exist without the former.

- Mental models: beliefs, ideas, images, and verbal descriptions consciously or unconsciously formed from own experiences guide thoughts and actions. Organisations tend to preserve certain behaviours, rules and values as mental models. Therefore, an open culture, promoting inquiry and learning from errors is required to compare old and new ideas and put them into practice.

- Shared vision: a common picture of organisational visions can be either built on the individuals’ visions or imposed from above.

- Team learning: this is the result of individuals engaged in dialogue and discussion with colleagues or peers’ groups, thinking, acting and learning together.

Senge related Argyris and Schon’s (1978) double-loop learning to creation or innovation while single-loop learning is related to copying.

Although different studies have proposed characteristics of learning organisations based on Senge’s theory, several authors have stressed specific characteristics for learning or for becoming a learning organisation (Kontoghiorghes et al., 2005; Pollack et al., 2009). They are: openness of communications and interactions, knowledge about the organisational vision, self-identification of individuals with the vision, rewards for learning, training environment, resource assignment and infrastructure allowing the flow of knowledge and ideas, and support and recognition of the effort.

Universities do not seem to change easily when they are bureaucratic or collegiate hierarchical organisations. They used to apply single-loop learning (Boyce, 2003), keeping their core values and internal structures stable. Consequently, such universities are not examples of learning organisations. Single-loop learning is instrumental, incremental, evolutionary, programmable, and linear. It uses accepted heuristics, formulas, and approaches. From another perspective, universities have been considered as loosely coupled systems, in
which limited interactions hinder learning. From this point of view, it seems that universities are not structurally suitable to be learning organisations.

Double-loop learning can be applied better to large-scale, institutional and sustaining change in Higher Education. Second-order changes are transformative and irreversible (Kezar, 2001). They require collective action (Clark, 2000) and a mental model cognitive frame (Senge, 2006). Changing values, reconfiguration of the internal environment and acquiring and practicing new competencies are the intersection of organisational change and organisational learning (Boyce, 2003).

Tension has been detected among self-organizing community learning processes and the formal management structures established in earlier stages. Informal networks are important in spreading innovations but they cannot substitute formal organisational structures and priorities (Russell, 2008). It is therefore necessary to examine the relationships that enable the influences in the transfer of the adoption of the learning innovations among the individual teachers and the formal organisational system.

**Key contributions to the thesis**
- Universities can be seen as a particular type of complex organisations, because they rely on their tradition of emphasis on the educative, research, public responsibility and social role.
- Loose coupling issues affect universities structure, in which individuals and workgroups have a high degree of autonomy.
- A movement from traditional to business-approach management has been taking place in some countries, mainly due to governmental deregulation policies.
- As complex systems, universities have to be studied with an understanding of the interactions that connect each part of the system.
- Double-loop organisational learning may significantly affect innovation processes.

### 2.4 The institutional environment: Sweden and Argentina

Although there are common features across countries, differences between Swedish and Argentinean contexts need to be presented. The national higher education system structures, evolution regarding technological learning innovations, funding policies and the internal institutional contexts of the two universities are broadly explained in section 3.5.

The theoretical background regarding the institutional context was initially narrower, but as usually happens in an interpretive approach, evolving findings
related to research question 1 made a broader and deeper review including both national contexts necessary.

2.4.1 Swedish national governmental policies for ICT-based education

The Swedish National Agency for Higher Education is the central governmental body that deals with issues affecting universities and higher education institutions. It is responsible for higher quality auditing of the educational process, distribution of resources to institutions’ management, educational innovation support and students’ recruitment. The Swedish Parliament and the Government determine the distribution of resources, but the institutions themselves decide on their use.

Swedish schools, colleges and universities are public (government-funded). However, in the 1990s, the Swedish Government introduced a project for transferring universities to independent foundations, providing them in turn, with the freedom to manage their resources and to decide on their own organisation. Three universities accepted the offer: Chalmers, Jönköping and the Stockholm School of Economics. In all the cases, university students do not pay tuition fees.

In over ten years, the Swedish Government has made a sustainable commitment to and substantial investment in promoting ICT in schools, encouraging teachers to use technology in their teaching. Strategic policies have been developed on both European and national levels in a top-down perspective of online education implementation (Gu, 2011). The fact that universities often receive additional funding from the Government based on the number of students encourages competitiveness and raises an additional reason for taking e-learning initiatives.

The Swedish Agency for Distance Education (DISTUM) was created in 1999 concerned with the development of ICT-based learning. In 2001, the Ministry of Education and Science emphasised the need for pedagogical reform in Higher Education, promoting the use of ICT in education as a means to expand recruitment in universities (eLene, 2005). Among other reasons, in sparsely populated regions of inland Sweden, there was a shortage of human capital because of young people moving away for higher education (Eliasson, 2006). Consequently, national and local policies of net-based programmes aimed to mitigate the problem (Hanes & Lundberg, 2008). In 2002, DISTUM ceased working and the eUniversity Swedish Government project through the Swedish Net University was launched.

Thirty-five colleges and universities were integrated into this Net University. The participating institutions received financial support for courses and methodology development over a period of three years, 2002-2004. At the beginning of the 2004/2005 academic year, 3,500 e-learning courses were available through the Swedish Net University (Ericson, 2005).
2 Theoretical background

In 2005, the Swedish Knowledge Foundation (a nearly ten-year old ICT educational use initiator) started the greatest investment in Sweden in ICT in education and research, with a funding programme for a ten-year period. One reason for this decision-making was the result of its own research about student teachers’ attitudes, access, and use of ICT. The studies reported that ICT was not well integrated into teachers’ education and teachers were not prepared with enough ICT knowledge and skills that were required in their classroom practice (Knowledge Foundation, 2005).

The Swedish Net University Agency changed its name to the Swedish Agency for Networks and Cooperation in Higher Education (NSHU) in 2006. However, its objectives remained the same.

There has been a long tradition of distance learning in Sweden, even before ICT. A pioneering initiative was Hermods, one of the largest and most influential distance-teaching organisations since 1898 (Holmberg, 2008). Thus, the development of e-learning in Sweden seems to be a natural evolution of traditional distance learning. Sweden does not depend on e-learning as an alternative to improving access to higher education, because its educational system is well established. However, e-learning is seen as a complementary or additional tool for enhancing knowledge (Hylen & Groth, 2003) and several universities have been involved in online education initiatives since 1999. By 2006, Sweden ranked as one of the best among the 27 countries in Europe regarding ICT infrastructure in schools: 89% of Swedish schools had access to the Internet and reported integration of ICT into teaching in some way (European Commission Information Society and Media, 2006).

As a result of this sustained governmental support to ICT in education, colleges and universities have developed websites with external and internal information. Many have also installed various forms of virtual learning environments such as First Class, Luvit, Lecturer, Ping Pong, Blackboard or in-house developments based on Internet access via SUNET (Swedish University Computer Network). SUNET is a governmental network that manages research and education communities, rooted since the 1980s in NORDUNET (a net for the five Nordic countries). Plans and policies for ICT education, providing training for teachers or IT resource centres have already been developed (or are in progress). Lund and Linköping university centres for learning and teaching are examples of initiatives to encourage the use of IT in education.

However, at the beginning of the century, there were some doubts regarding the use of ICT in Higher Education. Analysing Swedish IT policies and the actual situation in universities and university colleges, researchers (Hylen & Groth, 2003) concluded that at that time:

- there was a lack of empirical data on IT and the use of IT within higher education;
- IT was not integrated into the strategies and plans of the institutions for higher education;
- instead of strategic development, projects were setting the agenda;
- few incentives for innovations and change were perceived by teachers;
- there was a gap between the government policy regarding educational global trends and the more practical and incremental approaches to ICT at institutional level;
- the documentation, feedback of experience, lessons learned and project results of ICT learning implementations had to be systematized;
- the academic incentive structure needed to be modified with more powerfully rewarding efforts to improve higher education through IT;
- universities should develop a clearer integration of IT issues into their strategic decision-making.

Time elapsed and most of these issues are being or have been solved, but the latter issue continues, as reported by the OECD (2009): an absence on both the national and the school level of a long-term integrated strategy for continuous and sustainable investment for improving the ICT educational environment.

According to Gu (2011), the Committee for Renewed Teacher Education in Sweden stated that the new teacher’s education should provide skills concerning the selection of ICT and media for teaching and learning (Government Directive, A New Teacher Training, 2007). In 2008, Swedish Government Directives issued an additional directive relating to teacher education for lifelong learning following guidelines from the European Union. Additionally, in 2008, a new teachers’ education programme (SOU-Sustainable Teacher Education) determined that ICT should be a component of all teachers’ education programmes and it should be used as an educational resource.

According to the Swedish National Agency for Higher Education report (2011), more than half of Swedish higher education institutions feel that there is a lack of joint strategies for distance education, even though they may have strategies at school or departmental level. In the reported survey, it is claimed that strategy documents about the strategic processes for online education in higher education institutions do not cover, for example joint policies, organisational changes or funding reallocation to assist in the development of distance education.

Despite the initial doubts, several traditional universities faced the challenge. Several distance-education programmes are provided in cooperation among different higher-education institutions that are implementing distance education in the context of international cooperation. The University of Lund for
2 Theoretical background

example, is a leader in transforming sections of its traditional distance-learning department into e-learning departments.

Lund University is one of Sweden's oldest, largest and most comprehensive universities. In 1996, Lund University initiated a project involving both distance education and continuing education. Strategic considerations led to a decentralised management structure with different central units. The Office for Continuing and Distance Education (OCDE), as overall responsible, played a central role in the development of the online courses in the university. Most significantly, it provided training for teachers and non-interrupted technical support services to academia staff and students. In 1998, Lund Virtual University was set up as a concept and idea. In 2001 Lund University Online was launched and in 2002, it achieved global reach with online courses. Lund University started with a few traditional distance courses and currently offers more than 150 online courses, in different modalities, mainly full virtual online courses and blended mode-courses. Extra resources were assigned to encourage departments' decentralisation and teachers' improvement of online distance courses. The university also established the Learning and Teaching Development Centre (UCLU) to support all these initiatives (Jönsson, 2005; Ossianillson, 2002). Other examples are Dalarna, Umea, Uppsala, Oresund, Linköping and Stockholm universities, as well as the Royal Institute of Technology.

The reported lack of uptake of ICT-based education can also be blamed on resistance from teachers. It may be that they do not want to integrate innovative and traditional methods of teaching or could be because in Sweden, the responsibility for teacher training lies in individual willingness and in universities' support. Teachers are not paid any extra money for implementing online courses (eLene, 2005). As result of this resistance, universities are trying to blend traditional campus-based learning with e-learning as a way to manage the barriers. According to Ericson (2005) campus-based learning will continue to account for at least 50% of Swedish university education in the next years.

2.4.2 Argentinean national governmental policies for ICT-based education

Only public institutions were in charge of Higher Education in Argentina until 1958. At that time, private universities were licensed as non-profit institutions, with the civil legal status of a foundation. They are often called corporate universities because companies or business associations usually own these foundations.

Technical universities are a special case of public institutions. They offer only technological careers (e.g. the National Technological University and the Technological Institute of Buenos Aires). Universities are geographically concentrated in one or several head offices in the same city, with some exceptions. Remarkably, the National Technological University, with head
office in Buenos Aires, has 19 schools and 10 academic units distributed throughout the country.

The National Higher Education Law (1995) was the first national law to regulate and coordinate the higher education system in Argentina. It addresses university education and non-university colleges, from the public (national and provincial) and private sectors. Among the most prominent statements of this law, the following can be mentioned:

- The definition of the Council of Universities, depending on the National Ministry of Education as the coordinating body of policies, standards for quality accreditation and strategies for the university system. Representatives from national and provincial Ministries of Education and representative rectors of all national universities are integrated into it.

- The statement of the institutional evaluation process of the higher education system through the National Commission for University Evaluation and Accreditation (CONEAU)

- The setting of standards and the operating regime for private universities as well as the organizing and governance basis for public universities

- The reaffirmation of universities’ autonomy regarding academic and institutional issues, and their autarchy (independence and self-ruling) in economic and financial decisions

- The National Government’s responsibility for the funding of public institutions

- The broadening of university traditional goals (education and research) by extending the action and results of academia into the community

- The encouragement to the creation of new spaces and educational modalities incorporating new learning technologies.

According to the institutional autonomy established by this law, the government of public universities is carried out by collegiate bodies and by single-person charges elected by each institution’s board. The former have been assigned regulatory functions, policies and controls. The single person positions perform the executive functions.

Collegiate bodies are organised hierarchically into three levels: the University level (Superior Council), the Schools level (Directive Board) and the departmental level (Departmental Board). They are composed of representatives from faculty, students, non-teaching staff and graduates. The University Assembly made up by representatives of the Superior Council and the Directive Board is responsible for the reform of institutional statutes and the election of the rector.
2 Theoretical background

The individual authorities are also organised in the same three levels: the University level (the rector, vice-rector and his secretaries and directors), the School level (the dean, associate dean, secretaries and directors) and the departmental level (the head of departments and secretaries). They are elected by their respective boards.

Additionally, the governance of national universities often has a very strong influence of political interests, both from the national context and from within each institution.

Private universities also enjoy institutional autonomy, but as they depend on foundations with their own legal status, decisions are subject to a board established by each foundation. This board designates rectors, deans and secretaries. There are no student representatives, although in some cases, there are teachers representatives.

Regarding the university management profile, the usual model shows a normative character, political bias and bureaucratic processes predominating over the meritorious or innovative criteria.

University undergraduate studies at national universities are tuition-free, although the Higher Education Law allows universities to charge them. Because of the citizens’ strong opposition to this option, public universities decided to charge fees only for postgraduate studies. Private universities finance themselves by collecting tuition fees, as they do not receive any funding from the state.

The number of students enrolled determines the government budget for public universities. This budget has been becoming meagre in recent years because of the economic and financial situation of the national government. Universities had to find other ways of financing, mainly through funds or programmes for quality improvement and from external sources. According to the institutional statutes, they are allowed to earn incomes from external sources only through fee-paid consultancy and services to other public and private institutions and enterprises (Fernandez Lamarra, 2002, 2004).

Within this current scenario, Ministry Resolution 1717 has regulated distance education in Argentinean universities since December 2004. The most relevant precedent is the Distance Education Committee, in 1995. This commission was assigned the analysis of the legal and academic conditions to support the Ministry in authorizing universities’ distance careers.

Based on that report, Ministry Resolution No. 1716 (1998) regulated the approval of distance studies. In 2000, the number of approvals grew rapidly, leading to 79 courses, including undergraduate, graduate and postgraduate levels. In 2005, it accounted for 200, 65% of which belonged to public universities and the rest to private ones. In many cases, they were only precarious forms, dominated by the blended learning modality, the delivery of a large amount of content and the use of basic technology tools such as e-mail (García Aretio et al., 2009; Mena, Rama et al., 2008).
Technological advances and new forms of distance education led to Resolution No. 1717 in 2004. The new normative is currently in effect and regulates distance education in Argentina. It provides an institutional framework for the creation and adoption of distance careers, stating explicitly that distance education includes "proposals frequently identified as off-campus education, open education, assisted education, flexible learning, electronic learning (e-learning), blended learning (b-learning), virtual education, online education, network learning, learning or computer-mediated communication (CMC), e-learning, and others showing the characteristics mentioned above." (Res. No. 1717, n.p., researcher translation). The resolution also emphasises that "institutions intending to develop distance education alternatives must ensure an academic organisation suitable for specific institutional monitoring, evaluation and management” (n.p., researcher translation).

The UBA XXI Program, started in 1985, was the first formal distance education initiative, led by the University of Buenos Aires. Delivering learning material by ground mail complemented with radio and TV transmissions, allowed students in the last period of middle level schools to prepare for higher education admission. Other distance learning forms were related to adult learning and jobs.

The National University of Quilmes was the pioneering institution in virtual education in Argentina. In 1999, it used a platform provided (through a leasing contact) by the Open University of Catalunya (UOC). The university managed academic and pedagogical issues while a private consortium handled economic and administrative management. The rector of the university was aware of the risks such as the economically unstable context of the country, its peripheral geographic location, the lack of an off-campus tradition in higher education and specially, the lack of cumulative know-how (Villar, 2002).

With the national economic crisis in 2001, the university could not sustain the modality because it could not pay the UOC for the use of the platform. In 2003, new authorities modified the vertical approach of the early experience. The decentralisation of decision-making led to a better and more flexible integration of managers and teachers. The project was re-baptized the Virtual University of Quilmes (VUQ) and was re-allocated in the institutional structure. It depends directly on the Superior Council as a separate unit. It has its own academic management and a Consultative Board integrated by representatives of each department of the schools together with an Education, Communication and New Technologies Board. They created a kind of think tank and the VUQ designed the current platform in accordance with the SCORM standard.

In the light of the limitations of the previous failed model, the possibility of capitalizing their own experiences was largely the success factor of the new initiative, according to the university’s authorities. Although the documentation is not extensive, it is focuses mainly on the pedagogical and economic troubles faced during the second implementation, and not on the internal institutional processes. Other universities recognised the benefits of using this unique available information to consider their own situation.
2 Theoretical background

Currently, the Secretary of University Policies (SPU), an agency of the Ministry of Education, intended to carry out new innovative educational initiatives, provides innovation funds in higher education. The Secretary defines criteria to apply for the funds and distributes the money among the projects presented by universities.

The Project for Improvement of Engineering Education (PROMEI, 2005) is a response from the Secretary to the efforts of engineering academic units of national universities in the implementation of quality improvement projects. It is based on the recommendations reported during the universities accreditation process. In this context, the SPU outlined the basis for the implementation of the PROMEI project to improve the quality of engineering education in Argentina.

Taking advantage of this funding opportunity, universities started applying for online education implementation, among them the UTN.

2.4.3 Similarities and differences between Sweden and Argentina’s policies regarding ICT-based education

The Swedish higher education system is mainly public, with the exception of a few private institutions. Private and public higher education is equally distributed in Argentina.

Since the beginning of the 1990s, the Swedish Government’s ambition has been to transform the country into an information society, by highly supporting ICT in education among other factors. Sweden has a long tradition in distance learning, not necessarily based on ICT. Being on the digital wave, the Government provided networked structures supporting e-learning initiatives, leading to several universities and colleges becoming involved in pioneering experiences. In the second stage of evolution, the focus broadened to international opportunities based on the ‘borderless education’ philosophy, and a coordinated strategy for teachers’ training in ICT, based on ‘lifelong learning’.

On the other hand, effective funding actions appeared around the middle of the new decade, in Argentina. Actually, the higher education system became regulated in the 1990s. There is a middle-term tradition of distance learning and just one university can be counted as a pioneering initiative. There was no governmental centralised network structure to support e-learning, and no coordinated programme for teachers’ training, keeping the focus of online education on the local perspective of e-learning users.

As an overall feature, economic and political reality differs between the two countries. The economic stability, political guidelines, employment and education levels of the population have been significant factors at the moment of defining high-level strategies regarding ICT-based education in each country. Cultural factors, either from the external environment or internal to the
organisation also differ regarding online education adoption. Theoretical frames to study cultural issues in each setting are discussed in the next section.

2.4.4. **The role of culture in IS adoption in different geographical settings**

Leidner and Kayworth (2006) considered that national, organisational and group culture is important to the study of IS in that it can influence the use of information technology, allowing different levels of analysis. In Kaarst-Brown and Robey’s (1999) study, contextual factors (societal, individual, and organisational) influence the enculturation processes (individual and group socialization, knowledge acquisition, and leadership) which in consequence, develop outcomes (conflict, innovation, or integration of IT). In turn, the outcomes influence the contextual factors and enculturation processes in a recursive and ongoing process over time. Nevertheless, from 80 articles analysed by Leidner and Kayworth (2006), the overwhelming frame has been culture seen as stable and difficult to change. Few studies have addressed the cultural impact on e-learning settings (Bates, 1999; Liu, 2004; Tylee, 2002), although it has been recognised that cultural effects may be especially important when using and selecting technology innovations in different geographical settings.

Srite and Karahanna (2006) espoused how national culture may influence individual-level acceptance behaviours in the diffusion and use of technologies across national boundaries. Although national culture is a macro-level phenomenon and the acceptance of technology is an individual-level concern, they argued that national culture affects the cultural individual values, which in turn influence technology acceptance.

Several definitions of national culture have been put forward. However, Hofstede’s definition is the most used (Straub et al., 2002). Building on Kluckholm (1951)’s anthropologic definition of culture, in the 1980’s Hofstede defined national culture, as “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede, 1980, p. 13).

Hall (1983) refined the concept by comparing culture with an invisible mechanism operating in thoughts, often subconsciously. Later on, Sackmann (1991) viewed organisational culture from a more interpretive perspective as the collective construction of social reality. Jermier et al. (1991) distinguished tacit (assumptions) and explicit components (norms and practices) of culture. Basic assumptions are the core of culture and represent the belief systems that individuals have toward human behaviour, relationships and reality. They are interpretive schemes to perceive situations and to make sense of events (Sackmann, 1992). Values represent what is important to a particular cultural group as a manifestation of culture. Assumptions are invisible and therefore not easy to study. Spencer-Oatey (2000, p. 4) extended the interpretive role of culture by including in the definition “attitudes, beliefs, behavioral norms and basic...
assumptions and values that are shared by a group of people and that influence each member's behavior and his/her interpretations of the "meaning" of other people's behavior".

The vast majority of studies have conceptualized culture in terms of the value dimensions of national culture (Hofstede, 1980).

Hall (1976) identified two dimensions of national culture:

- The context, concerned with the method of communication. High-context cultures rely on minimal information in the transmitted message, while in low-context cultures most of the information must be in the message.

- Time-orientation, deals with the way in which cultures relate time to their activities. Monochronic cultures value schedules and see people who do not have the same perception of time as disrespectful. Polychronic cultures adopt a more fluid consideration about scheduling time. These cultures are deeply steeped in tradition and relationships, they are more collectivistic and they are based on non-verbal communication (Cohen, 2004).

According to Hofstede (1991), people from one country are shaped by the same values and norms, therefore countries were preferred by most researchers as the unit of analysis. Moreover, Hofstede's patterns were preferred for a more detailed analysis of culture at different levels of granularity.

Hofstede (1980) assessed the differences in national cultures of 50 countries, in multinational organisations, on the dimensions of power distance, uncertainty avoidance, individualism–collectivism, and masculinity–femininity. Based on these studies, each country could be positioned on a scale represented by a value index for each dimension.

Power distance is defined as "the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally" (Hofstede, 2001, p. 98). Applying the concept of power distance to e-learning implementation, countries with a high degree of power distance would implement one-way teaching, the implementation process would be strictly governed by the university management, and the education would be teacher-centred. In countries with a low degree of power distance, two-way teaching would be implemented on the initiative of the occasional teacher or group of teachers, and the education would be student-centred.

The dimension of uncertainty avoidance is defined as "the extent to which members of a culture feel threatened by uncertain or unknown situations" (Hofstede, 2001, p. 161). Applied to the context of e-learning implementation, resistance to the introduction of e-learning can be hypothesized to be higher in a country with a high degree of uncertainty avoidance. Moreover, the students can be expected to prefer structured and teacher-centred learning environments.

Individualism as a cultural dimension stands for a society in which the ties between individuals are loose. Higher scores mean that individualism is high, while low scores highlight collectivism. Everyone is expected to look after
himself/herself and her/his immediate family only. Collectivism, conversely, stands for a society in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people’s lifetime continue to protect them in exchange for unquestioning loyalty (Hofstede, 2001). In an e-learning context, this could imply that students in a country with a low degree of individualism/collectivism are expected to ask questions and contribute frequently to online discussions, whereas students from a country of a high degree are not expected to speak up in the e-learning environment.

Masculinity and femininity represent two poles ranging from a society in which social gender roles are clearly distinct (masculinity) to a society in which social gender roles overlap (femininity). Masculine cultures value competitiveness, assertiveness, ambition, and the accumulation of wealth and material possessions, whereas feminine cultures place more value on relationships and quality of life. Applied to a context of e-learning implementation, teachers from a masculine culture would expect rewards for developing the use of e-learning tools, while teachers from a more feminine culture would not. Furthermore, in a masculine culture, individual competition in course performance among students would be more common than collaborative group work.

Later on, long-term orientation was added as a new dimension after a study was performed in 1988 to distinguish the difference in thinking between Chinese and occidental people (Hofstede & Bond, 1988).

The most common framework for analyses of national cultural differences is Hofstede’s (1980). His constructs have been widely preferred in research on technology and culture, and have been used when a cultural basis defines the selection and adoption of technology.

Although it is an internationally accepted framework and the most cited in research, Hofstede’s cultural dimensions have been criticised (e.g., Gorman, 2006; Jones, 2007; McSweeney, 2002; Myers & Tan, 2003; Smith, 2002). The criticism is based on the fact that Hofstede’s works published in the period 1980-2003 are too simplistic aggregation of dimensions and they are based on surveys performed in the 80s. In addition, the original sample consisted of only IBM employees and socialist and Third World countries were not included. Most nations are groups of ethnic units, and in the last decade, the whole world has been deeply transformed by globalisation, including its cultural features. Even the proposed dimensions have been questioned.

The cross-cultural GLOBE (Global Leadership and Organisational Behaviour Effectiveness) research project started in 1993 as a replication and re-elaboration of Hofstede’ study specifically applied to leadership. It is a joint initiative involving different countries’ researchers in a qualitative approach, increasing the cultural dimensions to nine and grouping nations into ten societal clusters.

The results of the GLOBE study have attracted criticism (Smith, 2006; Tung & Verbeke, 2010; Vermaik & Brewer, 2008), mainly that the dimensions
are based on Hofstede’s work, and it is still far from being adopted by researchers as is the case of Hofstede. Similarly, because of the reported lack of empirical data in related developed studies, Hall’s patterns are criticised as difficult to apply in research (Dahl, 2004).

Besides the fact that Hofstede dimensions are the most used and recognised in the research field, they rely on variables that are directly observable in social and organisational processes. Therefore, his framework was preferred for this thesis.

Key contributions to the thesis

- Cultural issues may be especially important when using and selecting technology innovations in different geographical settings.
- The vast majority of studies conceptualise culture in terms of dimensions of national culture.
- Despite the criticism, the most referenced framework for analyses of national cultural differences is Hofstede’s: power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity and long-term orientation.

2.5 Adoption and diffusion of technology innovations: theories and models

2.5.1 The sequential model founding theories

Rogers (1962, p. 17) defined adoption as “a decision to continue full-scale use of an innovation”, without discerning whether an innovation product or an innovation process is concerned. Damanpour and Schneider (2006) stated that most studies on organisational innovation have considered adoption as a decision regarding the use or rejection of innovation.

Conversely, within a dynamic and systemic perspective, individual adoption can be seen as a definable single decision act while at the organisational level adoption is seen as a series of complex, continually evolving and contingency decisions (Frambach & Schillawaert, 2002; Martin & Beimborn, 2007).

The terms ‘adoption’ and ‘diffusion’ are sometimes used synonymously. Although the same conceptual umbrella encompasses them, they relate to different (macro-micro) levels of analysis (Hultman, 2007).

Rogers (1995) captured diffusion as both a process and an outcome in his model. He integrated the time dimension into the decision of adopting or rejecting the innovation, the earliness of adoption and the rate or speed of adoption.
Diffusion is the process by which an adopted innovation is communicated through certain channels over time among the members of a social system. It refers to the accumulated level of users of an innovation (Rogers 1995). It is then, a post-individual adoption process. As a process, Strang and Meyer (1993) emphasised the importance of external and institutional conditions affecting the rate and form of diffusion.

As an outcome, the diffusion focus has to be placed on the objects, the subjects and the setting involved in the processes with an emphasis on the consequences (shaping, transformation and adaptation). The social structure is changed. New groups based on categories of adopters, and new relations among individuals and between individuals and the organisation appear. The innovative object of adoption may also change.

According to Dwivedi et al. (2008) and Tscherning and Damsgaard (2008), the most popular theories regarding the diffusion of adopted technology innovations’ research in the IS field are Roger’s (1962, 1995) Diffusion of Innovations theory (DOI) and Davis’ (1989) ‘Technology Acceptance Model (TAM).

Many authors (Agarval & Prasad, 1998; Cooper & Zmud, 1990; Moore & Benbasat, 1991) have expanded Rogers’s proposal for use in IS research developing complementary models. DOI theory has been applied and adapted to several research contexts, including e-learning.

As stated, it is a very popular research frame but limitations of the model have been reported. It is deterministic (Bangozzi, 2007), individual-oriented, and not organisationally applicable. It has been widely used regarding the voluntary use of innovations but little applied in studies of mandatory cases (Yousafzai et al., 2007). According to Wainwright and Waring (2007), Rogers’s earliest model did not focus on new technology innovations and its modifications by subsequent authors to make it usable in IT research are still controversial (McMaster & Wastell, 2005). It has also been argued that there are competing theories (Baskerville & Pries-Heje, 2001) or a constantly improved list of innovation adoption factors (Anand et al., 2006). According to Lyytinen and Damsgaard (2001), it is mainly used to predict but not to understand or explain the adoption and diffusion of technological innovation.

In general, DOI theory is seen as simplistic and static, and not suitable for application to complex and networked technologies and collective adoption cases. Technology innovation is considered a discrete package moving from an independent innovator to organisational adoption. The adoption decision is atomic and isolated and it is a rational decision based on information, perceived, observed or communicated through some channel. The diffusion process evolves in stages distinguishable only by an adoption rate (push and pull forces). Finally, there is no consideration of institutional policies and strategies. Furthermore, changes to an innovation during the adoption and innovation process are often ignored and attention is focused on the adoption decision rather than on the implementation.
2 Theoretical background

Technology Acceptance Model (TAM) is rooted in the social psychology theory of Theory of Reasoned Action, (Fishbein & Ajzen, 1975). It is commonly applied to describe individual user acceptance of IS (Lee & Baskerville, 2003) by means of perceived usefulness, perceived ease of use, external variables and attitude/intention of the users towards the innovation. Throughout time, other authors have extended that model. Karahanna and Straub (1999) included the influence of external variables such as training, support and perceived accessibility. Venkatesh and Davis (2000) introduced social processes as external variables influencing perceived usefulness to a new version of the model, the TAM2. In 2003, Venkatesh et al. proposed an integration model of previous theories called UTAUT (Unifies Theory of Acceptance and Use of Technology). It contains four core determinants of intention and usage (driving factors): performance expectancy, effort expectancy, social influence and facilitating conditions. The variables of gender, age, and experience of use moderate the key relationships in the model.

Nevertheless, the DOI and TAM theories propose models based on sequential stages. All these approaches have been criticised because of their lack of consideration of the feedback loops of the iterative cycles of embedding technology (Olson & Eoyang, 2001). Moreover, researchers starting with Rogers himself (Rogers & Shoemaker, 1971) have repeatedly reported a bias in the adoption literature. Members of the social system should adopt the innovation and not reject it. Though claiming a lack of recognition of the problem, the bias is assumed and the not-to-adopt decision is not very kindly labelled. The pro-bias is introduced into the research when only successful cases are selected for study (Denrell & Kovacs, 2008).

Other authors have suggested the use of alternative theoretical perspectives (e.g. institutional theories, structuration theory, and sensemaking) (Denis et al., 2001; Woodside & Biemans, 2005) to study adoption as part of a complex interaction of actors.

2.5.2 The networked models

Following the General Systems Theory, only open systems are subject to innovation changes as an adaptation to external and internal pressures. This two-level phenomenon requires at least an actor (individual, group or organisation) and the environment, in which it is inserted, and the flows move from one level to the other in both ways.

Two approaches must be considered as complementary to study this multilevel linkage: bottom-up and top-down processes. The middle-out approach adopts some aspects of the two. Different models for diffusion theories of innovations have tried to represent bottom-up, top-down or middle-out spreading flows approaches (Bates, 1999; Fullan, 1994; Miller, 1995). Bottom-up and top-down approaches are familiar terms that are widely used in organisational theories and changes often begin with one of the approaches and
evolve into the other. The middle, instead, is often overlooked, as it is not easy to define what lies between the extremes and to understand the relations and overlapping that are built.

The top-down approach helps the understanding of the contextual and managerial influences and their impact on dependent variables at the lower level, when achieving a change forced through power or financial coercive strategies (Miller, 1995). Situated in universities, the top-down adoption approach is characterised by centralised management from the top, with the development of an institutional vision, associated strategic plans based on policy, and centrally allocated funding and infrastructure.

The bottom-up processes originate in the perceptions, cognitions and attributes of individuals. Through interactions, the change emerges at higher level, arising from innovators, working individually or in groups. Kozlowsky and Klein (2000) identified two ways to accomplish the change: the composition of individuals’ perceptions of organisational policies or procedures and social interactions encouraging innovation and the compilation of emergent patterns. In the bottom-up approach, leadership emerges voluntarily from teachers without the formal support of high authorities. A common mistake of researchers concerning the bottom-up approach is the inappropriate ascribing of individual attributes to higher-level entities (Gupta et al., 2007).

The middle-out approach combines the other two. It takes central support but accepts a collegial structure and problem-solving focus from leaders at the middle organisational department level. Its purpose is neither policy-based nor rooted in individualism (Cummings et al., 2005).

The relational perspective of diffusion also proposes networked structures as social ties providing opportunities for tacit learning because of the similarity of goals or activities (Uzzi et al., 2007; Watts, 2004). Multilevel networked models of adoption and diffusion of innovations try to adjust the reported weaknesses of the sequential models, mainly the missing interactions and communications among actors, coping with the relationships among higher and lower levels (Van Slyke et al., 2004; Wejnert, 2002). Networks are based on multiple types of ties (strong and weak) and actors’ position, considered in terms of an overall pattern of relationship.

2.5.2.1 The networked grassroots diffusion model

Spreading in organisations occurs through informal channels and without organisational support. The grassroots diffusion network is considered an emerging communication structure within organisations (Monge & Contractor, 2003; Van Slyke et al., 2004). It is spontaneous, self-organizing and self-managing. One or more individuals acquire an innovation, learn by themselves and implement the technology without institutional support, allowing colleagues also to adopt and span it by what is termed social contagion (Fichman, 2004).
2 Theoretical background

Because daily life increasingly incorporates ICTs, individual adopters become critical in introducing innovations into an organisation. Initiators can usually be typed as innovative (Van Slyke et al., 2004). They share their knowledge and enthusiasm about the innovations with their colleagues, contributing their own resources to solve the lack of institutional support. They all act as elements of diffusion social networks, across subunits within the organisation or outside. Initiators face learning new options on their own so they are well informed about the features of the innovation. They provide their own resources to manage the lack of organisational support at the early stages of the adoption process. Gaining with their own effort a significant mass of adopters, the management level finally notices them.


The grassroots diffusion pattern of an innovation (see Figure 2) usually begins in an organisation when an initiator introduces the innovation to colleagues through strong-tied interaction. In the next step, these colleagues act as nodes in a diffusion network. The spanning process crosses unit or group organisational boundaries through weak-ties colleagues, and the individual-to-individual process restarts.

The information about the innovation is spread through a network that is organisationally neither sanctioned nor supported. The overall diffusion network is a combination of small-networked groups. An effective grassroots diffusion process requires both strong and weak ties. Strong ties are found among members who communicate frequently and have many shared interests. Then, the innovation information is spread quickly (Monge & Contractor, 2003). However, if the innovation diffusion is not to be limited to the introducing network, weak ties are required to continue the innovation spreading into other networks with infrequent communication. Members developing highly interdependent tasks with other networks facilitate grassroots diffusion, and the observability and trialability of the innovation are conducive to diffusion because the organisation does not intervene in communicating institutional information about its existence or the benefits of adopting it.

Van Slyke et al. (2004) agreed with Markus (1987) in that organisational resources without involved individuals’ interest do not lead to innovation diffusion. The perception of utility of the adoption leads to greater intention or purpose of use of early adopters. However, they never or scarcely ever have recognition of the effort. This issue becomes important to later adopters as they enter the process when they find visible acceptability as a way of informal legitimation. Initiators extend to their circle of low-interested colleagues their interest in the potential benefits of the innovation. As early adopters, they encourage their close workgroup to adopt the innovation. The attitude of
adopters is closely related to positivism toward the innovation and this fact strongly depends on the social skills of the initiators to show their own successful result in order to effect adoption by later adopters (Karahana et al., 1999).

The organisation also benefits from the work of initiators in a grassroots diffusion process. Initiators become trained at their own cost and they act as expert technical support during the formal implementation. Later adopters rely on this help to lower the risks and uncertainty. In this diffusion model, individual adopters lack formal training, and they must learn by observing the way of using the innovation by colleagues or practising self-learning for non-work purposes. Later on, they will transfer the knowledge gained to work-related activities (Belanger & Van Slyke, 2000).

The process leads to organisation-wide, although incomplete, diffusion. When higher management levels notice the initiatives, a promotion or hampering action can be consequently decided upon, leading to organisational

Figure 2. Grassroots diffusion model (based on Van Slyke et al., 2004)
2 Theoretical background

adoption or neutralization of the innovation. Innovations, informally diffused by grassroots, are usually out of management level control. In the case of adoption, they can be either formally or informally embedded at the organisational level. A deeper process of organisational involvement is required for institutionalisation.

In universities, the strength of the boundaries among faculties and departments or the existence of cross-disciplinary collaboration can affect the adoption process across the institution (Bates et al., 2007). McNaught et al. (2000) identified as critical factors for adoption and diffusion: the existence of institutional policies, institutional support infrastructure to facilitate the change process, organisational culture, and personal motivation and attitude towards the innovation.

Moreover, cohesion among academic staff is difficult because of the physical isolation of teachers within their classrooms (Carolan & Natriello, 2006). Enlightening this problem and based on Granovetter’s (1983) work, Carolan and Natriello described the relation of strong and weak ties in terms of complementary dimensions. “Exposure to newer ideas comes from interaction with those with whom we are weakly tied, because such individuals travel in different social circles and thus have access to information and resources that we do not. Yet, those to whom we are only weakly connected are less motivated to share this information. We are more likely to receive information or other resources from those with whom we are more strongly tied; a set of people we trust, work with closely, and with whom we share more personal information” (2006, p.2). This perspective explains the diffusion pattern of online education as innovation among colleague teachers at the individual level.

Key contributions to the thesis

- Within a dynamic and systemic perspective, individual adoption can be seen as a definable single decision act while at the organisational level adoption is seen as a series of complex, continually evolving and contingency decisions.

- Diffusion is a post-individual adoption process of communicating the adoption decision to other members of a multilevel social system.

- The most popular theories in the diffusion of adopted technology innovations’ research in the IS field are Rogers’s Diffusion of Innovations theory (DOI) and Davis’s Technology Acceptance Model (TAM). However, they are sequential staged models.

- Bottom-up and top-down approaches must be considered as complementary to study adoption and diffusion in multilevel organisational linkage.

- Multilevel networked models of adoption and diffusion of innovations try to adjust the weaknesses of the sequential models (e.g. the missing interactions and communications among actors, the relationships among higher and lower levels).
- Members of an organisation are more likely to share information or other resources with those with whom they are more strongly tied than with those with whom they are weakly connected.

### 2.6 Institutionalisation of change as a multilevel ongoing process

The term institutionalisation derives from institution. Grief (2006) defined it as a system of rules, beliefs, norms and organisation that can generate a behaviour as a reproduction process of activity sequences. Colyvas and Jonsson (2011, p. 38) extended the definition as “the manner of attaining a social order that reproduces itself, as well as the state of having realized this order. As such, institutionalisation is both a field-level, higher and lower-order phenomenon that manifests as practices and structures across and within organisations”.

The leading Swedish organisational theorist, Brunsson (1985, 1989, 1998) addressed institutionalisation of changes in public administration as a nexus of political decision-making and administrative action. Moreover, action requires commitment, motivation and collaboration of the organisation members. He viewed institutional change within the public specific context as the result of “individuals, no one of which has complete control over the others when it comes to organisational actions” (Brunsson, 1985, p. 7). According to Douglas Skelley (2000, p. 115), “the problem for public sector organisations is that they are especially inhibited by their nature when it comes to making significant changes”. Public institutions need to affirm legitimacy with external context, which gives them support in return.

Some concepts are confusingly assimilated to institutionalisation, such as adoption, diffusion and embedding. The term ‘institutionalisation’ differs from ‘adoption’ in that an adoption, being either individual or institutional may not persist in time nor may it become embedded into the organisation.

Diffusion and institutionalisation sometimes inappropriately refer to ubiquitous practices that are widely diffused but never institutionalised, or to institutionalised practices that are scarcely or never used by the members of an organisation (Colyvas & Jonsson, 2011).

The difference between diffusion and institutionalisation is seen as the concern of the former with spreading and the focus of the latter on permanency and formalisation. Colyvas and Jonsson (2011) clarified the difference in a comparing matrix (see Figure 3) in which the axes represent the widespread of practices or structures in an organisation on one side, and their legitimacy on the other. Furthermore, they remarked that diffusion research has not deeply studied the shaping influence of diffusion on institutionalisation or vice versa (Colyvas & Jonsson, 2011).
In accordance with Colyvas and Jonsson’s (2011) perspective, institutionalisation is considered in this work as a dynamic and ongoing process as well as an outcome state, representing practices and structures across and within organisations. As a recursive process reflects the interactions of the actors involved in the definition of norms, the reproduction of the practices and the building of signification structures (legitimation) as a way of attaining a self-reproducing social order. As an outcome, it is the state gained through the process. The consequences of the process are also multilevel and the effects are greater than or different from the aggregation of the individual parts. They may result from a selection, adaptation or recombination of the alternatives.

The integration at institutional level of an innovation is a nested and layered phenomenon that needs to be studied as higher and lower-level linkages. An innovation that is institutionalised only at high organisational levels cannot avoid the persistence of old and local forms in low-level structures (decoupling). Reproduction only at low-levels results in less persistent forms of institutionalisation. A great number of bidirectional links between levels lead to a high degree of depth and a strong transformation of structures. Thus, the wider, deeper and stronger the linkage, the higher the likelihood that institutionalisation will transform the existing structures.

Many supporting factors are required to integrate a learning innovation into the structure of Higher Education institutions. Like building blocks, the internal enabling environment, a structure to support the implementation, coaching and mentoring support functions, clear delineation of roles and responsibilities, accountability for the implementation, and coordination and work rewarding can be mentioned.
Collins and Moonen (2001) identified three stages in educational technologies’ institutionalisation in Higher Education:

- Pre-initiation and initiation: activities are mainly bottom-up experiences
- Implementation: a more strategic approach is developed
- Institutionalisation: the change becomes an integral part of the core processes in the institution.

Nevertheless, MacKeogh and Fox (2008)’ study reflected a relatively early stage of e-learning development for most European institutions, far from being institutionalised. According to the HEFCE, HEA (Higher Education Act) and JISC (Joint Information Systems Committee) (2009), and despite of the time and effort invested, traditional campus-based universities are still struggling with strategies to embed change and institutionalise e-learning. Although an adaptive perspective is available, many universities are critically constrained by governmental regulations and funding support dependency.

Several strategic perspectives have been proposed with partial levels of reported success. Although more than 80% of universities offer some form of e-learning (Allen & Seaman, 2007), failures (stagnating, shrinking or discontinuing) can be mentioned. Ayers and Grisham (2003, p. 40) reported that “just IT has transformed the context of teaching and scholarship without transforming either teaching or scholarship itself, so has IT transformed higher education without transforming the places that set the standards for education: colleges and universities”. People at the top have fewer incentives to innovate and they do not push leading faculty. The major identified reasons for initiatives’ failure are that they never lose their special project status (Surry & Ely, 2002) and they never become being fully institutionalised (Olford, 2002).

**Key contributions to the thesis**

- Institutionalisation is a dynamic and ongoing process as well as an outcome state, representing practices and structures across and within organisations to attain a self-reproducing social order.
- The institutionalisation of an innovation is a nested and layered phenomenon that needs to be studied as higher and lower-level linkages.
- Three stages towards educational technologies institutionalisation in Higher Education have been identified: pre-initiation, implementation and institutionalisation.
- Traditional campus-based universities are still struggling with strategies to embed change and institutionalise e-learning.
2 Theoretical background

2.7 Relating individual technology innovation adoption and organisational theories

The relationship between technology and organisations and their integrations under a socio-technical perspective is a key issue in IS research (Bygstad et al., 2008). Leonardi and Barley (2010) proposed focusing on the routine and institutions lying at the core of organisation and social theory rather than on material artifacts to study IT affecting organisations.

The term social integration denotes reciprocity of practices between actors (Giddens, 1986) and technological integration refers to the assembly of technical components and systems. A socio-technical network integrates the two concepts. Bygstad et al. (2008, p. 57) defined integration “as the planned and emergent process of linking different stakeholders and technology into existing socio-technical networks”. “Socio-technical integration implicitly addresses the relationship between technology and organisation” (p. 74). In the socio-technical integration pattern there is a dynamic coupling between IS development and the organisation. Early developments, as organisational innovations, may change the intended product, and interactions may lead to early routinisation. The pattern also relates to organisational learning when incorporating knowledge (hits, mistakes and improvements) during a stepwise process.

“Few substantive theoretical accounts exist which adequately integrate multiple levels of analysis and explain innovation and change in terms of the interconnections between structural influences and individual action. Addressing this challenge requires an explanatory framework that takes into account both micro and macro perspectives” (Wong, 2005, online). Adequate theories of innovation and change must simultaneously link the micro and macro levels of analysis and explain change (or stability) over time in terms of the interaction between individual actions and structural influences (Hung, 2004). Different theories present perspectives and theoretical bases to understand and explain this mutual integration.

The updated literature about organisational processes of innovation is split into two main theoretical streams (Pishdad et al., 2012). One focuses on the macro level and sees the environment as the main conductor of institutionalised behaviour (see for example Greenwood et al., 2008). The second theoretical stream focuses on the micro level of social behaviour in organisations and is more concerned with the emergence of shared meanings and patterns of behaviour (Baptista, 2009).

Within the macro-level focus, Baptista views institutionalisation as a phenomenological and cognitive process primarily centred in the minds and behaviour of individuals, rather than in the social or organisational arrangements. Other recent studies view the institutional process mainly as political results of the power of managerial actors, articulated through meaning (Zilber, 2008).
The micro-level processes are assessed through sensemaking theory. “Whereas institutional theory provides powerful explanations of the influences of institutional structures on IS implementation, it does not specifically address how the human agency influences the social practices from which the institutions are created. To extend our understanding of IS implementation, we thus argue for the use of complementary theories to the institutional perspective, and suggest juxtaposing institutional theory with the theory of organisational sensemaking to add focus to the details of local practices and the human agency that inform and respond to institutions in IS implementation” (Jensen, 2009, p. 344).

Giddens’s concepts of structuration, a process-oriented view of institutional structures as both a product and a constraint on human action, provided the basis for the linkage. As result, Barley and Tolbert (1997, p. 6) defined institutions as “shared rules and typifications that identify categories of social actors and their appropriate activities or relationships”. These researchers proposed the merging of institutional and structuration theories developing a recursive model of organisational change over time. They looked for a representation of the relation between action and institution that would allow an examination of change and its reproduction as an ongoing process.

Although structuration theory seems to provide a meta-frame to analyse the individual level with complex organisational interactions, it does not define technology as a particular dimension. In response to this lack, some attempts have been made to extend Giddens’s theory with an IT dimension, in the light of the pervasiveness of technology innovations in organisations (Orlikowski, 1992; Pozzebon & Pisonneault, 2005; Walsham, 2002).

The link between technology-triggered changes at the micro and institutional levels can be studied using AST (Adaptive Structuration Theory), the frame proposed by DeSanctis and Poole (1994), including the technology dimension and focusing on interpersonal interactions at multiple levels.

In the next sections, the concepts that provided the theoretical background to the research questions of the thesis from pluralistic perspectives are discussed in a short review.

2.7.1 The organisational macro-level and the contextual constraints: Institutional theory

Organisations are institutionalised to different degrees, as all of them are subject to norms and procedures, social practices and external governance rules. Organisational activities seek legitimacy by adopting institutional practices.

Institutional theory is a frame to study the grounded institutional processes that develop formal organisational structures. The earlier institutional perspective based its theoretical frame on the ways in which bureaucracy and institutions dominate our society. It considered organisational actors as passive recipients of institutionally provided scripts to structure their actions. “DiMaggio and Powell in 1983 highlighted coercive, normative, and mimetic processes of reproduction. Coercive factors involved political pressures and the force of the state, providing
regulatory oversight and control; normative factors stemmed from the potent influence of the professions and the role of education; and mimetic forces drew on habitual, taken-for-granted responses to circumstances of uncertainty” (Powell, 2007, p. 2).

More recently, Greenwood et al. (2008) and Powell (2007) proposed a new perspective that they respectively called organisational institutionalism and new institutionalism. This perspective considers that individuals act because of conceptions derived from a cognitive influence in addition to the possibility of acting based on obligation. This renewed and broad perspective views institutions as social constructs influencing individual preferences and actions, moving away from its original roots. The sociological interpretation of new institutionalism holds that the logic of appropriateness guides the behaviour of the actors within an institution (Schmidt, 2010). In addition, Schneiberg and Soule (2005) advocated the importance of opportunities and cultural frames shaping the diffusion process.

Disruptions from the environment, social, technological or legal, affect the existing organisations. Institutional pressures on individuals take place, usually in the form of top-down processes. The idea of innovation emerges and the possibility of change arises. However, individuals at the micro-level make decisions that can be studied as outcomes of sensemaking processes. The outcomes, as a bottom-up flow, develop bridges of interaction between levels. Social actors may eventually adopt new structures and diffuse them. Overtime, these structures may become institutionalised. This is a cyclical process: emerge, diffuse, change, die and be replaced by innovations (Haunschild & Chandler, 2008).

### 2.7.2 The organisational micro-level: individuals’ sensemaking

The term was adopted in IS by Dervin (1983) to assess how people make sense in designing and using information systems (Jacobson, 2000). In organisational studies, it has its roots in Weick’s earlier works on social psychology and loosely coupled systems (Mills et al., 2010).

Dervin (1983) defined sensemaking as the cognitive internal and procedural external behaviour, which allows the individual to construct and design activities through time-space. The sensemaking approach is situationally and contextually bound and rooted, referring to the variety of perspectives that better depicts a situation in a given time-space. According to Weick (1995), it is characterised by properties (grounded identity construction, retrospection, focus on extracted cues, plausibility rather than accuracy, enactment and social interaction) and its core theoretic premises are:

- Reality is not complete but rather filled with discontinuities or gaps
- Information does not exist independently of and external to human beings
All information is subjective, internally guided and constrained by human limitations, and limitations of present, past and future time-space.

Information seeking and use are constructing activities, as personal creation of sense. They are not a merely transmitting activity.

From a methodological view, the core technique of sensemaking is the micro-moment time-line interview, a detailed storytelling conducted by the involved actors to cover the theoretical model dimensions: ‘situation-gaps-uses’, followed by the researcher’s in-depth analysis of collected qualitative data.

Organisation emerges through sensemaking. It does not precede or produce sensemaking. “Sensemaking is about the interplay of action and interpretation rather than the influence of evaluation on choice” (Weick et al., 2005, p. 409). Typically, sensemaking processes are triggered by an important organisational event or to organisational routines disruptions. During the break, sensemaking requires individuals to make sense of what is currently occurring and what should be performed next in an ongoing process (Boudes & Laroche, 2009).

Based on Dervin’s work (1983) about individual sensemaking and Weick’s (1995) extension about organisational sensemaking, Klein et al. (2006) presented a theory of sensemaking as a set of processes initiated when an individual or organisation recognise the inadequacy of their current understanding of events. Although the sensemaking perspective focus is on micro-level actions, acting may also be attributed to institutional constraints and traditions.

Sensemaking starts with noticing and bracketing a variance by the actor’s mental models. Focused on equivocality, difference or newness, sensemaking is a way to deal with uncertainty (Mills et al., 2010). Ongoing organised actions require the understanding of what is happening to reorganise the situation.

Weick (1988) involved noticing and bracketing in the concept of enactment, representing people bringing structures and events into existence and setting them in action. The importance of the notion of enactment is that it provides a direct link between individual cognitive processes and the environment.

The step of selection takes as input the enactment results, framing them as references into structures and meanings borrowed from past experiences to make sense of changes and develop actions. Labelling during the selection allows the management of the experience through conceptual categories adapted to local circumstances. The results of the enactment and selection processes create meaningful environments. They are stored during the retention process to be used as feedback in the next cyclic scenarios, as sources of guidance for further actions and interpretations.

Sensemaking has proved to be useful in interpreting case studies of companies (Bansler & Havn, 2004; Vaast & Walsham, 2005). However, analysing and interpreting human actions as a response to online education innovations using sensemaking have not led to cumulative research. Gioia and
Thomas (1996) investigated top management academia levels making sense of changes and Spence (2011) studied students' sensemaking about adoption in a tertiary school.

2.7.3 Linking macro and micro-level interactions

Sensemaking is not context free. Actors make sense within and with institutions (Weber & Glynn, 2006). Suddaby and Greenwood (2001) propose institutional theory to explain this situation. Several authors have argued that this theory considers organisational actors as passive (Fligstein, 2001), or that it does not explain how and why actors internalise, influence and reproduce social practices (Barley & Tolbert, 1997; Jensen et al., 2009).

On the other hand, Lounsbury and Glynn (2001) found empirical evidence that organisational members are socialized into expected sensemaking activities, and that cognitive and normative forces derived and enforced by powerful actors such as government, professions and managerial groups shape behaviour. This statement, clearly related to institutional theory, counterpoints with Weick's (1995) early statement that sensemaking is the feedstock of institutionalisation.

Institutionalism researchers, according to Barley and Tolbert (1997, p. 95) “have paid little attention to the process by which such assumptions [values, norms and beliefs] arise and are maintained”. Moreover, even though “institutional research initially claimed that organisational structures are socially constructed, they neither have directly investigated the processes by which structures emerge from or influence action” as the link between institutions and everyday activities.

These positions can be reconciled by linking the micro and macro levels of analysis. Weber (2003) connected sensemaking and institutional perspectives in his study about globalisation and convergence, concluding that corporate sensemaking is not a linear relationship: institutions start corporate sensemaking vocabularies but they have little influence in the subsequent stages.

New institutional theory addresses macro-organisational structures while sensemaking looks for understanding of individual micro processes addressing individuals’ cognitive and social interaction to deal with unexpected events, e.g. the introduction of new technology.

2.7.4 The production and reproduction process: Structuration Theory as a meta-theory

Giddens’s structuration theory (1986) is a general theory of social organisation rather than a theory specific to IS (Jones & Karstens, 2008). Instead, Mackrell and Nielsen (2007) saw structuration theory as a useful meta-theory for IS research within which a diversity of approaches, theories and methodologies can be addressed or integrated (Walsham, 2005).
Structuration theory provides a suitable framework for understanding the dialectical nature of adoption of online education, enabling the study of the integration of macro and micro levels of analysis by recognising the contributions of both structural processes and human agency (Hardaker & Singh, 2011).

According to the theory, social phenomena are the result of both structure and agency as a mutually constitutive duality, producing and reproducing social structures. Giddens argued that institutionalists explain “social behaviour in terms of structural forces that limits individual’s capacity to do things in their own way” (Hardaker & Singh, 2011, p. 223) and studies focusing on the individual factors explain social reality ignoring the influence of external entities. Structuration theory asserts that both perspectives are interlinked and refers to this interactivity balance of agency and structure as duality of structure.

Giddens identified three dimensions of structure (signification, domination and legitimation) and three dimensions of interaction (communication of meaning, operation of power relations and enactment of normative sanctions), respectively linked through modalities of interpretive schemes, facilities and norms. Signification refers to the transfer of meaning through interpretative schemes and communicative acts. Domination is seen as the exercise of control through resources and acts of power. Legitimation provides values and goals through norms and acts of sanction (Timbrell et al., 2005).

The emphasis of structuration is on the interplay between individuals and society and on active processes rather than on static patterns, thus overcoming the dualism of individual and organisation in organisational learning and change. Social systems have structural properties (rules and resources) produced and reproduced by social practices or the actions of individuals within the social systems. Instead of a stable or constraining phenomenon, Giddens proposed a dynamic of constraining and enabling actions. He distinguished two types of rules: interpretative and normative. Actors interpret the world in which they live through interpretative rules related to cognitive aspects. Normative rules regulate the legitimization of actions.

Individuals draw upon the rules and resources of a pre-existing structure, and in order to reproduce them, they have to be ‘knowledgeable’ about them in the sense that they know the circumstances of their actions and the rules they follow. From another perspective, Hardaker and Singh (2011, p. 225) viewed structuration theory in line with a critical approach “acknowledging actors as knowledgeable and reflexive, continuously monitoring the environment in which they operate, and this awareness of the social context influences individuals to intervene in the world or refrain from any intervention”.

This construction and reconstruction of structure by the interaction of knowledgeable actors is called ‘structuration’ (Berends et al., 2003). This concept implies the power to ‘act otherwise’ and change (with resulting intended or unintended outcomes). Based on this implication, Berends et al. (2003, p. 1042) connected Giddens’s concept of knowledgability with
organisational learning, understanding the latter as “the development of knowledge held by organisational members, which is being accepted as knowledge and is applicable in organisational activities, therewith implying a (potential) change in those activities… The process of organisational learning is realized in organisational practices, as a specific form of structuration…and not reduced to individual learning”.

An important point to state is that structuration theory has been involved in a long debate between criticizing and supporting authors (Archer, 1982; Cohen, 1986; Jones & Karstens, 2008, 2009; McLennan, 1984; Mestrovic, 1998; Poole, 2009). Despite the criticism regarding its inadequacy in providing guidance for empirical research (Wong, 2005), it has inspired an increasing number of organisation and management articles covering very diverse topics (Broger, 2011). Without being exhaustive, the following can be mentioned: entrepreneurship (Chiasson & Saunders, 2005; Sarason et al., 2006), organisational learning (Berends et al., 2003; Bresnen et al., 2004), technology use (DeSanctis & Poole, 1994; Orlikowski, 1992), communication (Barry & Crant, 2000; Orlikowski & Yates, 1994) and IS (Jones, Orlikowski & Munir, 2004; Orlikowsky & Barley, 2001; Pozzebon & Pisonneault, 2005; Walsham & Han, 1991).

Structuration theory has been proposed (Berends et al., 2003; Giddens, 1986) as a linking theoretical frame to analyse the relationships between individuals and the complex interactions of organisational learning. Poole and DeSanctis (2004) propose an analytic approach of seven requirements to examine the process of structuration:

1) Identification of structures
2) Relationships among structures
3) Description of the social system
4) Appropriation of structures
5) Contextual influence on structures
6) Influence of actors
7) Power dynamics

However, its concept of production and reproduction of social systems through members’ use of institutional rules and resources in interaction cannot cope with the fact that IT artifacts enforce or limits human behaviour.

2.7.5 Including IT: the Adaptive Structuration Theory

In 1992, Orlikowski examined the interaction between technology and organisations through the structurational model based on Giddens’ structuration theory. She argued that previous models considered technology as an external force that would have deterministic impacts on the organisational structure.

The structurational model proposes the duality of technology: technology as product of human action, technology as a medium of human action,
institutional conditions influencing interaction with technology and technology as an ongoing influence of institutional structures of signification, domination and legitimation. Moreover, she encouraged research on patterns of interaction of technology and organisation in specific contexts and types of technology.

DeSanctis and Poole (1994) developed Adaptive Structuration Theory (AST) as a step forward from Structuration Theory by explicitly including technology as a dimension in Giddens’s structuration process. They proposed Adaptive Structuration Theory (AST) as a theoretical perspective for studying technology and organisational change. AST “extends current structuration models of technology-triggered change to consider the mutual influence of technology and social interaction” (DeSanctis & Poole, 1994, p. 125).

Based on the seven structuration requirements, AST outlines two theoretical premises that explicitly involve IT in the theory:

1. The influence of structures embedded in the context (structures, rules, IT and people providing spirit, features and dimensions of encouragement or constraint). This premise embraces the first three structuration analytic requirements.

2. The reciprocal causation of spirit, features and dimensions, to generate patterns of human-IT interaction.

In accordance with Structuration Theory, the social structures (rules, procedures, hierarchies, organisational knowledge, resources) provided by institutions frame human activity and decisions. Technology modifies, combines, or enhances the existing social structures, bringing new ones into interaction. “There is a recursive relation between technology and action, it iteratively shaping the other...If we are to understand precisely how technology structures can trigger organisational change, then we have to uncover the complexity of the technology-action relationship” (DeSanctis & Poole, 1994, p. 125).

IT is seen as a social structure in the sense that it provides procedures and tools as structural features for interpersonal exchange (e.g. collaborative working, learning communities, entertainment social networks, etc.). IT creates sources of social structures for group interaction and appropriation.

Appropriation, in AST refers to the immediate visible actions that evidence deeper structuration processes, equivalent to Giddens’s modalities of structuration (interpretive schemes, facilities and norms). AST identifies four different appropriation ways:

- Direct use of the structure, related to other structures, interpreted as they are used, and making judgments (affirming or rejecting its usefulness)
- Faithful (consistent with the spirit) or unfaithful (out of line with the spirit) appropriation
2 Theoretical background

- Instrumental uses or purposes (intended use, individualistic, for fun, power or social influence, consensus)
- Attitude towards the appropriation (positiveness, comfort at work, self-value in the environment, challenge)

However, according to DeSanctis and Poole, they can also be described in terms of their spirit. An advanced technology spirit represents the underlying philosophy based on design metaphors, user interpretation of the features, formal and informal nature of interaction, and management pronouncements about purposes, promoted goals and values. The extent of the spirit and structural features variance encourage different forms of social interactions: a more controlled or more relaxed atmosphere of use.

Tasks and the organisation environment also have to be considered as sources of social structures. According to the AST authors, the sources refer to internal pressures, corporate information or cultural beliefs, for example. However, institutions function within the context of larger social and political trends, and the focus of many organisations is on maintaining legitimacy and economic support from external sources. Thus, the external context, little considered in the AST becomes important.

Individuals in organisations make decisions and select which technology structures to use. Consequently, adoption varies. The AST factors influencing the group appropriation of structures are:

- Members’ style of interacting (autocracy/democracy)
- Members’ knowledge of and experience with technology structures
- Members’ perception of others’ knowledge (belief of acceptance of use by others)
- Members’ agreement on appropriation (suitability of the structure/power pressures)

When during these production, reproduction or blending processes, structures become shared, they have triggered organisational change. Organisational change occurs gradually through multiple levels. Overtime, new social structures may become part of the larger organisation. “In this way, advanced IT can serve to trigger organisational change, although they cannot fully determine it” (DeSanctis and Poole, 1994, p. 131). Defined structuration as the process by which social structures are produced, reproduced or blended, the use and reuse of technology structures and actions lead overtime to their institutionalisation.

AST can be applied in research studies using quantitative as well as interpretive methods because it sustains an integrative and pluralistic perspective. Three strategies have been proposed for assessing the AST model:

- Diachronic analysis, longitudinal through time to study evolution and cause-effect questions
- Synchronous analysis, at a given point in time, to study connections and patterns
- Parallel analysis involving two groups or more to study similarities/differences.

As DeSanctis and Poole suggested, the concepts of AST can be applied to advanced technologies and other organisational contexts. All the characteristics of advanced technologies underlie online education innovation, endlessly reconfigured and redefined through production and reproduction.

According to Pozzebon and Pissoneault (2001) and Thomas et al. (2008), structuration theory, and AST as an augmented version, has some limitations. One of the most important is the difficulty of empirical application. According to Ritzer et al. (2001), a meta-theory is a broad perspective that overarches theories to establish a coherent framework in order to make sense of them. Following Thomas et al. (2008), meta-theorization reviews the existing knowledge in a given domain and defines the relationships among it in a model as an overall way of seeing a field of study. It is performed after a theory or several have been applied to primary studies. Some criticism has been raised of meta-theorizing. Overarching perspectives have been charged as vague or too abstract, providing little use to practising theorists (Ritzer, 1990). However, meta-theories are by definition not intended for practitioners but for improving the understanding of existing theories and their integration or complementation.

AST provides a rich meta-theoretical perspective to articulate specific theories, creating a suitable context in which to embed them into the AST framework. Consequently, the linkage of other theories can be explained with an overarching perspective of the phenomena.

A literature review about the application of AST as the meta-theory within the IS field (Thomas et al., 2008) revealed that although several studies were developed, few belonged to the e-learning domain, and in addition, they studied only the learner’s perspective of adoption and use of the innovation in a business company. None of them studied teachers’ and managers’ perspectives in a university context, which are the focus of this thesis.

**Key contributions to the thesis**

- Technology and organisations integration from a socio-technical perspective is a key issue in IS research.
- Interconnections between structural influences and individual actions require an explanatory framework that takes into account both micro and macro perspectives.
- New institutional theory addresses macro organisational structures while sensemaking seeks to understand individual micro processes addressing individuals’ cognitive and social interaction to deal with unexpected events.
2 Theoretical background

- Structuration theory has been proposed as a linking theoretical frame to analyse the relationships between individuals and the complex interactions of organisations, but it cannot cope with the fact that IT artifacts enforce or limits human behaviour.

- AST extends the current structuration models of technology-triggered change to consider the mutual influence of technology and social interaction.

- AST provides a rich meta-theoretical perspective to articulate specific theories. Consequently, the linkage of other theories can be explained with an overarching perspective of the phenomena.

2.8 To sum up: a pluralistic and complementary framework to explore a complex scenario

Because of the intention in this research to address Internet-supported education as a driver of changes in the university organisational context, the term ‘online education’ was preferred to e-learning. Short and medium-term emerging technologies will soon be entering the educational mainstream.

Having stated online education to be an innovation, it is necessary to study not only the parts and processes in isolation but also the results of the dynamic interaction of parts as a whole. A systemic approach provides this framework.

Innovation granularity, extent and the linkage between macro and micro levels of an organisation were examined as well as the pro-innovative bias assumption of usefulness.

Adoption research theories and models (sequential and networked), and the elementary building entities (subject, object, processes and context) were introduced and reviewed in-depth in the literature. Studies about context have been criticised as atomistic and multi-level interactions have rarely been studied (Gupta et al., 2007). Furthermore, specific studies about institutionalisation in Higher Education are scarce and mainly prescriptive.

Several researchers have urged a move to more open interpretive approaches focusing on complex processes (Woodside & Biemans, 2005), network models (Hausman et al., 2005), reconceptualization of adoption as interactions (Hultman, 2007), and influences and consequences of innovations adoption processes at multiple level of analysis. According to De Freitas and Oliver (2005), adoption and diffusion research would benefit from a combination of approaches considering both the institutional and the individual factors influencing adoption.

The reported needs for systematic and integral studies of the processes from online education adoption at individual level to institutionalisation motivated
the examination of interactions and relationships among institutional actors with a scenario view.

Scenarios are tools for focusing thought (OECD, 2006). Van Notten (2005) defined research scenarios as consistent and coherent descriptions reflecting different perspectives, which can serve as a basis for action. He pointed out their non-predictive purpose, the evolutionary and change-addressing nature and the process-oriented, model-based and integrative approach as the scenarios’ characteristics.

Therefore, a research scenario representing the forces and actors that shape the adoption of online education in universities to implement learning innovation was developed for the thesis (see Figure 4). The square frame delimits the local context of each research setting while the rounded square marks the boundary between the institutional internal environment and the external context.

E-learning is positioned as both an internal and an external element. It is an innovation developed and used in the market, adapted to the institutional context. According to the working definition, when academic programmes within an educational institution frame e-learning, it is considered online education.

Environmental factors (governmental policies, technology, demographic changes, and economic policies) surround the universities’ boundary. Institutional internal factors (governance, university profile and technology infrastructure) define the multilevel space in which managers, administrative staff and teachers develop the processes of adoption and institutionalisation of online education. The adoption, diffusion, embedding and institutionalisation processes are not represented in a time dimension as they can be cyclic, mutually reinforcing and intertwined. They will be examined as top-down, bottom-up or emerging new patterns.

In short, the aim of the first part of this chapter was to introduce the state of the art of online education as innovation and the characteristics of the internal and external institutional contexts of the research settings. Next, the core concepts and models of adoption, diffusion and institutionalisation of innovations are presented.

Finally, and following Douglas Skelley (2000) in that models and new interpretations from organisational theory may fit the political and cultural peculiarities of institutions, pluralistic theoretical perspectives relevant to the research problem are discussed with a complementary approach.
The conceptual background allowed the outline of the research scenario with the aim of developing through the research process a descriptive and explanatory multilevel model of the meanings of actors and the dynamics of the adoption and institutionalisation processes of online education, to be discussed in the concluding chapter.
3 Research approaches

In Chapter 3, the research approach of the thesis is presented. The methodology underlying the research is discussed as well as the style adopted by the researcher. Next, the research settings are described. Finally, the methods for data collection and analysis are discussed.

3.1 The interpretive approach

The aim of the thesis is to study and understand teachers and university managers’ opinions and experiences relating to online education influencing sustainable institutional changes; thus the interpretive paradigm within IS underlie the research process. The methodological approaches were chosen in accordance with the research questions (see section 3.3).

The nature of the research focused on describing and understanding the experiences and meanings of university teachers and managers regarding the adoption and institutionalisation of online education, is consistent with an interpretivist epistemological approach and a constructivist ontological view. Interpretive studies hold that people create and/or associate their own subjective and intersubjective meanings when they interact with the world around them. Therefore, interpretive researchers intend to understand phenomena by accessing these meanings and revealing the underlying connections among different parts of a particular social reality. Interpretivism stands on the ontological perspective of constructivism, understanding reality as socially constructed and perceived by its participants who make sense of it through essentially dynamic interrelations. The interpretive approach has recently become much more important in the IS field than it was in the 1990s (Walsham, 2006). In IS research, it aims “at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context… where knowledge is a social construction by human actors” (Walsham, 1993, p. 4).

However, some criticism of the interpretive approach points to its focus on understanding the societal influences, not questioning or changing them, as proposed by the critical approach (Howcroft & Trauth, 2004), the legitimacy of interpretation, or the exclusion of explanations for unintended consequences of actions.
3 Research approaches

3.2 The goals of theory

Theories “aim to describe, explain, and enhance understanding of the world and, in some cases, to provide predictions of what will happen in the future and to give a basis for intervention and action” (Gregor, 2006, p. 616). Generalisability and causality are usually concepts at the centre of theory.

“Generalizability refers to the validity of a theory in a setting different from the one where it was empirically tested and confirmed” (Lee & Baskerville, 2003, p. 221). There is no consensus about the degree of generalisation required in a theory, and in social research, many authors think it is at least questionable, because of the complexity of the problems and the large number of conditions affecting the outcomes (Gregor, 2006).

The level (meta-theory/theory), scope (substantive/formal) and boundaries are indicators of the generality of a theory. Nevertheless, “generalization from the setting (usually only one or a handful of field sites) to a population is not sought; rather, the intent is to understand the deeper structure of a phenomenon, which it is believed can then be used to inform other settings” (Orlikowski & Baroudi, 1991, p. 5).

I must recognise that not all the events in the settings could be observed, analysed and interpreted due to time restrictions and operational reasons. Therefore, the conclusions of the thesis are based on empirical data gathered at particular moments and in particular places. The thesis follows Orlikowski and Baroudi’s belief, gaining a deeper understanding of the adoption and institutionalisation process by studying two particular settings with the aim of providing knowledge, useful in other similar settings.

The concept of causality refers to the relation between cause and event and it is often linked to predictive goals. Traditionally, explanation underlies the mode of reasoning about causality. However, later works reject the narrow association of understanding with causation. Close to cognitive perspectives, Achinstein (1983) characterised explanation as the pursuit of understanding through a communicative process. He defined the act of explanation as the attempt by one person to produce understanding in another, answering a certain kind of question in a certain kind of way (Mayes, 2001).

Research question 1 examines the way in which teachers shape or influence online education adoption in the university domain, and research question 2 identifies changes at the institutional level developed by the adoption. Both questions attempt to clarify the relations underlying explanations of their existence, without being predictive.

Papers I to VI examine the processes, interactions and meanings developed by online education, and where, when, how and why the phenomena of adoption and institutionalisation are likely to occur, providing possible explanations from the interpretation of actors’ beliefs and behaviour. Gregor labelled this type of theory as theory for understanding, because of their emphasis on how the world may be viewed, to understand how things are, or why they are as they are in a particular real-world situation. DiMaggio (1995, p.
391) called it enlightenment. He pointed that “in this view, [theory] is not to
generalise”. Papers VII and VIII focus on explanations and prescriptions of an
IS development.

3.3 A mixed methodological approach

Qualitative, quantitative or mixed approaches are the methodological options.
The power of qualitative research lies in its being generative (LeCompte et al.,
1993) involving discovery and interpretation. This work is based on the
interpretation of everyday activities, motives, intentions and meanings as
perceived and experienced by people, aiming to provide an understanding of
these actions, in a deeper way than can be achieved by a purely quantitative
approach.

Nevertheless, and although a qualitative research approach was judged as
appropriate for the research questions, a combination with a quantitative
approach was used in a mixed methodological choice. Complex contexts and
processes can be better assessed by combining the strengths of different
research methods (Kaplan et al., 1988).

The use of mixed approaches seeks to expand the findings of one’s
strengths with those of the other (Creswell, 2009). Following Creswell (2009), a
sequential strategy can progress from a quantitative phase to a qualitative phase
with a detailed additional exploration involving few cases or individuals, or vice
versa, beginning with a qualitative exploration and followed by a larger sample
to generalise the results. In a concurrent or parallel strategy, both forms of data
are collected at the same time of the study, then, the interpretations of the
overall results are integrated.

Strategies for data collection and analysis can be combined using different
designs. In this thesis, interacting and iterative steps using a combination of
strategies with complementary purposes were preferred.

At the beginning of the study, when performing the literature review for
Paper I, a concurrent strategy with both qualitative and quantitative data
collection and analysis was used.

For Papers II, III and IV, a sequential strategy, initially quantitative, and
qualitative afterwards, was carried out for a deeper study and data triangulation
purposes. A quantitative systematic research process was performed through a
survey. Using questionnaires with a sample of teachers, quantitative data were
gathered with the aim of testing statistically the attitudes towards and purpose
of online education, and changes throughout time were found that might shape
the adoption process at multiple organisational levels.

A later qualitative analysis emerged from data provided by the open
questions of the questionnaire and in-depth interviews with some teachers
enriched the understanding of the scenario.
3 Research approaches

Papers V and VI were written using a mixed approach through in-depth interviews with teachers and managers based on the results of the quantitative analysis of questionnaires. Text analysis of institutional documents was performed to identify and understand formalised changes at institutional level and with additional triangulation purposes. An ongoing project of an online education development allowed the identification of differences among stakeholders and the proposal of guidelines to reduce these differences in Papers VII and VIII.

A challenge in qualitative research is to provide trustworthiness, a concept that involves rigor of the process and relevance of the outcome. Qualitative researchers take the position that situations can never be exactly replicated because they search for understandings in a specific context, and objective reality is rejected by subjective interpretations.

However, Lincoln and Guba (1985) proposed a model for assessing the trustworthiness of qualitative data. The model, accepted among many qualitative researchers, is based on the definition of four aspects of trustworthiness (credibility, transferability, dependability and confirmability) matching the four positivist research criteria (internal validity generalisability, reliability and objectivity) and the identification of the most frequently applied strategies for each of them.

According to Lincoln and Guba (1985), credibility is an evaluation of the research findings’ representation or not of a “credible” conceptual interpretation of the data drawn from the participants’ original data. Transferability is the degree to which the findings of the research can apply or transfer to the community or to other projects. Dependability is an assessment of the quality of the processes of data collection, data analysis, and theory generation. It relates to the issue of ensuring that the data collected are stable and consistent over time. Confirmability is a measure of how well the research findings are supported by the data collected.

Some strategies provide trustworthiness to several criteria. Following Creswell and Miller’s (2000), Krefting’s (1991) and Lincoln and Guba’s (1985) models to establish qualitative research trustworthiness, Table 1 shows the relation of the criteria and strategies proposed by these authors to the assessments in the thesis in order to show trustworthiness of the processes carried on and of the outcomes produced.
Table 1. Summary of criteria and strategies to establish qualitative research trustworthiness of the thesis (based on Creswell & Miller, 2000; Lincoln & Guba, 1985; Krefting, 1991)

<table>
<thead>
<tr>
<th>Qualitative criteria</th>
<th>Strategies</th>
<th>Assessment in the thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credibility</td>
<td>a) Prolonged field experience and engagement of the researcher</td>
<td>More than 20 years in the Argentinian setting and 6 years in the Swedish setting at the time of the research start-up</td>
</tr>
<tr>
<td></td>
<td>b) Time sampling</td>
<td>2007 and 2009 questionnaires and informal interviews in the two settings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2009 in Argentinian setting engaged scholarship</td>
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<tr>
<td></td>
<td></td>
<td>2010 interviews’ scheduled period and document analysis in the two settings,</td>
</tr>
<tr>
<td></td>
<td>c) Reflexivity (researcher background or involvement as bias)</td>
<td>See discussion in in section 3.4</td>
</tr>
<tr>
<td></td>
<td>d) Triangulation</td>
<td>Crosschecking of data and interpretations through different data methods and sources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(qualitative analysis of questionnaires, in-depth interviews at multiple organisational level and institutional documents analysis, all of them in different settings)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Besides confirmation, they provided more complete views of the phenomenon</td>
</tr>
<tr>
<td></td>
<td>e) Information checking with participants</td>
<td>Because of political reasons, each interviewed person checked the documented data and interpretations of their own data. Documented information from the interviews was crosschecked with other interviews of the same setting by the researcher.</td>
</tr>
<tr>
<td></td>
<td>f) Peer examination</td>
<td>Data, interpretations and partial conclusions were discussed with researchers of other universities in Research Seminars 3 and conferences.</td>
</tr>
<tr>
<td></td>
<td>g) Interviews technique</td>
<td>Semi-structured, face-to-face in-depth interviews, supported with a developed</td>
</tr>
</tbody>
</table>

3 “The LMS doesn’t exactly make me a better teacher- Reflections on doctoral research about virtual learning environments”, performed at KTH Royal Institute of Technology, Stockholm, 2011, with the participation of researchers from: Uppsala Universitet, Gotchong Universitet, the Royal Institute of Technology, Jönköping International Business School and Stockholm Universitet.
### 3 Research approaches

| h) Authority of the researcher as measurement tool | Interview guide, documented with field notes. The selection of key-informants was based on positions and functions related to online education initiatives (22 managers and teachers from the four Swedish schools and 12 from the two Argentinean schools) |
| i) Structural coherence | High degree of familiarity with the phenomenon and the setting, and proved research background and experience of the researcher |
| j) Nominated sample | Heterogeneity was focused when seeking explanations about conflictive or inconsistent data, as in qualitative research data are not necessarily consistent but credible |
| k) Comparison of the demographic characteristics of the informants | The selection of key-informants was based on positions and functions related to online education initiatives as stated in the institutional functional charts of both universities |
| l) Time sampling | Teachers and managers from all the involved schools, different ages and both genders were represented. |
| m) Dense description | Dense background information about the context and the internal environment of the research settings is discussed in sections 2.4 and 3.5 |
| n) Dependability external audit | Not applied |
| o) Dense description of data gathering and research methods | See discussion in section 5 |
| p) Stepwise replication | Not applied |
| q) Triangulation | See item d |
| r) Peer examination | See item f |
| s) Code-recode procedure | Testing recode was performed with questionnaires’ data |
| t) Confirmability external audit | Not applied |
| u) Triangulation | See item d |
| v) Reflexivity | See item c |
3.4 Choosing the style of the researcher

As a researcher, I had two options: to import conceptual frames into the research situation or to address the research situation with minimal pre-concepts in order not to introduce bias. The former allows the researcher to work on logically coherent ground, while possible biases weaken the option. The latter, and this was the choice, allows open-minded exploration, which would, in turn lead to the lack of comparability with existing concepts. This could also be seen as a positive feature that may justify a further deepening research.

As explained in section 2.8, I drew on an initial guiding research scenario and a comprehensive literature review instead of a prescriptive perspective for exploring, observing and analysing the complex processes under study. This approach led to a continuing iterative reflection and the re-building of an evolving theoretical approach, in the light of new findings emerging from the data gathered and analysed. This strategy allowed the selection of suitable theories for the interpretation of each part and the whole.

I looked at the phenomena free of pre-assumptions to be able to interpret what I was actually seeing, not what I expected to see, or what I hoped to see. There were no a-priori narrowing hypotheses because they would be connected to the events. An a-priori theoretical frame would have limited what to look at, and the overall aim was not to validate existing theories, but to dig over the surface and interpret the findings.

A qualitative researcher can be an outside observer or an involved participant in the study. One carries out the study mainly through data collection using questionnaires and formal or informal interviews without direct involvement. The latter is seen as a participant observer, not perceived as aligned with a group in the organisation, with economic concerns or strong prior views.

Close involvement is advantageous if in-depth access to people is required, or the researcher gains participants’ motivation as they see that s/he is trying to make effective contributions to the case, e.g. using action research (Baskerville & Myers, 2004). However, some disadvantages have to be considered: action research is especially time-consuming; participants may be less open when perceiving the researchers’ stake and researchers may lose critical distance in valuing their own contribution.

Weighing the advantages and disadvantages, both styles (outsider-involved) were used in this research, according to the situation: the researcher as an outsider in the literature review, survey and interviews performed for Papers I-VI, and an involved researcher in the study using action research for Papers VII-VIII.

In some cases, researchers are likely to misunderstand informants because they do not use a common language, or the knowledge about the studied situation is different. These limitations can be minimised when the researcher has sufficient pre-existing personal involvement in the studied topic (Blaikie,
3 Research approaches

(2000) while taking care not to bias the case. S/he would potentially establish a better rapport (or sympathetic relation) with the actors, enabling a more professional engagement that would result in a rather intense and open interchange about how the processes emerge and develop.

Backyard research (Glesne & Peshkin, 1992) involving my immediate work setting was used. My background as Information Systems Engineer and Master in Higher Education Teaching eased communication with the participants in the study because of the common terminology when referring to online education initiatives. In addition, the fact that I have been working for more than twenty years at the National Technological University and for six years as an invited professor at Jönköping University eased the understanding of the organisational structure and cultural issues and gave access to institutional documents in both settings.

3.5 Working in different countries: the research settings

Two universities, one in Sweden and the other in Argentina, were selected as research settings. Although initial comparative studies were developed on data gathered in both settings, a complementary approach to the settings was lately preferred to a comparative one. Following the definition of complementary as “serving to fill out or complete, mutually supplying each other’s lack” (Merriam Webster, on line), this perspective allowed a more complete picture.

As detailed in the theoretical background, the external context points out significant differences in the governmental policies, funding system and country state of e-learning initiatives. These differences became deeper in the institutional internal contexts as is noticeable in the following section. Exploration of the effects of individual and institutional influences in the adoption of e-learning and the institutionalisation process was encouraged in both environments. The language spoken in the two countries differs, and translation of questionnaires, interviews, and documents to a common language (English) was necessary for analysis and interpretation.

Following Taylor and Bogdan (1998), the proposed qualitative research took place in the natural setting in which the survey was conducted with easy access to data and key informants. My personal research experience and open-mindedness acted during the process as a useful resource for the understanding of emerging perspectives, preventing the imposition of preconceived frameworks.
3.5.1 Jönköping University (JU)

Jönköping University is a private (not state-owned), non-profit institution of higher education with the right to award doctorates. It was created in 1977 but in 1994 changed to the ‘foundation’ type conforming to national regulations and quality requirements.

Kwiek (2008), researcher for the EUEREK Project (European Universities for Entrepreneurship: their Role in the Europe of Knowledge) argued that being a non-state foundation-based Swedish university with equal access to public funding, Jönköping University does not fit the generalised concept of private institutions. Jönköping is exceptional in being eligible for public funds applicable to both teaching and research. "The most important difference is that Jönköping University does not charge student fees and has full access to public research and teaching funds which, from a comparative perspective, makes it similar to public sector institutions" (Kwiek, 2008, p. 3).

It is located in Jönköping, the tenth largest Swedish city and a strategic centre for commerce and logistics activities. Many large international groups and companies are also established in Jönköping. The area is well known as an economically growing region, which emphasises entrepreneurship as a driving force for regional development. Jönköping University comprises four independent schools: the School of Engineering, Jönköping International Business School, the School of Education and Communication, and the School of Health Sciences. The Corporation Laws regulate the four schools’ activities as separate corporate entities with their own boards. A board governs the overall foundation. The governing board is responsible for ensuring the effective management of the university and for planning its future development.

The internal board members include the vice-chancellor, and representatives of the academic staff and student body (Jönköping University institutional website, http://hj.se/en.html).

The foundation status allows Swedish universities greater freedom in staff recruitment and research. More recently, the Government stated a third mission of universities besides traditional education and research: cooperation with society. Each of the four schools carries out the three missions through internationalisation, entrepreneurship and business renewal, technological improvements for industrial companies, a focus on innovative learning and international cooperation. It is a small-sized Swedish university. At the time of the study, 421 employees had spent at least 10% of their time as teachers during the last year. The teachers work as lecturers, assistant professors, associate professors or full professors. In addition, PhD students with teaching responsibilities were included in the study. Three out of the four schools were using the commercial virtual learning environment PingPong™ to support e-

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4 Since 2011, Swedish universities charge fees for non-European students.
3 Research approaches

learning, while the fourth school used an in-house learning platform\(^5\). The e-learning environments integrated features such as publishing course documents, discussion forum, chat, bulletin board, electronic tests and evaluations.

3.5.2 National Technological University (UTN)

The National Technological University began as the National Workers' University in 1948. It was created to solve the problem of the lack of technical specialists in the country at that time. As a distinguishing characteristic still currently in force, students, in all cases, should simultaneously develop a working activity related to their careers for admission to the university. In 1959, the university was renamed as the National Technological University.

It is a public university specialised in engineering, thus it can be classified as a technical university, according to local taxonomy. It is the second largest one in Argentina. From more than 70,000 students, 25,000 are students of Information Systems Engineering.

The UTN can be depicted as a traditional bureaucratic organisation with a strong federal approach, now starting its involvement in educational innovations. It is spread across the country in 29 self-governing Regional Schools (see Figure 5).

The government of the university is divided into executive bodies (Rector, Deans and Department Directors) and collegiate bodies (Superior, Directive and Departmental Boards). These bodies are structured hierarchically, so issues concerning the departments' domain are discussed and approved in the Departmental Boards, issues concerning the school are discussed and approved in the Directive Boards and issues concerning the university are discussed and approved in the Superior Board. All the decisions have to be communicated up or down the hierarchical chain, and executive bodies must carry out these decisions through Academic, Administrative and Research Secretaries (National Technological University institutional website, http://www.utn.edu.ar/institucional).

As the focus of the UTN is technology, all the educational programmes are different specialisations of engineering (e.g. Electronics, Mechanics, Chemistry, and Information Systems). The Department of Systems Engineering prepares engineers in the Information Systems field. About 250 teachers work in the department, most of them under temporary contracts. Among them are full professors, associate professors, and lecturers. There are also supporting staff, such as chief technician and assistants, who assist professors in laboratory sessions and seminars (practical work). According to Finquelevich and Prince (2006), the UTN is an emerging university regarding adoption of educational technology with sufficient technological infrastructure.

\(^5\) In 2011 JIBSNet was cancelled and the four schools now use PingPong.
Figure 5. Distribution of UTN schools throughout the country
3.6 Data collection and analysis

When discussing the theoretical background (Chapter 2), concepts and organisational theories were described together with the complementary and pluralistic multilevel frame that guided the methodological and operational decisions. In the papers of the compilation thesis, the primary research methods were examined to provide support for the results. Nevertheless, because of the publishing limitations, some issues are additionally discussed in this chapter. The chapter ends with a table summarising the methodologies and methods usefully applied in the empirical studies.

Ovaska (2009, p. 162) argued that “a diversity of research methods and paradigms within the discipline is a positive source of strength. This is justified by the notion that diversity provides a wider range of knowledge upon which to base research and theory. This is especially important in a discipline like IS which deals with real world complexities”. Research findings and conclusions supported and triangulated by several sources and data collection methods, are more convincing.

The methods for data collection and analysis used in the empirical studies are reviewed and discussed in the following sections. Data collection processes using multiple methods provided richer and more detailed descriptions.

This work was carried out iteratively in phases following the research questions, making reinterpretations after each stage. Paper II, III and IV were developed in parallel. The emerging findings defined the data collection methods for the next phase, in which data for Papers V and VI were gathered iteratively. Again, the results from this phase directed the selection of data collection in the last phase, during which papers VII and VIII were written.

Regarding ethical issues, individuals’ consent for the study was agreed by consensus. In the questionnaire form, an informed data privacy policy was explicitly written and the respondent implicitly accepted it by answering the questions. Before starting the interviews, the research purposes were clearly explained and anonymity of the respondents’ name was guaranteed. Nevertheless, they allowed information to be identified by their positions.

Because of the opportunity for attending international conferences or the time required for journals’ acceptance, the publishing date of the papers does not coincide with the date they were produced (see Table 2).
Table 2. Instruments used in each paper and actual time of development, related to Research Questions

<table>
<thead>
<tr>
<th>Papers</th>
<th>Instruments</th>
<th>Questionnaires</th>
<th>Informal interviews</th>
<th>In-depth interviews</th>
<th>Institutional documents</th>
<th>Action Research Focus groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Teachers in the two settings</td>
<td>Teachers in the two settings</td>
<td>Key informant teachers and managers in the two settings</td>
<td>From the two settings</td>
<td>Engaged scholarship in one setting</td>
</tr>
<tr>
<td>II</td>
<td>RQ 1</td>
<td>2007 and 2010 (Arg)</td>
<td>2007 and 2010 (Arg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td></td>
<td>2006 and 2009 (Swe)</td>
<td>2006 and 2009 (Swe)</td>
<td></td>
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</tr>
<tr>
<td>IV</td>
<td>RQ 2</td>
<td></td>
<td>2010 (Swe and Arg)</td>
<td>2010 (Swe and Arg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>VI</td>
<td>RQ 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2009 (Arg)</td>
</tr>
<tr>
<td>VII</td>
<td></td>
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<td></td>
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<tr>
<td>VIII</td>
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3.7 The survey questionnaire

Within the selected mixed approach for research question 1, a survey design was preferred for collecting data from a sample of the population of teachers in both universities to make inferences about their attitudes, purposes and experiences. Because of the economy of the design, the relative speed of the distribution and collection phase and the possibility of characterising a large population from a rather small group, the chosen method of data collection was a questionnaire.

The survey was initially designed as cross-sectional, as data were collected at a certain point in time, such as a snapshot. The distribution and collection of both rounds of questionnaires were performed using e-mail, unless the respondent wanted to receive a printed copy for confidentiality reasons, yet the privacy policy was detailed in a covering letter including the purpose of the
questionnaire, the use of the provided information, returning instructions and contact person (see Appendices B and C).

For external validity, the design of the instruments followed the guidelines of previous studies, mainly a large survey performed in the UK (University of Brighton, 2005). That questionnaire was widely used in other goal-similar but contextually different surveys. Not only was it adapted to the contexts of the thesis, but also some more questions were added focusing on more specific issues. Having in mind a combined strategy with qualitative analysis, open questions were included, as a way to explore the respondents' opinions without directing them.

Regarding internal validity, the survey questionnaire was distributed in Sweden during 2006 to the entire population (421 teachers/PhD students) of the four schools of Jönköping University by internal mail. In Argentina, it was distributed at the beginnings of 2007 by personal e-mail to the entire population (200 teachers) in two schools of the National Technological University (UTN). The questionnaire was pre-tested in a similar but small pilot experience and just a few minor changes were required.

The questionnaire gathered demographic data suitable for descriptive statistics (such as age, position, gender, school/career in which the respondents work). It also included eleven closed and five open questions about attitudes towards the use of technology in education, purposes, experiences, support, use of technologies and platforms, individual perceptions about institutional support and future strategies, driving factors and barriers, advantages, disadvantages and perceived attitudes of students and colleagues towards online education initiatives. Open questions were included for further use in a qualitative analysis with the aim of gaining a richer view from the explanations. The closed questions were measured either on nominal scale or five-point Likert scale (from strongly disagree to 'strongly agree' or 'very negative' to 'very positive'. The questions that used nominal scale asked the respondents to tick statements. It was also possible to report options not included in the list. The questionnaire template is displayed in Appendix C.

The purpose of the first survey was to verify whether the drivers and barriers as well as the attitude, intention and purposes of use of online education modality coincided (or not) with the existing quantitative studies. In addition, qualitative data encouraged interpretations and explanations of figures while open questions allowed hidden factors to emerge, which were not considered in the closed questions.

A second round of data collection was performed three years later in both settings. The questionnaire used in 2009-2010 was similar to the one used in 2006-2007, in order to gain comparable results. However, some minor changes were necessary, mainly for updating reasons. For example, in 2006-07, distance and blended education were not proposed as options because those modalities were at that time in a very immature state, and in 2009-10, Internet
conferencing and mobile technologies were added as options considering the improvement of their use among teachers and students.

The population of teachers answering the questionnaire was also similar to the one surveyed in the first round, with the double purpose of a follow-up study to undertake a deeper analysis and to determine whether the hindering as well as driving factors were still the same or whether any differences or changes could be found. It can be argued that after three years, the population might not be the same, but a major number of teachers still held their positions according to the mail list used in the questionnaire delivery.

The chronological steps for the two surveys, were in practice the same, although they were first developed in the Swedish setting and six months later in the Argentinian setting because of the difference in the course period (northern and southern hemisphere):

- Identification of the available sample of teachers to respond to the questionnaire
- Questions wording, sequencing, scaling and translating (English, Swedish and Spanish)
- Pre-testing of questionnaires with a small sample of volunteer teachers
- Distribution by e-mail
- Reception of answers and archiving
- Printing and coding
- Data loading using statistical software (SPSS™)
- Data processing and quantitative analysis
- Qualitative interpretation of nominal and open questions
- Cross-checking with interviews’ information

3.7.1 Questionnaires analysis

The population was clustered according to schools or careers, and stratified according to demographics. The response rate in the Swedish setting was 38% (159 respondents). It cannot be fully conjectured why 62% of the staff chose not to complete the questionnaire. However, it could be hypothesized that a plausible explanation for the low response rate was that teachers with a negative attitude towards e-learning chose not to respond. Open questions about how the respondents perceive their colleagues’ attitudes towards e-learning underpin this hypothesis.

Of the respondents, 32% believed that the attitudes of the staff differed to a large extent. As most of the respondents were positive towards e-learning, it can be concluded that, except for the respondents, there must have been negative teachers choosing not to answer the questionnaire. Another possibility, captured from the informal interviews, is a certain degree of fear about lack of confidentiality.
In the Argentinean setting, although the response rate was higher, 55% (110 respondents), the explanation for the low response rate was in line with the Swedish case. After collecting the questionnaires, some professors were informally interviewed about their reason for non-response. The generalised response was that not answering was a way to show a very or rather negative attitude towards e-learning, instead of stating this in the questionnaire.

Quantitative analysis was performed using the SPSS™ software package by computing frequencies of the responses for each of the items of the questionnaires in both settings. A comparative analysis between the results from the first and second rounds in both settings was performed. An additional cross-tab analysis was used to explore whether factors, such as age, individual positiveness and context encouragement, were related to some pattern of use of online education.

Descriptive statistics, rate of changes and correlations as a measure of non-causal relationships among defined constructs were applied to the questionnaire data. The aim was not to testing hypotheses but to find differences in patterns between the research settings. Accordingly, qualitative analysis of differences over time was developed complementarily. Following Miles and Huberman (1994) and Sieber (1973), quantitative methods helped to show the generality of specific observations, linking quantitative and qualitative data in a multi method design that allowed the description of a situation and the changes occurring over time.

After four years of technological and contextual changes, a positive shift in teachers’ attitude towards online education and greater confidence in working with constantly improved virtual environments could be discerned. The increasing perception of institutional strategies addressing the concerns reported in the first round questionnaire (e.g. lack of institutional support and lack of time) marked sustained growth of their involvement in adopting online education. Although the use increased by almost 80%, the purposes continue to be mainly administrative and not pedagogical.

More complete details of the findings are displayed in Papers II to VI. As an overall conclusion, it can be said that after four years, there are still key factors that have to be faced when developing online education. These factors are of a strategic nature and the way to handle them seems to be more political than technological or pedagogical.

### 3.8 In-depth interviews

A consequence of the second questionnaire analysis was the emergence of clear teachers’ perceptions of involvement in online education initiatives of the university managerial level’s. In the first questionnaire performed three years earlier, the perception was the opposite. This finding fostered an emphasis of questions about this change using interviews.
In-depth interviewing is referred to as nondirective, semi- or unstructured face-to-face encounters between the researcher and the selected informants. Following Taylor and Bogdan (1998), the aim was to understand participants’ perspectives, experiences or perceptions about the situation under study. Moreover, descriptions of activities that could not be directly observed because they had already happened (historical information) or there was no possible access to them because of normative constraints were captured. In addition, the semi-structured interview approach is useful for eliciting information about specific topics while allowing the emergence of new ones (Hannan, 2007).

It is important to consider the limitations of interviewing. It cannot be entirely assumed that what a person says to the interviewer is what the person believes or will do, and sometimes interviewers have to make assumptions about unobserved things. This limitation was controlled with triangulation of data with institutional documentation.

As stated in Table 2, research question 2 was addressed using a qualitative approach under an interpretive perspective. In accordance with Maykut and Morehouse’s assertion that “data of qualitative inquiry is most often people’s words and actions, and thus requires methods that allow the researcher to capture language and behavior” (1994, p. 46) and their suggestion of applying in-depth interviews validated with documental collection and analysis, both instruments were used.

The interviews were performed during 2010 in the Argentinean and in the Swedish university, mainly as conversations rather than as formal question-answer exchange, to establish a comfortable atmosphere.

Within a flexible research design, neither the number nor the type of informants needs to be specified beforehand (Taylor & Bogdan, 1998). According to these authors, there is an inverse relationship between the number of informants and the depth of the interviews. For that reason, the number of informants was limited to 22 in the Swedish university and 12 in the Argentinean university. The informants were located from institutional documentation stating positions and assigned functions related to online implementations from both the teachers’ and the managers’ level.

The choices of teachers and managers were based on the assumption that multiple organisational levels representing not the quantity but the quality of data gathered sustained trustworthiness (see Table 3).
Table 3. In-depth interviews’ key informants

<table>
<thead>
<tr>
<th>Research Setting</th>
<th>Number of informants</th>
<th>Position of informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jönköping University (Sweden)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RFL (Resource Centre for Flexible Learning)</td>
<td>1</td>
<td>- Coordinator</td>
</tr>
</tbody>
</table>
| School of Engineering | 3 | - Acting Educational Director  
  - 2 teachers |
| School of Health Sciences | 6 | - Dean  
  - Deputy of Dean  
  - Head of Department  
  - 3 teachers |
| International Business School | 5 | - Associate Dean for Education  
  - 4 teachers |
| School of Education and Communication | 7 | - Educational Director  
  - Director of Education Program  
  - Technology administrator  
  - Single-subject courses administrator  
  - 3 teachers |
| TOTAL | 22 |                        |
| National Technological University (Argentina) |                        |                        |
| University authorities | 2 | - Secretary of ITC  
  - Technology Coordinator |
| Bs.As. School | 5 | - Academic Secretary  
  - Online Education Coordinator  
  - Secretary of Postgrade Studies  
  - Head of IS Department  
  - Teacher |
| Gral. Pacheco School | 5 | - Vice-Dean  
  - Pedagogical Coordinator  
  - Technology Coordinator  
  - 2 teachers |
| TOTAL | 12 |                        |

Interviews were conducted at the interviewees’ workplace having previously made an appointment. They were scheduled to last for two hours, allowing a thorough examination of the planned topics without tiring the interviewees. The sessions started with a brief on the purpose of the interview and the use of interviewer’s contributions, followed by the way in which the responses would be documented. As most of the participants systematically rejected tape recording, field notes were written down during the interviews. Some of the participants, in both settings, provided supporting institutional documentation, e.g. reports, brochures, boards’ resolutions, university policies, and government...
programmes. Data collection and analysis were in some cases concurrent
processes, as the findings in certain interviews, redefined the emphasis on
themes in the next ones.

A basic interviewing guideline was built taking into account the
questionnaires previously distributed to academic staff to compare the
perceptions of teachers and institutional authorities over time. To unfold
participants’ interpretations and facilitate the sensemaking analysis process,
questions tended to be open-ended. Nevertheless, I was still free to explore
and add emerging or interesting questions during the interview, digressing from
the guideline structure. Moreover, the interviewees were encouraged to broaden
the topics or express their opinions freely, as they would be identified only with
coded names to guarantee anonymity.

The planned topics of the interview guideline were:

- Personal background of the interviewees
- Institutional context, external and internal, as an encourager and provider
  of funds and organisational structures to sustain online education adoption
- Online education implementations; perceived institutional purposes for
  the adoption of online education, the sequence of the process, institutional
  support for or encouragement of teachers’ adoption of the modality
- Historical review of the process from the interviewee’s own experiences,
  the earlier stages of adoption regarding the own close context, readiness
  because of previous related experiences etc.
- Personal view of online education future perspectives

An insider interviewer conducts interviews with individuals or groups of which
s/he is also a member (Kanuha, 2000). This insider knowledge is advantageous
to the understanding and interpretation of human behaviour. Nevertheless, I
adopted a more reasonable position held by Witcher (2010), as a relative insider
sharing some, but not all, knowledge with the interviewees, because of natural
diversity.

Familiarity with the terminology because of my background and
membership of both universities placed me in a privileged position that enabled
sensitive transcripts faithful to the words of the participants, enhancing
the quality and integrity of the interpretations and contributing to the
trustworthiness of the process and findings.

As the interviewer, I took on the role of a facilitator, encouraging the
interviewees to speak. However, I was especially careful not to induce or judge
responses or attitudes. The selected strategy, known as funnelling, was to move
from general to specific topics and from broad to narrow perspectives. To
depthen the response to a question or to increase the richness of the data
provided, further or more specific examples were required from the interviewee.
To avoid misinterpretations, interviewees were frequently asked for
confirmation of the researcher’s interpretations.
3 Research approaches

3.8.1 Interview analysis

As explained, the interview’ data were registered using handwriting notes taken while performing the interviews as transcripts. Interpretive research approaches view transcripts as contextual theoretical constructions rather than objective representations of reality (Lapadat, 2000). A transcript is one possible representation, and it cannot be expected to reproduce accurately all the aspects of a speech or objectively reproduce the exchange between interviewer and interviewee. Transcription refers to the transformation of spoken discourse into a written form amenable to analysis. A literal rendering is most frequently impossible (Wood & Kroger, 2000). However, Poland (1995) argued that transcription is a key contributor to data quality and process rigour as well as reflexivity, contributing to the credibility of findings.

Because the number of interviews allowed manual coding and content analysis was not useful to the interpretive perspective of the study, no data analysis software was used.

Although listed as a linear procedure, the following steps were carried out as an iterative and reflexive process in order to complete the analysis phase:

1. Reading/re-reading of transcriptions for patterns recognition
2. First level coding: organisation of a-priori defined themes and identification of emergent units of meaning (words/paragraphs).
3. Second level coding: reformulation of the empirical concepts into theoretical concepts
4. Grouping of concepts into categories and corroboration of coded themes
5. Analysis: building of a model of understanding by looking for coherence and differences.

Template analysis (Crabtree & Miller, 1999; King, 2004) is a particular method of thematic qualitative data analysis from any kind of interviews transcription. The template organizing model is more focused than other analysis methods because it helps the researcher to focus on specific parts of the text (Schmidt & Dyhr, 2008). It was therefore, the selected technique for this study. The template is not the product of the analysis but a helping tool for interpretation. It allows the prioritisation of themes to examine them within individuals’ context as well as across participants, in order to avoid overwhelming amounts of details.

A coding template was used to summarise the relevant categories and subcategories as stated by the interviewees. Categories were derived from the themes proposed in the research objectives, and were organised in a meaningful way. The initial coding strategy usually starts with hierarchical categories, from broad to narrow and specific themes. This strategy allowed text analysis at different levels of specificity. Higher-order codes provided a general overview, while detailed codes enabled distinctions within and between interviewees.
Developing these codes was part of the analysis process as they emerged from data instead of a fixed set.

The report summary adopted the format of a matrix to obtain a more integrated view and display relevant example paragraphs visible together with coded data. Rows and columns helped in finding and showing relationships or outliers as suggested by Nadin and Cassell (2004). Selected segments of the conversations draw illustrative examples in the reports included in Appendices E and F.

Following Maxwell (2005), outlier cases were also interpreted, increasing the theoretical validity of the study. Nevertheless, qualitative research requires reflexivity on the behalf of the researcher, reflecting his/her own involvement and the shaping influence in the research process.

Following Dervin (1983), making meaning of the interview data intended an interpretation of individuals’ construction of a sense about a time-space reality that allowed them to move forward. The members of an organisation act in different ways when facing a new situation and developing sensemaking processes. The research focused on analysing the meaning that teachers made of the concepts they used to challenge or define the new reality of online education innovation in their work environment.

As a result of the interview’ reading and interpretation, sensemaking processes were initiated when teachers as individuals perceived the inadequacy of their current understanding of events and they reacted by trying to understand the link between the prior and the current situation. Embedded in the university context, in which organisational culture and institutional power define environmental constraints, teachers’ personal identity, experiences, drivers and barriers allowed them to make retrospective sense of the situation. Building through attitudes (more positivism to innovation), new knowledge (training and experiences in using the innovation) and beliefs (innovation as a market opportunity or social responsibility in responding to students’ demands) helped them to cope with the change.

A sensemaking process was carried out as connected sequences of enactment, selection and retention activities. After noticing the disruption, teachers started the enactment process by looking first for reasons in institutional constraints, cultural traditions or environmental pressure.

Weick et al. (2005) made clear that this step deals with the question what’s the story here? To answer it, bracketing of raw institutional data and labelling past experiences allowed teachers to identify enacted interpretations that worked before (retrospection) and/or equivocal data as raw data to be interpreted. In the selection step, Gioia and Mehra’s (1996) prospective sensemaking was used, by teachers and managers attempting to make strategic sense of the future and its opportunities (a business opportunity, the way to hold their position in the future). In the retention phase, the institution stored successful sensemaking, embedding it into its structure as gained knowledge.
3 Research approaches

The sensemaking interpretive strategy started by raising questions about common or rare facts. Then, the findings were structured around the main themes and the identified categories. Interviewees’ confidentiality was respected throughout the transcription and analysis processes. Comments are attributed neither to individuals nor to real names of schools (identified from now on as A, B, C and D in the Swedish setting and M and N in the Argentinean setting). RFL (Resource Centre for Flexible Learning) centre of the Swedish university preferred to be mentioned.

The concepts for each theme were intended not to be too numerous to keep the interpretation and sensemaking under control. Irrelevant or scarcely mentioned concepts were specifically studied and after a selection, only outliers were included.

Categories and subcategories of concepts were classified within four themes following the questionnaire spirit, framed by the theoretical concepts of the research questions: institutional context, online education initiatives, retrospective of the adoption process and personal prospective view of online education institutionalisation.

The institutional context item allowed the identification of the funding support sources and the teachers’ perceived changes in organisational structures as consequence of the adoption of the innovation. Data about online education initiatives confirmed teachers’ perception of the existence or non-existence of institutional strategies, the adoption flows, the drivers and the barriers to the individual adoption. The storytelling about the historical retrospective of the process revealed the initial scenarios of teachers’ individual attitudes towards online education, as well as the personal experience with distance learning initiatives and/or related technologies as influencing factor in the adoption. Finally, teachers’ own view of future perspectives of the innovation clarified the fostered progress of the institutionalisation process and enabled issues to be solved.

The themes and first-level categories are the same in both matrices, but the sense making in each setting pointed out slightly different second-level categories of concepts. The analysis matrices of both settings can be found in Appendices E and F.

The findings in the Swedish setting are extensively discussed in Paper VI. As an overall picture of meanings made by the interviewees, sensemaking processes were carried out at different times and I different ways, developing different outcomes in each school. The engagement with online education initiatives of the interviewees from schools C and D is remarkable, counterpointing the low degree of involvement of interviewees from schools A and B.
3.8.1.1 The Argentinean interviews analysis

The Argentinean findings, because of paper size limitations, could not be discussed extensively in Paper V. Consequently, I will devote this section to a more detailed presentation of the sensemaking analysis and interpretation in the setting.

Although online education adoption currently tends to converge to a unique platform adoption, the processes flowed very differently in each of the three studied environments within the same Argentinean setting. Disruption was noticed at different moments and from different source in each.

As stated, the first group of interviewees was selected from the top management environment in the main central building of the university. There, decisions are made to be applied in all the dependent schools. However, within the frame of autonomy each of them has by creation statutes, decisions can be implemented discretionally. The other two groups of interviewees consisted of teachers and managers of two schools located in Buenos Aires.

According to storytelling confirmed by institutional documents, in the central university building online education was foreseen at the beginnings of the decade as “a technological challenge for a technological university”. Though the tools were still immature, the initiators group tried alternatives, one after the other, starting all over again after each failure. The two Argentinean schools started with low-level technology education encouraged by teachers’ individual interests.

Around 2005, the overall picture was chaotic: central management without finding the path to a successful development and schools geographically dispersed through the country running parallel but isolated individual initiatives.

A governmental funding programme (PROMEI) launched in 2005 allowed a second cycle of online education adoption. The three environments’ interviewees reported that everybody quickly made sense of the economic opportunity to obtain resources. At the same time, in school N another research revealed that working duties were the main cause of students’ dropout, raising a social concern.

In addition, 2007 was the national election year and political issues were a significant factor in any decision. In the UTN, by nature since its creation a bureaucratic and politicized university, contingency influenced the internal decisions of adoption of a centralised platform.

Similarly to those of the Swedish setting, the findings showed that sensemaking processes were carried out at different time and in different ways, developing different outcomes in each school. Sensemaking was not accomplished as an evolving continuing process along time, standing on a first failed cycle that served as retrospection to the second. School teachers never came to know about development attempts in the central management of the universities.

As confirmed by the document review, bureaucratic procedures were followed and resolutions were written, but they were never properly
communicated. At the same time as formal decisions were made, teachers in schools were developing individual initiatives at their own cost and effort because they ignored the existence of those strategies and economic support.

The support from colleagues and in the case of N, the encouragement of a small group of initiators, characterised the sense made about online education as challenging innovation in both schools during the bottom-up first phase of individual adoption. The grassroots diffusion pattern and strong ties among close groups fit the process, as happened in the Swedish setting.

Nevertheless, the meanings changed radically as a consequence of the external funding driver and in the case of N, the social issue of students’ dropout because of working.

The process can be modelled as a stream coming bottom-up from the teachers’ level in the form of decentralised individual initiatives actually working, and a top-down flow of strategies and norms coming at the same time from the highest decision level disconnected from actual implementations. Finally, the two streams met gently and a new culture of innovation slowly but effectively becomes embedded in this traditional institution.

The organisational structures changed significantly at the high central level of the university, but the drivers resulted in different outcomes in the two schools. The one that adopted online education and the centralised platform as a ‘political gesture’ accompanied the decision only with the creation of a pedagogical and not a technical support centre, criticised by teachers as being ‘light’ on knowledge. N school instead, developed a strong technical and pedagogical support unit, based mainly on the willingness and enthusiasm of the initiators’ group rather than on economic incentives. The little money available was used for hardware equipment.

Contrary to Swedish teachers, the ownership of didactic materials seems not to be a deep concern for Argentinean teachers. Knowledge and past experiences of using online platforms did not provide retrospective sensemaking, as most of them did not have any experiences.

However, communication failures made the difference in the second cycle of sensemaking at the managers’ level. Prospective interpretation was used only in school N, as the sensemaking there was guided by the opportunity to solve the problem of student’ dropout and not by institutional constraining frames as was the case in school M.

Institutionalisation also ran on different paths. In school M, the traditional culture of on-campus education was stated as ‘the goal’ not to be missed. It could be further analysed whether the argument was raised as a flag for an underlying political strategy of disagreement. It could be clearly seen that the sense about an organisational frame of tradition was not the same interpretation as in the Swedish setting. In N instead, blended or full online courses were administratively recognised in the same way as on-campus courses, showing an advanced but isolated level of institutionalisation.
3.9 Institutional documents collection and analysis

Document collection and analysis constitute a social research method whereby something written can be read and re-read relating to aspects of the social world. The data from documents can be quantitatively analysed using content analysis, or qualitatively analysed using interpretive analysis of accounts, allowing a deeper understanding of the social world (Ahmed, 2010), depending on the aim of the study.

Among the different sources of documents available, official documents from the universities were used because they are objective statements of strategies and facts. All of them were provided by university managers, published in publicly accessible media (institutional website and/or printed format), and in the Argentinean case they were numbered in accordance with administrative procedures and signed by the designated authorities.

The documents were collected during 2010, simultaneously to the interviews in both settings being performed. They were analysed in depth some months afterwards.

A step-wise analysis of the collected institutional documents was performed with the aim of finding evidence of institutionalisation strategies. At the same time it would allow the verification of the interpretations of the interviews with teachers and managers. Miles and Huberman’s (1994) suggested processes were applied. The document data were organised, sorted and coded for reducing. Then, the data were displayed using a document analysis worksheet based on the model proposed by the National Archives (online) to facilitate the drawing and verification of the conclusions. The list of analysed documents and a sample worksheet are included in Appendix G.

The Argentinean set was made up of Superior Board resolutions, articles in the institutional journal, managers’ reports, presentation letters of the virtual campus project and statistics from the Virtual Global Campus. The Swedish set consisted of reports from RFL, JU schools’ strategy plan 2009-2012, statistical institutional reports, Web information on online courses, institutional brochures and organisation charts.

The UTN documents were all in Spanish language but Jönköping University’s documents were written in Swedish or English; therefore, native-speaking collaborators helped in translating the Swedish ones into English and the analysis could not be performed as deeply as in the case of my native language documents. The Swedish university documents confirmed interviewees’ storytelling without uncovering any unclear situation as was the case with the Argentinean documents.

The creation and mission statement of Argentinean university units devoted to online education development were unquestionably found in early resolutions and they set out the bureaucratic spirit that guides any decision in
the university. New units and their hierarchy dependence have been created and modified several times. However, the mission and functions were generically defined without stating operational guidelines, control and evaluation of their performance until 2007. At that time, the whole initiative was located under the PROME1 programme and the Government would ask for visible results to deliver funds.

In accordance with the purpose of using documents as a source of formal institutional information, the analysis provided an invaluable basis for triangulation. The storytelling from interviewees was largely confirmed. In addition, in the Argentinean university case, the importance of communication as a critical success factor was stated: the existence of profuse formal documentation did not lead to the diffusion of the information.

3.10 Working in collaboration with the stakeholders

Boyer (1990) introduced the perspective of engagement of Higher Education researchers and society in the 1990s as a two-way interaction between the academy and the outside world, extending the university to the community. Later on, the concept of scholarship of engagement evolved from the collaborative generation of knowledge to include the connections between theory and practice (Boyer, 1996), following Schön (1983)’s distinction of knowing-about-practice from knowing-in-practice. In an earlier work, Holland (2005) viewed engaged scholarship as incorporating multiple perspectives and approaches to difficult problems.

Recently, Van de Ven (2007) reinforced the debate assuming that academic and professional knowledge, although different, constitute closely related domains. “Research knowledge should be useful for advancing science and practice” (Van de Ven, 2011, p. 387), connecting scholar researchers and practitioners whose kind of knowledge and perspectives are more insightful when working engaged than working alone.

Engaged scholarship, as defined by Van de Ven, is “a participative form of research for obtaining the different perspectives of key stakeholders (researchers, users, clients, sponsors and practitioners) in studying complex problems” (2007, p. 9). It involves studying complex problems with and for practitioners and collaboration to produce knowledge and practices from different perspectives to learn and gain a better understanding of a problem domain through the interaction of researchers and stakeholders. The approach seems suitable for stimulating communication between scholar researchers and practitioners in problem formulation, problem solving and implementations within the IS research field.

Van de Ven argued that the gap between theory and practice can be addressed in three complementary ways to frame it: knowledge transfer, science
and practice as distinct forms of knowledge, and knowledge production. “They provide complementary insights for understanding reality... It is easy to see the need for a pluralistic approach to knowledge coproduction among scholars and practitioners” (Van de Ven, 2007, p. 4). Accordingly, “scholars need to develop and exploit new forms of knowledge production that facilitate and leverage interactions between practice and theory to develop scientific as well practical knowledge” (Mathiassen & Nielsen, 2008, p. 5). Moreover, Edmonson (2011) advised researchers to meet people in the setting, learning from different perspectives and expertise, to gain novel insights.

Van de Ven’s (2011) diamond model relates four activities:
- Problem formulation: situating and diagnosing the research problem, by “talking with people who experience and know the problem as well as reviewing the literature on the prevalence and boundary conditions of the problem” (p. 388).
- Theory building: developing plausible alternative theories to address the problem in its particular context, engaging relevant knowledge experts.
- Research design: collection of empirical evidence from participants who can provide access to data.
- Problem solving: transferring knowledge, interpreting different meanings and negotiating with participants to reconcile conflicting interests.

**Research Question/Purpose**

<table>
<thead>
<tr>
<th>Research Perspective</th>
<th>To Describe/Explain</th>
<th>To Design/Intervene</th>
</tr>
</thead>
<tbody>
<tr>
<td>detached outside</td>
<td>Basic Science With Stakeholder Advice 1</td>
<td>Policy/Design Science Evaluation Research For Professional Practice 3</td>
</tr>
<tr>
<td>attached inside</td>
<td>Co-Produce Knowledge With Collaborators 2</td>
<td>Action/Intervention Research For a Client 4</td>
</tr>
</tbody>
</table>

*Figure 6. Alternative forms of engaged scholarship (from Van de Ven, 2011)*

According to Van de Ven (2011), engaged scholarship can be practised following four approaches (see Figure 6), depending on the purpose (describe, explain, design and evaluate, and intervene) and the involvement of the researcher (outsider, insider):
3 Research approaches

1.- Informed basic research: inside informants and stakeholders play an advisory role while the researcher directs all the research activities;

2.- Collaborative basic research: researchers and stakeholders co-produce knowledge (not an applied orientation);

3.- Design and evaluation research: examines “normative questions dealing with the design and evaluation of policies, programmes or models for solving practical problems” (p. 390);

4.- Action research: defines an “intervention approach to diagnose and treat a problem of a specific client” (p. 391), based on a learning strategy of researchers and stakeholders, by engaging and intervening in the client’s setting. This approach requires intensive interaction, training and consulting by researchers with stakeholders.

Within the IS research domain, Mathiassen (2002) proposed three approaches of engaged scholarship in line with Van de Ven’s model, based on the underlying knowledge interests:

- Practice research: focused on understanding IS practices.
- Design research: focused on designing artifacts and methodologies supporting stakeholders’ needs.
- Action research: focused on changing IS practices through problem-solving of a specific client need.

The approach bridges the gap between theory and practice by applying the principle of learning by doing. In addition, it is oriented to medium term objectives of scientific contribution through active collaboration of the researcher and the stakeholders of the project, who now turn into co-researchers.

3.10.1 Action Research

Action research, an engaged scholarship approach proposed by either Van de Ven or Mathiassen, is also known as participatory research or active learning through contextual action. Its origins can be traced to 1946, when Kurt Lewin argued that actual social problems could not be investigated under laboratory conditions. He defined it as comparative research of the conditions and effects of various forms of social action, using a spiral stepped process, each step of which is a cycle of planning, action, and findings of facts about the outcome of the action.

Towards the 1970s, different schools undertook action research (contextual action, radical action to overcome imbalances of power, feminism, marginalisation, or educational research). More recently, several works have
encouraged action research in the IS field (see for example Baskerville & Myers, 2004; de Vries, 2007; Nielsen, 2006).

It is not the combination of a first stage of research and the subsequent implementation and testing of results. It involves the follow-up and description of the process itself, whereby continuous learning results in experiences and participants’ new knowledge, although they are not always successful outcomes.

Susman (1983) proposed the initial theoretical model (see Figure 7). It begins with the identification of a problem, data collection and diagnosis. Then, using group techniques for generating ideas, possible solutions are proposed, evaluated and discussed until a single plan of action is selected and implemented. Data are collected and analysed throughout the entire intervention process, and the results are evaluated. Theoretical interpretations lead to specific learning of all the participants. If necessary, the problem is reconsidered iteratively.

![Figure 7. Action Research Model (adapted from Susman, 1983)](image)

Babbie (2003) considered that the study of particular cases is the form with which a researcher can study interactions, meanings and rules in a particular context over which he has little control. Action research focuses on examining the changes by running a process and obtaining conclusions about it. The researchers collect data to identify problems, addressing the underlying causes.
After designing and implementing a solution to the studied problem, additional data are obtained and analysed. The appropriateness and usefulness of the implemented solution or the subsequent design of a new action in a cyclical process is discussed to achieve acceptance from the researchers or from the destination context of the solution (Whitman & Woszczynski, 2003).

A previous pilot project to design a prototype of educational software in 2007 in one of the schools in the Argentinean setting brought evidence of the disjunction between the mental models of the members of the development team, the users and the stakeholders. It could be detected in the logical design phase influencing the quality of the software product. The interacting actors (or stakeholders)’ backgrounds and the multidisciplinary characteristics of the team involved in the development stressed the integration process. Many technological improvements on e-learning initiatives arose since the early implementation experiences, but designing problems remained unsolved at the time of the thesis.

A new non-experimental implementation project for online education began in 2009 during the development of this work, generating the opportunity to provide a clearer understanding of the implementation process of an online education initiative.

The aim of the ongoing study was the implementation of an alternative blended-learning modality for a pilot course, to provide a solution to the situation of working students. An open source technology platform following international standards was selected. The research process systematized and documented the challenge and the collaborative experience of the teachers, technicians and students involved in the development.

Regarding the setting’s contextual background, most Argentinean universities are characterised by having, since their creation, as is the case of the UTN, a universe of students who enter their career while having working duties at the same time. This situation increases in advanced stages of the career. Thus, they have to combine work with their academic studies. Faced with a globalising world, in which time is not an abundant resource, ensuring time availability for education is not a feasible option for many, especially when many of the course offers are restricted to specific and inflexible times and spaces.

The development process of the software application was studied following the action research approach within the engaged scholarship perspective. The client was a specific school of the National Technological University and the goals had been clearly stated: implement an alternative blended-learning modality for a pilot course, to solve the problematic situation of working students.

The study included deep engagement of the researcher and stakeholders, collaboratively seeking an explanation or interpretation of the operational data. The participants’ group was made up voluntarily but the project leader previously defined the required roles. The group included:
- An expert in Education Science, to monitor pedagogical interests
- Two teachers, at that moment in charge of the developed course. In the second stage, one of them was appointed as local administrator within the institutional structure
- An institutional representative of strategic policies and financing issues
- Two informatics professionals in charge of the design and development of the software (one was the project leader)
- Two students (one beginner and one advanced) as final users
- Myself, as the involved researcher, with solid background in Education Sciences and Informatics and working as a teacher at the school.

For triangulation purposes, this study included many different types of data to describe and analyse interactions within a particular context. Data about the entire process of an online education implementation were collected through interviews, documents and focus group discussions. They allowed a significant reduction of the disjunctions among the individual mental models, addressing a harmoniously agreed view of the goals of the project outcome.

The actors listened to each other. Therefore, conducting and moderating the focus group did not constitute a great effort to the involved researcher and in many cases the result was not only harmonising but also motivating. New ideas and different perspectives arose regarding the compatibilisation of goals. They were systematically documented, reviewed and analysed by the group. A detailed report of the results can be found in Paper VIII.

3.11 Summary

As argued in Chapter 2 that online education adoption and institutionalisation should be considered as complex phenomena, the use of complementary data collection methods and their benefits and challenges were discussed in this chapter. The whole study adopted a flexible research design and the intended plan resembled a road map more than a schedule.

The methodological issues that guided the choice of these methods were initially introduced. A summary of the research frame connecting the data collection methods and analysis perspectives with each research question is presented in Table 4.
Table 4. Research frame summary

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Research approach</th>
<th>Data collection methods</th>
<th>Data analysis perspectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ 1: Which factors influence or shape teachers’ adoption of online education in universities?</td>
<td>Mixed (Sequenced quantitative- qualitative approaches)</td>
<td>Cross-sectional survey using pre-tested questionnaires on the entire population of four schools in the Swedish setting and two schools in the Argentinean setting in 2006</td>
<td>Statistical analysis followed by interpretive sensemaking analysis of statistical findings out of the interview data for trustworthiness and explanatory purposes</td>
</tr>
<tr>
<td>RQ 2: Which changes at organisational level are developed by online education adoption and institutionalisation in universities and how?</td>
<td>Qualitative</td>
<td>Non-directive, semi-structured, face-to-face formal in-depth interviews with individuals or small groups of key-informants Conversations documented as field notes (tape-recording was not allowed by the participants) Institutional documents collection</td>
<td>Template-based sensemaking analysis of the interview notes Document worksheet analysis</td>
</tr>
<tr>
<td>RQ 3: How can individuals and institutional purposes be harmonised to facilitate online education implementations?</td>
<td>Qualitative (engaged scholarship)</td>
<td>Action research in an ongoing implementation Focus group discussions Individual and group interviews documented as field notes (tape-recording was not allowed by participants)</td>
<td>Template-based sensemaking analysis of individual interviews and focus group sessions in an ongoing implementation</td>
</tr>
</tbody>
</table>
4 Summary of the Papers

The research questions were addressed in a collection of published papers. A summary of each is provided in section 6.1. Each paper not only produced valuable results, confirming or revealing outcomes when addressing a specific research question, but they also operated as inputs to the others papers.

Initially, Paper I confirmed the needs for further research in the discipline field regarding the specific topic of online education in universities and the intertwined linkage of organisational levels in the adoption process.

Papers II, III and IV addressed research question 1 in the Swedish and Argentinean settings, revealing at the same time, teachers’ fuzzy perceptions of changes in the institutional attitude towards involvement, strategies and encouragement to a more formal and intense use of e-learning.

Those teachers’ perceptions motivated research question 2, addressed in Papers V and VI, uncovering perceived and formalised organisational changes in both settings.

Interpretations of interviewees’ storytelling during the data collection in the Argentinean context fostered research question 3. The lack of common goals envisioning of online education among the stakeholders was therefore studied to find clues to reduce the mismatch. The results are presented in Papers VII and VIII.

Paper I: Exploring the current theoretical background about adoption to the institutionalisation of online education in universities: needs for further research

This paper has been summarised in section 1.3.3

Paper II: Professors’ driving and limiting factors for the adoption of e-learning in Higher Education within Argentine context

The driving and limiting factors as well as the attitudes, purposes, experiences and perceptions of institutional support were explored by designing and distributing a questionnaire among professors from engineering careers at the National Technology University in Buenos Aires, Argentina, as an emergent country. A comparative analysis was performed on data collected using questionnaires as well as an overall comparison with previous studies carried out in developed countries. The template for the questionnaire is displayed in Appendix C.
It was concluded that though not all the professors are involved in e-learning, this does not necessarily mean that they do not believe that it is important and it is a road opened to the future in Higher Education context. The number of significant problems associated with institutional culture, support and lack of strategies appeared to be very significant.

According to the country educational environment (students working while studying at university and professors holding several jobs), the main purpose of using e-learning is communication with students and the main driving factor is enabling more active student participation. Due to this context, asynchronous communication is largely preferred over synchronous communication.

Although the high ranked barriers (lack of knowledge about technology and lack of incentives for teachers) seemed to belong to individual concerns, they were apparently a consequence of institutional culture and politics. The development and support of e-learning reside on individual or subgroups initiatives instead of institutional strategies.

Finally, these conclusions suggested that key factors such as strategies, support, recognition, incentives and training in updated technologies, most of them regarding institutional constraints, have to be handled with priority to technological or pedagogical issues, and these findings coincide with those of major studies previously performed in developed countries (JISC, 2005).

Paper III: Teachers’ perception of institutional strategies in e-learning implementations: a comparative study of an Argentinean and a Swedish university

In this work, the focus was on analysing organisational aspects and institutional strategies for e-learning developments comparing the perspectives of teachers in the two settings. The results were quite similar for the two universities. The major barriers to e-learning at both sites were lack of time and lack of knowledge about technology. Although the findings seemed to be related to individual concerns, they could also be seen as a consequence of an institutional culture that restricts the time for updating and training. Furthermore, not everybody was strongly enthusiastic about implementing e-learning. Therefore leadership and structural and cultural issues involving the specific claim already mentioned, became a main issue in the Swedish and Argentinean institutions.

The teachers reported that they gained limited support from the university management in their ambitions to develop e-learning. Hofstede’s Power Distance dimension was middle ranked for both countries. According, both academic staff, to a greater or lesser degree, coincided in thinking of universities as centrally managed institutions leading and supporting their e-learning initiatives by rewarding individual efforts. Both institutions recognised the impact of technology on education and the need for change, but at that time,
and according to the findings, e-learning initiatives at the individual level were replacing institutional strategies and projects.

**Paper IV: The impact of national culture on e-learning implementations: a comparative study of an Argentinean and a Swedish university**

The aim of this study was to conduct a comparative analysis of the attitudes, driving factors and barriers regarding e-learning at an Argentinean and a Swedish university by analysing national culture as a possible explanation for the similarities or differences. Despite the fact that the cross-cultural studies of Hofstede (2001) suggested that there are cultural differences between Argentina and Sweden, interestingly, the results for the two universities were quite similar. A plausible explanation for the differences in attitudes and perceptions might be that the common academic organisational culture counteracts the differences in national culture.

As a difference, Argentinean teachers stated communication with students and active student participation as more important driving factors than Swedish teachers did. On the other hand, university teachers from both countries used e-learning tools for administrative rather than pedagogical purposes. One explanation for this finding might be that the transition towards technology-based teaching and learning was perceived to be too challenging. Teachers from both universities blamed for the lack of support and institutional encouragement.

**Paper V: The impact of communicating institutional strategies in teachers’ attitude about adopting online education**

This paper deepened the results of a study performed between 2006 and 2010 at the teachers and university management level looking for individual and organisational changes over three years. The selected research setting for the study was the National Technological University of Argentina. After the data from the questionnaires had been analysed, in-depth interviews were performed with institutional authorities and teachers selected as key informants. Three interviewed top-managers revealed that since 2002, the university management had created a large amount of instructions and bureaucratic documents about implementing online education. A review of the institutional documents confirmed this.

The interviews and documental data analysis provided the clue that not only is the development of strategies a determinant of the institutionalisation of e-learning innovations but also the formal and informal communication and socialization of them across all the institutional levels. Formal decisions about
online education were not properly communicated down the university hierarchy.

This work leaves the study of the full institutionalisation of online education process open. The technological infrastructure has been installed, pedagogical innovations are being carried out and staff members are engaging in a new institutional culture but administrative changes are still missing. The UTN has a strong tradition of on-campus culture and usually, modifications are complex processes.

**Paper VI: Institutional strategies influencing the adoption of online education in universities**

The focus of this work is on the processes that took place within the Swedish university regarding online education adoption and the developed organisational changes. It contributed to the understanding of individual meanings and organisational strategies regarding the innovation. Although Management and Education research has studied these dimensions, they are examined in this study from a complementary and pluralistic perspective, as interlinked and interacting in a specific context. The approach allows interpretations based on empirical data to clarify explanations.

After three years, a new study repeating the questionnaire used in the previous survey was conducted with teachers and in-depth interviews were carried out with key informants of the setting. Relevant changes regarding training and friendly design of e-learning platforms, in addition to new technologies in Educational Technology domain had been taking place, and a positive shift in teachers’ attitude towards online education and more confidence in working with constantly improved virtual environments could be discerned. The increasing perception of institutional strategies addressing concerns reported in the initial phases of the survey (e.g. lack of institutional support) seemed to encourage the sustained involvement of teachers in adopting online education. Moreover, the results of individual, institutional and contextual influences were identified and explained through the lens of sensemaking.

**Paper VII: Flexibility to harmonise teachers and institutional stakeholders’ purposes of e-learning initiatives**

In 2007, an e-learning pilot project aiming to study the logical design issues of educational online software was carried out. The specific purpose of the work was to identify the visions that actors held about the pedagogical objectives of development and the agreements or disjunctions among them.

The analysis of agreements among institutional representatives, users (teachers and students) and the development team, was based on the study of
the vision of the characteristics each one of them had built in his/her mind about the pedagogical objectives of the final product. The results showed the existence of significant disjunctions between the mental models of the members of the development team, the users and the institutional stakeholders.

**Paper VIII: An experience of an engineering online education implementation involving action research**

The creation of governmental programmes for funding Technology Education projects in Argentina allowed the implementation of institutionally planned initiatives, providing the chance to undertake a methodological study of the process. A new non-experimental implementation project of online education began in 2009. An engaged scholarship study was carried out using the action research approach with the aim of strengthening and deepening the findings of the previous experience reported in Paper VII, including not only pedagogical but also operational and strategic objectives in the discussion.

Ambiguity of the objectives and conflicts characterised the initial phase. The proposal of agreed solutions to disjunctions appeared in the next phase as a cooperative goal. Collaborative processes of negotiation followed as focus groups discussions proved to be useful in reducing the individual distances to common goals. Therefore, human acting evidenced the interaction of individual agencies, institutional constraints and organisational culture (Keller et al., 2009), as a way of connecting macro institutional and micro individual levels.
5 Concluding discussions

The aim of this research was to examine the processes that take place within the university domain regarding online education adoption, the interactions among organisational levels, and the resulting organisational changes addressing institutionalisation of the innovation. As explained in the methodology chapter, an initial research scenario and a comprehensive literature review provided a guiding, rather than a prescriptive or framing theoretical model for exploring, observing and analysing the complex processes under study. This approach led to the continuing reflection and re-building of an evolving theoretical approach in the light of new emerging findings from data gathered and analysed. This iterative process allowed the selection of theories for interpretation.

A pluralistic and complementary perspective contributed to the understanding of the adoption, change and institutionalisation processes of such a complex organisational phenomenon as online education. It allowed the integration of individuals, technology and organisation interactions in a dynamic and systemic whole. An interrelated and systemic analysis of innovation in education using different but linked theoretical frames seemed to be more suitable for achieving the aim of this thesis than the study of discrete initiatives. Consequently, the actors-technology relationship and the interactions at macro and micro levels within universities were broadly and deeply studied from more than one angle. Figure 8 depicts a simplified model of the theoretical approach that guided the path of the research, and the linkage of the research questions and findings in a pluralistic framework. Grassroots patterns, national culture and sensemaking theory provided complementary insights to explore teachers’ drivers and barriers influencing their adoption decision about online education. The results address Research Question 1 relating to the factors influencing teachers’ adoption of online education in universities. On the other hand, environmental factors and organisational perspectives guided the exploring processes of strategic decision-making at the managerial level in the two different settings. The interactions between macro and micro-levels were studied from the complementary perspectives of institutional and sensemaking theories. This pluralistic framework provided answers to research question 2. Action research within a scholarship engaged perspective guided the study of an ongoing online education implementation in one of the settings, clarifying the issues proposed in research question 3. The Adaptive Structuration lens, as a meta-theory, allowed an overarching interpretation of the processes in both the Swedish and the Argentinean scenario.

Three research questions were posed in the thesis. Each of them was answered in more than one paper. Therefore, Table 5 connects each research question, its corresponding papers and the conclusions.
Table 5. Research questions and conclusions

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Conclusions</th>
</tr>
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<tbody>
<tr>
<td><strong>RQ 1:</strong> Which factors influence or shape teachers’ adoption of online education in universities?</td>
<td>There are key factors such as a lack of time, support, recognition and institutional strategies that are major facts obstructing teachers’ adoption of online education in both Argentinean and Swedish universities. These political and strategic issues may need to be handled with priority to technological or pedagogical issues to encourage teachers’ adoption. Governmental encouragement, social and market pressure, and institutional culture are significant drivers of teachers’ adoption decision. Although some similarities and differences could be found, it has to be inferred that the international organisational culture of academia exceeds national cultural issues in adopting online learning. The grassroots diffusion pattern through peer colleagues’ support was found to be the most recognised way that teachers influence the adoption and diffusion process in the university. In the Swedish university, teachers played a more active role as primary adopters in the institutional adoption process than in the Argentinean setting, where their influence was unequal.</td>
</tr>
<tr>
<td>Papers II, III and IV</td>
<td></td>
</tr>
<tr>
<td><strong>RQ 2:</strong> Which changes at organisational level are developed by online education adoption and institutionalisation in universities and how?</td>
<td>In the Swedish setting, formalised institutional strategies and management centres created at the university and school level fostered the process. The Argentinean setting also formalised institutional strategies, However, because of autonomy rights, some schools have developed management units and others have not, resulting in uneven levels of change. Strategic institutional policies about learning innovations were developed in both settings because of the same event: governmental support. In both settings, the institutional frame affected individual sensemaking in the adoption and structuration processes of online education. However, teachers made different meanings about the change. In the Swedish setting, it was mostly seen as a strategic opportunity, while in Argentina, it was primarily intended as a political gesture to the university’s authorities and additionally, a social opportunity. The adoption processes can be described in both settings as a stream coming bottom-up from the teachers’ level in the form of decentralised individual initiatives, and a top-down flow of strategies and norms coming at the same time from the highest decision level in both settings. A one-way flow was not found as a pattern in any of the settings. An emergent finding in the Argentinean setting was a lack of common goal’ envisioning and conflicting interests among stakeholders regarding online education implementations.</td>
</tr>
<tr>
<td>Papers V and VI</td>
<td></td>
</tr>
<tr>
<td><strong>RQ 3:</strong> How can individuals and institutional purposes be harmonised to facilitate online education implementations?</td>
<td>An ongoing implementation study confirmed the lack of common goal’ envisioning among stakeholders in the development of an online education project. The use of focus group techniques, sensemaking and consensus or negotiation criteria proved to be successful in reconciling conflicting interests and goals.</td>
</tr>
<tr>
<td>Papers VII and VIII</td>
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</table>
Regarding the contributions of the thesis, research results provide complementary and pluralistic insights into the research field of Information Systems, to both theory and practice, as well as into Higher Education managers’ decision-making. The findings developed through an integrative approach contribute with knowledge to the call from researchers to fill the gap regarding disconnection between individual and organisational IT adoption studies (e.g. Bohorquez Lopez and Esteves, 2010; Greenhalgh et al., 2005; Jeyaraj et al., 2006). Interactions at macro and micro organisational levels could be modelled as the cyclic linkage between sensemaking outcomes and institutionalised structures. A higher level of theorization resulted in a meta-theory model to describe and explain the linkage itself within the perspective of adaptive structuration theory. In addition, the literature review highlighted future IS research lines.

The results are also relevant to the community of university managers and the practitioners’ community of systems developers. University managers would benefit from the findings by taking advantage of the documented experience-gained knowledge of similar higher education institutions to support their own university initiatives.

Scholar-engaged research allowed implications for practice to be attained. For example, conflicting interests among stakeholders in an ongoing implementation could be reconciled by changing the existing practices through sensemaking and negotiation.

Furthermore, the knowledge contribution of the thesis could be applied to implementation of information technology innovations in other organisations.
with similar characteristics as the studied higher education institutions. Such characteristics are, for example, to be complex and knowledge intensive.

5.1 Theoretical implications

Innovation theory, complemented with organisational theories provided the foundation for the description and analysis of the information technology innovation and the adoption processes. As McPherson (2002) stated, through decisions made at the management level, organisations have the power to facilitate or to control the development of e-learning innovation by imposing administrative or financial procedures. Strategies that are chosen at university management or school level affect the feasibility of the adoption.

The findings revealed an intertwined combination of top-down and bottom-up approaches during the adoption process in both setting. Nevertheless, each of them was carried out with different meanings, mainly because different institutional frames influenced the sensemaking processes. Confirming the findings by Keller et al. (2007), e-learning initiatives were experienced as a primary individual undertaking in both research settings of this thesis.

The influence of colleagues or small initial groups within the close context followed the pattern of strong ties proposed by grassroots diffusion theory. The development of weak ties among groups at different levels or in different schools was not identified. The pattern may reflect the different paths and outcomes of adoption and formalisation in the different and rather isolated schools, although they belong to the same universities. In the Swedish setting, it can be inferred from the interviewees that the institutional culture, the sense of pertaining to a school or individual identity construction made teachers follow their close group decisions without expressing frontal opposition. In the Argentinean university, the geographical dispersion of the schools seems to be the most plausible explanation for the different isolated processes of colleagues’ diffusion of innovation.

At the Swedish university, earlier undertakings encouraged from schools as a soft top-down flow, some of them contemporary with individual initiatives, could be found. Conversely, in the Argentinean setting, the organisational middle-levels only became involved in the process after the higher levels prompted them to adopt the modality, far in time from individuals’ start-up.

National culture theory provided some clues regarding the adoption processes. Based on the findings, there are similarities and differences between the two universities. Regarding the similarities, a tentative explanation for these findings might be that the international, organisational culture of academia exceeds national cultures when it comes to the studied aspects of e-learning implementation. It seems that university teachers primarily accept and use the features of online education that influence their traditional professional role less. The transition to a very different new role might be too challenging.
However, some differences emanating from national culture could be identified. Argentinean teachers rely on individual attempts, and not on organisational management, which is considered as bureaucratic and unreliable, to solve academic challenges.

The institutional culture of each of the universities appears to be highly related to their national policies about innovation in e-learning. Both universities recognise the critical influence of government policies and funding as drivers of the initiatives. A closer examination shows that although both countries’ governments provided encouragement for e-learning innovation, the purpose of benefiting from the funding was different in each setting. It is also remarkable that the start of governmental encouragement differed by several years: the 1990s in Sweden (Rogers’s early adopter) and the middle of this decade in Argentina (late majority).

### 5.1.1 From complementary theories to a meta-theory

#### 5.1.1.1 Sensemaking and organisational learning

A point of debate among researchers has been how the concept of learning and change can be applied to organisations. Many researchers argue that organisational learning is more than an aggregation of individual learning (Crossan et al., 1999; Kim, 1994; Nonaka, 1994; Vince, 2001). Organisational learning involves the creation of knowledge by individuals and the transfer of the gained knowledge to others. These processes trigger changes at organisational level, and its subsequent embedding in organisational memory, or institutionalisation into systems, structures, strategies and routine practices (Argyris & Schon, 1978; Crossan et al., 1999).

However, none of the perspectives has dealt with multiple-level interactions playing a critical role in organisational learning and change (Nicolini & Meznar, 1995). Seligman (2006) pointed out that perceptions, attitudes and intention of use are factors largely studied regarding the adoption of IT innovations but a process-oriented perspective of these factors working together in adoption remains unexplored.

Universities can be seen as complex organisations, such as an ensemble of multiple organisational units, with dual individual-collective interactions and tacit-explicit knowledge interchange. The processes supporting the interactions and the creation, distribution and sharing of organisational knowledge can be examined as sensemaking processes. Several researchers have explained organisational learning (Argyris & Schon, 1978; Senge, 1990) as loops of interactions in which actors learn from errors and experiences, and organisations can be seen as interpretive systems (Daft & Weick, 1984). Tovstiga et al. (2004) proposed an integrative framework of the sensemaking process and organisational learning, based on the tension between exploitation
and exploration. An organisation explores new ways of doing things while exploiting what it has learned.

The use of sensemaking at the organisational micro-level provided the study with theoretical constructs (noticing, bracketing, labelling, enactment and identity) to analyse, interpret and explain different individual’s assumptions and actions when they perceived changes in the academia context. However, within the institutional frame, normative and cultural assumptions and pressures seemed to mediate sensemaking about innovation adoption and implementations.

The sensemaking noticing and bracketing processes focus on differences and errors, the same as learning organisations. It was also stated that important influences on sensemaking include media, gender, individual personality, personal values, culture and geographic influences (Blake, 2001; Hunter et al., 2004). Therefore, national culture theory complements the frame to make sense of online education adoption in different countries.

At management level, sensemaking of the changes was carried out in the two universities according to two well-differentiated concepts, revealed by Gioia and Thomas (1996). During the adoption process, Swedish sensemaking was guided by strategic meanings while Argentinean managers were deeply framed in political interpretations. The entrepreneurial Swedish institutional culture and Argentinean bureaucratic context, split sensemaking into market business opportunities in the former and coping with governmental policies in the latter.

The process can be modelled as a bottom-upstream coming from the teachers’ level in the form of decentralised individual initiatives actually working, and at the same time a top-down flow of strategies and normative coming from the highest decision level disconnected from actual implementations. Finally, the two streams met gently and a new culture of innovation is slowly but effectively becoming embedded in this traditional institution.

5.1.1.2 Sensemaking and Institutional theory

According to Jensen et al. (2009), Weber and Glyn (2006) and Weick et al. (2005), sensemaking and new institutional theory are linkable as they draw on social theories. Social interactions link macro and micro levels through contextualization, action formation and transformation. Traditional institutional constraints commonly try to exert individual actions of sensemaking in line with institutional rules, roles and beliefs. The emerging transformation of sensemaking, as a bottom-up flow affects the organisational structure leading sometimes to the embedding of the innovation at the group or organisation middle-levels and even to institutionalisation of the outcome.

As Weber and Glynn (2006, p. 1657) stated, “the connection may be under researched, but institutional ideas are certainly not incompatible with sensemaking perspective”. Figure 9 presents a model of the proposed cyclic linkage between the
5 Concluding discussion

Sensemaking and Institutional theories, based on Weber and Glynn’s proposal but enhanced with the findings and interpretations of the thesis.

![Diagram](image)

**Figure 9. Cyclic linkage between Sensemaking and Institutional theories within the university environment (based on Weber & Glynn, 2006)**

Environmental change (technology, market, governmental policies) and institutional culture (traditional constraints and triggering flows e.g. entrepreneurism) influenced the adoption and implementation of online education in both research settings. These pressures were brought into play as top-down implicit or explicit flows from managers’ macro-level to individual actors, developing sensemaking processes. The interviewees repeatedly referred to early Swedish encouragement and funding on one hand and late Argentinean government programme and university boards’ resolutions on the other hand, as drivers of their sensemaking actions.

In both universities, the environmental influences and the institutional logics constrained teachers’ sensemaking. In the Swedish setting, governmental encouragement policies, social pressure and institutional entrepreneurial spirit led to two of the schools making sense of online education as an opportunity.
Selected actions resulted in individuals and organisational changes (positive attitude, adoption of the modality and creation of support and management units) that firmly embedded and reproduced the educational innovation on the path to institutionalisation in the near future.

Institutional logics shaped rational behaviour. According to DiMaggio and Powell (1983) and Thornton and Ocasio (2008), they provide a link between macro-structural perspectives and micro-processes. Sensemaking can be used as an effective approach to understand how individuals create meanings from institutional logics and select actions accordingly. For example, teachers accepted an additional workload as part of their normal teaching activities in both settings, even though they all claimed it was unfair. It can be interpreted as the imposition of institutional logics to keep their positions.

On the same line, Jacoby (2004) noticed that a structural factor such as bureaucratization, strongly patterns the interactions between individuals at the operative level and managers. Such was the case in the Argentinean university, in which teachers and managers missed communication through institutional documentation and procedures, leading to almost parallel worlds developing e-learning initiatives.

Nevertheless, sometimes institutions start sensemaking by providing the occasion (Weber & Glynn, 2006; Weick, 1995). The driver may be a new institutional expectation, sometimes contradictory or ambiguous regarding the institutionalised frame. The entrepreneurial spirit of the Swedish university seemed to provide the occasion to the school that saw online education as a business opportunity.

In the Argentinean university, governmental encouragement policies, social pressure and institutional bureaucratic tradition defined a scenario of conflict. In one of the schools, teachers and managers made sense of the adoption as a strategic decision (good use of the economic opportunity to soften social pressure) to adopt, embed and institutionalise online education. The new online education structure was produced, and in a following step, it was reproduced in most of the courses. Moreover, they have already started a second cycle of innovation. Being an ongoing innovation, new technological or pedagogical features may start at any time. Currently, the school is strongly considering the inclusion of a social network for teachers and students in the institutional platform.

The proposed cyclic model emphasises the reciprocal interaction in structure construction within a learning perspective. Teachers and managers will be influenced by the students’ pressure, the institutional logics, their personal constructed identity and the lessons learned and stored during the retention phase of the past adoption processes to rebuild the organisational structure.

The other surveyed school made sense of the change as a political decision (good use of the economic opportunity to harmonise political positions), embedding but not institutionalising online education.
5 Concluding discussion

Although the inputs and outcomes differed in the two settings, the process model represents and explains both behaviours. Nevertheless, I felt that a higher-level theory, a meta-theory could better explain the linkage between sensemaking and institutionalism. This position will be discussed in the next section.

5.1.1.3 The umbrella of a meta-theory

Online education as technology mediated learning is an interdisciplinary science, mainly nourished by educational science and IT, within IS (Alavi & Leidner, 2001; Hrastinski, 2007). IS research has examined the usage and outcomes of information technology but although a significant number of theories have resulted, limited work has been carried out either on integrating these theories (Thomas et al., 2008) or on addressing the social and technical dynamics of change at multiple organisational levels (Zmud et al., 2001). Complex relations and interactions between components of socio-technical systems can be studied linking findings through complementary theoretical approaches, but proposing a theory about the linkage itself with an overarching perspective has not been extensively addressed.

The use in this research of complementary theories to address online education dynamics at multiple organisational levels, mutually influencing each other, helped in identifying, analysing and understanding this interaction. As depicted in Figure 9, Sensemaking and Institutional theories can be linked into a cyclic process, leading to the duality concept of structuration theory, according to which, institutional rules and resources affect and are affected by individuals’ sensemade actions.

I argue that results linked by sensemaking and institutionalism can be studied with the overarching perspective of meta-theorization. AST is proposed in this thesis as a meta-theoretical umbrella to explain the linkage of Sensemaking and Institutional theories in the specific domain of online education and universities (see Figure 10).

Institutional theory and AST share premises such as a focus on social structures, non-deterministic models and a longitudinal interpretive research approach, but most significant to this work, the existence of appropriation by a set of actors and the creation, maintenance and change of institutions through action (DeSanctis & Poole, 1994). AST allows the appropriation of rules and resources (sources of structures) to be thought of as a qualitatively different outcome from adoption, in which the re-design process can be part of the produce, reproduce or blending actions of appropriation, leading overtime and eventually to institutionalisation.
Therefore, and in the context of this work, the AST appropriation of structures was analysed at different levels (micro/individual and macro/institutional), identifying new structures and the way in which they are used, interpreted and combined.

By recognising the interaction between institutional theory and AST’s appropriation concept at multiple levels of an organisation, the institutional theory’s limited perspective of focusing on only one level is mitigated. As actors instantiate the production, reproduction or blending of social structures, institutionalisation and de-institutionalisation are the non-deterministic possible result of the same structuration process.

On the other hand, sensemaking and AST share explanatory properties for the structuration processes (Mills et al., 2010). The level of the positive attitude of actors, consensus of technology use and faithfulness to a consistent purpose

Figure 10. AST as an explaining meta-theory for the complementary linkage of the sensemaking and institutional theories.
of structures with the overall goals revealed during the interviews the ways of the appropriation processes. Sensemaking bracketing and selection processes allow individuals to construct and design their actions to create or change structures. Following this thinking, the sensemaking processes allowed the study of the mutual interaction of actors and the interaction of actors with embedded structures, including IT.

Among the nine categories of structuring moves proposed by DeSanctis and Poole (direct, substitution, combination, enlargement, constraint, contrast, affirmation, rejection and neutrality), sensemaking analysis of the data collected from teachers and managers of both universities showed that the adoption and embedding of online education fell into the combination move category. Some courses remained on-campus while others became full-distance or blended.

Over time, it could be stated that issues of institutional power cannot be ignored when making sense of reality as well as Poole’s knowledgeable human agency role and the duality of structures used in the production and reproduction. The results are the outcomes of the enactment-selection-retention processes that develop reflexive and iterative changes in the institutional culture. In the studied settings, members of the institutions changed the organisational reality. Moreover, as they learned through action, organisational learning seemed to be a form of retrospective and reflexive sensemaking.

Building theory from the findings allowed the development of a first-order model representing the linkage among institutional theory and sensemaking with a complementary perspective. A higher level of theorization resulted in a meta-theory model to describe and explain the linkage itself, whereby the production of new structures is directly influenced by:

a) structures (institutional drivers and traditional constraints) entering the model as features, spirit and dimensions;

b) environmental pressures as alternative social structures (governmental encouragement, social or market needs);

c) actors’ style of interaction (grassroots diffusion pattern) and sensemaking (attitude, purpose of use, perception of support and strategies, knowledge and experience with the existing structures and the innovations, agreement about its adequacy and identity construction).

Different forms of interaction are set according to the institutional culture. New social structures emerge through social interaction processes of appropriation, in which appropriation results vary following the institutional, environmental and individual influences.

In accordance with the appropriation processes and existing social structures, the new structure becomes embedded as knowledge and experience gained through retention, and eventually becomes institutionalised.

5 Concluding discussion
A new production cycle, such as the adoption of social networks in online education platforms, is currently being nourished by the institutional and contextual environments. The organisational and individual knowledge gained will help teachers to make sense of new meanings and the adoption of the innovation will probably develop a new structure in an open-ended dynamic process.

5.2 Implications for practice

Regarding the implementation and integration process of technology innovations in organisations, the socio-technical integration pattern (Bygstad, 2008) seems to match the complex non-linear and political nature of the integration of both settings. Early adopters experimenting with IS innovation attracted new adopters, who eventually modified the functionality specified by managers during implementation in a self-feeding process. With slight differences, this pattern was found in both universities.

In the Swedish institution, the intended platforms (PingPong and JIBSnet) were proposed in a rather top-down strategy by the institution. They were tried only by initial adopters. With time, their choice (among other factors) defined the final adoption of one of the platforms. In the Argentinean institution, because of a top-down decision, stakeholders’ representatives designed and tried pilot developments. In a stepwise process, the application was refined and implemented voluntarily by the schools.

In both cases, action preceded meanings. Structuration theory, and as an extension AST, sustains the importance of shared action over shared meaning. In additional, Weick (1979) posited in his Means-Convergence model of sensemaking that the members of a group with diverse goals first share activities and through this coordinating action, they develop shared goals (Brooks, 1997). Weick’s theory counterpoints the traditional belief that organisations create a goal and then, subsequent actions fit the vision.

According to observations made during the action research, in the first stage of the project, members did not make sense of the shared goals regarding the activity, as they were looking at different targets. Ambiguity of objectives and conflicts characterised the initial phase.

Actors become adaptable by agreeing on design issues of the application, suitable to fit most of the objectives. They were also creative when interacting during the focus group sessions. The entire process was influenced by evolving mental models. Starting with actions for agreement led to individuals’ sensemaking of common perceptions and understandings about the innovation, developing changes in their visions that defined new actions towards a new outcome in an iterative interacting process.

In the second stage, the case showed that sensemaking and reciprocal harmonising actions represented the starting of a collective structured joint
action of redesigning the application functionality. Common meanings and a common institutional frame moved the actors to share goals in order to maintain the accomplished structure by subordinating themselves to the institutional interest. In this way, the new shared stable structure fitted into the structuration process.

Nevertheless, as an overall result, it can be concluded that there is still no ready model or clear path ensuring successful institutional online education strategy development and initiative implementation in any of the research settings.

5.3 Limitations and further research

The adoption of online education can be reliably seen from an interpretive perspective. Teachers and managers’ contextual role and adoption and use decisions are social constructions whereby social institutions and practices are produced and reproduced. Although Rogers’s diffusion theory and the Technology Acceptance model were the initial frames to address the research questions, they did not provide a suitable lens to explore the linkage and interactions among organisational levels, as they are linear models (Barley & Tolbert, 1997; Seligman, 2006). Consequently, the stance in this work was to develop a pluralist approach linking social theories to explain individual and institutional social construction as a dynamic and intertwined process.

Although Lapointe and Rivard (2007) held that the complementary use of a variety of theoretical models is not a very common research approach in IS, a complex organisational phenomenon such as the adoption and institutionalisation of a technological innovation could be better explored using theoretical perspectives as a complementary approach. It provides a richer interpretation of the processes from different angles, following a pluralistic view of frames. Moreover, Orlikowski and Barley (2001) suggested that organisational and information technology theories can provide a broader understanding from their interaction than using isolated perspectives.

The research used both data and theory triangulation. Data triangulation results from the collection of data from different actors in different settings using different methods. Therefore, the risk of biases is greatly reduced. Analysing and interpreting the same data using multiple theoretical frames provides theory triangulation.

Regarding the research design, the survey questionnaire was based on a widely used and tested instrument, adapted to the research questions’ objectives; therefore, its construct validity was presumed. The social context was explored from first-hand data from actors. A limitation of the data gathered could be that it was self-reported. Verification was only possible through reasonability and cross-checking with the available documentation.Selective remembering of past events, exaggeration or minimisation have to be considered. The
assessment of trustworthiness and un bias of the qualitative data and research design are thoroughly explained in section 3.3.

Although quantitative statistics analysis was performed, research questions did not have inferential or predictive, but descriptive and explanatory purposes. Therefore, high statistical significance testing to measure the probability of obtaining the same results in a similar population was not within the scope of the study. Furthermore, I was aware that the size of the sample would not lead to good statistical significance values.

The interviews were based on the same guide and the coding scheme was the same for both settings. However, and although the interviews and most of the documentation were in English, my lack of knowledge of the Swedish language was a limitation in the reading and interpretation of some institutional documents. I had to rely on translators.

In the empirical studies, the focus has been on teachers and managers’ experiences and meanings in the adoption and institutionalisation processes of online education. Students, although important actors in the scenario, were intentionally left aside from the research model as there is an important cumulativity of research involving their participation in the process.

It may be expected that the review in Paper I encourages researchers to improve the knowledge and cumulativity of the IS field and Educational Technology. Furthermore, the classification frame can be improved either for greater clarity or for richness of analysis.

In spite of the contributions of this study to the IS and organisational field, online education innovations are continuously upgrading the space of still-unsolved issues. Universities must respond to society’s higher education expectations. Answers may lead to different institutional models of university, opened to a new organisational culture. Within a new learning philosophy based on information technology exploitation, studies about these possible models are required. As reported in the questionnaires, institutional responses to the lacking reward and recognition policies also call for deeper considerations about their development and implementation.

The study, although performed in different settings with particular cases as suggested in previous research (e.g. Russell, 2008) in order to obtain deeper insights, still remains context-specific. More context-extensive work will be needed to transfer the conclusions to a more general context.

New technologies that are usable in the educational process lead to learning processes that cannot be managed but facilitated within an open-ended perspective. Sensemaking about the adoption, embedding and institutionalisation of very innovative environments (e.g. convergence, ubiquity, learning objects, collaborative or experience-based learning) and knowledge management of experience gained deserve researchers’ interest within a pluralistic field approach.
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128
References


129


References


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Appendices
Appendix A  Related publications


Gamondes E., Jover, M., Napoli, F., VerdeRey, M. & Casanovas, I. (2008). *La formación de Ingenieros en Argentina por medio de e-learning: requerimientos de los nuevos trabajos para los graduados en Electrónica, Mecánica y Sistemas de Información* [Engineers training in Argentina using e-learning: requirements of the working market to graduates...
Appendices


Appendix B: List of reviewed articles in Paper I - Extended concept matrix

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<td>2008</td>
<td>e-Learning Adoption Conceptual Framework: The Link Between e-Learning Characteristics and Adopters Characteristics</td>
<td>James Njenga and Louis Fourie</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>ICEL</td>
<td>2008</td>
<td>Teachers' Perception of Institutional Strategies in e-Learning Implementations: A Comparative Study of an</td>
<td>Casanovas, Fernandez, Hrastinski, Keller and</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Conference</td>
<td>Title</td>
<td>Author</td>
<td>University</td>
<td>Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERTECH 2008</td>
<td>Teachers’ Perception of Institutional Strategies in E-learning Implementations: A Comparative Study of an Argentinean and Swedish University</td>
<td>Casnovas, Fernandez, &amp; Tomassino</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendices

Appendix C: 2006/2007 Questionnaire template

The same questionnaires were distributed in Jönköping University (Sweden) and National Technological University (Argentina). The former was in Swedish and English, the latter was in Spanish and English.

**e-Learning Survey**

We are a group of researchers interested in the use and development of e-learning in higher education. We would like to ask you to complete the following questionnaire, which will help us understand the use of e-learning at Jönköping University. This questionnaire has been sent to everyone who teaches at the University.

*We define e-learning as learning and teaching facilitated online through network technologies*. Common technologies include websites (such as Ping Pong, JIBSnet), video conferencing and e-mail.

All answers in this survey will be treated confidentially. The questionnaire will take about ten minutes to complete. Feel free to answer in English or Swedish. It is distributed with permission from Jönköping University and is expected to give insights into how e-learning may be further developed at the University.

If you have any questions regarding the questionnaire, do not hesitate to contact us.

Thank you for your help!

Jörgen Lindh     Stefan Hrastinski     Christina Keller     Inés Casanovas
lijo@jibs.hj.se   hrst@jibs.hj.se    kelc@jibs.hj.se    Icasanovas@ihh.hj.se
036-10 1780      036-10 1774      036-10 1778

---

1. Background questions:

<table>
<thead>
<tr>
<th>a. What subject do you teach?</th>
<th>b. What is your employment position?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Lecturer</td>
</tr>
<tr>
<td></td>
<td>□ PhD Student</td>
</tr>
<tr>
<td></td>
<td>□ Assistant Professor 7</td>
</tr>
<tr>
<td></td>
<td>□ Associate Professor 8</td>
</tr>
<tr>
<td></td>
<td>□ Full Professor</td>
</tr>
<tr>
<td></td>
<td>Other, please detail.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c. Gender:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female □ Male □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>d. Age:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 20 ≤years&lt;30</td>
</tr>
<tr>
<td>□ 30 ≤years&lt;40</td>
</tr>
<tr>
<td>□ 40 ≤years&lt;50</td>
</tr>
<tr>
<td>□ 50 ≤years&lt;60</td>
</tr>
<tr>
<td>□ 60 ≤years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>e. At which school do you teach?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Jönköping International Business School</td>
</tr>
<tr>
<td>□ School of Education and Communication</td>
</tr>
<tr>
<td>□ School of Engineering</td>
</tr>
<tr>
<td>□ School of Health Sciences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>f. What is your general attitude to using e-learning to support education?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Very negative</td>
</tr>
<tr>
<td>□ Rather negative</td>
</tr>
<tr>
<td>□ Neither positive nor negative</td>
</tr>
<tr>
<td>□ Rather positive</td>
</tr>
<tr>
<td>□ Very positive</td>
</tr>
</tbody>
</table>

2. Have you used e-learning to support your courses?

Yes □ No □  If the answer is “No” go to question 8!

3. For which of the following purposes do you use e-learning? Tick all that apply.

<table>
<thead>
<tr>
<th>a</th>
<th>Additional support for distance students</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Additional support for on-campus students</td>
</tr>
<tr>
<td>c</td>
<td>Assignment submission</td>
</tr>
<tr>
<td>d</td>
<td>Collaborative learning</td>
</tr>
<tr>
<td>e</td>
<td>Communication with students</td>
</tr>
</tbody>
</table>

7 Lektor
8 Docent
Appendices

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>f</td>
<td>Distributing course material</td>
</tr>
<tr>
<td>g</td>
<td>Providing access to multimedia resources</td>
</tr>
<tr>
<td>h</td>
<td>Providing links to web-based resources</td>
</tr>
<tr>
<td></td>
<td>Other (please detail).</td>
</tr>
</tbody>
</table>

4. Which of the following groups support you in the e-learning development process? To what extent do they agree/disagree?

<table>
<thead>
<tr>
<th>Group</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Department management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. External organisations</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. IT administrators</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Other university institutions</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. System developers</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Colleagues</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Students</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

5. Which of the possible driving factors for e-learning development listed below have been relevant for you? Tick all that apply.

<table>
<thead>
<tr>
<th>Factor</th>
<th>☐</th>
<th>☐</th>
<th>☐</th>
<th>☐</th>
<th>☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Meeting special educational requirements of students with disabilities</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Attracting geographically distant students</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Distributing course material</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Enabling more active student participation</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. Enhancing learning and teaching quality</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Improving competitive advantages</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Improving cost/efficiency</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>h. Improving flexibility in time and space</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>i. Facilitating partnerships with other institutions</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>j. Simplifying administrative processes</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>k. Meeting student expectations</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other (please detail).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
6. What kind of e-learning systems are you currently using? Tick all that apply.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Commerical (e.g., Ping Pong, Blackboard)</td>
</tr>
<tr>
<td>b</td>
<td>Developed in-house (e.g., JIBSnet)</td>
</tr>
<tr>
<td></td>
<td>Other (please detail)</td>
</tr>
</tbody>
</table>

7. Which of the following technologies do you use to support your courses? Tick all that apply.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Assignment submission</td>
</tr>
<tr>
<td>b</td>
<td>Chat</td>
</tr>
<tr>
<td>c</td>
<td>Discussion boards</td>
</tr>
<tr>
<td>d</td>
<td>Distribution of course material</td>
</tr>
<tr>
<td>e</td>
<td>Video conferencing</td>
</tr>
<tr>
<td>f</td>
<td>E-mail</td>
</tr>
<tr>
<td>g</td>
<td>Instant messaging</td>
</tr>
<tr>
<td>h</td>
<td>PowerPoint presentations with audio</td>
</tr>
<tr>
<td>i</td>
<td>Streaming video</td>
</tr>
<tr>
<td>j</td>
<td>Animations</td>
</tr>
<tr>
<td></td>
<td>Other online resources (please detail).</td>
</tr>
</tbody>
</table>

8. In your opinion, what are the barriers to further (or any) e-learning development at your department or in your courses over the coming years? Tick all that apply.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Institutional culture</td>
</tr>
<tr>
<td>b</td>
<td>Lack of appreciation</td>
</tr>
<tr>
<td>c</td>
<td>Lack of incentives for teachers</td>
</tr>
<tr>
<td>d</td>
<td>Lack of knowledge about technology</td>
</tr>
<tr>
<td>e</td>
<td>Lack of money</td>
</tr>
<tr>
<td>f</td>
<td>Lack of strategies or leadership</td>
</tr>
<tr>
<td>g</td>
<td>Lack of student engagement or motivation</td>
</tr>
<tr>
<td>h</td>
<td>Lack of technical support staff</td>
</tr>
<tr>
<td>i</td>
<td>Lack of time</td>
</tr>
<tr>
<td>j</td>
<td>Technical problems</td>
</tr>
<tr>
<td></td>
<td>Other online resources (please detail).</td>
</tr>
</tbody>
</table>
Appendices

9. How is e-learning integrated in your department? Tick all that apply.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
a. | Expected as part of your teaching |
b. | Encouraged through project funding |
c. | Not encouraged by management |
|   | Other (please detail). |

10. At what level are strategies on e-learning decided upon? Tick all that apply.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
a. | University management |
b. | School management |
c. | Department management |
d. | Subgroups in department |
e. | Individual level |
f. | There is no e-learning strategy |

11. To what extent do you agree on the following statements on e-learning development at your department?

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>
a. | There is a strategy for future development |
b. | We are in the process of developing a strategy |
c. | I am unsure about future development |
d. | There is currently no further development underway |

12. Which prerequisites are needed if you are to use e-learning in your courses?

13. Which do you believe are the advantages of using e-learning?

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14. Which do you believe are the disadvantages of using e-learning?

15. How do you perceive students’ attitudes towards e-learning?

16. How do you perceive colleagues’ attitudes towards e-learning?
Appendices

Appendix D: 2009/2010 Questionnaire template

The same questionnaires were distributed in the Jönköping University (Sweden) in Swedish and English and in the National Technological University (Argentina) in Spanish and English.

I am developing my Doctoral Research at Jönköping International Business School (JIBS). It is framed in online education initiatives and institutionalisation issues in higher education.

If you have devoted at least 10% of your time to teaching during the last year, I would like to ask you to complete the following questionnaire which will help me to understand the university environment regarding online education through the vision and opinions of the teaching staff of universities established in different contexts. Jönköping University and National Technological University of Argentina will be involved in this research.

The questionnaire, as part of the survey, is a follow-up study that started with an almost similar one three years ago and results presented in international conferences. Evolution of technology and new learning initiatives developed in the meantime has made necessary a review of the scenario.

To the purpose of the research, online education is defined as teaching and learning through a set of technological, pedagogical, administrative and IS design issues, based on networked Information and Communication Technology, as distance education modality within the organisation and environment of education.

Thank you for your help!

Eng. Inés Casanovas
Ines.Casanovas@ihh.hj.se
Ph.D. Student in Informatics

1. Background questions:

a. What is your employment position?  
   - [ ] Professor
   - [ ] Associate Professor
   - [ ] Assistant Professor
   - [ ] Lecturer
   - [ ] PhD. Candidate
b. At which school do you teach?
   - \( \square \) Jönköping International Business School
   - \( \square \) School of Education and Communication
   - \( \square \) School of Engineering
   - \( \square \) School of Health Sciences

c. Gender:  
   - \( \square \) Female
   - \( \square \) Male

d. Age:
   - \( \square \) <30 years
   - \( \square \) 30 ≤ years <40
   - \( \square \) 40 ≤ years <50
   - \( \square \) 50 ≤ years <60
   - \( \square \) ≥60 years

e. What is your general attitude to using technology to support education?
   - \( \square \) Very negative
   - \( \square \) Rather negative
   - \( \square \) Neither positive nor negative
   - \( \square \) Rather positive
   - \( \square \) Very positive

2. Have you used online education?
   - \( \square \) Yes
   - \( \square \) No  
   **If the answer is “No” go to question 10!**

3. For which of the following purposes have you used online education? 
   Tick all that apply

   - \( a \) Distance education
   - \( b \) Blended education (*)
   - \( c \) Additional support for on-campus students
   - \( d \) Assignment submission
   - \( e \) Collaborative learning
   - \( f \) Communication with students
   - \( g \) Distributing course material

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<table>
<thead>
<tr>
<th></th>
<th>Providing access to multimedia resources</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Providing links to web-based resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other (please detail)</td>
<td></td>
</tr>
</tbody>
</table>

(*) Blended-education: *a combination of online-distance and face-to-face on campus education*

4. By which of the following groups were you supported in the online education development process? Tick all that apply

<table>
<thead>
<tr>
<th></th>
<th>Strongly supported</th>
<th>Normally supported</th>
<th>Little supported</th>
<th>Not supported at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Department management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. External organisations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. IT administrators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other university institutions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. System developers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Colleagues</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Which of the possible driving factors for online education development listed below have been relevant for you? Tick all that apply

<table>
<thead>
<tr>
<th></th>
<th>Meeting special educational requirements of students with disabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Attracting geographically distant students</td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>Distributing course material</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Enabling more active student participation</td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>Enhancing learning and teaching quality</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>Improving competitive advantages</td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>Improving cost/efficiency</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>Improving flexibility in time and space</td>
<td></td>
</tr>
</tbody>
</table>
### 6. What kind of online education platforms are you currently using? Tick all that apply.

- **a.** Commercial (e.g., Moodle, Blackboard)
- **b.** Developed in-house
- **c.** Yahoo Groups (or similar)
- Other (please detail).

### 7. Which of the following technologies do you use to support your courses? Tick all that apply.

- **a.** File loading/interchanging (course materials, videos, animations, links, assignments...)
- **b.** Chat
- **c.** Discussion boards
- **d.** E-mail
- **e.** Instant Messaging
- **f.** Video conferencing
- **g.** Telephone conferencing (eg. Skype)
- **h.** Mobile technology (cell phones, PDA's, Portable Media Players.....)
- Other online resources (please detail)
8. In your opinion, which are the barriers to further (or any) online education development at your department or in your courses over the coming years? Tick all that apply

<table>
<thead>
<tr>
<th></th>
<th>Barriers to Further Online Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Institutional culture</td>
</tr>
<tr>
<td>b</td>
<td>Lack of appreciation of the effort</td>
</tr>
<tr>
<td>c</td>
<td>Lack of economic incentives for teachers</td>
</tr>
<tr>
<td>d</td>
<td>Lack of knowledge about technology</td>
</tr>
<tr>
<td>e</td>
<td>Lack of money</td>
</tr>
<tr>
<td>f</td>
<td>Lack of strategies or leadership</td>
</tr>
<tr>
<td>g</td>
<td>Lack of student engagement or motivation</td>
</tr>
<tr>
<td>h</td>
<td>Lack of technical support staff</td>
</tr>
<tr>
<td>i</td>
<td>Lack of time</td>
</tr>
<tr>
<td>j</td>
<td>Technical problems</td>
</tr>
<tr>
<td>k</td>
<td>Lack of formal institutional status of the initiatives</td>
</tr>
<tr>
<td></td>
<td>Others (please detail)</td>
</tr>
</tbody>
</table>

9. How is online education supported or encouraged in your department? Tick all that apply

<table>
<thead>
<tr>
<th></th>
<th>Support for Online Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Expected as part of your teaching</td>
</tr>
<tr>
<td>b</td>
<td>Encouraged through project funding</td>
</tr>
<tr>
<td>c</td>
<td>Not encouraged</td>
</tr>
<tr>
<td></td>
<td>Other (please detail)</td>
</tr>
</tbody>
</table>

10. At what organisational level are strategies about online education decided in your work environment? Tick all that apply

<table>
<thead>
<tr>
<th></th>
<th>Organisational Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>University management</td>
</tr>
<tr>
<td>b</td>
<td>School management</td>
</tr>
<tr>
<td>c</td>
<td>Department management</td>
</tr>
<tr>
<td>d</td>
<td>Subgroups in department</td>
</tr>
<tr>
<td>e</td>
<td>Individual level</td>
</tr>
<tr>
<td>f</td>
<td>There is no online education strategy</td>
</tr>
</tbody>
</table>
11. On which of the following statements about online education development in your department do you agree?

Strategies

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. There is a strategy for future online education developments</td>
<td>☐</td>
</tr>
<tr>
<td>b. The Department is in the process of developing a strategy</td>
<td>☐</td>
</tr>
<tr>
<td>c. I am unsure about future developments</td>
<td>☐</td>
</tr>
<tr>
<td>d. There is currently no further development underway</td>
<td>☐</td>
</tr>
</tbody>
</table>

Institutionalisation (**)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Online education initiatives are formalised in the institutional procedures</td>
<td>☐</td>
</tr>
<tr>
<td>b. Online education initiatives are in process to be formalised</td>
<td>☐</td>
</tr>
<tr>
<td>c. Online education initiatives are being considered to be formalised</td>
<td>☐</td>
</tr>
<tr>
<td>d. Online education initiatives are not going to be formalised</td>
<td>☐</td>
</tr>
<tr>
<td>e. I am not sure/I don’t know</td>
<td>☐</td>
</tr>
</tbody>
</table>


12. Your perceptions

a. How do you perceive students’ attitudes towards online education?

........................................

b. How do you perceive colleague teachers’ attitudes towards online education?

........................................
## Appendix E: Swedish setting interviews analysis matrix

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories (high-level coding)</th>
<th>Sub-category/Paragraphs</th>
<th>Number of interviewees that talked about the sub-category</th>
<th>Examples [School of the respondent]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Institutional context</td>
<td>1.1 Funding support</td>
<td>Government</td>
<td>8</td>
<td>“Swedish governmental support to IT in distance learning can be seen in the NSHU Agency and Net University project” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Swedish government founded NetLearning projects so HHJ applied for money and they got it.” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Initially there was little interest from the University in the initiative so the group went to the International Office in Stockholm and got some financial support for an Erasmus project” [A]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The macro environment is favourable to these initiatives as the Swedish government wants to reach all kind of students (distant, disabled..) based in the philosophy that knowledge should be accessible for everyone in society” [D]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“I started in 1994 with a distance learning cooperation project (funded by government) between Sweden, Iceland, Finland and Norway” [D]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The first financial supporting came from Swedish government” [RFL]</td>
</tr>
<tr>
<td>Institution</td>
<td>5</td>
<td></td>
<td></td>
<td>“We had financial support (200.000 SEKS) that was not much but it was a way to show teachers institutional interest” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The School Education Manager has been discussing with the University Financial Manager for larger funds” [D]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The Steering board is spending greater amounts of money in online education since 2008 or 2009 approximately” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The university assigns 600.000 seks each year for pedagogical projects and teachers or lecturers apply for the money. In the last year most of the projects were connected with online education” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“RFL started working in 2007 with a funding of 250.000 SEKS/year” [RFL]</td>
</tr>
<tr>
<td>Schools</td>
<td>4</td>
<td></td>
<td></td>
<td>“We get some (little) money from the school to be used in the development of the courses. Every department has a budget for financing resources of every program and they have to use it for the courses.” [A]</td>
</tr>
</tbody>
</table>

* X.Y. and Z are anonymous references to mentioned real names
<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-category</th>
<th>Examples (School of the respondent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Themes</strong></td>
<td><strong>Sub-category</strong></td>
<td><strong>Examples (School of the respondent)</strong></td>
</tr>
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</tr>
<tr>
<td>Themes</td>
<td>Categories (high-level coding)</td>
<td>Sub-category/Paragraphs</td>
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<td>School level strategies</td>
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<tr>
<td>2.2 Adoption flow</td>
<td>Bottom-up</td>
<td>7</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Both direction (bottom-up and top-down)</td>
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<tr>
<td></td>
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</tr>
<tr>
<td>2.3 Drivers</td>
<td>Market demand/Business concern</td>
<td>13</td>
</tr>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>
Social and economical pressure

In the health sector, students are older (in average) than in the other schools so they are usually working, have a family... So I would say that it was social reality pressure at school level.

For those people out of the academic world, like professionals, or even students working or having family is a very good alternative.

Nurses and especially from those countries (China, India and Africa) usually are middle-class people that can't afford travelling to Sweden. It is a very good tool to reach students that have difficulties to come to Sweden from abroad.

European countries: So far, the development of business concern...
<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories (high-level coding)</th>
<th>Sub-category/Paragraphs</th>
<th>Number of interviewees that talked about the sub-category</th>
<th>Examples [School of the respondent]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* X,Y, and Z are anonymous references to mentioned real names</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Students can choose their own paths to study</td>
<td>3</td>
<td>“It is easier to study at home, when and how the students prefer or can” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.4 Support (Training)</td>
<td>8</td>
<td>“The initial group had to learn by themselves, you know, trial and error. They only got some technical support from a member of the group who had some technological knowledge” [RFL]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Teachers were encouraged to discuss and interchange experience with colleagues” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Then coffee-breaks interaction among colleagues spread the idea.” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“There was no support, all learn by experience. It has been frustrating as there was scarce or no training support.” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“We neither had training. We interchanged knowledge and help between colleagues” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The pattern of spreading was between colleagues” [D]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“I used self-learning, trial by error, as at that time there was not any support from the institution” [A]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RFL (lately)</td>
<td>5</td>
<td>“Nowadays, the main technical support provider, as seminars, is RFL” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific units/centre for technological support</td>
<td>4</td>
<td>“We have a unit that provides pedagogical and technological support to the School (IT-funktionen) that also depends on IT-Services (a unit for the four Schools)” [D]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The first teachers had to train by themselves but afterwards a new person was recruited as technical support and that person was a key factor in the success of the initiative” [D]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5 Recognition</td>
<td>14</td>
<td>“We got technology facilities but not more money for work overload” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Most of the times this extra work is considered as part of normal work” [RFL]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The work overload is not considered, not even taken into account the time for planning the courses” [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“We had extra workload and we received very little extra money from the University as recognition of...”</td>
</tr>
</tbody>
</table>
Themes

Sub-category

Number of paragraphs

Examples (school of the respondent)

School of the respondent

* X, Y, and Z are anonymous references to mentioned real names.

3. Historical review of the process

3.1 Initial scenario of personal attitude towards online education

A small initial group of adopters

"Initially it was a very small group of teachers involved in the new idea. The rest loved face-to-face teaching."

B "This small group is always necessary to introduce the idea or act as promoters among their colleagues."

C Interviewee as encourager or initiator

"I succeeded with old teachers because I had lots of meetings with them, till they got involved in the project."

C "I was the responsible for starting online education in the school as there were goals to accomplish."

C "I tried to motivate other departments showing them examples and results, not using persuading tactics."

Need to be institutionally encouraged

5 "Schools were facing a set of teachers 50-60 years old, that did not feel comfortable with computers because they belonged to a generation that had to adopt this technology under pressure. In this situation, there was need for a leader to motivate and stimulate them."

C "Not all the teachers were wishing to be involved. Encouragement was necessary."

C "Teachers need to have clear defined goals, methods, expected results and benefits so, having a formal documented plan is the right way."

C "At the moment we deliver just what we are asked for and nothing more."

C "The moment we deliver just what we are asked for, nothing more."

C "The moment we deliver just what we are asked for, nothing more."

C "The moment we deliver just what we are asked for, nothing more."

C "We have a lot of extra work. This is not extra work. The time for developing materials is considered as part of normal work."

C "We have a lot of extra work. This is not extra work. The time for developing materials is considered as part of normal work."

C "We have a lot of extra work. This is not extra work. The time for developing materials is considered as part of normal work."

C "We have a lot of extra work. This is not extra work. The time for developing materials is considered as part of normal work."
<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories (high-level coding)</th>
<th>Sub-category/Paragraphs</th>
<th>Number of interviewees that talked about the sub-category</th>
<th>Examples [School of the respondent]</th>
</tr>
</thead>
</table>
| | | Rejection, frustration or scepticism | 4 | “I definitely prefer only face-to-face discussions. Some can say that I am an old man that couldn’t follow the development of ICT… The initial, foundational idea of A was to be an international on campus institution to gather and mix students from different backgrounds. So online learning is against our basic interest as they can’t be face-to face” [A]  
“I personally think that in engineering there is a need for working/practising in labs with any kind of special devices that can’t be at hand at home (in physics, for example), so e-learning can be at the most a complement of on-campus learning”. [B]  
“…positive but frustrating, taking into account my own experiences and the institutional environment’ lack of interest and support” [A]  
“I would categorise myself as sceptical, 50/50, as I like direct contact with students, but it gives students that can’t be on-campus a possibility to “attend” the courses.” [A] |
| 3.2 Personal experience with distance initiatives/technologies | Distance courses based on TV, multimedia devices or previous online courses | 10 | “We have a great experience using multimedia tools. We have our own filming studio” [C]  
“They [teachers] felt it [online courses] like an opportunity of using cameras in a producing-process for online teaching” [D]  
“Many teachers were already moved by the TV based experience” [C]  
“My experience begun 15 year before with a TV conferencing course with Scotalnd and USA”. [C]  
 “[In 1994] I was involved in a 5-week academic course. Material was sent by e-mail, afterwards by video” [D]  
“I started working with distance education in 95s with a course filmed and broadcasted to learning centres” [A] |
| | None experience | 5 | “No personal experience leading courses, always in hierarchic level. I only used conferencing tools” [C]  
“None experience in using online learning. I mainly attend thesis supervision.” [A]  
“I recognise small experience in online education as teacher, I have been acting at management level, building it up” [D] |
| 3.3 Platform | PingPong | 14 | “There are now two platforms in use in the University: PingPong and JIBSnet but the latter will disappear soon” [RFL]  
“From the upper levels it was defined the use of PingPong” [C]  
“They [teachers] started working with PingPong using specially videoconferencing with American
Themes

Categories

(1) Themes

Level

Sub-category/Paragraph

Number of interviewees that talked about the sub-category

Examples

[School of the respondent]

* X, Y, and Z are anonymous references to mentioned real names

4. Personal view of future perspectives online learning

4.1 Institutionalisation

"I am not sure if online education has started an institutionalisation process."

"Online education is institutionalised"

"The School is not still ready as most of the staff needs motivation, support and training"

"I see a continuing emphasis on online education at institutional level of adoption, but still the process depends strongly on the president attitude"

Institutional authorities acting as barriers

"The four deans are positive to online learning initiatives but the thing is that strategies have to be discussed in the Educational Board".

"The person who should be responsible for the developing of online education, as far as I could see, is not involved in the idea"

"The responsible for the decision of opening online courses hasn't increased its number. I know that there are budgeting problems but I also think he is not positive to this modality"

4.2 There are important issues to be solved

Ownership of the material (Intellectual property)

"Someone else can use it without my consent"

"The issue of the owner ship of the material is something tricky now. Intellectual property in Sweden is not concerned about this. There are no answers. I proposed that the University sign an agreement..."
<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories (high-level coding)</th>
<th>Sub-category/Paragraphs</th>
<th>Number of interviewees that talked about the sub-category</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>* X, Y, and Z are anonymous references to mentioned real names</td>
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<tr>
<td></td>
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<td></td>
<td>with teachers in which they keep the ownership and the university the right to use it. But up to now nobody has pronounced about his proposal‖ [A]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“There has been a Union discussion about the ownership of the material‖ [A]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“The main problem perceived by teachers is the ownership of the materials‖ [B]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“Talking about the issue of the ownership of the developed courses, it’s taken for granted that the teacher is the owner of the course, but there is not a written definition of it‖ [D]</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“The main weakness of ONL is the ownership of the material‖ [C]</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>“The main problem we have to manage is making compatible the different standard levels of technology available for public healthcare among Sweden, India and China‖ [C]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“The main problem [with courses in Tanzania and Armenia] is the access of students to Internet‖ [C]</td>
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<tr>
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<tr>
<td></td>
<td>Level of technology available in distance settings</td>
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</tbody>
</table>
### Appendix F: Argentinean Setting Interviews Analysis Matrix

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Subcategory/Paragraphs</th>
<th>Number of Interviewees that talked about the subcategory</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional Context</td>
<td>Funding Support</td>
<td><em>Government</em></td>
<td>8</td>
<td>In 2005, the Ministry of Education and the Department of University Policies open a program for funding educational innovative projects of national engineering universities (M)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>National government encouraged through PROMEI Project funding (Program for Improving Engineering Teaching)</em> the promotion of different distance education modalities as a way to improve teaching quality and retention of students (N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Among the reasons, one is not included in the resolution but it was the defining reason: money from PROMEI program</em> (M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Changes in Organisational Structures</td>
<td><em>Schools</em></td>
<td>5</td>
<td>In 2007, there was some own money for the developers and the few teachers in the project (M)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>We could use money from the Foundation as an investment in hardware for online education. It was totally agreed that the whole school would benefit from results</em> (N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>In 2002 the Subsecretary of Information and Communication Technology, recently created by university Resolution 248/02 started mentioning Virtual UTN</em> (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>In 2006 (University Resolution Nº125/06) high management designed another person in charge of the Secretary who started a new management style, more proactive and innovative</em> (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Changes are slow because of the politicized situation of the university</em> (U)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td><em>The central coordinator does not interact with teachers or school administrators</em> (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Because of personal interaction we knew about the global virtual campus and the unit directed by J</em> in the main building. The coordination unit was the agent we needed to be sure we were working in the right direction* (U)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Schools 2002, the Secretary of Information and Communication Technologies, recently created by university Resolution 248/02, started mentioning Virtual UTN</em> (N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>In 2006, the Ministry of Education and the Department of University Policies open a program for funding educational innovative projects of national engineering universities</em> (M)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>We could use money from the Foundation as an investment in hardware for online education. It was totally agreed that the whole school would benefit from results</em> (N)</td>
<td></td>
<td></td>
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</tbody>
</table>

Note: *K and J are anonymous references to mentioned real names.*
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<tr>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>* K and J are anonymous references to mentioned real names</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>since 2010*(M)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“In 2010, M school adopts the university virtual global campus and starts the configuration of blended courses for 2011” <em>(N)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“In 2008, we deeply involved in online education, as part of the global virtual campus” <em>(N)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Discreet math is our first experience with a virtual course. It has only two instances on-campus for examination” <em>(M)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Each school adopting the Virtual Global Campus had to design a local administrator” <em>(M)</em></td>
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<td>“Each adopting School had to appoint a local technological administrator and a pedagogic coordinator, both of them reporting to the central coordinator. Local coordinators interact only with teachers and tutors of their own School. Conflicts among technical and pedagogical local staff have to be solved by this central coordinator” <em>(N)</em></td>
</tr>
<tr>
<td>Do not perceive changes</td>
<td>2</td>
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<td>“We were working in online small initiatives, without perceiving any simultaneous change in the institutional context. They began noticeable when the Research department called for projects to be funded by PROMEL but I did not perceive any changes in the organisational structure” <em>(M)</em></td>
</tr>
</tbody>
</table>

| 2. Online education initiatives | 2.1 Institutional strategies | No strategies or the interviewee does not know about specific strategies | 1 | “I do not know any specific strategy. I was only called by two persons in charge of an educational innovation unit to a meeting in which they showed an already developed and configured environment. They gave some quick tool training, but still I do not know the position of this unit in the organisational chart, and which are their plans and objectives” *(M)* |
|--------------------------------|-----------------------------|------------------------------------------------|----|“The University Resolution Nº248/02 defined the mission of the Subsecretary (of ITC) : planning and development of UTN Virtual campus, coordination of the Technological University Net and the Educational Videoconferencing Net, promotion of the use of Information and Communication Technologies in educational activities, especially in off-campus modalities and coordination of teachers training” *(U)* |
| University level strategies | 4                          |                          |                                                       | “In 2007, guidelines for the development of programmes, courses and careers in distance modalities were...” |
Themes | Categories
--- | ---
(Revised) | (Revised)

**Themes:**

- **Themes:**
  - **Categories:**
    - **(high-level coding)**

**Sub-categories/Paragraphs:**

- **Number of interviewees that talked about the sub-category**

**Examples:**

- **[School of the respondent]**
  - *K and J are anonymous references to mentioned real names fixed through a resolution document. The Secretary's strategy moved to a flexible School's integration-entrance view‖ (U).
  - ―This time, mistakes of previous experiences, like the isolation and not diffusion of strategies were carefully considered‖ (U).
  - ―There was not a revolutionary initial plan, instead it was evolutionary, mainly based on resources availability‖ (U).
  - ―We have received several Resolutions of the Superior Board regarding the creation and coordination of supporting units and the guidelines for implementations‖ (N).

- **School level strategies**
  - 8

- **At that time (2005) there was no any interest from the School management‖ (M).
  - ―In 2008 the Superior Board of the school approved a resolution for intensive online courses‖ (M).
  - ―Some Schools keep using their own platform. They are allowed to do it because of their autonomous right of government, but as a ‘political gesture’, they assigned some courses to the Global Campus‖ (U).
  - ―Before the communication of new strategies to teachers, coordinators requested clear guidelines to highest authorities to avoid chaotic implementations‖ (N).
  - ―High level authorities are deeply concerned about online education development‖ (N).
  - ―A teacher must present a formal note to authorities justifying the request for converting his/her on-campus course in a online course, the Directive Board analyzes it and approves the initiative‖ (N).
  - ―There was a pilot initiative involving one course and after the successful results, the experience was extended to the continuing level of the course as a validation. Being successful too, the modality can be adopted by other courses‖ (N).

- **Missing communication strategies**
  - 11

- **The subsecretary (of TICs) was formally created with a superior resolution… we had several resolutions that we failed to communicate because the channels of communication were a lot of formal procedures since 2002 but our failure was that we trusted in the defined channels and they remained sleeping in administrative employees’ desks. Teachers are aware of the courses and the possibilities to convert their on-campus courses in online courses but the communication of strategies to the teachers is never tackled‖ (U).
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| 2.2 Adoption flow | Bottom-up | | 5 | “We never knew about those resolutions. We only realized that something was going on when PROMEI program was publicly advertised by the national ministry of Education” (M)  
“We have an informal but direct relation with the university initiators of the central platform so we knew about the project before formal resolutions were distributed” (N) |
| | | | | “University authorities recognise that different modalities of distance learning had already been implemented at individual and informal level in several Schools, without an academic and institutional frame.” (U)  
“The few teachers that believed in online education were using developed free tools, such as Yahoo Groups, mail, even chart since long time ago. Most of us did it without any institutional encouragement, with the initial aim of convincing our colleagues, get some visible results and then push authorities for support” (M)  
“A small group of enthusiastic teachers were using Yahoo or Google to interact with students out of the institutional time for courses. I myself configured a Yahoo group as it were a learning platform, with folders with organised material and threads of messages as forum. Although we had positive results, it has limitations, thus when we knew about the Moodle initiatives we acted intensively to convince the other teachers” (N) |
| | Top-down | | 3 | “Resolutions of the Directive Board formalised the decision, made only by authorities. It is assumed that all individual current initiatives will have to submit to the institutional platform” (M)  
“Involvement of higher authorities was vital in a so geographically dispersed university like us” (U)  
“After some time, a virtual campus was developed in the SubSecretary of Information and Communication Technology using proprietary software and offered to all schools” (U)  
“The Virtual Global Campus (CVG) within the now Secretary of Information and Communication Technology, was formally presented to all the Schools” (U)  
“Once school authorities got involved in the idea, everything was easier” (N) |
<p>| 2.3 Drivers | Governmental | | 3 | “UTN signed up for this program (PROMEI) in 2006, and it can be assumed that the possibility of having |</p>
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<td>Funding</td>
<td>Financial aspects</td>
<td>7</td>
<td>&quot;You know, it is convenient for any university management to be in line with the governmental political machinery. And the Agency for University Policies is demanding technology education.&quot;</td>
</tr>
<tr>
<td></td>
<td>Social and economical pressure</td>
<td>Funding</td>
<td>4</td>
<td>&quot;In Argentine Higher Education, in general but mostly in UTN, the problem of giving up studies at School because of work is a critical issue.&quot;</td>
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<td>Pressure from higher levels</td>
<td>Pressure from higher levels</td>
<td>2</td>
<td>&quot;Resolutions from the University Central Management were marking the line. We had our own platform, but as a political gesture, courses of engineering careers were transfer to the Global Virtual Campus, while paid courses mainly provided to the community and companies were kept in ours.&quot;</td>
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<td></td>
<td>Technology pressure</td>
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<td>2</td>
<td>&quot;A technological challenge for a technological university.&quot;</td>
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<td>Support (Training)</td>
<td>Initial learning by own experience/training or colleagues' support</td>
<td>Training</td>
<td>7</td>
<td>&quot;Developers were working by trial and error as more pressure was less of time and more...&quot;</td>
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<td>training” (N)</td>
<td>&quot;At the beginning I did not know how to start doing things in Moodle, but another teacher in the team helped me” (N)</td>
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<td>&quot;The educational innovation unit gave some tips but it was not enough. Support from colleagues that have learned it in other universities were welcomed” (M)</td>
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<td>Specific unit for technological support</td>
<td>4</td>
<td>&quot;We provided training to virtual tutors” (M)</td>
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<td>&quot;The central coordination of CVG organised training meetings for the local administrators, among the schools to interchange experiences” (U)</td>
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<td>&quot;The pedagogical and technical coordinators were so nice helping us! Even convincing some skeptical teachers” (N)</td>
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<td>2.5 Recognition</td>
<td>It is expected as normal part of teachers’ work (no extra money)</td>
<td>5</td>
<td>“Only two persons have to keep continuity in the virtual campus, for more than thousands of users” (U)</td>
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<td>&quot;The teacher must be involved, even economically in the initiative development... This is a missing question to be solved” (N)</td>
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<td>&quot;It is a huge additional work, especially if teachers are in charge of several courses as it is normal here. It works better with elective courses because only one course is opened” (M)</td>
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<td>&quot;Nowadays, there are not possibilities of economic incentives to teachers” (M)</td>
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<td>&quot;Up to now we were doing everything for free. I expect that some day there will be some economic recognition. It is fair” (N)</td>
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<td></td>
<td>3. Historical review of the process</td>
<td>A small initial group of adopters</td>
<td>5</td>
<td>“At the beginning we were seen as if we were from another planet, but slowly we were not only accepted by other teachers but they become interested and sometimes actively involved in our ideas” (N)</td>
</tr>
</tbody>
</table>
|        |                               | Interviewee as | 4 | “I started with a project by 1999 using FirstClass but knowledge about this type of courses was at that
3.2 Personal experience with distance initiatives/technologies

- Distance courses based on TV, multimedia devices or previous online courses. In 2001, we had a very valuable experience with a Microsoft platform, but it was only used for a government course. (U)
- I have been working in a Terciary career using videoconferencing. (U)
- I was part of the FirstClass project far in 1999. (U)
- A few teachers started using it and Dokeos was my earliest experience. (M)
- In 2001, we experienced a Microsoft platform, under an agreement of the company with the government. (M)
- It was a big effort because we had no experience with leaning platforms, only Yahoo. (N)
- In 2003, we used that technology in an attempt to provide access to a pilot platform from mobile devices, but it was not successful. (U)
- In 2000, we experienced a Microsoft platform in an agreement of the company and government. In 2003, we decided to proceed to a pilot platform for mobile devices, but it was unsuccessful. (U)

Themes
- Themes

Categories
- Categories

Sub-category / Paragraphs
- Sub-category / Paragraphs

Number of interviewees that talked about the sub-category
- Number of interviewees that talked about the sub-category

Examples
- Examples

Encouraged
- Encouraged

None experienced
- None experienced

Need to be institutionally encouraged
- Need to be institutionally encouraged
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<td>“In 2006, a research group began exploring Moodle” (U)</td>
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<td>“The Virtual Global Campus (CVG) within the recently named Secretary of Information and Communication Technology, was formally presented to all the Schools. It had a centralised architecture but its adoption was not coercitive, each school could decide” (U)</td>
</tr>
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<td>“Standardized open source architectures were considered better than the existing platform, and Moodle was selected. It was free and this tackled one of our weaknesses: money” (U)</td>
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<td>“In 2006, the department developed its own virtual space using Dokeos, an open source tool, although it was not very friendly and the critical problem was the continuity of Internet connection of the school” (M)</td>
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<td>“In-house development and outsourcing were out of consideration as we did not have resources. Moodle was the lifebelt, it was free, under an international standard, a lot of information available, friendly for beginners…what else do you need?”</td>
</tr>
<tr>
<td></td>
<td>Outsourcing</td>
<td></td>
<td>1</td>
<td>“Community Extension courses are hosted in a private company” (M)</td>
</tr>
<tr>
<td></td>
<td>In-house development</td>
<td></td>
<td>1</td>
<td>“Initially, we did not adopt the university platform implemented at that time. We prefer to pay a developer and a technical support” (M)</td>
</tr>
<tr>
<td>4. Personal view of future perspectives online learning</td>
<td>4.1 Institutionalisation process</td>
<td>Institutionalisation</td>
<td>7</td>
<td>“There are several schools that absolutely want to use their own developed campus mainly because of political reasons. We cannot talk about institutionalisation at university level. It has to be reached at school level first” (U)</td>
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<tr>
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<td>“Virtual courses do not have the same administrative recognition as on-campus courses, like in University of Buenos Aires” (M)</td>
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<td>“Online courses are only complementary. The institution keeps holding to its traditional culture of on-campus education” (M)</td>
</tr>
</tbody>
</table>
|                               |                                |                          |                                                          | “Although it has improved a lot, online education has not developed and became formalised, at
**Themes**

**Categories**

*Themes:*

- Ownership of the material (Intellectual property)
- Conflicts
- Updating with new technologies
- Number of interviewees that talked about the sub-category

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**Examples:**

- "No one have questioned the ownership of their material" (M)
- "Technicians, teachers and management were not very integrated in what project goals refer" (U)
- "There are certain courses in both modalities, on and off-campus. Students can choose. There are a few ones that are only online, and the others are still on-campus, but we are in the process of moving at least a as blended" (N)
- "We have made a survey about student needs and they are satisfied with the current tools in the platform. When asked about including social networks, they also preferred to maintain their part of the work. And I would like some type of assistance, similar to the platform that we use here. We have a lot of ideas about social media, but we need to find a way to implement a university social network within the CVI platform. And we are going to implement a university social network within the CVI platform. We are interested in the implementation of a social network. We are trying to find a way to implement a university social network within the CVI platform."

**Conflicts:**

- "Technicians, teachers and management were not very integrated in what project goals refer" (U)
- "There are certain courses in both modalities, on and off-campus. Students can choose. There are a few ones that are only online, and the others are still on-campus, but we are in the process of moving at least a as blended" (N)
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**Number of interviewees that talked about the sub-category:**

- Ownership of the material (Intellectual property): 1
- Conflicts: 1
- Updating with new technologies: 1
- Number of interviewees that talked about the sub-category: 5

**Examples:**

- "No one have questioned the ownership of their material" (M)
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**Examples (School of the respondent):**

- "K and J are anonymous references to mentioned real names" (M)
- "We have made a survey about student needs and they are satisfied with the current tools in the platform. When asked about including social networks, they also preferred to maintain their part of the work. And I would like some type of assistance, similar to the platform that we use here. We have a lot of ideas about social media, but we need to find a way to implement a university social network within the CVI platform. And we are going to implement a university social network within the CVI platform."

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**Examples (School of the respondent):**

- "K and J are anonymous references to mentioned real names" (M)
- "We have made a survey about student needs and they are satisfied with the current tools in the platform. When asked about including social networks, they also preferred to maintain their part of the work. And I would like some type of assistance, similar to the platform that we use here. We have a lot of ideas about social media, but we need to find a way to implement a university social network within the CVI platform. And we are going to implement a university social network within the CVI platform."

**Examples (School of the respondent):**

- "K and J are anonymous references to mentioned real names" (M)
<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories (high-level coding)</th>
<th>Sub-category /Paragraphs</th>
<th>Number of interviewees that talked about the sub-category</th>
<th>Examples [School of the respondent]</th>
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<tr>
<td></td>
<td>stakeholders</td>
<td></td>
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<td>*K and J are anonymous references to mentioned real names</td>
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<tr>
<td></td>
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<td></td>
<td>&quot;The teacher must be involved, even economically in the initiative development, because it is a interdisciplinary task&quot; (N)</td>
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<td></td>
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<td>&quot;Conflicts between technical, pedagogical and institutional stakeholders naturally arose, but these normative frames, though rudimentary, are acting as facilitators of decision-making, communication and resource assignment.&quot; (N)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>&quot;We need not only didactical strategies but mainly those for development and implementing initiatives&quot; (N)</td>
</tr>
</tbody>
</table>
Appendix G: Document list and analysis template

UTN documents

- Superior Board Resolution 1105/2001
- Superior Board Resolution 248/2002
- Superior Board Resolution 836/2003
- Superior Board Resolution 1036/2003
- Superior Board Resolution 125/2006
- Superior Board Resolution 1133/2007
- Superior Board Resolution 2114/2010
- UTN University & Enterprises Nº 30 (Apr/09) Institutional Journal
- Announcement to Deans about the creation of the Global Virtual Campus (2006)
- Statistics from the Global Virtual Platform about courses’ activities and use at University level (2010)
- Web institutional information about FRBA school E-learning Center
- Draft of the project creating the unit for Educational Innovation and Virtual Campus in FRBA school (2008)
- Report of the unit for Educational Innovation and Virtual Campus FRBA school (2010)
- Statistics from the Global Virtual Platform about courses’ activities and use at FRGP School (2010)
- Research report about students dropout quantitative and qualitative analysis
- FRGP Directive Board resolutions aproving the creation of the Communication Centar, the appointment of the local pedagogical and technological administrator as the links with the Global Virtual Platform management
- FRGP Directive Board resolutions aproving online course regime and procedures

JÖNKÖPING UNIVERSITY documents

- Institutional organisation charts (2009)
- Mål för Informations-, KommunikationsTeknikens (IKT) utveckling vid Hälsohögskolan i Jönköping 2009 – 2012
Appendices

- SEAL III Program Training for teachers of vocational subjects and NSHU brochure
- JTH draft plan in which online education is mentioned
- Web institutional information about RFL
- From project to permanent activity (2006) RFL report

Document analysis worksheet
(based on the US National Archives and Record Administration design)

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**Document identification**

Type of document: ____________________________________________

Physical characteristics or media: ____________________________

Date of the document (or retrieval): __________________________

Author: ____________________________________________________

Position: __________________________________________________

Addressee/s: ______________________________________________

**Document information**

Title: ______________________________________________________

Keywords: _________________________________________________

Purpose: __________________________________________________

Reference to other documents: _______________________________

Comments: _______________________________________________
Collection of Articles and Papers

Paper 1
Exploring the current theoretical background about adoption to the institutionalisation of online education in universities: needs for further research.
Ines Casanovas

Paper 2
Professors’ driving and limiting factors for the adoption of e-learning in Higher Education within the Argentine context.
I. Casanovas, G. Fernandez & C. Tomassino

Paper 3
Teachers’ perception of institutional strategies in e-learning implementations: a comparative study of an Argentinian and a Swedish university.

Paper 4
The impact of national culture on e-learning implementation: a comparative study of an Argentinian and a Swedish university.
C. Keller, J. Lindh, S. Hrastinski & I. Casanovas

Paper 5
The impact of communicating institutional strategies on teachers’ attitude about adopting online education.
Ines Casanovas

Paper 6
Institutional strategies influencing the adoption of online education in universities.
I. Casanovas, C. Keller & J. Lindh

Paper 7
Flexibility to harmonise teachers and institutional stakeholders’ purposes of e-learning initiatives.
Ines Casanovas

Paper 8
An experience of an engineering online education implementation involving action research.
Ines Casanovas
JIBS Dissertation Series


<table>
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<tr>
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<th>Title</th>
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<td>018</td>
<td>Hall, Annika</td>
<td>“Strategising in the context of genuine relations: An interpretative study of strategic renewal through family interactions”</td>
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<td>Nilsson, Ulf</td>
<td>“Product costing in interorganizational relationships – A supplier’s perspective”</td>
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<td>Samuelsson, Mikael</td>
<td>“Creating new ventures: A longitudinal investigation of the nascent venturing process”</td>
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<td>021</td>
<td>Bruns, Volker</td>
<td>“Who receives bank loans? A study of lending officers’ assessments of loans to growing small and medium-sized enterprises”</td>
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<td>022</td>
<td>Gustafsson, Veronica</td>
<td>“Entrepreneurial Decision-Making: Individuals, tasks and cognitions”</td>
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<td>Agndal, Henrik</td>
<td>“Internationalisation as a Process of Strategy and Change – A Study of 16 Swedish Industrial SMEs”</td>
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<td>Ejermo, Olof</td>
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<td>“Taxation of Cross-Border Partnerships: Double-Tax Relief in Hybrid and Reverse Hybrid Situations”</td>
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<td>028</td>
<td>Blombäck, Anna</td>
<td>“Supplier brand image – a catalyst for choice: Expanding the B2B brand discourse by studying the role corporate brand image plays in the selection of subcontractors”</td>
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<td>Nordqvist, Mattias</td>
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<td>Karlsson, Tomas</td>
<td>“Business Plans in New Ventures: An Institutional Perspective”</td>
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<td>031</td>
<td>Johnson, Andreas</td>
<td>“Host Country Effects of Foreign Direct Investment: The Case of Developing and Transition Economies”</td>
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<td>Nyström, Kristina</td>
<td>“Entry and Exit in Swedish Industrial Sectors”</td>
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<td>Salvato, Carlo</td>
<td>“Micro-Foundations of Organizational Adaptation. A Field Study in the Evolution of Product Development Capabilities in a Design Firm”</td>
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<td>Gräšiö, Urban</td>
<td>“Spatial Spillovers of Knowledge Production – An Accessibility Approach”</td>
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<td>035</td>
<td>Dahlqvist, Jonas</td>
<td>“Assessing New Economic Activity – Process and Performance in New Ventures”</td>
<td>Business Administration</td>
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No. 041  Hultman, Jens (2007): “Rethinking adoption – Information and communications technology interaction processes within the Swedish automobile industry”, (Business Administration).
No. 064 Ots, Mart (2010): “Understanding value formation - A study of marketing communications practices at the food retailer ICA”, (Business Administration).
No. 068 Wikner, Sarah (2010): “Value co-creation as practice: On a supplier’s capabilities in the value generation process”, (Business Administration).
| No. 072 | Cui, Lianguang (2011): “Innovation and network development of logistics firms”, (Business Administration). |