Multidimensional Framework for the Analysis of Innovations at Universities in Catalonia

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Abstract: The purpose of this paper is to contribute to a better understanding of the nature of change processes and dynamics at Catalan universities. A multidimensional approach was adopted to examine the change processes and to analyse organizational innovation in higher education. The paper draws involved in each particular innovation. Analysis of these innovations has led to the identification of common characteristics and a proposal for a multidimensional framework for future innovation analysis. Finally, the innovation cases analysed highlighted interactions between three innovation characteristics, defined as scope (number of people involved), nature (organizational or curricular) and term (short, medium or long).
Keywords: Innovation; higher education; change management; leadership; change impact.

Marco multidimensional para el análisis de las innovaciones en las Universidades de Cataluña
Resumen: El propósito de este artículo es contribuir a una mejor comprensión de la naturaleza de los procesos y dinámicas de cambio en las universidades catalanas. Se adoptó

un enfoque multidimensional para examinar los procesos de cambio y para analizar la innovación organizativa en educación superior. El artículo parte de la literatura anterior sobre innovación universitaria y de seis estudios de caso de innovaciones en educación superior a nivel del sistema universitario, a nivel institucional y de programa curricular cubriendo diferentes niveles organizacionales y fases de desarrollo. El diseño fue propio de la investigación cualitativa y se basó en entrevistas individuales y grupos de discusión, con el objetivo de la recoger datos de seis grupos diferentes de sujetos involucrados en cada innovación en particular. El análisis de estas innovaciones ha llevado a la identificación de características comunes y una propuesta de un modelo para el análisis multidimensional de la innovación futura. Por último, los casos de innovación analizados nos evidenció la interacción entre tres características de la innovación, definida como el alcance (número de personas implicadas), la naturaleza (o de organización curricular) y duración (corto, mediano o largo plazo).
Palabras-clave: Innovación; educación superior; cambio organizacional; liderazgo; cambio.

Marco multidimensional para a análise de Inovações em Universidades na Catalunha
Resumo: O objectivo deste artigo é contribuir para uma melhor compreensão da natureza dos processos de mudanças e suas respectivas dinâmicas nas universidades da Catalunha. Para analisar os processos de mudança, assim como a inovação organizacional no ensino superior, foi adoptada uma abordagem multidimensional. O estudo parte da literatura anterior sobre inovação universitária, seguido por uma análise empírica de seis estudos de caso sobre inovação no ensino superior. O referido estudo foi realizado no âmbito dos sistemas universitários, institucionais e de programas curriculares e abrangeu os diferentes níveis organizacionais e fases de desenvolvimento. Trata-se de uma investigação de natureza qualitativa, com análise baseada em entrevistas individuais e nas discussões de grupos focais, com o objectivo de colectar dados de seis diferentes grupos de sujeitos envolvidos em cada inovação em particular. A análise dessas inovações levou à identificação de características comuns e a proposição de um modelo para a análise multidimensional da inovação futura. Por fim, os casos de inovação analisados evidenciaram a iteração entre três características da inovação, definidas como: alcance (número de pessoas envolvidas); a natureza (ou de organização curricular): e a duração (curto, médio ou longo prazo).
Palavras-chave: Inovação; educação superior; mudança organizacional; liderança; impacto da mudança.

The University in a Context of Change

The current university environment is characterized by complexity and by conditions that are changeable and demanding. Universities are obliged nowadays to make changes, most of which arise from the need to provide a service in line with society's requirements. Hargreaves and Dawe (1990: 277) described this situation, asserting that "the organizational culture of an educational institution, such as the University, is under a changeable process which generates internal conflicts, and most of them are the consequence of the discrepancies between the role performed by the universities and the role they should perform in the current society".

The literature on changes in university organizational culture is abundant and wide-ranging; nevertheless, there is general agreement on a number of fundamental aspects:

globalization, the increasing difficulty of funding universities, internalization, the mobility of students and teaching staff, management.

Neave (2001) considers the Anglo-Saxon pattern to be a developing trend for universities throughout the world, as the increasingly global environment has pushed shifts in governmental funding and policies, increased reliance on private and corporate funds, and administrative decision-making. Mendoza & Berger (2005) and Slaughter & Leslie (1997) note that reward structures constitute another area in which major differences exist between industrial and academic cultures. The academic profession is driven by intrinsic motivation and rewards that have historically been based on a fascination with research, the attractions of teaching, and discipline-oriented prestige rather than on material or monetary incentives (Clark, 1987).

Tierney (1988) notes that the external environment layer is characterized by the continually evolving nature of colleges and universities according to the interactions between conditions in the external environment and the needs and concerns of groups within the institution. Becher (1984) suggests that discipline-based subcultures are the primary source of faculty identity and expertise. In a similar vein, Clark (1987) illustrated the nature of the academic profession as a collection of academic tribes and territories with a widening array of disciplines and specialties. Nonetheless, departments form the main structure of higher education, and their culture is also a significant source of identity for faculty members (Becher, 1989). Finally, there is an overarching core culture of the academic profession based on concepts of academic freedom, individual autonomy, production and dissemination of knowledge, collegiality, collegial governance, service to society through the production of knowledge, and education of the young (Clark, 1980; Morril & Speed, 1982; Ruscio, 1987).

In any event, studying the culture in Higher Education must take into account the relations of the university with its environment (local-global), its governance and its internal structure.

Some innovations implemented by universities have arisen through external pressures or imposed policies, such as the European Higher Education Area (EHEA). Among the six case studies analysed in this article, three are influenced by the EHEA:

- Educational science project – This innovation introduces a new curriculum on the basis of the EHEA guidelines
- Evaluation of teaching –The criteria used by the Agency for System Quality at Catalan Universities for the evaluation of teaching took into account the achievement of the new teaching competences, and
- Problem-based learning – This methodology is based on the EHEA guidelines, since one of its core aspects is to promote active learning among students; others come about as a result of internal initiatives from within the universities themselves.

We are in agreement with Hanna (2002: 354), who states that "the most important and immediate task for today's universities is to develop a new culture, which promotes and pays attention to change at all levels of the organization…The universities have to create, articulate and adopt new institutional strategies which allow them to survive and prosper in the educational market." One of the challenges facing universities is the need to maintain their role as reference institutions in the creation, generation and communication of knowledge for the development of society. The role of the universities as creators and communicators of knowledge must be backed by an organizational culture favorable to change. However, the establishment of such an organizational culture requires that universities assume strategies that allow them to adopt a new culture–one that is more

focused on the values and behaviors geared to accepting change, the willingness to improve, and characteristics of the innovation culture.

The process of implementing change at the university should take into consideration the contributions of Clark (1998a, 1998b), who identifies and analyzes five basic elements for the innovation activities at universities: a strong management staff, a developed environment, a diversified funding source, a motivated academic staff and an enterprising culture. Sporn (2001) explains the importance of considering the interactions between them for the implementation and development of innovation within any institution. Sporn (2001) also identifies a number of proposals relating to critical factors needed to advance towards the adapted university: an environment characterized either by crisis or opportunities, a proper definition of the mission and the goals, the organizational culture, a well-structured organization, professionalized staff managers, committed leadership and participation in the decision-making process.

Tomas (2006) asserts that for a university to reform, it must undergo cultural change. She lists a number of internal and external strategies aimed at achieving this objective. The management of change and the comparison of current and desirable cultures is one of the key strategies noted by Tomas.

Studying Innovation in Universities

There are many different methods and models used to examine the nature of innovation. An exhaustive review refers us to the study of some dimensions identified by various authors: the source (causes, origins) (De la Torre, 1998), the values (the group of beliefs, ideologies, thoughts and purposes which lead the innovation process) (King and Anderson, 1990; Boada, de la Fuente and de Diego, 2007), the leadership (style and perceptions of those who promote innovation) (McNay, 1995; Ramsden, 2002 and Fullan, 2001, 2008), stages of development (phases in which the innovation process occurs from the early stages of development and institutional practices) (Fullan, 1990; Beck, 1997; Kanter, 1998; De la Torre, 1994, Hall and Hord, 2001; Notan and Croson, 1995; Rogers, 2003), strategies (actions, measures and interventions), obstacles and hindrances (barriers to innovation) (Robins, 1987; Aguilar, 2003; Villa, 2008), impact (communication of results at the institutional level (Escudero, 1990) and funding (the cost of innovation) (Clark (1998a/1998b). Institutional culture exerts a major influence on how changes originate and develop. Indeed, in his typology of university cultures, which identifies collegial, developmental, negotiating and managerial cultures, Bergquist (1992: 45) identifies the different concepts of change for each type of culture: "A faculty member who tacitly accepts the norms, values, and rules of precedence of the collegial culture will usually assume that institutional change takes place primarily through – and power resides in – the quasi-political, committee-based, faculty-controlled governance processes of a college or university".

In a managerial culture, one influences and changes things by being skilful in managing people and money. It is in the careful attention to the regular administrative duties of a college or university that one has an effect on the institution's operations. These are the "games" that grown faculty members must play to "massage their egos", "avoid work" or "delude themselves" about the amount of influence they really exert on the life and goals of the college or university.

The developmental culture can also bridge the gap between the needs of individuals and requirements of the institution itself. Rationality is particularly important in this culture.

In the negotiating culture, the academic senates and collective bargaining units represent two quite distinct and often incompatible sources of faculty power on a college or university campus. Attempts to make faculty unions out of faculty senates have usually been unsuccessful. Kemerer and Baldridge (1975: 142) conclude: "Most senate attempts to usurp traditional union functions will probably be challenged successfully, particularly if the senate has not previously or consistently dealt with economic issues and working conditions."

As decision-making contexts grow more obscure, costs increase, and resources become more difficult to allocate. Leaders in higher education can benefit from understanding their institutions as cultural entities. (Tierney, 1988:5)

Every innovation process is started from causes or triggers, the nature of which may or may not be problematic. Being aware of any problem at the organizational level can motivate the implementation of changes, particularly when people are not comfortable and have the will to solve the problem. Innovation can also be the result of external proposals or can be implemented with a view to adapting the organization to a new regulation. There are also alternative sources of innovation, such as the management staff or other agents related to the organization. The adoption of strategies addressed to the implementation of change implies the recognition and the dialectical analyses of the problematic involving the transformation of the educational process.

Regardless of people's opinions about change, the values leading the process of change at any organization also determine the perception of the personnel involved in the change and of the activities they perform. This has resulted in the need to consider the values of the people responsible for the innovation process and its promoters, the values of those responsible for its implementation (the operators of innovation) in the daily practice and the values of those affected by the innovation process.

Any study of leadership has to consider the context in which it operates, referred to by Hersey (1988) and Blanchard and Hersey (1988) in terms of situational and contingent leadership. The effectiveness of an innovation is also determined by the situation of those who receive the implementation of innovation, their capacity and motivation. According to Fullan (2001), instead of encouraging others to solve problems for which the solution is already known, the organizational leader should deal with those problems for which a solution has never been found. Ramsden (2002) considers that the hardest task assigned to university leaders consists in the creation of the proper environment needed to ensure success in the innovation process, and at the same time the recognition of those measures without proven success. Thus, junior academic managers as well as heads of departments face the same tensions when confronting innovations (Mercer, 2009).

Innovations can go through several phases, and there are several models designed to explain these phases in the educational context (De la Torre, 1994). However, most of these models serve to describe the innovation rather than to analyse and comprehend its meaning. The seminal taxonomic study of the nature of change carried out by Lewin (1951) identified three steps of the process: unfreezing, displacement to another level, and refreezing and its integration into a new situation. Nolan and Croson (1995) developed a model to show phases of innovation, from its beginning, communication, control and integration.

In the view of Kanter (1988), there are four tasks: the generation of ideas and the motivation of those entrepreneurs who might begin the innovation process; the definition of groups and the acquisition of power needed to convert all ideas into reality; the realization of the idea and the creation of innovation, transforming the idea into a product, plan or prototype that can be implemented; and the communication, dissemination, spreading and extension of the model, the commercialization of the product or the adoption of the plan.

As innovation plans are structured in phases, the sequence of these processes cannot be static or linear, but must be dynamic and flexible, bearing in mind that there may be contingencies and unexpected factors affecting the plan.

All innovation strategies can meet obstacles. Indeed, there are authors who suggest innovation as a means of overcoming barriers that may appear during any process of change (Herriot and Gross, 1979). Instead of considering these barriers as a threat or an impediment, they should be considered as an opportunity for reflection, cohesion, or even as an incentive to the success of the innovation. In earlier research, Tomàs (1995) showed that a functional or planned resolution of conflicts at the organizational level could lead to structural changes which may in turn bring the organization to a more advanced level.

Several reviews concerning barriers to change (Robbins, 1987; Aguilar, 2003; Villa, 2008) show that the taxonomy of barriers can be summarized as: source; model of attitude; objective or subjective nature; distance of reach or magnitude; and solution approach. Accordingly, the study by Topa & Morales (2008) is conclusive when it states that attitudes prior to change have a direct impact on the results.

The processes of innovation are reflected in the institution in which they have been implemented, generating both tangible and intangible results. Innovation strategies are designed and led by people who, in most cases, are determined to achieve their objectives. However, many either fail to fully achieve their objectives or obtain unexpected results. Transformations either in people or institutions are not easy to implement and most take time, chiefly because a change in culture is a demanding process.

The impact of change on people, structures and social environment depends to a large extent on the efficacy of the innovation process, the organizational and pedagogical capacity of the centre and its availability to maintain and incorporate the changes. It also depends on the type of leadership.

Financial support is also a key factor in the implementation of innovation strategies. Clark (1998a, 1998b) states that having a diversified source of funds, e.g. governmental, private and industrial financial support is vital to the institution in the event of one of these sources drying up.

Analysis of Innovation: Methodological Design

This research involved the use of an ideographic study, a qualitative design aimed at in-depth comprehension of the specific reality of six different types of innovation. Using an analytical multi-case model, the following innovations in Catalonia were selected: the implementation of an educational project in a faculty of sciences; a plan concerning gender equality at a traditional research university; curricular design based on project/problem-based learning in a nursery school; the launch of a new postgraduate program for the deaf community; an institutional plan for early retirement in a traditional research university; and an evaluation plan for university teachers led by the Catalan University Quality Assurance Agency (AQU) in another traditional research university.

Context at Catalan Universities: The Six Cases

Catalonia is one of 20 autonomous regions of Spain established by the democratic constitution of 1978. Since the 1980s, the state has undergone a process of increasing decentralisation, devolving power to the various autonomous communities in ways which, despite similarities, also show up significant differences. With a population of seven million,

Catalonia is a region with a long history, a language of its own and distinct traditions, many of which date back to the medieval period.

Research is focused on a selection of 6 cases at three public universities. Each has been chosen by factors of scope, scale and time. The innovation cases can be briefly described as follows:

1. The educational science project is an organizational innovation and affects the faculty as a whole. Its implications are diverse: organizational, curricular and evaluative; they also affect the relations structure.
2. Preliminary action plan for equality between women and men. Biennium 2006-2007. The purpose of this action plan is to foster a culture of equality at universities.
3. Evaluation of teaching. The Agency for System Quality at Catalan Universities *(Agència per a la Qualitat del Sistema Universitari de Catalunya, AQU)* created a commission of experts from the Catalan public universities to prepare a guide for designing and implementing a model of teacher evaluation at public universities in Catalonia.
4. Early retirement plan. Seeking to improve the utilisation of human resources, the plan aims firstly to encourage voluntary retirement with a part-time employment contract, and secondly to stabilise the position of teachers and promote the recruitment of younger professors.
5. Problem-based learning (PBL) at the School of Nursing. The School of Nursing took a decision to innovate on teaching-learning strategies using the PBL method. This innovation was carried out from a curriculum based on a list of topics as the distribution of subjects and exposure of students to an integrated curriculum based on competencies.
6. Postgraduate studies relating to the deaf community. In 2003, the Faculty of Teacher Training launched two postgraduate courses relating to the deaf community, also open to non-graduates. One of these was aimed at deaf students; the other, which has resulted in the creation of an official Masters Degree in the Deaf Community, Education and Sign Language, has one course aimed at deaf students and the other at hearing students.

Data collection

Data were collected using two methods: individual interviews and focus-group interviews. Interviews for both individuals and focus groups were designed in line with the following topics: the origin of the change; the need for the change and its objectives; change planning; the stage or phase in which the change is at the moment of the questioning, problems or difficulties, the type of leadership at the front of the process, the observed impact, the global value given to the process and the funds invested to the process.

Informants were recruited according to three different profiles: promoters, those who act as ideologists or visionaries and establish goals and objectives of change; managers and those in charge of implementing the different measures relating to change; and receivers, or those who receive the benefits of change. Table 1 synthesises the final sample of informants.

Table 1.
Number of informants by case, instrument and profile

Individual Interviews	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Promoters	2	1	1	1	1	1
Implementers	2	1	2	1	1	2
Receivers	0	1	2	2	2	1
Focus Group Interviews						
Promoters	0	1	2	0	0	0
Implementers	0	2	10	6	6	0
Receivers	6	12	12	8	0	0

According to the methodology used in this study, closing the recruiting of the sample also involves ending the selection of informants and data collection. In order to determine the end-point for sample recruiting, three criteria were considered, each applied in accordance with the nature of each case, the timing of the research, and the methodological approach used to design the interview in line with a university's culture of change. These criteria were: theoretical saturation, meaning that recruitment of new informants is not necessary if it is expected that none can add useful information; theoretical definition, which in the context of this research means that research objectives and questions should allow the research group to determine the time when data collection is complete and when the analysis phase can start; complete profiles, meaning all informants provide data.

Data Analysis

Because of its nature, the data analysis phase is a complex procedure that includes an interpretative effort involving coding and categorisation of the conceptual meaning of the data collected. The analysis carried out in this research has been developed across three highly differentiated levels. The first of these analysis levels involves identifying the units of study and their global conceptual meaning. Each of the units of analysis represents an interpretative framework obtained after the textual transcription of the data. During this phase, we used an open system of coding, which involves segmentation of the entire information into different coherent units, the meaning of which configures the first basic conceptual matrix. Definition of the conceptual relations between the studied units was achieved by means of a constant analysis of their meaning and the possible links between them. As a result, the conceptual relations were defined in seven dimensions: origin, values, leadership, phases, barriers and obstacles, impact and funding.

The second level of analysis includes the textual interpretation at both the intermediate and the more elementary units of analysis. During this intensive analytical phase, we used an axial coding system based on the seven dimensions previously defined. In order to maintain the uniformity and coherence of the coding system, textual references

were individually defined by means of the informants' quotes. As a result, this system provided a list of shared and unambiguous conceptual categories identified by an exclusive code.

The third level of analysis focuses on the synthesis and meaning process and serves to identify the textual paragraphs that can be distinguished from others according to their semantic, syntactic and pragmatic properties. During this intensive phase, a system of selective coding was used. The objective of this coding system was to identify those factors associated with a certain category, their integration and grouping. As a result, this system provided a complex structure comprising not only the sense of the analytical process but the textual structure of the transcriptions and their relation to the research objectives.

Table 2.
Analysis of Innovation: Dimensions of the Study

Dimension	Description
Origin	This dimension summarizes the semantic units related with the bases and cases leading the innovation process. Others properties such as reach and nature are also incorporated.
Values	This dimension summarizes the semantic units which serve to describe the values leading the behavior of the people involved in the innovation plan at any level of responsibility. The value given for those who promote the change (promoters/managers), those in charge of the implementation of change (implementers) and those who might be affected by the change (receivers) is also included; thus they reflect their main beliefs, which are considered key elements of the institutional culture.
Leadership	This dimension summarizes the semantic units which serve to describe the relations established between the different informants across the several circumstances involved in the innovation process and the people responsible for them as a function of the level of leadership: territorial, in the case of schools, centers or departments; institutional, in the case of universities; and systemic, in the case of the Catalonian university system. This dimension has to do with how leadership is performed, its intensity and the degree of support given to the innovation plan.
Phases	This dimension summarizes the semantic units, which serve to identify the general perception, difficulties or factors related with all the studied innovation programmes and their phases. Regarding the design, we highlighted the phases of design and the process of sensitising. Regarding the phases needed to implement change, we asked the informants to value the process carried out and to score each of these phases.
Barriers and Obstacles	This dimension summarizes the semantic units which serve to identify the people's perception of change at any level of the organization (promoter, manager and receiver) and their opinions on barriers (at the personal or organizational level) to the implementation of change. They were also asked about any apparent social, legal or organizational barriers to change.
Impact	This dimension summarizes the semantic units, which serve to identify any evidence of impact resulting from the innovation programme. Innovations can affect people in the organization, for instance, students and/or teachers; or its impact can be reflected in the curricular program, the structural organization as well as economic or social life.
Funding	This dimension summarizes the semantic units which serve to describe the shortage or availability of funds used in the innovation, the sources of both received and invested funds, the homogeneity or heterogeneity of these sources and the efficiency of the innovation in financial terms.

Framework for the Analysis of University Innovations

Several results were obtained from this research. One of these is related to the comprehensive model of analysis of university innovations. The analysis model for university innovation comprises two phases: the characterization of change and the characterization of innovation as a function of the seven dimensions previously defined.

The first phase of the model allows the characterization of change according to three variables: scope, nature and deadline. The scope of the innovation can vary from university systems to specific organization units such as schools or departments. In terms of nature, the innovations can be organizational or curricular. And in terms of deadline, the model differentiates between short, middle or long periods of time. Table 3 summarizes the type of innovations according to the variables previously mentioned.

Table 3.
Types of innovation

Variables	Type
Scope	System Center Unit
Nature	Curricular Organizational
Deadline	Short Middle Long

The second part of the model includes the study of the seven dimensions: origin/source, values, leadership, strategies, obstacles/barriers, impact and funding. The origin/source dimension focuses on the root of the innovation and is related to its genesis, cause and orientation. The genesis or trigger of change can be internal, external or a mixture of the two. The causes, which may generate an innovation, are mainly related to three variables: a problematic situation, a mandatory rule or a benchmarking process. The orientation of the innovation can be "top-down" or "bottom-up". In this sense it can also be considered a differentiation between three types of innovation: emergent, imported or imposed (King and Anderson, 1990). Emergent innovations are those processes that are fully developed by the group, imported innovations are those that apply foreign ideas adapted or adopted from previous experiences, and imposed innovations are those enforced by a higher hierarchical level.

Depending on the hierarchical level, three types of innovation are defined: self-started, in which the process is generated from and aimed at the same hierarchical level; descendent, in which the innovation is designed at a superior hierarchical level and implementation is carried out at an inferior hierarchical level; and ascendant, in which the proposal of change is made from a hierarchical level with insufficient competences but is aimed at a higher hierarchical level. All innovation programs and their values can be analysed from an axiological point of view and may include: promoters, implementers and receivers. Depending on their nature, values can be ordered as social, communitarian or academic and personal.

The model permits identification of the leadership dimension as a function of three characteristics: nearness/proximity, style and support. Nearness/proximity is related to the implication, accessibility and presence shown by the leader during the period of change implementation. Style represents how the leadership is performed and can be linked with the different theories developed in this field (distributed, transformational, etc.). Thirdly, support shows the extent to which the leader expresses his/her backing, advice and guidance to all the people, measures and conflicts involved in the change process; support can be demonstrated on isolated occasions or constantly over a period of time.

The model identifies five phases during the innovation process: the pilot or experimental phase, the diffusion and communication phase, the implementation and execution phase, the evaluation or assessment phase and the consolidation phase.

The obstacles/barriers dimension shows the factors against the process of change during any phase. Three different types of obstacles/barriers were identified: individual, organizational, social and normative. Individual obstacles/barriers are frequent among people with strict routines and in some cases related to position at the organization. Organizational obstacles/barriers are due to the structural and cultural nature of the organization. Social obstacles/barriers are mainly related to financial factors and most are linked with the environment (university and educational system). In most cases, the university context is characterized by a highly normative and regulated field; this fact can lead to obstacles/barriers. The model presented is able to distinguish between different levels of normative development.

The impact analyzed during this research considers five possible scopes of scenarios: people, curriculum, organizational structures, economy and social environment. Finally, the funding system is analyzed by means of two variables: the sources (public, private or mixed) and the type of resources invested in the organization (personal, material, functional, etc.). In Table 4, we summarize the approach and include some opinions from the interviews and focus group.

The framework presented might have a number of potential uses. First, it allows the description of specific innovation scenarios at universities. Second, the model is useful in analyzing the dynamics of change at universities by means of an exhaustive procedure. This model could also be of use in designing a helpful structure to compare the different types of innovation strategies at universities. Finally, the model is helpful for comparing the results observed at the different scenarios and provides an opportunity to compare different levels or establish comparative studies. Use and implementation of the framework across different contexts will offer additional feedback to improve and safeguard the validity and reliability of the instrument.

Finally, taking into account the set of dimensions used in this research, we believe this study may be of use in carrying out analysis of several types of innovation at the university level, implementing institutional change designs, assessing them and performing comparative studies. The innovation cases analyzed revealed interactions between the features of innovations, as scope (number of people involved), nature (organizational or curricular), and term (short, medium or long) and selected explanatory variables (origin, leadership, phases and strategies, values, resistance and obstacles, impact and financing). Further research on each kind of innovation is needed to permit the generalization of our results.

Table 4.

Change Processes at Universities: A Multi-dimensional Framework

Dimensions	Voices	Variables	Indicators
Origin	*"I think that change arises from the need to adjust to new regulations and to the overriding European area. We were aware that the higher education orientation had to be changed, but the fact that it came as a diktat from Europe led us to the conviction that we should promote the shift in the teaching paradigm".* Agustín, Innovation promoter.	Cause/ motivation	Improvement, Problem, Normative, Competitiveness, Benchmarking
		Genesis/ initiative	Internal / external / mixed Emergent / imported / imposed
		Orientation	Self-started, Descendant, Ascendant
Values	*"Promoting an equality plan is a commitment to the whole of society, and our universities have always addressed social demands".* Amalia, Innovation promoter	Agents	Promoters, Implementers, Receivers
		Nature	Universal or social, Institutional
Leadership	*"For me, there is one thing that is clear about the successful change in our faculty: it is due to the support of the dean from the very beginning. He was always there, listening, helping and giving support when something went wrong".* Antonio, Change recipient	Proximity	External/ Internal leader
		Style	Distributed, Transformational
		Support	Isolated, Constant
Phases	*"When the new manual for teacher evaluation was presented, it was explained that an experimental phase would be carried out before the model was implemented. In previous meetings, special emphasis was placed on this subject. It was very important to make clear that this preliminary version should be reviewed after completing the experimental phase and that everybody could contribute to its improvement".* Ariel, Change recipient	Previous	Experimentation
		Initial	Communication / Sensitising
		Implementation	Putting into practice
		Evaluation	Institutionalisation
		Consolidation	Results
		Information	Meetings and feedbacks
		Sensitising / Communication	Meetings, web pages, Intranet, email, journals, publications, brochures,
Barriers/ obstacles	*"Opposition to the process was more evident when it resulted in people being overworked: in this case, they would really complain. This is quite common and affects both teachers and students in almost equal measure. Students who protested more did so when they had work load peaks".* Amalia, Innovation promoter	Individual	Role, Position
		Organizational	Culture, Structure
		Social	Individual, Functional
		Normative	Degree of normative development
Impact	*"Since the project started, I have noticed that students have become much more autonomous; they are now working more frequently in groups and taking more responsibility for tasks. They have developed a remarkable capacity for generic competences without losing levels of specific competences".* Amalia, Innovation promoter	People	Satisfaction, Formative, Beliefs
		Curriculum	Design, Development, Assessment
		Structure	Complexity, Size, Formalisation
		Social	Image, Social recognition, Values
		Economic	Salary, institutional resources
Funding	*"Carrying out our plan was much more expensive. We have received funding from the regional government and nearly all of the money has been spent on new infrastructure and on training the teachers involved. Without this external funding, we would not have been able to implement the innovation".* Anna, Change promoter	Sources	Public / private / mixed
		Resources	Personal, Material, Functional,

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