Responding to new policy demands: A comparative study of Portuguese and Dutch non-university higher education organizations

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A Dissertation presented in partial fulfillment of the Requirements for the Degree of Doctor in Public Policy

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Summary in English

This dissertation studies the responses of Portuguese polytechnics and Dutch hogescholen to new policy demands. These non-university higher education organizations focus on training professionals through practical learning approaches in close collaboration with regional/local industries and communities. In the past decade, such organizations have been undergoing changes related to their governance and educational provisions. National governments demanded them to focus on a research mandate and innovate educational provisions and training to be more responsive to the needs of local labor markets, industries, and communities. However, there is little research on how these organizations responded to new policy demands in their local contexts or how they contributed to the training of an adequately skilled labor force.

Current research about non-university higher education generally either showcases in-depth single-country specificities of adaptation to new policy demands or provides international comparisons of the size of the sector and national laws and regulations related to the new policy demands. With a focus on non-university higher education organizations in Portugal and the Netherlands, this dissertation aims to provide an in-depth comparative understanding of responses to new policy demands, with the goal of producing broader generalizations relative to the sector. Portugal and the Netherlands are selected as case study countries because both have binary higher education systems with both university and non-university organizations. This accounts for representativeness. At the same time, there are political, economic, and social differences between the countries, as well as differences in how they regulate non-university higher education organizations. Such differences are considered potential explanatory forces for policy outcomes in most higher education literature.

Unlike previous literature, which considers the political, economic, and social environments only as factors affecting organizational responses, this dissertation focuses on the organizational *experience* of conditions in political, economic and social environments in response to the new research policy and the demand for educational innovation. More specifically, it defines political, economic, and social environments as parts of the higher education field that interact and depend upon each other for resources and survival. Fields are characterized by institutional pluralism, while organizations are faced with multiple

institutional prescriptions from political and social institutions, known as field actors. For the most part, the role of the national higher education field has been downplayed or absent from research on organizational responses to new demands and adaptations in higher education. With this in mind, the dissertation undertakes a qualitative comparative analysis, employing several conceptual streams from new institutional theory to explain how experienced conditions in the national higher education field shape non-university higher education organizations' responses to new policy.

The objectives of this dissertation therefore extend beyond in-depth understanding of the responses to new policy, to explain the reasons behind these responses, and (a) specify the role of non-university higher education in providing labor markets with adequately skilled employees, (b) inform policymakers about the characteristics of non-university higher education organizations so they can create effective and diversifying policies in national contexts, (c) enable national policymakers to draw on concrete examples to foster the development of non-university higher education programs, and, finally, (d) contribute to the development of the higher education literature that explores responses to new policy demands and change processes.

First, this study shows that, in each of the two countries, non-university higher education organizations respond differently to new policy demands. This goes against the expectation of convergence and uniformity within European higher education systems targeted by harmonization policies -- such as the Bologna Process -- and by reforms aimed at adjusting national higher education systems to a shared European level with common political agendas and strategies. This research shows that Dutch *hogescholen* have intermediary functions in their higher education fields, where collaboration with local businesses and communities has evolved into partnerships in education that, through research, lead to innovation (Chapter 2). This role of the *hogescholen*, and the nature of their research practices and educational provisions, is unique. The main characteristics of the new research mandate are readily discernable. Research consists of practical problem solving activities, driven by local industry and community, and is multiparty, multidimensional, and hybrid (Chapters 4 and 5). At the same time, Dutch *hogescholen* struggle to attain scientific legitimacy because their research is dominantly practice based and with problem solving outputs. This legitimacy seems critical due to increasing political pressure to collaborate

with universities. Therefore, Dutch *hogescholen* have begun hiring more staff with PhDs, as well as encouraging current staff to pursue PhDs and introducing courses on research methodologies in order to equip students and researchers with greater scientific rigor in their research practices.

Portuguese polytechnics attempt to function as universities, while at the same time incorporating diverse research practices in a way that provides innovative educational provisions (Chapters 3 and 6). All polytechnics attempt to adopt Mode 1 knowledge production, that in which they believe universities engage. This term is used to characterize research driven by scholarly questions, and the extensive knowledge found in their respective disciplines. It refers to fundamental scientific research aimed at advancing a disciplinary field of science. At the same time, some polytechnics also adopt Mode 2 knowledge production through projects funded in collaboration with universities and external stakeholders. This term is used to characterize context driven research, where questions arise from the perception of problems in the industry. The aim of such research is to find generalizable solutions for an industrial sector rather than solve a specific company problem. Mode 2 usually leads to more generalizable knowledge production that aims to shift, redefine, and innovate an industry, but not generally to concrete outputs that solve problems for industries or societies. A few polytechnics that I analyzed also advanced Mode 3 knowledge production (Chapter 2). This term is gaining recent popularity, and scholars try to differentiate it from Mode 2 by arguing that research questions are always defined by local companies or local context, and that concrete, applicable outputs are always accomplished. Definition of Mode 3 type of research has also been expanded through the findings of this dissertation and essentially represents practice based and short term problem oriented research which serves educational purposes (upgrading students' and teachers' skills and knowledge of the profession and dynamics in the work environment), improves company products or designs solutions and contributes to local and regional innovation in professions. Different types of research result from the absence of a coherent research strategy for polytechnic education at national field level. The arrangement of research seems, instead, to be left to organizational discretion. This leads to a variation in research activities and practice from one polytechnic to another without the possibility of synthesizing a coherent definition of research and its characteristics for the sector. At the

same time, it suggests that polytechnics in Portugal are flexible and strategic, thereby voiding organizational homogeneity.

Second, the study shows that these different responses to policy demands are a result of organizational and individual *experiences* of conditions in the national higher education field. Based on theoretical insight from new institutional theory, this dissertation's findings show that the organizational experience of conditions within the field of national higher education shapes the organizational understanding of new demands. Organizational action in response to new demands is therefore not defined autonomously without influence from the field of higher education. Organizations which experience stability in their field of higher education, such as the Dutch *hogescholen*, are characterized by institutionalized organizational identity, or central, enduring and distinctive features defined at the field level and collectively understood by organizational members. They relied on these in order to perform research (Chapter 5) and unintentional decoupling in response to demands for innovation in education (Chapter 4). On the other hand, however, Portuguese polytechnics, which experience conditions in their field as complex, and therefore uncertain, are characterized by identity ambiguity; they strategized in response to the new research mandate (Chapter 2 and Chapter 6). This means that the organizational experience of complexity regarding conditions in the field of national higher education influences responses to new policy demands as it also shapes the organizational understanding of self.

Additionally, this study reveals that more attention should be paid to micro elements within organizations, including individuals with specific skills and social networks as they have an opportunity to mediate change and respond to new demands in innovative ways (Chapter 3). These individuals experienced their field in specific ways which influenced their strategic responses and eventually had an impact on organizations. In fact, they perceived the new policy demand as incompatible and incongruent with the cognitive norms and values that guided their behavior, leading them to experience field complexity and contributing to innovative responses. This finding highlights micro "macro" (or field) incongruences which contribute to an experience of complexity.

The results of this dissertation have significant implications for national and European policymaking initiatives. They suggest that policymakers should consider promoting coherent policy frameworks when implementing a new demand and tailored to national and

local contexts, while promoting European collaborative trends within the non-university higher education sector.

Higher education managers, on the other hand, should be more attentive to organizational processes and in particular the type of skills, knowledge and abilities of their academics in their organization if they want to advance certain innovative undertakings relative to change. Overall, the dissertation offers practical advice to policymakers and academic managers in higher education organizations, and especially the non-university higher education sector as it undergoes policy change. With this said, the study informs the field of higher education policymaking and strategic change management in higher education.

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CHAPTER 1
Introduction

Context and purpose

In a world of increasingly competitive economies, higher education has become imperative (Pucciarelli & Kaplan, 2016). It is an engine of growth and economic recovery, enhancing the position and reputation of respective countries by fostering knowledge production and application through research and innovation (Psacharopoulos & Patrinos, 2004; Hanushek et al., 2008). The economic strength and innovative potential of countries depends upon the education and skills of their workers (Cerina & Manca, 2012). For both new and old employees, formal education is the most common way of acquiring necessary skills (Sweetman, 2002). Skilled workers determine the competitiveness of countries through their ability to innovate and manage technological changes in their working environment (ILO, 2010). They support national innovation by generating new knowledge and adapting acquired knowledge to local use (Power & Malmberg, 2008). However, it is predicted that in the next 15 years, 80% of the natives born in European countries and the US will be over 50 years of age (Dychtwald et al., 2006). These workers will not be able to use new technologies because they will lack the knowledge, skills and competencies crucial for the enhancement of knowledge economies and competition at international levels. New entrants into the labor force are also expected to be lacking adequate skills such as critical thinking, teamwork and other soft skills in general (see Robles, 2012). This situation pressures educational organizations and national higher education systems to improve the quality and accessibility in order to provide workers with skills that are of medium to long term value to labor markets (e.g. Griffith et.al., 2006; Simões & Duarte, 2007).

In order to meet the needs and challenges of competitive European and national labor markets and provide adequately trained and skilled workers, European governments have been diligent in their promotion of changes in governance, quality assurance, funding allocation, human resource policy and teaching and research practices in higher education institutions in order to foster change. They have stimulated cutting edge research, innovation, critical thinking and high end teaching at higher education organizations, as well as through increased university business collaborations and entrepreneurship activities (Charles, Kitagawa & Uyarra 2014) and flexible laws relevant to organizational functioning and autonomy (Enders et al., 2013). Numerous calls for redesigned curricula have been put

forward by scholars, practitioners, and governments alike, as the skill sets and competencies that students possess are seen to differ from those required for turbulent, unpredictable and ever-changing job markets (EC, 2012a). As a result, there has been a recognizable emergence of research on how higher education organizations manage the multiple new challenges stemming from the demands of their policy environment. It has been important to understand whether and how universities both adapt to recent changes and shape their strategies towards the changing environment (Ebersberger, 2013). It was equally relevant for university management and leadership to be able to draw on best case practices to facilitate processes of change within their organizations (Howells et al., 2014) and make the process of adaptation more efficient, desirable and effective (e.g. Cummings et al., 2005).

Whereas the bulk of current research has focused on how universities have handled change and new demands, there is relatively limited understanding of how these new policy demands affect non-university higher education organizations in Europe. Research on non-university higher education organizations is gradually receiving greater attention as horizontal and vertical diversification of higher education systems are becoming a pressing concern for European higher education policymaking (Norbert, 2016). Understanding what these different organizations are doing and how they cope with change and new policy demands can potentially help policymakers and national governments to create diversifying mechanisms for adaptation and policies that go against the logic of convergence and assimilation to university education (see Morphew & Huisman, 2002; Bleiklie, 2001). At the same time, the role of these types of European higher education organizations and systems in training highly skilled workers can be highlighted, thereby emphasizing their distinctiveness from universities (Heitor et al., 2014). Non-university higher education organizations provide training for the masses of such specialized workers, and their importance has been particularly highlighted at times when productivity growth experiences a decrease in Europe (Mas & Stehrer, 2012). However, it is not fully understood whether and how these organizations are playing such key roles in their national contexts, which informs the main research question of this dissertation:

How are non-university higher education organizations responding to new policy demands and what characterizes their responses?

Non-university higher education in Europe

Non-university higher education organizations (e.g, *institutos politécnicos* in Portugal, *hogescholen* in the Netherlands) provide professionalized education for the needs of the regional and local economy, enforce close collaboration with the professional field in training (e.g. Netherlands), and provide alternative higher education training aimed at increasing countries' knowledge base and open up opportunities for access to higher education (e.g. Portugal) (De Weert & Soo, 2009). These organizations emerged in most European countries in the late 1970s, having originated from mergers of smaller industry-oriented institutes or local colleges (Urbano, 2011). Some appeared later, including those in Finland in the 1990s, and had a predefined regional function. Collectively, the role of such higher education organizations around Europe is to provide students with undergraduate training and ensure robustness of professional skills so they can work in the industry they had intensely studied (Huisman, 2008; Maassen et al., 2012). The initial aim was to provide students with learning conditions that reflect or resemble working situations and equip them with a ready-to-work mindset (Hasanefendic, Heitor & Horta, 2016). In theory, these organizations are nothing like universities; in fact, they were created to be different.

Recently, these organizations also came under the spotlight because of the number of changes in their external environment that affect their functioning. First, they were only recently presented with a research mandate. Research for non-university higher education organizations was broadly defined through national policies and within the context of applied and problem-solving practices which support the active learning of professions through engagements with local industry (Kyvik & Lepori, 2010). Scholarly literature has accounted for differences in research practices across non-university higher education organizations in Europe as a part of their new mandate (De Weert & Soo, 2009). Studies have shown that research as a new mandate of non-university higher education was conceptualized differently at organizational levels, diversely incorporated in teaching within different countries and supported by very different research funding schemes (e.g. Lepori, 2007; De Weert & Soo, 2009). Yet, visible differences regarding the new research mandate across countries have not been comprehensively explored and explained. Previous research, for instance, is limited to explaining how non-university higher education organizations managed change in the framework of the new mandate and does not sufficiently address

why differences across countries occur. This earlier research provides summaries of trends of changes and differences among countries and fails to account for all the complexities in the national context and within the organizations in influencing responses to the new mandate (Teichler, 1996).

Second, non-university higher education organizations have increasingly been pressured to innovate in education and change their curricular practices to be more attentive to changing societal demands (Hoidn & Kärkkäinen, 2014) and local labor market needs (Harvey, 2010). As higher education organizations are traditionally linked more closely to professional fields and labor markets, they were requested to contribute more effectively to supplying labor markets with qualified human resources that could meet a range of complex demands in multidimensional socially, culturally, technologically and economically challenging professional environments (CEDEFOP, 2012; CEDEFOP, 2013). Many studies have systematically addressed this issue by showing developments in pedagogy at these organizations within national contexts (e.g. Kettunen, 2011), benefits of workplace learning (e.g. Virolainen, 2007) and innovations in educational models (e.g. Penttilä et al., 2013). These studies emphasized diversity in the improvement and innovation of learning and teaching practices, with the common goal of being more responsive to the needs of the environment and society by revising their curricular practices. Still, these studies were usually single country studies and did not contribute to a more generalizable understanding of how and why these organizations dealt with new demands and changes in their environment in diverse ways.

In general, there is limited knowledge on the ways that non-university higher education organizations respond to new demands and undergo change in Europe because studies are either comparisons without in-depth characterization of similarities and differences across countries and their explanation, or they are dispersed single case studies which do not account for generalizations. This situation significantly handicaps theory development (Teichler, 1996; Välimaa, 2008), as well as successful policymaking targeting improvement, development and innovation in and for these organizations at European levels and, finally, diversification from universities. Acknowledging a gap in the understanding of how non-university higher education organizations *across* different European countries respond to

changes related to the new research mandate and demands to innovate in education in diverse ways, this dissertation focuses on two main sub-questions:

> *SUB-RQ1 How do non-university higher education organizations respond to the demands to innovate in education and what accounts for any differences in responses?*

> *SUB-RQ 2 How do non-university higher education organizations respond to the new research mandate and what accounts for any differences in responses?*

The overall objective of the dissertation is to *comparatively* address the organizational dynamics of non-university higher education organizations responding to new demands and provide in-depth understanding of the reasons behind their diverse responses in order to (a) specify the role of non-university higher education in providing labor markets with adequately skilled employees, (b) inform policymakers about what these organizations are doing in times of change and what characterizes their behavior so they can come up with effective and diversifying policies in national contexts, (c) foster organizational development which impacts the training of students with skills from medium to long term relevance for the local labor markets and industry, and (d) contribute to generalizations regarding non-university higher education responses to new policy demands.

Responding to change and new demands in higher education

In the higher education literature, two main streams have developed that address how higher education organizations manage change and new policy demands in their environments. One attempts to describe the multiple dimensions with which the environment and changes can be characterized (e.g. Altbach, 2015; Horta & Yudkevich, 2016). These studies are usually guided by the premises of institutional theory and resource dependency, which describe how market forces and social and political pressures can produce highly deterministic and homogenous environments (Scott, 2004). The environment is described as rule setting *field,* dominated by rules stemming from political and social institutions (field actors) and taken-for-granted norms about what constitutes legitimate or acceptable organizational behavior (Oliver 1997; Meyer & Rowan, 1977; DiMaggio & Powell, 1983). Institutions "are the rules of the game in a society, or, more formally, are the humanly devised constraints that shape human interaction" (North, 1990,

p. 3). Institutions "reduce uncertainty by providing a structure to everyday life" (ibid.) and include both formal rules, such as laws and constitutions, and informal constraints, such as conventions and unspoken norms.

In the institutional view, organizations are perceived as passive recipients of demands and adapt to new policies under the influence of institutionalized isomorphic pressures. Isomorphism occurs when organizations imitate and incorporate the norms and values of their institutions in fields considered to be legitimate, with the end result that organizations in the same field would become increasingly similar and homogenous (DiMaggio & Powell, 1983). For example, Chan and Mok (2015) examine the changing landscapes of the quality assurance regimes in Taiwan and Hong Kong. They show that quality assurance regimes in each of these countries were implemented differently due to the pressures stemming from national fields and system specificities (e.g. the national higher education field). Similarly, in an examination of private higher education in Morocco and Tunisia, Buckner (2016) shows that these two countries differ in number and status of private higher education organizations because of the embedded traditions and norms regarding historical legacies or differences in national historic commitment to free education in each country's higher education field.

In contrast, Seeber et al. (2016) contend that national contexts, institutional constraints and ability to attain resources and available information in the higher education field, known as *field conditions*, do not solely affect higher education organizations responses, pointing to the role of organizational characteristics such as identity, governance and structure in the determination of country differences. This line of thinking draws attention to the other group, which studies higher education responses to changes in their environments. The scholars in this group focus on higher education organizations' perspectives and strategies towards the environment and changing policy (e.g. Magalhães et al., 2013; Wilkins & Huisman, 2012; Horta & Patricio, 2016). For example, Fumasoli and Huisman (2013) and Fumasoli et al. (2015) emphasize organizational identity as a strategic risk-reducing device in accomplishing organizational change. They emphasize that reality is constructed as experienced by organizational members and that organizational reactions and feedback to institutional pressures are filtered through organizational identity (see also Kodeih & Greenewood, 2014). Organizational identity is usually defined by the central, distinctive,

and enduring characteristics of an organization when its past, present and future are taken into account (Whetten & Godfrey 1998). Organizational identity has been considered a powerful tool of resistance to demands from the field, while at the same time it has also been used by organizations as a guiding tool in managing new institutional demands (Kodeih & Greenwood, 2014).

Furthermore, Degn (2016) and Stensaker (2004) show that the tensions between reforms and changing ideas about higher education on the one hand, and academic or organizational identity on the other, may lead to contestation and decoupling, among other diversified responses to change. Academics may perceive reforms as threats to their academic identity and contest them rather than change. Others decouple, or strategically assume, reforms, but don't practice them. These studies are grounded in social constructivist approaches which concur that the meaning and potential impact that the field holds for the organization is the result of assumptions that individuals have about reality in general -- and specifically about the field that surrounds them. They have emphasized that organizations are active agents in their fields which metabolize, translate and reshape policies as a result of their culture, structure, governance and underlying norms and values that are specific to an organization (Mampaey, 2016; Pinheiro et al., 2017). In many ways, this research emphasizes that institutional pressures and new demands are 'edited' (Sahlin & Wedlin, 2008) as a function of organizational self-interests. In other words, as s, higher education organizations do not passively absorb new demands); instead they "actively mold them into an internally accepted format" (Karlsson et al., 2014, p. 248). Collectively, this stream of research signals that organizations are not passive recipients of new demands, but share a unique dialogue within their field in response to changes resulting from organizational dynamics (Benneworth et al., 2016). In this way, fields are not merely sites of isomorphic pressures, as frequently asserted in higher education literature, but are also places where new demands and changes are discussed within frameworks of organizational activity (see Lounsbury, 2001).

This suggests that it is necessary to study both field conditions and organizational characteristics if one wants to gain an in-depth understanding of how and why higher education organizations respond to change and new demands. In order to understand and explore how and why non-university higher education organizations across Europe

responded to the new research mandate and demands for innovation in education in diverse ways, I analyze two aspects of this relationship. First, I investigate national higher education field conditions and the national contexts in which they are embedded through the experience of organizational members of national higher education fields (organizational perspective). I then examine which organizational characteristics influence organizational responses to new demands by analyzing the actions, beliefs and norms (values) of their members. Since the focus is on both the field and the organization, I frame the analysis within new institutional theory.

New institutional theory provides a sociological view of organizations, how they influence one another, how they interact within their fields and how they affect societal outputs (DiMaggio & Powell, 1991; Powell, 2007; Greenwood et al., 2008).The focus of new institutional theory is on the dynamics of the organization (meso level), within organizations (micro or individual level), and outside organizations (macro level), as well as the dialogue between the field and the organization in addressing organizational outcomes (Suddaby, 2010). Different from neo-institutional theory, new institutional theory considers the formation and change within organizations and at field levels to be a result of individual and organizational action (Hodgson, 1993; Lounsbury & Zhao, 2015). Unlike neo-institutional theory, new institutional theory claims that organizations and individuals are not shaped by their fields, but that the field functions as a way of providing resources, information and constraints. In this way, new institutional theory offers many theoretical lenses for addressing different levels of analysis, while also enabling researchers to address not only the constraints, information and resources (or dynamics) within the field, but also the complex processes inside the organizations that help in understanding organizational behavior.

By focusing on field conditions and organizational characteristics, different levels of analysis can be addressed. This dissertation, therefore, spans multiple levels of analysis and includes several related conceptual streams from new institutional theory developed in parallel. The use of multiple concepts and theoretical lenses within new institutional theory offers possibilities for understanding the characteristics of organizations, the field, and the multidirectional interactions between organizations and their fields (Suárez & Bromley, 2016). It jointly allows for the examination of the relationship between the field and

organizational characteristics in accounting for diverse non-university higher education responses to new demands across European countries and provides in-depth understanding of their behavior in national contexts, which was lacking in previous research.

Case country selection

To answer the research questions of this dissertation, I undertook a qualitative comparative analysis of the ways in which public non-university higher education organizations in Portugal and the Netherlands have been managing change in relation to the new research mandate and responding to demands to innovate in education. In the cross-country comparative chapters (Chapter 2 and 3) I also include the referential analysis of one country, Germany, and two territories of China, Hong Kong and Macau. Germany was included in Chapter 2 as a case study because the goal was to compare innovation in education in the Portuguese polytechnic with countries with a similar binary sector of higher education yet different dynamics of national higher education fields, due to differences in regulatory and socioeconomic contexts. The German case was located in a rural area; through collaboration with higher education organizations, it stimulated its economy and contributed to the opening of several dozen small and medium enterprises. The Dutch case was situated in an urban area and closely collaborated with big and small companies. At the same time, regulatory mechanisms in the two countries also differed, as Germany's non-university higher education sector is governed and funded by the state (and not the federal republic of Germany, which means that there are differences among states, thereby providing a unique setting), whereas the Netherlands regulates laws and policies for non-university higher education sector as a whole.

With this chapter, I hoped to show that in both urban and rural zones, under different socioeconomic and regulatory conditions, non-university higher education organizations found a way to innovate in education, reflecting their intermediary and unique functions in binary systems of higher education. At the same time, I hoped to highlight how achieving common goals (such as innovation in education, which perpetrates intermediary and unique function of non-university higher education) can be achieved, though they will inevitably require different mechanisms for success -- also due to the specificities of each country's socioeconomic and regulatory conditions. These findings are also expected to stimulate

science policy in Portugal that takes into consideration national specificities and possibilities when initiating change in education for polytechnics, aiming to better position their diversifying role in the higher education field.

In Chapter 3, the analysis of curriculum innovation in higher education settings expands to consider other regions of the world, such as Hong Kong and Macau, so as to highlight how individuals introduce diverse change. This is an unexplored topic in higher education literature because the higher education setting is regarded as an institutionalized arena where individuals are restricted to acting in accordance to the norms and values that guide their behavior (Scott & Biag, 2016). However, even in such settings, some individuals found a way to push boundaries and innovate. In this chapter, the focus is on individual behavior and the generalizability of individuals' characteristics of in institutionalized settings. Therefore, the setting is perceived as unchangeable; this leads to a better understanding of the relationship among different individual characteristics in fostering innovation in education in institutionalized higher education settings, the main objective of the chapter.

Portugal and The Netherlands: A comparison of non-university higher education organizations

The choice to study non-university higher education organizations in Portugal and the Netherlands was two-fold. First, both countries were characterized as having horizontal diversification in their higher education fields and have implemented a binary higher education system. Netherlands introduced the binary sector in 1986, and non-university higher education organizations emerged as a result to enhance industrial production and provide the labor market with employees holding skills that the profession requires (Boer, 2016). In Portugal, non-university higher education was created as an alternative to training the labor force, especially in remote or rural areas where the need existed to produce more highly qualified professionals for specific regions and enable access to higher education for more people than was currently provided (Lemos, 2015. The goal in both countries was to train skilled professionals, and the emphasis was on practical education; but the push was different. In Portugal, polytechnics were pushed by the Government with the reforms of Veiga Simão, Minister of Education from 1970 to 1974, in an effort to expand and diversify the higher education system in Portugal during the mid-1970s (Urbano, 2011). In the

Netherlands, however, the push for such educational institutions originated in the industries and industrial associations in urban as well as rural areas that were in need of professionally-oriented skilled workers (Boer, 2016).

Apart from the similarities in the binary structure of higher education (and with the obvious difference in origins), these two countries have also been introducing similar changes in their environments, affecting non-university higher education regarding the new research mandate and pressures to innovate in education (De Weert and Soo, 2009). For example, both countries introduced laws and policies to differentiate between the university and non-university sectors in their higher education systems by stipulating that non-university higher education is more applied, practical and oriented towards the professions. At the same time, both introduced research mandates for the non-university higher education sector within the same period (the beginning of 2000) as part of European policy efforts to stimulate knowledge creation and dissemination.

However, the countries were considered different in economic and policy terms, which influenced the structure and dynamics of their national higher education fields (e.g. their field conditions). Whereas Portugal suffers from socioeconomic and economic divergence across regions, especially between urban and rural areas, this is not the case in the Netherlands. The Netherlands is usually perceived as a flat country in both geographical as well as economic dimensions. Its institutional setting is known to result in a fairly equal distribution of income (see, for example, De Groot et al., 2006). Nevertheless, in terms of political and policy development for higher education, innovation and modernization, Portugal and the Netherlands keep a similar pace (De Coster et al., 2008), although obvious differences exist in the amount of institutional autonomy and governance, but also funding. For example, the Netherlands is considered a country with an entrepreneurial university governance model and a market-based type of higher education policy (Antonowicz & Jongbloed, 2015). Portugal, on the other hand, is a country which has been democratizing higher education and introducing changes in terms of governance in higher education institutions, though they are still controlled and steered by the government, thereby limiting institutional autonomy (Antonowicz & Jongbloed, 2015). The Dutch and Portuguese higher education systems and allocation of funding substantially differ as the Dutch universities and non-universities receive a higher amount of core funding.

In terms of policies related to non-university higher education, the countries also differ in that the Netherlands has fostered several funding policies for the development of a unique and diversifying research role from non-university higher education sector when this role was introduced some ten years ago, whereas this has not happened in Portugal (De Weert & Soo, 2009). Portugal has only recently started with targeted funding initiatives for support of practice based and problem oriented research activities at polytechnics. These differences in terms of higher education economics and policy are critical elements to consider for those wishing to understand adaptation processes to new policy demands, especially because national higher education offers different possibilities for organizations to respond to change and attain legitimacy by adapting to new policy demands (see Pfeffer & Salancik, 2003). These fields influence growth not only within higher education organizations, but also in the ways they cope with change based on resources and conditions in their environments (Galan-Muros & Plewa, 2016). It was important to acknowledge these field level similarities and differences because they are considered influential in shaping responses to new demands. They also help explain issues critical for achieving an in-depth understanding of organizational responses to new demands in higher education, thereby contributing to the development of theory in higher education (see Välimaa, 2008).

Portuguese higher education system

Higher education in Portugal is organized as a binary system. University education aims at providing solid academic training, combining the efforts and responsibilities of both teaching and research units, and polytechnic education concentrates on vocational and advanced technical training that is professionally orientated. The current system comprises 15 public universities (all represented in the Portuguese Rectors' Council), 15 public Polytechnic Institutes (represented in the Council of Portuguese Polytechnic Institutes or CCISP), five public non-integrated Polytechnic Schools (nursing, nautical school, police school etc.) and more than a hundred public Higher Education Schools, dependent on the Ministry of Education and Science (OECD, 2007; File, 2008). Fees are set by each higher education organization, depending on the type and quality of the course, although tuition is capped at around 1000 Euros for students studying in the first cycle (OECD, 2007; EURYDICE, 2010). Quality assurance of higher education is based on the evaluation and

accreditation of higher education institutions and their study cycles, through the Portuguese Higher Education Evaluation and Accreditation Agency ('A3ES'), created in 2007. The student population in 2015-2016 was 191.633 at public universities and 106.251 at public polytechnics[1].

Portuguese polytechnics

Polytechnics in Portugal were created in 1979 through Decree-Law nº 513-T/79 (Lemos, 2015). These organizations were created mainly to train highly skilled professionals and were strategically spread across the country to reach the most remote areas and facilitate access to higher education (see Urbano, 2011). They do not have managerial autonomy since they are State controlled and are not allowed to create, suspend or cancel study programs, as contrasted with university autonomy (see Martins, 2012). Public polytechnics tend to have a lengthier process when recruiting staff, which can explain how over 50% of the total staff is hired under special short-term contracts (Urbano, 2011). There were 9.438 teaching staff at public polytechnics as of 2015-2016 and 15.704 academics at public universities [2]. As of 2014, 32% of the teaching staff at public polytechnics held a PhD whereas this number was 7% before 2002. This significant increase in the number of teaching staff with a PhD is a result of a 2009 national Law which stipulated that at least 15% of the total full-time teaching staff must hold doctorates and at least 35% must hold the title of specialist. The title of specialist is a category of teaching staff exclusive for polytechnics. To become a specialist one must have at least a Bachelors degree, 10 years of practical experience and pass a public examination (Decree-Law nº 207/2009).

Salaries and conditions of service (including teaching loads) are set on a national basis, with very little room for organizational flexibility or merit-based rewards, since the academic career structure is prescribed in law for both the university and polytechnic sectors (File, 2008). To be able to reach the top of the career in a polytechnic (as in a university), the teaching staff must do an *aggregation*, a "proof of knowledge" in a disciplinary field that takes place at a university.

[1] http://www.dgeec.mec.pt/np4/dgeec/
[2] http://www.dgeec.mec.pt/np4/dgeec/

Polytechnics currently offer three-year undergraduate degrees, two-year masters and two-year short cycle programs (Urbano, 2008). This relatively new structure is a consequence of the implementation of the 2005 Bologna Process in Portugal. Most current courses are trying to implement or design their educational provisions around problem-based learning and enhance linkages with the external stakeholders in education.

Research, when it was defined as applied approximately ten years ago, became an official mandate, and is pursued in collaboration with regional industries and the local community for solving problems (Jongbloed & Kaiser, 2013). Some polytechnics in Portugal collaborate with local businesses and SMEs, and very few of them have a clearly defined regional mission in terms of research development (De Weert & Soo, 2009). Most research done is academic as the teaching staff in the polytechnic were traditionally trained at universities, had to do research or a PhD, and maintain good relations with or also work at associated university research centers. In this context, research at polytechnics is very similar or the same as that done at universities (Teixeira & Neave, 2012; Amaral & Rosa, 2004). At the same time, there are very few policies in place at governmental level to differentiate research at polytechnics from university type academic research. In fact, Portuguese polytechnics must compete for research funding with universities, and they get no core funding for research (Urbano, 2011). Eligibility for research funding is determined by publications, which is also the main measurable output for career progression. In sum, many Portuguese polytechnics end up emulating the functioning of universities due to their tradition and origins, lack of policy mechanisms in place to differentiate between the careers of university and polytechnic teaching staff, and competitive pressures for research funding alongside universities, hampering system diversity and easing the path of polytechnics towards academic drift (Mourato, 2014). The term "academic drift" is used to describe "a long-term process induced by educational systems' dynamics whereby vocationally and professionally oriented post-secondary education institutions with a focus on professional training, teaching, and learning strive to become like universities by incorporating university structures and emulating their values, norms, symbols and practices" (Christensen & Newberry, 2015, p. 33). Polytechnics in Portugal are said to copy universities for several reasons, such as when competing in attaining students and acquiring

external research funding (Christensen & Newberry, 2015). However, academic drift is not a universal tendency (Harwood, 2010), and it is not fully explored in the Portuguese case.

Dutch higher education system

Higher education in the Netherlands follows the same binary system as Portugal and consists of universities, which focus on the development and enhancement of fundamental research practices in academic professional settings, and non-university higher education organizations or *hogescholen,* which are more practically oriented and focus on the transfer of theoretical knowledge and skills in close cooperation with the professional practice (Huisman, 2008). Higher education in the Netherlands is rooted in the history and culture of the nation (Luijkx & Heus, 2008). The most significant characteristic of the Dutch higher education system is its organizational autonomy in governance and management (Marginson et al., 2008). There are also well-established cooperative efforts throughout higher education sectors, as evidenced, for example, by the collaboration among technical universities, merger negotiations between research universities and *hogescholen*[3], and mergers among industry, society and professional fields (Kaiser et al., 2005). According to the most recent data, there are more than 446.000 students enrolled in the *hogescholen* sector (a significant growth considering there were 181.100 in 1975; De Boer, 2017), which represents more than 65% of total enrolments in the tertiary education sector in the Netherlands[4].

<u>*Dutch hogescholen*</u>

The Dutch government went to great effort to differentiate between their two types of higher education. The strategic creation of *hogescholen* as non-university higher education organizations allowed for the training of professionals for industry, having taken place in close collaboration with the professional field. These institutions belonged to secondary

[3] One example of merger negotiation is 2003 agreement between University of Amsterdam and Hogeschool van Amsterdam. The merger happened at the Board level, which meant that the two separate organizations had a joint Board, but kept their organizational autonomies (Witte et al., 2008). The goal of the merger was for researchers to cooperate more closely. Furthermore, cooperation would make it easier for students at the Hogeschool van Amsterdam to pursue an academic diploma at the University of Amsterdam, and dropouts from University of Amsterdam to pursue a professional education at the Hogeschool van Amsterdam. The merger was dissolved in 2017. New mergers are planned between Tilburg University, Avans Hogeschool and Zuyd Hogeschool.

[4] http://cijfers.vereniginghogescholen.nl/

education up until 1986 when they were legally acknowledged as a subsector of the higher education system (Boer, 2016). By 1986 there were 150 *hogescholen* which were further merged into today's 37 publicly funded *hogescholen* (Boer, 2016). The *hogescholen* in the Netherlands are restricted in their ability to award degrees and are not fully funded by government. This is only with regards to Masters level programs, however, though they offer some professional and research Masters programs (Huisman, 2008). They mainly offer four-year undergraduate degrees, which include an obligatory internship. There is also the option of a two-year program, which leads to an associate degree (similar to a Portuguese two-year short cycle course), that was introduced in 2006-07.

The mission, objectives and strategy of the *hogescholen* in the Netherlands are not defined in a separated act from the one that addresses universities. The Higher Education and Research Act of 1993, amended in 2002 replaced the University Act, the Higher Professional Education Act and other regulations governing higher education and research to provide a broader characterization of the higher education sector in the Netherlands and cater for the differences in the system (De Weert & Boezerooy, 2007). According to the Act, the *hogesholen* are expected to offer theoretical instruction and develop in their students the skills required for practical application in a particular profession. One of the differences between the Dutch *hogescholen* and the research universities is that admission to *hogescholen* is contingent upon completion of the five-year upper general secondary education, upper secondary vocational education or the six-year university preparatory education. University education is only accessible to those who've finished the six-year preparatory education or completed the first year of *hogescholen*.

With regards to governance and autonomy, the *hogescholen* are now decentralized decision-making organizations with autonomous budget spending initiatives (Huisman, 2008). The present situation, in terms of level of autonomy, is considerably different from the situation in the mid-1980s, where *hogescholen* were under severe regulatory constraints imposed by the government. Nowadays, organizational autonomy is less limited by national regulations, but there is still strong oversight regarding accreditation, program supply, access and, of course, the overall budget for higher education (Huisman, 2008).

Hogescholen (both public and private) in the Netherlands have a total of 34.957 teaching and support staff (according to data from 2015), and currently only 5% of *hogescholen* staff hold

a PhD[5]. Their teaching staff is divided among teachers, teachers with some research obligations and non-tenured teachers with research. Most teaching staff are professionals from the field or experts in the industry, and a large percentage work part time as they have their own businesses on the side (Griffioen & de Jong, 2014). For assessment and career advancement in these three categories, different criteria apply which are discussed with the teacher manager and/or team leader of researchers in accordance with organizational rules and prescriptions. Publishing in high impact international and peer reviewed journals is not as relevant to those at the *hogescholen* as other factors related to the quality of teaching, engagement with the professional field, participation and set up of research projects and delivering concrete results to society (Andriessen & Schuurmans, 2017)

With regards to the new research mandate, the *hogescholen* started developing research activities as an official task some ten years ago (Griffioen & de Jong, 2015). Research is understood as beneficial to professional practice, quality of education and the professionalization of the teaching faculty; it is achieved through collaboration with the industry and small businesses contributing to regional upgrading and smart specialization (Hasanefendic, Heitor & Horta 2016). The Dutch Government steered the desired developments in research and the research agenda at the *hogescholen* in the initial years (Luijkx & de Heus 2008) and supported the development of strategic research agendas by creating the position of *lector* and a specific research funding instrument *RAAK* (Regional Attention and Action for Knowledge Circulation). *Lectors* are individuals who have both professional and, (usually) academic experience. They are expected to contribute to knowledge transfer, acquire contracts from third parties and develop professional networks in their domains (see Hasanefendic, Heitor & Horta 2016). Those at the Dutch *hogescholen* call them "professor," and their numbers have been increasing, from more than 20 in 2001-2002, to more than 100 in 2003-2004, over 250 in 2006-2007 and between 450 and 500 in 2015[6].

RAAK is a funding program designed to stimulate regional collaboration between *hogescholen* and businesses, especially small- and medium-sized businesses and public institutions with a view to developing joint innovation activities and stimulate knowledge

[5] http://cijfers.vereniginghogescholen.nl/

[6] Information obtained from the official website on the role, position and statistics on lectors in the Netherlands https://www.lectoraten.nl/

exchange and circulation (Jongbloed, 2010). Since 2010, the government has also funded the creation of Centers of Expertise at *hogescholen*. These are intermediary organizations which link the *hogeschool's* main research agenda and different lines of research with external stakeholders and professionals in the field, industry or community. The idea behind these mechanisms was to allocate research practice to the foundations of *hogescholen* education, including knowledge about the professions and preparation for direct entry into labor markets, thus differentiating them from universities.

Methodology

This dissertation employs a qualitative comparative methodology based on case studies *(*Gehman et al., 2017*).* Qualitative research is a "naturalistic, interpretative approach concerned with understanding the meanings which people attach to phenomena (actions, decisions, beliefs, values etc.) within their social worlds" (Snape & Spencer, 2014, p. 3) with the aim of exploring and understanding phenomena in a broader sense. Phenomena driven research is defined as problem-centered and focused on capturing, documenting, and conceptualizing organizational phenomena of interest (Schwarz & Stensaker, 2016). Higher education literature typically reports on research that is phenomena driven and focuses on practical implications and the problem relevance of the case study (Teichler, 2013). A case study is a rich empirical instance of some phenomenon, typically using multiple data sources (Yin, 1994).

This dissertation's objective was to explore non-university higher education organizations' responses to the new research mandate, as well as their responses to innovation in education in two countries, Portugal and the Netherlands. This goal also addresses the desire to achieve an understanding of why responses differ by focusing on organizational members' actions, beliefs and motivations towards the new policy demand. This generally requires the detailed personal focus that in-depth interviews and participant observation allow (Legard et al., 2003). For this reason, I collected data from 93 interviews, three focus groups, legislative documents, reports, newspaper articles and websites and filled two large A4 format notebooks with observation and field notes. Given that the organizational members interviewed had diverse ways of interpreting even 'the same' situations, a large degree of complexity in qualitative accounts was generated. These accounts were

interpreted in different ways and via different methods of analysis according to the data obtained and different research questions addressed, reinforcing the flexibility of the research design (Table 1.1). In case study research, different data and research questions call for distinctive approaches to the specifics of coding and display (see Eisenhardt in Gehman et al., 2017).

	Research method used (Yin, 2004)	**Data collection:** Primary and secondary data	**Type of Analysis Done**
Chapter 2	Cross country comparative case study	30 semi structured interviews and 3 focus groups; photos	Cross-comparative analysis (Khan & Van Wynsberghe, 2008)
Chapter 3	Multiple case comparative study	6 open ended interviews	Explanation building based on constant comparative method (Yin, 1994; Merriam & Tisdell, 2015)
Chapter 4	Single case comparative study	53 accreditation reports	Comparative qualitative content analysis (Hsieh & Shannon, 2005)
Chapter 5	Single case comparative study	20 semi structured interviews; observation notes, minutes meetings, institutional documents	Interpretative and iterative analysis (Strauss & Corbin, 1998)
Chapter 6	Single case comparative study	40 semi structured interviews; field notes and legal documentation and websites	Interpretative analysis (Strauss & Corbin, 1998; Gioia et al., 2013)

Table 1.1 Summary of research method, data collection and analysis in each empirical chapter

Qualitative methods were used to illuminate the experiences and interpret the events and social phenomena of interviewees with different roles (Sofaer, 1999) and emphasize the relationships between two or more conditions (in the field or organization) that led to diverse responses, making them an optimal tool (if not a necessary approach) for addressing issues regarding change processes and organizational behavior (Yin, 1994). On the other hand, the sheer volume and richness of data (for example Denzin & Lincoln, 2008; Patton, 2005) allowed for optimal clarification and a detailed understanding of complex phenomena and processes as they emerged (Ambert, 1994). Also, since I addressed two different research sub-questions, the use of different research strategies and different methods of

data collection, sampling and analysis guaranteed that the research topics and underlying research questions would be best approached and that sufficient details on the topics would be provided (Patton, 2005). Addressing different sub questions, in different ways, limits bias (Ritchie, 2003), as different informants spoke about the topics of these sub questions from different perspectives.

Outline and explanation of chapters

This dissertation includes five empirical chapters, an introduction as Chapter 1 and a conclusion as Chapter 7 (see Table 1.2). The five empirical chapters are organized in two groups. The first three chapters deal with organizational responses to demands to innovate in education and training in Portugal and the Netherlands. The last two chapters focus on responses to the new research mandate (see Table 1.2). Essentially, the chapters are centered around the two groups from different perspectives. The chapters embed the interpretation and analysis of organizational responses in different conceptual streams of new institutional theory, except for chapter 2. Chapter 2 explores organizational responses to demands to innovate in education by analyzing and interpreting the consequences of the new learning paradigm in non-university higher education in a comparative way. Organizational characteristics and field dynamics have a descriptive role in this chapter as they serve as a framework for analysis. Although seen as causal to diverse implementation of the learning paradigm, they are thereby explored in subsequent chapters in more length, the focus of chapter 2 is on the characteristics and development of the innovative learning paradigm across countries in non-university higher education.

The unique theoretical concepts which formed the basis for chapters 3,4,5 and 6 emerged during data analysis phase. This means that the initial interpretation of data guided me in the direction of theory. In fact, the use of different conceptual streams from new institutional theory lowered the risk of phenomena driven research being seen as too descriptive or constrained to national specificities without the possibility of contributing to the knowledge about the phenomena and/or the scientific field (Teichler, 2013). Generating knowledge about the same phenomena this way allowed for a variety of research paths and outcomes, and gave the phenomena-driven approach the robustness it needs to be

considered valuable for knowledge production and scientific (higher education) field advancement.

	Title	Topic	Conceptual streams	Research question
Chapter 2	Hasanefendic, S., Heitor, M., & Horta, H. (2016). Training students for new jobs: the role of technical and vocational higher education and implications for science policy in Portugal. Published in: *Technological Forecasting and Social Change, 113, (Part B), 328-340.*	Innovation in education	Constructivism as a learning theory (Phillips, 1995) and problem based learning (Lehmann et al., 2008).	SUB RQ1
Chapter 3	Hasanefendic, S., Birkholz, J. M., Horta, H., & van der Sijde, P. (2017). Individuals in action: bringing about innovation in higher education. Published in: *European Journal of Higher* Education, 7 (2), 101-119.	Innovation in education	Institutional entrepreneurship theory (e.g. Battilana et al., 2009).	SUB RQ1
Chapter 4	Frederik, H., Hasanefendic, S., & van der Sijde, P. (2017). Professional field in the accreditation process: examining information technology programmes at Dutch universities of applied sciences. Published in*: Assessment & Evaluation in Higher Education, 42(2), 208-225.*	Innovation in education	Loose coupling theory (Weick, 1976; Orton & Weick, 1990).	SUB RQ1
Chapter 5	Hasanefendic, S. (2017). When organizational identity guides change: A Dutch university of applied sciences and the new research mandate. Under review: *Higher Education Research and Development.*	Research mandate	Organizational identity theory (e.g. Albert & Whetten, 1985; Whetten, 2006).	SUB RQ2
Chapter 6	Hasanefendic, S, Patricio, T and De Bakker, F. G. A. (2017). Heterogeneous responses of Portuguese polytechnics to the new research policy demands. Published in: *University as a Critical Institution?* Eds. Rosemary Deem and Heather Eggins, Sense Publishers: Rotterdam, The Netherlands.	Research mandate	Theory on institutional fields (e.g. Scott, 1994; Zietsma et al., 2017).	SUB RQ2

Table 1.2 Outline of chapters and relevant information

Chapter 2, "*Training students for new jobs: The role of technical and vocational higher education and implications for science policy in Portugal*", contextualizes the role of non-university higher education in Portugal, the Netherlands and Germany with regards to demands to innovate in education to be more attentive to changes in the local labor market and the professional field. The chapter embeds the results within the framework of a constructive learning theory which highlights the way that the learning process and human knowledge are constructed by individuals and within social communities (Phillips, 1995). Namely, non-university higher education organizations in Netherlands and Germany are partnering with the professional field and societal stakeholders in undergraduate education to develop innovative learning pedagogies built upon a problem-based curriculum and short-term and project-oriented research. The chapter argues that these organizations provide "living laboratories" (or "test beds") that facilitate learning in increasingly uncertain markets, help in the training of future generations (see also Wagner, 2012), and stimulate learning through the processes of knowing, playing and making.

This is what highlights the intermediary function of non-universities in higher education in Germany and the Netherlands. In Portugal, innovative practices in education are appearing in the form of short cycle education with an increasing emphasis on problem-based and project-oriented research in the curriculum, suggesting opportunities to develop similar intermediary functions in the national higher education field. The chapter further emphasizes that in order for intermediary function of non-university higher education to develop several aspects are critical to address. First, it highlights the specific role of human intermediaries in supporting collaborative learning and research methodologies, particularly problem-based learning approaches in partnership with economic and societal stakeholders. The second aspect concerns the organizational dimension and the organizational context necessary to facilitate highly specialized knowledge -- in particular, the availability and readiness to create specialized research centers that provide a professional context adequate for fostering the necessary routines to collaborate with industry at high specialization levels. Last, but not least, the third aspect concerns the external environment and funding conditions, which depend on specific local and national field conditions.

Chapter 3, "*Individuals in action: bringing about innovation in higher education*", focuses on innovative curricular changes enacted by individuals in university and non-university settings, across several European countries, and in Hong Kong and Macau. The chapter embeds the research of these individuals into institutional entrepreneurship literature. Institutional entrepreneurship literature addresses individuals who introduce innovation from the "bottom-up" and in highly institutionalized fields (Battilana et al., 2009). Higher education as a field is usually considered to be highly institutionalized, where there are set regulatory, normative and cognitive prescriptions that guide and legitimize organizational behavior and condition access to resources (Scott & Biag, 2016). The chapter explains how individuals in institutionalized higher education fields can also assume the role of institutional entrepreneurs in higher education. This study shows that these individuals share a certain skillset and (most importantly) networks, in which they are central players who can leverage resources and mitigate the cost of innovative undertakings. Social networks serve as a bridge across different higher fields -- whether local, national or global (Pinheiro et al., 2017) -- and are used strategically to drive innovation and induce change within organizations.

Chapter 4, "*Professional field in the accreditation process: examining IT programmes at Dutch universities of applied sciences*", examines how the Dutch *hogescholen* responded to demands to innovate in education by being closer to and collaborating with industry and community. The chapter answers the research questions by exploring the extent to which the professional field is engaged in shaping learning outcomes at the strategic level and how the interaction is represented at the operational level by analyzing accreditation reports of all undergraduate course in information technology at Dutch *hogescholen*. The analysis is embedded within the theoretical framework, based on the concept of loose coupling (Weick, 1990), which allows for a more elaborate understanding of the interlinkages between the *hogescholen* and the professional field in the curriculum. If the interlinkage is loosely coupled, then actions of the professional field may have little or no effect on the curriculum. The basic underlying logic is that, unlike tight coupling (which presupposes highly integrated and responsive systems) and decoupling (which refers to the opposite alternative), 'loose coupling' indicates that the relationship and interlinkage between the *hogescholen* and the professional field in the curricula is less robust and free to adjust

accordingly to change without requiring a transformation in the curriculum (Orton & Weick, 1990). The results of this chapter suggest that there is tight coupling at strategic levels within the organization with the professional field, signaling legitimacy in the higher education field, and a loose coupling or decoupling at the operational or practice levels, which means that the interaction with the professional field is less obvious in practice and left to the discretion of the organization to arrange.

Chapter 5, "*When organizational identity guides change: A Dutch university of applied sciences and the new research mandate*", examines the responses of a Dutch *hogeschool* to the new research mandate and the role of organizational identity in the process. The chapter arrives at its findings by analyzing organizational members' perceptions and practices on research at different departments in two Schools. These findings point to the role of organizational identity as a tool in navigating organizational members in response to the new mandate. At the same time, the chapter suggests that this was enabled by the field conditions as field actors shared a coherent vision for the new research mandate and organizational members did not experience any contradictions regarding the new research mandate and the traditional role of *hogescholen*. In other words, the field actors provided congruent, compatible or harmonious prescriptions about the new mandate and provided legitimized institutional elements which organizational members drew on in defining central, enduring and distinctive elements of organizational identity. In this case, organizational identity has been institutionalized (Glynn, 2008; Thornton, Ocasio & Lounsbury, 2012) or defined at field level as a social category or collective identity (Lounsbury & Glynn, 2001; Ravasi & Schultz, 2006). The analyzed Dutch *hogeschool* responded to the new research mandate by imprinting the central, distinctive and enduring feature of its institutionalized identity. Research at a *hogeschool*, therefore, resembles the institutionalized *hogeschool* identity which is marked by its differentiation from universities, close collaboration with external stakeholders in education, and practical and problem solving activities to advance professions.

Chapter 6, "*Heterogeneous responses of Portuguese polytechnics to the new research policy demands*", explores the responses of Portuguese polytechnics to the new research mandate. The study embeds the analysis of the responses of organizational members at two Portuguese polytechnics, across different Schools and departments, within the field theory

literature (Scott, 1995). Field theory focuses on the characterizations of the field in which organizations are embedded and field dynamics (Scott, 1995, p. 56). Fields are characterized by institutional pluralism, where organizations are faced with multiple institutional prescriptions from field actors (Meyer & Höllerer, 2016). Organizations are expected to adhere to institutional prescriptions from field actors, which is relatively unproblematic when these prescriptions are congruent, compatible or harmonious, as this makes the fields stable by advancing clear regulatory, normative and cognitive frameworks (Greenwood et al., 2011). However, field actors may also disagree on desirable organizational behavior, especially in times of change, in which case incompatibility and contradiction among different institutional prescriptions surge as a consequence. This is defined as the state of complexity in the field (Greenwood et al. 2011). The study first shows that the political and social institutions in the field (field actors) do not share a comprehensive dialogue about research for Portuguese polytechnics, unlike in the Dutch case, and this creates a lot of contradictions regarding what type of research to do, leading to identity ambiguity and complexity. Then, the study continues to explore the responses of two Portuguese polytechnics in such a complex field to the new research mandate. Their responses are heterogeneous pointing to different strategic responses of polytechnics driven by organizational aspirations for strategic positioning in the field, yet enabled by the complexity in the national higher education field.

Chapter 7 discusses the theoretical, practical and policy implications of each of the five empirical chapters. It accounts for the diversified behavior of non-university higher education organizations responding to the demand to innovate in education and implement a new research mandate. It describes how experienced field conditions and organizational characteristics contributed to different outcomes. It also provides a discussion of limitations, a future research agenda and succinct policy implications to be able to contribute to a more effective and efficient policymaking aiming towards diversification of national higher education systems.

CHAPTER 2

Training students for new jobs: the role of technical and vocational higher education and implications for science policy in Portugal[7]

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Abstract

This article contextualizes the role of technical and vocational higher education in training the labor force and derives significant implications for science policy in Portugal. A cross-national comparative case study in Southern (Portugal), and Western (Netherlands and Germany) Europe, suggested that technical and vocational higher education is building distinct learning profiles in terms of new intermediary institutions promoting problem-based learning together with the implementation of short-term project-oriented research. Learning and training practices are increasingly research-based and, above all, inclusive of social and economic partners via formal and, most of the time, informal collaborative mechanisms. These practices may be economy- or policy-driven but occur as an opportunity for strategic action at organizational and content levels. For the Portuguese case, our analysis suggests that emphasizing short-term project-oriented research in short-cycle education may strengthen the institutional credibility of Portuguese technical and vocational higher education by engaging local external actors in training the labor force. In addition, it may help to stimulate the necessary institutional and programmatic diversification of higher education.

Introduction

The education and training of the labor force in Europe is facing new challenges (ILO, 2015; ETUI, 2015) as productivity growth and wealth creation needs to experience new boundaries (Schwab, 2014). Concurrently, higher education institutions (HEIs) are increasingly being asked to provide adequate training tools. Despite the efforts of national governments to increase participation in higher education (OECD, 2014a; Hoidn & Kärkkäinen, 2014), almost two-thirds of the adult population in Europe are still lacking skills that would make them successful in innovation-driven environments (OECD, 2013). These skills consist of a number of technical competencies and "soft" skills, including leadership, teamwork and efficient self-regulating competencies. The scarcity of this type of "skilled" labor force has been identified in many Southern European zones and other European peripheries (EC, 2012a), either in the service sector or in manufacturing (van Ark et al., 2008).

The scarcity of skilled workers has often been attributed to, among other things, the considerable gap between educational systems and companies' needs, or to the fact that learning and training profiles are not suitable for current industry settings (Tijdens et al., 2012). The relative mismatch between jobs and skills (Hart & Barratt, 2009) has also been recently addressed by Osterman and Weaver (2014) in the context of North America. The authors claimed that there is a need for "intermediaries", that is, institutions that can help match employer needs and training, and, at the same time, argued for the increasing relevance of non-university higher education (see also Wagner, 2012). Shaping the educational curricula in accordance with industry is, however, problematic (and often not recommended) since skill requirements are not easily definable (EC, 2012b). Approaching this issue requires a clear identification of relevant skills, rather than simply quantifying the skills of jobholders in a given occupational field (Elias & McKnight, 2001). This calls for a common language between employers and training institutions (Tijdens et al., 2012) and the development of intermediary functions in training institutions to match the educational supply with the needs of industry (EC, 2012a).

This article aims to contextualize the potential role of technical and vocational higher education[8] as intermediaries in this process and compares a Portuguese institution with other European institutions. This is established by focusing on the type of training provided in this type of higher education institutions through establishing comparative patterns in two considerably different situations: i) in two industrialized Western European cities, Amsterdam and Munster (in North Rhine-Westphalia, Germany); and ii) in a Portuguese polytechnic institution situated in the northeastern, most remote rural zone of the country (Bragança).

Our analysis suggests that strengthening problem-based learning and short-term project-oriented research through technical and vocational higher education can facilitate the process of training the workforce in skills of increasing relevance to local markets. This can be facilitated if training is built around collaboration, with external stakeholders engaged in the social and economic landscape of the regions under analysis. The article also argues that this process benefits from collaborative ties between the stakeholders and the practitioners of technical and vocational higher education. Our findings consider policy implications for Portugal in terms of new opportunities for curricula innovation in short-term higher education and new relationships between institutions and local economic and social actors.

Research framework

The growing worldwide participation in higher education - associated to appropriate systems assessing learning quality (Carless, 2015) - is currently being led by middle income countries (Figure 2.1)[9]. In Europe, many industrialized countries (e.g. Germany, Netherlands) have been fostering access to higher education since it is known to impact the future competitiveness and innovative capacity of countries and regions (Cardoso et.al, 2016). Policy efforts to diversify higher education in the last decade have stimulated interest in participation in technical and vocational higher education (e.g. Ahola, 2006), but resulted

[8]By technical and vocational higher education we refer to "non-university" tertiary education, such as "Polytechnic" in Portugal, "Fachhochschulen" in Germany and Switzerland, "*Hogescholen*" in The Netherlands, or "Community Colleges" in US. The term "Universities of Applied Sciences", as it is also referred to in Europe, is not intentionally used to highlight the rationale for fostering diversification of higher education and for strengthening non-university higher education (see Salmela-Mattila, 2014; Lepori, Huisman & Seeber, 2012).

[9] Mainly from East and Southeast Asia. These countries not only understand the value of education in itself (ingrained in East Asian cultures) but also its importance of higher education participation in developing nationally competitive global economies (Postiglione, 2011).

in substantial differences in the relative relevance of this type of educational provision (Figure 2.2). A comparison between Germany, The Netherlands and Portugal is illustrative of this point. The percentage of Dutch students in the technical and vocational higher education sector is twice that in Portugal or in Germany (VH, 2014a), representing about 420,000 undergraduate students enrolled in technical and vocational higher education in 2012, in comparison with 259,000 in universities (Vossensteyn & De Weert, 2013).

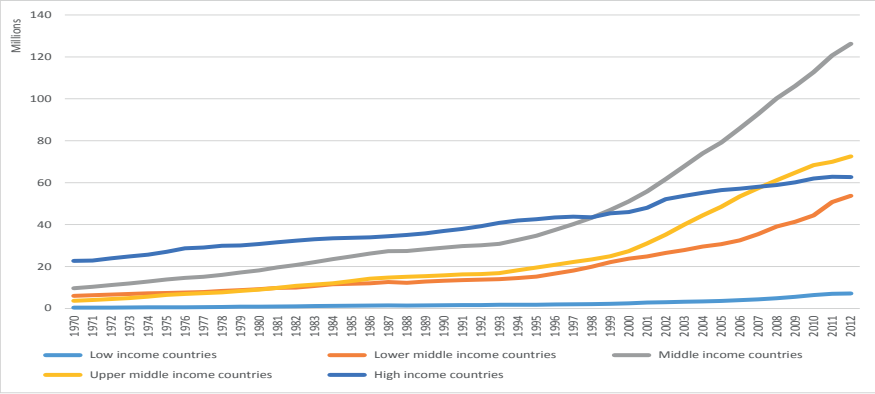

Figure 2.1 Enrolment in total higher education per level of income, 1970-2012; Source: World Bank; UNESCO; Note: "middle income countries" refers to the categories *Upper middle* and *Lower middle* income countries

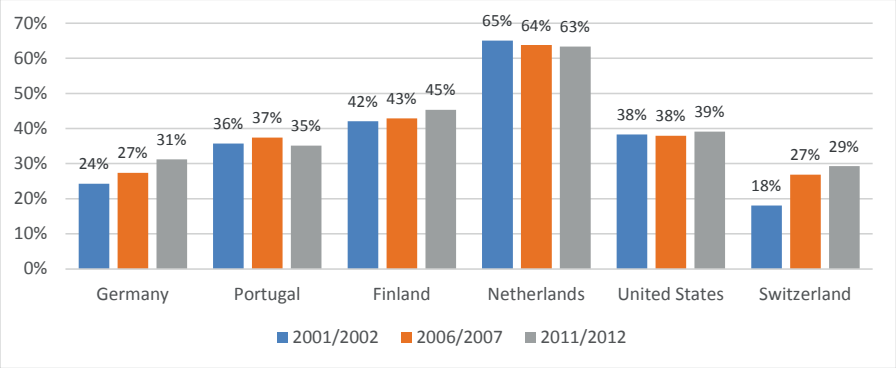

Figure 2.2 Evolution of the percentage of students in technical and vocational higher education (i.e., non-university higher education institutions) in terms of total number of higher education students. Sources: Germany (Destatis - Fachserie 11 Reihe 4.1 - Bildung und Kultur, Studierende an Hochschulen, Wintersemester 2013/2014); Portugal (DGEEC); Finland (Tilastokeskus - Statistikcentralen - Statistics Finland); Netherlands (Het Centraal Bureau voor de Statistiek); US (National Center for Education Statistics); Switzerland (Swiss Federal Statistical Office)

Also showing large variations across countries is the participation of technical and vocational higher education graduates in the labor market. The percentage of these graduates in the Dutch labor market is relatively high (22% of the total labor force; see ROA, 2012; VH, 2014b), more than twice the participation of university graduates (e.g., SEO, 2009). In Germany, technical and vocational higher education graduates represented only 5% of the total labor force in 201310, compared with university graduates, who made up 18% of labor force (Federal Statistics Office 2009). In Portugal, the participation of both types of tertiary education graduates in the labor market is still relatively low in terms of European figures, representing 26% of 25-34 year olds in 2010 (it was only 14% in 2001) and, therefore, still below the EU (31%) and OECD (35%) averages (Figure 2.3).

[10] https://www.destatis.de

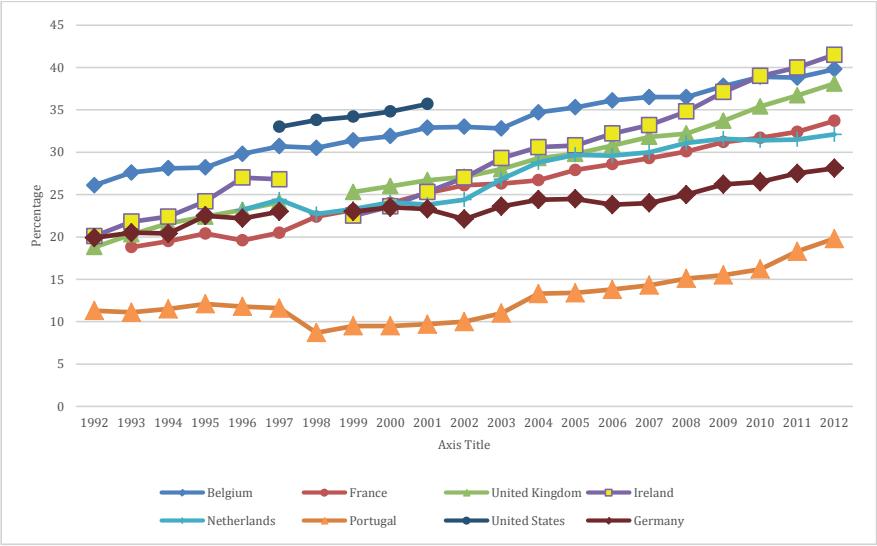

Figure 2.3 Labor force with higher education (% of total). Source: World Bank

More than just an issue of access and participation, social and economic stakeholders (e.g. Korte et al., 2013) are advocating for technical and vocational training systems to be more flexible and adaptable to societal needs. They stress the need for some sort of educational partnerships (e.g. Schultz & Windelband, 2008). Taking this context into account, the research of this article contributes to the on-going debate on the changing landscape for technical and vocational higher education (see Kettunen, 2011), including the debate on the role of social and economic stakeholders and their participation in new teaching and research modes of inquiry (e.g. Rip, 2004; Boersma et al., 2008). Developing new participatory modes of educational provision (Harvey, 2010) and stimulating their continuous evolution shapes individuals with the relevant skills for a rapidly changing labor market (Clancy & Goastellec, 2007) and contribute to sustainability of skilled and adaptable workforces (OECD, 2014a). This is associated to the concept of "problem-based learning" (PBL) which enhances skills and technical competencies that are of interest to new graduates and, above all, to those able to participate in the labor force (Lehmann et.al, 2008; Yasin & Rahman, 2011; Hoidn & Kärkkäinen, 2014). Problems that students are required to "solve" as part of the learning process in PBL often relate to professional

practice (Loyens, Kirschner, & Paas, 2012) and may be conducted and organized in such a way as to allow the training of large groups of students. Table 2.1 outlines some basic features of such a pedagogical approach, which emphasizes the development of specific students' technical skills and social skills (Bilán et.al, 2005). Implementation processes are facilitated by short-term projects, engaging external actors (e.g. Sandelin et al., 2012).

Characteristics of problem-based learning, PBL	Literature references
"Real life" problems and problem-based learning	Yasin & Rahman, 2011; Savery, 2006
Project-oriented research and interdisciplinary work	Savery, 2006; Lehmann et.al., 2008
Student-centered approach	Hoidn & Kärkkäinen, 2014
Teacher's role as facilitator of knowledge	Hmelo Silver, 2004
Self-directed learning: students diagnose their learning needs, strategies, goals, and resources needed to fulfill the task	Hmelo Silver, 2004;
Promotes team work and collaboration	Duch, Groh & Allen, 2001
Develops communication skills as students need to present their solutions (even if taking on different roles in projects/ teams).	Bilán et.al, 2005

Table 2.1 Features of problem-based learning and project-oriented research

Case selection

This article uses qualitative research focusing on case studies of three technical and vocational higher education institutions: the "Hogeschool van Amsterdam" in the Netherlands (HvA, case study 1), "Münster University of Applied Sciences" in Germany (MUAS, case study 2) and the "Instituto Politécnico de Bragança" (IPB, case study 3), in the northeastern part of Portugal.

We used a relatively small number of cases (Yin, 2003), with each case analyzed as an interpretative whole. A comparative method was used to enhance the scientific validity of our case study approach. The conditions and settings of each individual case were adequately specified following an "individualizing comparison" (Tilly, 1984, p. 87-9), with the specific characteristics of each case being assessed to determine how much the cases differentiated from each other. As a result, an explicit profiling of each individual case was achieved, and all of them were purposefully sampled to achieve validity and richness of the information obtained (Yin, 2003).

The appropriate form of purposeful sampling for the analysis of training in technical and vocational higher education in Portugal is the criterion case sampling. Criterion sampling suggests case selection based on certain common criteria (i.e., "technical and vocational higher education"; see Patton, 2005), and the rationale for our choice of the case studies was based on recent implemented research practices in these institutions and how they foster specific skill development through engaging students in short-term projects of local scope (SEO, 2009; Plewa, Galán-Muros & Davey, 2015). The strategy of analysis involved a synthesis of the data from the Dutch and German cases, which focus on the features of PBL and project-oriented research (Kelle, 1995). In order to achieve generalizability across those two cases, a cross comparative table was developed to draw implications for the Portuguese case. The research method made use of qualitative data analysis (Glaser & Strauss, 2009) encompassing institutional/case characteristics, educational approach, project work duration, local economic context, external stakeholder involvement in educational training, mechanisms supporting the educational approach, policy initiatives supporting the educational approach, and the perceivable results of the educational approach.

Data collection

The analysis reported in this article relied on multiple sources of data gathered from fieldwork observations and interviews conducted from 2014 to 2015 (see Table 2.2). In the initial stage, the authors undertook documental data review to familiarize with the system developments and policies related to governance and funding of technical and vocational higher education in Portugal, the Netherlands and Germany. The literature review framed our analysis and embedded case studies within the national contexts.

In 2014, all three institutions were visited and brief, open ended interviews performed with teachers, Deans of Schools and curricular managers to understand the institutional context. In 2015, ten semi structured ended interviews were conducted in HvA with heads of research groups at departmental level, teacher/researchers from two Schools, curricular managers, Department Heads, Deans of Schools and the Domain Chairmen. In MUAS, eight interviews were conducted with teacher/researchers, while twelve interviews were conducted in Bragança with students, teachers, educational managers, and the President and Vice Presidents of the institution. All of the interviews inquired about the purpose of technical and vocational education, the current teaching and research practices and their value in larger societal contexts, short cycle education, engagement of local actors in curriculum development, challenges in collaborating with industry, challenges in managing organizational and system expectations in terms of teaching and research quality and experiences in managing teaching and research practices.

In order to validate interview data, a focus group meeting was organized with five students from MUAS to inquire about the type of learning provided at the institution. A similar focus group was also organized in the HvA, and it involved a Head of the Department, a teacher/researcher and a Dean of one School at the institution selected for analysis. In addition, regular onsite visits and group discussions were systematically organized over the last few years with the teachers, Deans of Schools and the President of IPB. Photographs were also used as visual artefacts to elicit visualization of the learning settings at each institution. This is because the use of visuals is increasingly being considered as a means to communicate the institutional fabric of case study analysis (Metcalfe, 2012) and has proved to be a useful method in providing unique viewpoints of the phenomena studied (see Mannay, 2010). Overall, multiple data collection results in thick descriptions (Holloway, 1997) of the cases under observation.

Data collection	Documental data and visual data (e.g. photo-graphy)	Interview data	Website infor-mation	Participant observation/ note-taking	Focus groups (students)	Focus group (managers, teachers and lectors where applicable)	Field observation/ local players
HvA (Nether-lands)	X	X	X	X		X	X
MUAS (Germany)	X	X	X	X	X		
IPB (Portugal)	X	X	X	X		X	X

Table 2.2 Data collection matrix

Case study 1: lectors as *human intermediaries* in technical and vocational higher education

HvA is one of the four major HEIs in the Amsterdam metropolitan area, with a student population of about 40,000 and offering around 80 bachelor and master programs (SEO, 2009). As a Dutch *Hogeschol*, it provides technical and vocational higher education with an emphasis on teaching and research in a regional context (Huisman, 2008). This is fostered through two main initiatives: i) funded research projects through the "*Regionale Aandacht en Actie voor Kenniscirculatie"* (i.e., "Regional Attention and Action for Knowledge Circulation", RAAK; HBO-raad, 2008), and ii) the training and employment of *lectors* to develop regional research capacities.

RAAK is an initiative by the Dutch Ministry of Education that has subsidized research projects and networking in technical and vocational higher education in collaboration with (regional) companies and public sector institutions (HBO-raad, 2010) since 2004, emphasizing cooperation with SMEs (OECD, 2014b). The Ministry also funds special staff positions in technical and vocational higher education to develop research activities and act as "intermediaries" with industry (Huisman, 2008; HBO-raad, 2008), although lectors are

now hired by the institutions to maintain and encourage established linkages. A focus group of managers, lectors and teachers at the School of Technology of HvA described their "bridging" role within the research and higher education setting as follows: "*We can connect …, make the bridge….; We lectors have several companies of our own, or we have worked in the industry for a long time to have a wide network of companies, and we try to establish links with them in teaching and research."*

Each lector forms a "knowledge circle" (i.e., "kenniskring") made up of teachers and professionals from the private sector (Huisman, 2008). The goal is to ensure a human dimension to foster knowledge exchange across faculty and small and medium enterprises (SME), introducing project-oriented research by solving concrete problems of SME's, as well as to help in shaping the curricula. One successful circle developed into a knowledge distribution platform, and one of the lectors involved noted: "*We lectors and teachers have to work together….we have an idea of the knowledge that's important for our field, and together with teachers, we make a profile for research and teaching as a whole……especially, we introduced students to research via teaching programs. There is this minor for port logistics or city logistics, and students integrate it into research activities there, problem solving you know."*

To support these collaborative outputs further, public funding has been allocated since 2011 for the establishment of *Centers of Expertise* in technical and vocational higher education, as public-private joint ventures between education and economic sectors (see Deuten, 2013). In addition, students at HvA also collaborate with Amsterdam residents to solve specific urban problems as part of their coursework (SEO, 2009). Examples of learning practice include projects with the Municipality of Amsterdam (Directorate of Justice), the City Academy, and the research institution *De Karthuizer* at the School of Social Work and Law of the HvA (Table 2.3).

Sample Topic	Typical project duration	Typical field work	Typical class work	External stakeholder
Software development	3 months	Software practice and coding	Programming	Small ICT firms
AirPort seaport logistics	6 months	Technical and analytical work	Logistics benchmarking	Logistics companies in the Amsterdam region
Specific art crafts	3 months	Craft practice	Craft technologies	Small creative industries
Legal urban issues	6 months	Individual and Social discussion	Legal techniques	Municipality of Amsterdam (Directorate of Justice)
City logistics	6 months	Identification of malfunction	Technical laboratory (e.g. feasibility studies, benchmarking strategies and development of monitoring tools)	Companies of the metropolitan area of Amsterdam
Social innovation	6 months	Individual and Social discussion	Group analysis and statistical data	Research institute "*De Karthuizer*"

Table 2.3 Examples of vocational learning practice at HVA through short-term research projects with student participation

Features of problem-based learning and short-term project-oriented research

Problem-solving and short-term project-oriented research are at the heart of HvA's curriculum. Undergraduate students engage in various forms of short-term research from the first year through assignments that involve the analysis and comprehensive understanding of authentic company problems. As the students advance in their studies, they become more engaged in concrete research projects with companies that take place in teams and last from 10 weeks to 6 months. For example, a staff member responsible for curricular management at HvA´s School of Technology exemplified what is meant by problem solving activity and research work: "*Companies have problems that they try to solve…and we say we are going to solve this problem with our students. First, students do*

practical research on what is really the cause of the problem, and how can we solve the problem, by also investigating what other companies are doing or have done in this respect, or what we can find in the literature…so what students are doing here is a lot of project oriented research, especially in the first and the second year. Every quarter they have a project that is a real life project, where they ask questions on possible problems selected companies might face; then, in minors which are in the third year, they write a report on solving the real or concrete problem and present it at this big seminar we host every year."

The end solution and the process of problem analysis is usually presented to company representatives and the academic community in the form of seminars. Students at the School of Technology at HvA systematically reported that they were more focused on "problem solving" than specific subject oriented learning, and the spatial integration of their activity (Figure 2.4) was well representative of the learning environment:" We *just have a few lecture halls on the first floor…the majority of our work is done here in these small workshops…we work in small groups, and the teacher sometimes also works with us there on some projects.* "

Supporting interview data, field observations confirmed the large amount of student time devoted to "hands-on" projects, with close teacher interaction in the earlier phases of their undergraduate studies. Project work is seen as practice or application of acquired knowledge gained in class. Students gradually feel that they need theoretical lectures and guided problem solving activities to gain the knowledge necessary for the execution of the project in later stages of the curriculum. For example, in the Logistics Program at the School of Technology, the practice was described by a member of the teaching staff as follows: "*Students have to do a lot of mathematics here, but they really do not understand why and how they can use mathematics in the logistic profession. So what we are doing within these projects is implementing mathematics into the project more than we did before and also explaining to the students that mathematics is a part of the project …Everything that they get in theory is also explained in terms of professional practice*."

Figure 2.4 Learning spaces at HvA, School of Technology, 2013;
Source: http://www.o-drie.nl/wp-content/uploads/2015/02/OIII-HvALeeuwenburg.pdf.

A focus group comprising managers, teachers and lectors from the School of Technology at HvA identified that students mostly worked in groups on problem solving projects in the third and fourth year of their undergraduate studies. These groups are composed of students from different study programs and at levels that underline interdisciplinary processes. Teachers work closely with students to oversee their work, while lectors act as the liaisons between the company and the working groups. It should be noted that there is a predefined list of tasks that need to be achieved, following the practice of typical engineering projects in companies, so students have less autonomy to structure their own learning process. However, the emphasis is on practicing different tasks in the process.

Case study 2: problem-based formulation and learning in applied technology units

Münster University of Applied Sciences (MUAS) has about 12,000 students and is located in a densely populated German economic powerhouse with developed heavy industry (Danielzyk & Wood, 2004). The region currently accounts for 22% of the total economic growth in Germany[11].

[11] *NRW Invest.* Retrieved from www.wissenschaft.nrw.de

There is intense cooperation between MUAS and regional businesses, and this has significantly affected the learning practices at the institution (Baaken & Schröder, 2008), particularly after the State's reduction of basic funding in the 1990s (Göbbels-Dreyling & Rockmann, 2013). Consecutive reforms in higher education have reduced procedural supervision of individual institutions and made room for strategic actions to be undertaken at the institutional level (Klumpp & Teichler, 2008). As a result, MUAS has strategically created dependencies with a number of regional stakeholders to secure greater institutional legitimacy and integrity in the closer socio-economic landscape (Baaken & Schröder, 2008), which interlinked MUAS´s research capabilities with regional actors (Schröder et al., 2012). For example, the creation in 1998 of leadership positions for research affairs and technology transfer facilitated market logics in the processes of technology transfer (Schröder et al., 2012), and this was followed by the establishment of an applied technology unit in 2002 (S2BMRC, 2012). The unit offers brokerage events and flows of information with local businesses, a practice which has become institutionalized, as observed by one of the MUAS teachers:

> *We do two things within the centre, we are leading the projects usually from the public institutions whether it is the German government or the EU. And we do research about cooperation between universities and business, who is out there, what are they doing and how to do it better.*

Over the course of the last decade, the unit has specialized in detailed market analysis together with continuous assessment of specific institutional capacities in the various fields of knowledge. Independent diagnostics of the current performances plays a central part in this process to guarantee a systematic matching process with market needs. The continuous analysis of local businesses and potential partners, together with related organizational capacities, gives MUAS the capacity to i) frame its continuous strategic approach to businesses; and ii) continuously adapt the organizational structure and curricula to meet emerging challenges (S2BMRC, 2012). A teacher at MUAS commented as follows: *"Diagnostics is the most important step in collaborating with business…every higher education institution is different and every environment is different. We also send questionnaires to businesses to understand the environment as well to see if they cooperate with higher education institutions, and to see why they do it or why not. We want to see the image of the*

higher education institutions in the region and also, what companies need in their employees, what they need in terms of technical skills and soft skills."

MUAS has also set up a private transfer agency, *Transferagentur Fachhochschule Münster GMBH*, to manage the strategic partnerships and collaboration with many companies. The transfer agency functions as a company (49% owned by MUAS) providing a basis for strategic alliances and partnerships with many businesses. It has a total network of approximately 1800 companies, with a total number of 800 projects a year. It is regarded as a mediating office between academia and businesses, managing intellectual property, providing services, helping researchers/teachers through the administrative processes, assisting in commercialization activities, and organizing workshops during the course of projects (Korff et al., 2014).

Features of problem-based learning and short-term project-oriented research

Business collaboration is the essence of the MUAS curriculum, and for the purpose of this article, it is important to focus our analysis on two stable, long-term strategic industrial partnerships with BASF coatings GmbH and Merck KGaA (Korff et al., 2014, p. 90). These relationships involve industrial partners across MUAS in a diversity of teaching and research activities, including thesis supervision, internships and joint research developments (Schröder et al., 2012; Jaeger, 2011). Among many other relationships, they are particularly important in involving students in project work. As one of the teachers from MUAS elaborated: "*We involve students in the projects with companies, and this is changing their attitudes and minds. Now we involve Master's students in Bachelor's student projects, and they are responsible for running the project. The role of a Master's student is to drive the project, while the research is done by Bachelor's students, and we teachers supervise. In this way, students experience different roles in a research-based learning environment."*

The teachers, who usually have significant professional experience, are responsible for defining the topics of research and teaching but also manage research projects, whereas the students have different roles depending on their level of studies. One of the MUAS teachers exemplified this scenario: "*We develop projects and design the research strategy. We guide students in this.... actually, we have Bachelor's students who do the operational part and then Master's students who lead the project. Master's students lecture, facilitate and oversee group*

work, and because this is so new to them, we need to guide them."

Problem solving activities and project work are undertaken each semester as part of typical course work at MUAS. These consist of research undertaken on a semester basis, with guidance by teachers and continuous collaborative seminars involving external stakeholders (Figure 2.5). One teacher mentioned that there was "*…a contact person at each company for students so that they can ask questions…. there is also always one of us with the group, and we take care that things are going in the right direction; we do not structure it; we do not give many directions, but just make sure that things are working*." Students also reported that they were involved in different projects throughout the years. Table 2.4 lists sample projects identified throughout the observations made.

Figure 2.5 Example of collaborative seminar at MUAS; photo by Sue Rossano, MUAS, 2015

Sample Topic	Typical project duration	Work package organization	Typical class and fieldwork	External stakeholder
New chemical products for industrial markets	10-15 weeks	10 to 20 Bachelor students from six countries from MUAS	Collecting information about the product and technological processes, creating a database for personalized information with company contacts, survey	Chemical company
Process industry: drying systems and plants	10-15 weeks	17 students from Master course in International Management and 10 students from Cracow University	Desk research about the market, telephone interviews and phone calls with clients form different organizations	Producer of industrial drying plants
New piping technologies for cities	10-15 weeks	17 Master students from MUAS	Desk research, studying and evaluating megacities and their structures by using spider matrix, presenting results	Piping industry
Specialized IT marketing	10-15 weeks	16 Bachelor students from nine different countries from MUAS	Empirical survey to customers, non-customers and employees, presentation to customer	IT management consultancy
Optimization of a customer recovery strategy	10-15 weeks	No information available	Data preparation, analysis and interpretation, creating a multivariate model for customer assessment, deriving recommendations and action plan, results and presentation	Company offering products, systems and services in the construction and energy sector

Table 2.4 Sample examples of vocational learning practice at MUAS through short-term research projects with student participation

A student in the focus group underlined the relatively high degree of student autonomy: "*I am in a project where we made a survey, contacted companies and collected data, and I was in charge of most of the work, together with data analysis. We are supported by Master's students and supervised by two lecturers from the research unit. They provide us with significant feedback…"*

Interactive and demand driven learning in small groups is one of the characteristics of the MUAS curricula. Projects are short termed, usually limited to one semester, as companies are also looking for short-term projects and potential solutions to their every-day problems. Changing educational provision through "hands-on" projects and greater industry collaboration in the curriculum have fostered the development of student pro-activeness, facilitating the development of entrepreneurial skills among students. Some teachers specified that they focused on developing these skills in their classroom and through projects with companies: "*We need to prepare students for jobs that do not exist. So we need to give them a set of tools, a set of skills for them to be able to adapt to rapid changes. We put a lot of emphasis on soft skills and beyond that. We want students to have entrepreneurial skills…this means we want students to be able to recognize opportunities and grab them. To be proactive, flexible and adaptable."*

Students are also aware of the positive outcomes of such an approach to learning. Many have strategically chosen to study at MUAS, where they deal with real and practical problems, and where internships are obligatory. One of the students said: "*I decided to study here as it is much more practical. I did not want to be one of 500 students; here, every teacher knows your name, and you are not just a number, but teachers know you and you work in smaller groups. We are like 22 or 23 here, and it is amazing to be in smaller classes." Another student commented: "I actually studied at the university, and I changed as there were too many people, big groups, and I really like here because we work in small groups."*

Increasing company-institution collaboration and engagement of students in problem-solving activities with a practical application have contributed to changes in educational provision at MUAS (FM-Fachhochschule Munster, 2006). A lecturer outlined the benefits of the educational provision at MUAS for both students, companies and the institution: "*We are developing good professionals for the future…we do not expect all of them to be entrepreneurs…those are the characteristics that companies value in their employers so that is*

what we give them, we give them the tools…if someone wants to create the company and innovate they can as they have tools."

Since industry partners were given a more prominent role in shaping learning and research agendas at MUAS, the number of students increased from around 5900 in the 1980s (FM-Fachhochschule Munster, 2006) to more than 10,000 in 2014[12]. Additionally, third-party funding currently generates approximately one third of all institutional income. The applied research unit is self-sustained and profits from the engagement of SME's in problem solving activities. A major consequence of the strategic approach of MUAS to industry collaboration is its impact on the regional economy, with increased job creation and turnover (see Schröder et al., 2012). MUAS has shown that organizing its educational profile by creating system linkages has had a direct impact on the labor market, with the provision of qualified skills, while benefiting from a developed and competitive economic structure.

Case study 3: short cycles, striving for stakeholder engagement in a remote rural area

IPB is a Portuguese public institution of technical and vocational higher education (i.e., polytechnic) founded in 1983. Public polytechnics in Portugal are regionally dispersed across the country (File, 2008), either in developed urban settings or in rural locations where they act as the main, if not the only, higher educational provider in the region (Alves et al., 2015).

Over the years, IPB has become a key economic player in the Bragança district (IEP, 2012). It has about 7,000 students enrolled in four schools (agriculture, education, technology and management, health) and one off-campus school of communication, administration and tourism located in Mirandela, 60 kilometers from Bragança. Figure 2.6 provides an overview of the changing nature of students by educational level over the last few years, showing a considerable increase in short-cycle courses (i.e., CETs, "Cursos de Especialização Tecnologica"; IPB, 2013; IPB, 2014). This is aligned with reform changes in Portuguese higher education during the period 2006-2010, whereby the short-cycle courses were set to increase educational paths and possible entry routes to higher education (see Heitor & Horta, 2014).

[12] http://www.uas7.de/Fachhochschule-Muenster.13.0.html

One student noted: "*The short course is without doubt very useful. It gives us a lot of practical skills and information, as well as providing us with a new chance to enter higher education.*"

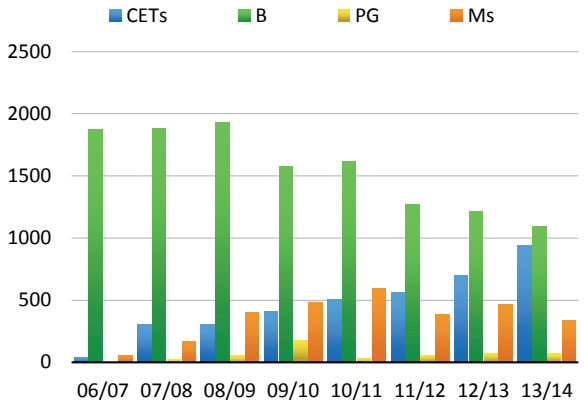

Figure 2.6 Evolution of new entrants at BPI, per year and per degree type; Source: IPB
Note: CETs (short cycle technological specialization courses); B (bachelor); PG (postgraduate courses): Ms (master)

Short cycle education at IPB aims to foster technical and vocational competencies and practical skills of relevance to regional labor markets. The focus is on practical application, as described by a teacher in computer networks and communication science: "*Classes are mainly practical sessions, with a duration of about 3 to 4 hours, with some half hour of theory and the rest is practical work in the laboratory.*" Also, a teacher in construction technologies mentioned that "*course contents of a subject may be explored in a theoretical form, but are always completed with practical exercises.*" In addition, a student mentioned: "*We practice a lot and through this practice we can better understand theory. The practice is organized around laboratory work.... Theory is just as a reference and we practice to understand the theory.*"

Figure 2.7 Practical activities as part of an agriculture coursework at IPB

During practical activities (see Figure 2.7), teachers work closely with students, a practice that is facilitated by classes of about 25 students, as reflected in the following student opinions: *"I have the best teacher-student interaction, compared with previous schools I attended. Teachers provide help in anything they can…this course is really good because the professors work a lot with us and help us out to understand what we are studying in theory."* The practical approach to vocational education is based on problem-solving methodologies, as explained by a teacher: "*I teach about hazards and risks in construction work and, for example, I start to show some photos for hazards analysis about construction safety. The students describe possible causes, consequences and equipment solutions to solve those issues following laws and rules. Students have to solve problems in some way, but the problems have already been resolved…they are real but not current.* "

The interest in short cycle courses has significantly increased in a few years, from about 40 to 940 new entrants since 2006/07 (Table 2.5). Currently there are more than one thousand students enrolled in vocational, short-cycle education at IPB, a stark contrast to less than 20 in 2006/07 (IPB, 2013). The number of short-cycle graduates continuing on to higher education degrees (i.e., "Licenciatura" degree) has also increased from 391 in 2013/2014 (IPB, 2013) to 510 in 2014/2015 (IPB, 2014). In other words, vocational short-cycle courses are stimulating student mobility with respect to higher degree education at IPB, which seems to be the case in many other institutions in Europe that have promoted this type of education (see Kirsch and Beernaert, 2011).

	CETs	B	PG	Ms	Total	New entrants/ Total students enrolled
06/07	**43**	*1875*	0	59	1977	*32,7%*
07/08	301	*1881*	26	164	2372	*38,5%*
08/09	308	*1932*	52	403	2695	*40,5%*
09/10	407	*1575*	175	478	2635	*37,0%*
10/11	508	*1613*	34	593	2748	*36,8%*
11/12	559	*1273*	59	381	2272	*32,6%*
12/13	699	*1210*	75	465	2449	*37,1%*
13/14	**940**	*1092*	69	336	2437	*38,3%*

Table 2.5 Number of new students at BPI per year per degree type

Although the number of students enrolled in short-term cycle's accounts for only 2% of the almost 400,000 students enrolled in higher education in Portugal, these students tend to be from less favorable social classes and would not likely enter higher education through traditional processes (see Kirsch & Beernaert, 2011). According to Cohen (2009), Raby (2009) and, more recently, Slantcheva-Durst (2013), short-cycle technical and vocational higher education stimulates greater social inclusivity and should be combined with student support systems, which are the key to diminishing the economic difficulties of students from disadvantaged social backgrounds. A teacher from IPB mentioned: *"we are usually working with students who come from poor families and who had bad classifications in high school…. and they do not have big aspirations for the future…. but I think we do good work here with those youngsters to provide them with self-esteem and show them that they may become good workers."*

The social movement initiated in Portugal with short-cycle technical and vocational education in 2007 has been mainly stimulated through public polytechnics (CNE, 2012), which account for more than 300 courses offered by 2012, representing near six thousand enrolments and more than two thousand graduates per year. Social inclusiveness has been

guaranteed through a rather homogenous structure of students (Teixeira et al, 2006), although in the case of IPB, there has been a high dropout rate (i.e., about 23%; IPB, 2013). One of the teachers at IPB explained that this may be a matter of student choice and the typical immobility that characterizes students in southern European regions: "*The majority of students that drop out come from outside the region. …in some cases they come from the coastal areas as they do not succeed in entering traditional higher education, and they choose vocational higher education instead…. you must understand, students still prefer "traditional universities", and they also prefer to stay in their region…. The net result is also connected with the dropout rate."*

The literature suggests that dropout rates in higher education are particularly associated with student socio-economic conditions, although educational quality may help in reducing dropout rates (Quinn, 2013). This may be achievable through greater professional integration and industry collaboration (Santoro & Gopalakrishnan, 2000; Ankrah & Al-Tabbaa, 2015), and in this respect, IPB has taken some steps towards improving their learning practices with problem-based methodologies. However, these are still isolated events, and field observations at IPB showed that the potential of system linkages with local industry remains underexplored. There is little industry and companies are mainly approached in order to provide internships, as a teacher noted: "*Students do internships in a regional company for three months, full time. The intention is that they use knowledge gained in the short-cycle while in the company. The internship is formalized by a cooperation protocol between our school and the traineeship company. At the beginning of the traineeship, we sign a learning agreement which describes the work plan adapted to company needs and course competencies."*

Although this type of internship is an important step in professional integration, it is still lagging behind an effective research environment, as described by a teacher in computer networks and communication science: "*I would not develop research practice for students in short-cycle, as they are short in duration".* A teacher in construction technologies made a similar point, "*Short course students don't do research. They do some work in laboratories but it is not considered research."* This statement contrasts with the findings of Plewa et al. (2015), who found that engaging experts from industry in curriculum design had a direct impact on the research alignment of the curriculum, and that there should be mechanisms

in place at the organizational level promoting problem-based research with business collaboration. This contributes to engaging external stakeholders in the process of knowledge sharing and co-creation.

Discussion

The evidence provided in this article considers a new culture of learning in terms of the role technical and vocational higher education may have in the education and training of the labor force, which is particularly dependent on the economic context and the maturity of the system linkages between higher education institutions and external stakeholders. Table 2.6 summarizes sample information about the 3 cases and suggests that problem-based, project-oriented learning strategies maybe be considered as integral parts of the curricula, which calls for increased collaboration with external stakeholders and short term project-oriented research. The PBL approach to technical and vocational higher education combined with research project work has been found to facilitate industry collaboration, leading to practices that stimulate graduate employability and a large social acceptability and technical credibility of higher education (SEO, 2009). The key issue to be noted is that the institutional context is important in setting adequate environments that allow a full implementation of PBL methodologies, which requires a rich and dense concentration of external stakeholders who have a high level of commitment and fully understand the challenges of higher education.

	Case 1: HvA	Case 2: MUAS	Case 3: IPB
Institutional context	40,000 students; in the metropolitan area of Amsterdam, NL	12,000 students; in the industry region of North Rhine Westphalia, D	7,000 students; in Bragança, rural northeast of Portugal
Learning/research approach	Problem-based learning and short-term project work as an integral part of the undergraduate curriculum	Problem based learning and short-term project as an integral part of undergraduate courses	Vocational short-cycle education (15 months); Practice based approach, but problem-based learning limited
Typical project duration with students	10 weeks to 6 months	10 to 15 weeks	Limited project work
Human intermediaries supporting learning/research approach	"Lectors" and related "knowledge circles", involving teachers and business experts; research staff	Professional staff and teachers	Teachers, on a voluntary basis
Specific institutional developments supporting learning/research approach	Centers of Expertise, taking the form of applied research units	Applied research unit ("S2BMRC"), including continuous industry diagnostics and monitoring; Technology transfer agency, (*"Transferagentur Fachhochschule Münster GMBH")*	Limited support of institutional research centers
Other specific funding programs	Public funding through the "RAAK-Regional Attention and Action for Knowledge Circulation"	Public and private funding, making use of dense industry network	Limited funding and industry network
Perceivable results of the educational approach	Focus in problem solving with skill development of relevance to local employers, as promoted through close industry collaboration	Local industry focus in collaboration, developing technical and entrepreneurial skills; high employability through close industry collaboration; third party funding	Focus on technical competencies for regional markets, based on problem solving

Table 2.6 Cross comparison of learning/research practices in the three cases studied

Many industrial and business stakeholders are advocating technical and vocational training systems that are more flexible and adaptable to companies' needs (CEDEFOP, 2013). They stress the need for partnerships between companies and educational providers that focus training on local companies' needs (Schultz & Windelband, 2008; Sastry & Bekhradnia, 2007). In global competitive and uncertain labor markets, new relationships between employers and higher education institutions need to be devised not only to be able to adapt training in response to demand (CHEPS, 2011) but also to cultivate the imagination for a world of constant change and new scientific and technical discoveries. Ultimately, whereas social and landscape entrenchments play a concrete role in curricular reform, the introduction of modern pedagogies enhances student learning processes (Hawk & Shah, 2007) and may contribute to innovation if new graduates find the necessary absorptive capacity (Passig & Cohen, 2014; OECD, 2014a).

The HvA and MUAS cases are examples of best practices of how an organization can set novel "collective standards" in learning via strategic collaboration with the social and economic agents. They need to be considered taking into account that they benefit from their locations in the densest European industrial zones with relatively very high GDP/capita levels. By taking an active role in engaging with external stakeholders, HvA and MUAS have developed specific internal organizational capabilities that self-sustain a model of learning and research adequate for modern vocational higher education. By adopting routines of systematic enquiry in industry, they have facilitated among students a culture of questioning, stimulating a learning culture that encompasses the joint development of technical expertise and entrepreneurial attitudes.

The experience of short-cycle technical and vocational programs at IPB show practice-oriented approaches, yet with a weak-research orientation and a shortage of linkages with regional and local stakeholders. This means that the majority of problems students tend to solve do not involve direct contact with companies or company representatives during coursework and are not necessarily associated with the systematic and continuous assessments of market needs.

In the context of this discussion, three main aspects should be considered with an emphasis on policy implications for Europe in general, and Southern Europe and Portugal in particular, regarding the role of technical and vocational higher education in training the labor force. At

this stage, we will not address the local or regional absorptive capacity external to the learning environment.

First, the human dimension in advanced technical and vocational education has always been relevant in any educational setting. The specific role of human intermediaries supporting learning/research methodologies, and particularly PBL approaches, should be emphasized in both HvA and MUAS. While in Amsterdam, the role of "Lectors" and related "knowledge circles", involving teachers and business experts, together with specific research staff, have become the central element of the learning systems, in Munster the activity of a dense network of professional staff and teachers with professional experience are the key element in maintaining and continuously strengthening a dense network of specialized firms. It is clear that the challenge of constant specialization in advanced industrial environments requires technical and vocational higher education institutions to acquire internal capabilities that understand the intermediary functions of problem-based research.

The second aspect concerns the institutional research context necessary to facilitate highly specialized knowledge. In particular, the "Centers of Expertise" at HvA and the unit "S2BMRC", or the Technology Transfer Agency at MUAS take the form of applied research units that provide a professional context adequate to foster the necessary routines to collaborate with industry at high specialization levels. However, they also provide the necessary differentiation from "business-as-usual" practices, allowing adequate learning settings in which students can learn and understand either new frontiers of technical expertise or the daily challenges of industry.

Last, but not least, the third aspect concerns the external environment and funding conditions, which do depend on specific local and national ecosystems and are particularly influenced by the overall funding level for research and development in the regions considered. Again, the relatively high funding level in the zone of Amsterdam and the specific public initiative through "RAAK- Regional Attention and Action for Knowledge Circulation" has created conditions favorable to a dense network of industry-science relationships. Also in Munster, public and private funding make use of a dense industry network that stimulates a process of continuous change through project-oriented approaches. Our analysis suggest that the three issues identified, namely, human infrastructure, institutional context and level of incentives, do provide the necessary

conditions for the modernization of technical and vocational higher education if the external context and absorptive conditions are adequate. Why is this innovative, and to what extent is it relevant? These findings suggest the need to emphasize the idea of technical and vocational HEIs as intermediary institutions in the process of building technical infrastructures to foster new markets and, above all, to train youngsters for jobs that do not yet exist. We argue that these institutions provide "living laboratories" (or "test beds") that facilitate learning in increasingly uncertain markets and help in the training of future generations (see also Wagner, 2012). However, we also want to stress that we recognize the increasingly important role of the engagement of external stakeholders in achieving these objectives. This is relevant because learning societies will increasingly rely on "distributed knowledge bases" as a systematically coherent set of knowledge maintained across economically and/or socially integrated set of agents and institutions (Conceição, Heitor & Veloso, 2003).

It should also be noted that our analysis shows that technical and vocational higher education, even in mass higher-education systems, continues to fulfil two basic functions that depend on the stability and autonomy of institutions. First, technical and vocational higher education remains an important incubator of the next generation of qualified professionals, and this does require effective "knowledge" relationships because there is no other way to train qualified professionals except in applied-research environments. Technical and vocational higher education is gaining greater relevance through innovation and the need to secure and explore relationships with industry. Among the most valuable roles of technical and vocational higher education is the opening-up of the social basis for young people. Increasingly, this is becoming one of the most essential contributions that vocational higher education is expected to make.

The second basic function is the higher education function of generating and promoting "cultural norms", which many authors claim should be promoted in both substantive and procedural terms in modern educational institutions. Nussbaum (1997) is more ambitious and advocates the maintenance of a "culture of liberal rationality". Here, we adapt and expand the notion explored by Conceição and Heitor (1999) that technical and vocational higher education should promote the necessary institutional integrity to help students to experience environments of free knowledge production and diffusion.

The PBL approaches described in this article explore this idea in terms of building "living laboratories" to educate students so that they have a better understanding of the dynamics of technical change. It is in this context that this article encompasses the idea that new learning paradigms are emerging through technical and vocational higher education. In particular, problem-based, project-oriented education, such as that described in this article, can be designed as a major shaping factor for development at an unprecedented level. However, the article also points out that higher education learning spaces must be reconfigured to support different modes of learning better, as well as to facilitate a more decentralized learning process, one which is no longer confined to knowledge infrastructures across space and time. This has led us to assess the learning environments in the cases studied

Our research proposition is associated with the idea of "indwelling", firstly introduced by Polanyi (1966) and recently explored by Thomas and Brown (2011) and Wagner (2012) in terms of understanding learning through the processes of knowing, playing and making. It also builds on Piaget's (1973) view of knowledge construction where "new truths" are learned, rediscovered or reconstructed by the students and not simply told to them. Seymour Papert adds to this idea by understanding knowledge construction as something that occurs in "a context where the learner is consciously engaged in constructing a public entity" (1980, p. 1). In other words, our results provide new insights into the modernization of technical and vocational higher education through "hands-on" experimentation in specialized knowledge networks.

This constructionist viewpoint facilitates a new milieu of discovery, learning, and sharing (see, for example, the analysis of Ritchhart et al, 2011; or Martinez & Stage, 2013), and our observations suggest that it also facilitates the exposure of students to a multi-disciplinary experience, forcing institutions actively to promote learning communities of students, faculty, staff and industry experts. Following the practices, skills, attitudes and values described by Horgen et al. (1999), any education setting must consider that learning a new practice requires moving through discovery, invention, and production not once, but many times, in different contexts and different combinations. Looking at the cases studied, one must realize that technical and vocational higher education has the potential to incorporate "reliable knowledge" into a complex system of experiences. The objective is to integrate

systems of knowledge and ways of practicing where one complements the other (Reeve & Rotondi, 1997). Our ultimate goal is to promote creativity among future generations through strategic and systematic thinking, encouraging communication with people and personifying a culture of learning in the context of technical and vocational higher education.

Conclusion and implications

This article argues that technical and vocational higher education is building distinct learning profiles in terms of new intermediary institutions that promote problem-based learning (i.e., "PBL) together with the implementation of short-term project-oriented research. Learning and training practices are increasingly research-based and, above all, inclusive of social and economic partners via formal and, most of the time, informal collaborative mechanisms. These occur, above all, as an opportunity for strategic action at organizational and content levels.

By performing a comparative cross-case study analysis in Southern (Portugal) and Western Europe (Netherlands and Germany), our analysis shows that emphasizing short-term project-oriented research in short-cycle education may strengthen the institutional credibility of Portuguese technical and vocational higher education by engaging local external actors in training the labor force. In addition, it may help to stimulate the necessary institutional and programmatic diversification of higher education.

Our analysis has identified three potential necessary conditions for the modernization of technical and vocational higher education if the external context and absorptive conditions are adequate: i) the human dimension (it has always been relevant in any educational setting), particularly the specific role of human intermediaries supporting learning/research methodologies, and particularly PBL approaches. This includes "Lectors" and related "knowledge circles", involving teachers and business experts, together with specific research staff, as the central elements of active learning systems; ii) the institutional research context necessary to facilitate highly specialized knowledge, namely, in the form of applied research units that provide a professional context adequate to foster the necessary routines to collaborate with industry at high levels of specialization; and iii) the external environment and funding conditions, which do certainly depend on specific local and

national ecosystems and are particularly influenced by the overall funding level for research and development in the regions considered.

Our intention here is not to suggest the replication of the Dutch or German approaches to technical and vocational higher education; rather, it is to explore the causal mechanisms behind emerging learning approaches. Therefore, the goal is to consider mechanisms by which PBL and short-term project research are enabling factors for training the labor force and stimulating the necessary conditions for wealth generation. Ultimately, this study is meant to be informative about the possibilities and opportunities to develop further the linkages with local and regional stakeholders via technical and vocational higher education as intermediary institutions in the processes of technical change. In addition, our analysis signals that in striving for this learning strategy, positions technical and vocational higher education in the process of meliorating the mismatch between skills and jobs, which could translate into the greater social acceptability and technical credibility of this type of higher education.

While we have listed a number of implications of our study, there are also several limitations that should be considered. First, we did not analyze the industrial intake on the collaboration with technical and vocational higher education in training the workforce. However, our contributions are still relevant to the current literature. Empirical research on higher education-industry collaboration has rarely addressed the issue of cooperation in the light of its relevance for learning and teaching. Most studies have largely derived conclusions concerning the effect of cooperation on innovation and business performance by undertaking econometric analysis (Hewitt-Dundas, 2013). We undertook a qualitative analysis and relied on the perspectives of students, teachers and managers to describe collaborative approaches to learning. Despite the lack of the industrial perspective, our study contributes to an ever-increasing body of literature aimed at understanding the perspectives of multiple stakeholders in cooperating with companies and other community organizations, and especially with respect to the type of training that is being provided in technical and vocational higher education (see Plewa, Galán-Muros & Davey, 2015).

A second limitation of our study concerns the methodology used in that we chose single institutional case comparison across three countries, which restricts the generalizability of our findings. However, this method provided a comprehensive analysis of each case and

guaranteed the validity of the analysis (see Plewa, Galán-Muros & Davey, 2015). Considering that our goal was to exemplify current training practices in three countries and explain the conditions under which training occurs in selected settings, we did not attempt to generalize recommend replication of common findings among cases. Ultimately, the aim of this analysis was to understand the emerging roles of technical and vocational higher education in providing the labor force with resilient skills to face ever changing and uncertain employment markets.

The shortage of a skilled workforce, particularly in Southern European countries, has been commonly attributed to a gap between the educational providers and industry (Hart & Barratt, 2009; CEDEFOP, 2012). Recent policy discourse is thus increasing pressures on higher education institutions to attend to the growing needs of employers. It is in this context that our article positions itself within the realm of technical and vocational higher education, which has traditionally nurtured its close relationship with the professional field in skill provision. The findings suggest that best learning practices can have a potential central role in minimizing the skill/labor market mismatch. The analysis suggests that developing modern pedagogies based on a collaborative, interdisciplinary, and hands-on approach to research and teaching can facilitate the closure of the skill/labor market gap.

Developing PBL activities and short-term project-oriented research can also be used as an impetus for the sustainable growth and modernization of technical and vocational higher education. Limitations of this approach have been reported in the literature in association with the complexity of problem design (see Tan, 2005) and, above all, with reference to skills gap in the teaching staff in terms of the ability to design problems instigating critical thinking and reflection (e.g. Maurer & Neuhold, 2012).

Emphasizing short-cycle of technical and vocational higher education is considered as a means to increase access to higher education (Heitor & Horta, 2014). However, short-cycle programs require the adaptation of learning and research approaches to local and regional markets and the design of educational provision that meet the opportunities in the environment, even if the economic structure is developing.

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CHAPTER 3

Individuals in action: bringing about innovation in higher education[13]

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Abstract

This article addresses academics who innovate in higher education and their characteristics. We undertake a qualitative case study of six individuals who implemented disruptive and transformative pedagogical approaches and curricular practices in their departments and/or at their institutions. Our findings point to six common characteristics -- motivation to change institutionalized practices, interest in change, experience in the field, multi-embeddedness, authority to act, and the strategic use of social networks -- which seem to play a role at individual levels in driving these disruptive and transformative approaches. While acknowledging studies in higher education that address innovation as a response to exogenous influences, this study highlights the role of individuals with certain characteristics in driving innovation and processes of endogenous change in higher education institutions. These findings are also relevant for higher education practitioners in their desire to foster innovative initiatives in institutional settings.

Introduction

There is an abundance of research into innovation in higher education, whether in curricular programs (McClure, 2015), delivery mechanisms (Davis & Jacobsen, 2014), pedagogical approaches, support service mechanisms (Sultan and Wong, 2013) or management (Amaral, Fulton & Larsen, 2003). The majority of these studies, however, tend to overlook the role of individual actors and, with it, their characteristics, while emphasizing exogenous influences that "challenged existing institutions in a field of activity" (Leca, Battilana & Boxenbaum, 2008, p. 3). For instance, higher education innovation is seen as a result of changes in the regional and economic contexts in which higher education institutions (HEIs) are embedded (Pinheiro, Geschwind, & Aarrevaara, 2014) and the changing nature of public policies with their coercive implications on the internal organization of HEIs (e.g., Richmond, 2015). However, such factors are not sufficient to comprehend the complexity of the phenomena because the causal processes involved at system, institutional and individual levels are distinct (Jepperson & Meyer, 2011).

This means that a single set of factors influencing innovation from a system or institutional standpoint cannot reflect individual motivations in undertaking innovative changes. For example, academics have different reactions to exogenous shocks within their institutionalized settings; this may influence the degree of innovation they undertake and are willing to engage in (Degn, 2016). Still, even when studies address the role of academics in change processes and innovation, they tend to over emphasize structural and cultural constraints in the academic workplace that prevent academics from engaging in innovative work (O'Meara, Terosky & Neumann, 2008). At the same time, these studies show academics' *reactions* to exogenous influences, rather than highlighting *action* as an endogenous response. This does not mean that there is no action, but rather that the lack of attention paid to individuals as actors and their characteristics in institutional innovation is limited.

This relative disregard for individuals as innovators in higher education contexts derives from the idea that institutional innovation as an actor-driven activity is unlikely in highly institutionalized settings such as higher education (Meyer et al., 2008), precisely because of constraints imposed by the institution on relevant or substantial individual innovation.

Constraints posed by institutional factors (i.e., power structures, values, norms, taken-for-granted attitudes, behaviors and routines) can delimit the level of success for innovation in higher education (these institutional factors seem to be particularly influential at departmental level; see Campbell & O'Meara, 2014). However, individuals can still undertake strategic action and instigate innovation in their institutions in the form of disruptive changes even if the external environment and/or institutional culture and structure are not as forthcoming as desired (Garud, Hardy & Maguire, 2007). This would suggest that the very individuals who are constrained by their institutions are also the ones that have the ability to change them. This 'dialectic' process (Seo & Creed, 2002), closely related to the paradox of embedded agency, is examined in length in organizational science literature through the concept of institutional entrepreneurs (DiMaggio, 1988).

To shed light on the possible enhanced role of individuals in this innovation process, we draw on the concept of institutional entrepreneurs (IEs), defined as individuals who disrupt the status quo and innovate in their institutions although constrained by environmental and institutional factors (Waldron, Fisher & Navis, 2015). Through the use of a theory that emphasizes these factors, we explore the characteristics of academics who promote innovation in institutional environments potentially averse to change, such as higher education. Furthermore, we identify the characteristics of these higher education IEs in order to better understand who they are and how they manage constraining institutionalized environments to achieve innovative undertakings.

The next section reports on the literature of innovation in higher education and the theoretical framework of institutional entrepreneurship in which the study is embedded. The method section provides details on the research setting, data collection procedures, method and analysis. In the final section, several key findings of the analysis are outlined, and a future agenda for research is discussed.

Innovation in higher education

Innovation is a "multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace'' (Baregheh, Rowley & Sambrook, 2009, p. 1334). In higher education studies, such innovation has been explored within the limitations of and in association with two bodies of literature. The first body of literature considers innovation in HEIs as a process of institutional adaptation to environmental pressures (Chatterton & Goddard, 2000), where multiple governance arrangements and professional identities of its members reside simultaneously (Dee, 2016). The responses to these pressures have forced HEIs to bring about new and enhanced practices and innovate at many levels -- and in many forms -- within institutional structures and curricular programs (McClure, 2015; Davis & Jacobsen, 2014).

The other body of literature explores innovation as mediated by the internal characteristics of HEIs. For instance, it examines how the success of innovation is dependent on the culture within a university (Kezar & Eckel, 2002). In exploring the success of changes in the curriculum at two colleges in the US, Merton and authors (2009) showed that implementation of a changed curriculum was affected by how well the change aligned with the values and norms of the institution. Alternatively, structure -- or the way lines of authority, communications, rights and duties of an institution are arranged -- directly affects the success of innovation within institutions. More recently, it has been suggested that the identity of an institution mediates strategy-making at universities (Fumasoli, Pinheiro & Stensaker, 2015).

These two bodies of literature address how both external (or system) and internal (or institutional -- e.g. its culture, structure or identity) characteristics of a university shape HEI innovation by mediating adaptations to exogenous influences. This literature emphasizes how HEIs are guided not only in their responses and appropriate behavior by their environment, but also by the norms and values prevalent in their departments, as well as the disciplines, which characterize their institutions (i.e., Christensen & Eyring, 2011; Dee, 2016). Under such conditions, undertaking and achieving innovation as an academic is highly unlikely considering institutional constraints to conform to the environmental rules,

norms and values apparent in the structure and culture followed by institutional members. Moreover, academics tend to prefer to maintain the status quo (Hacker & Dreifus, 2010).

While still part of a collegial environment -- though increasingly influenced by managerialism and competition -- academics are rewarded as individual performers for their research and contribution to the field, but often lack positive reinforcement for their institutional involvement and advancement (Dobele & Rundle-Theile, 2015). Lewis (2006) argued that current scholarly activity tends to distance academics from undergraduate teaching and learning, graduation outcomes, and student employability -- issues that could influence their thinking about the need for change and innovation for improving the curricula. The reason for this, in part, is the misalignment between teaching and research, as well as issues related to career progression, reputation and position which a field such as teaching (as traditionally understood) does not favor (Horta, Dautel & Veloso, 2012). This may be the norm, but there are exceptions.

Recently, claims have been made that, even in these environments, some academics strive to change institutionalized practices (Lattuca & Pollard, 2016). In fact, deans were found to have a key role in driving innovation in universities (Cleverley-Thompson, 2016).

Notwithstanding this literature, little is known about the role of academics as actors in driving institutional innovation, who these individuals are, how they conduct innovation, whether they share the values and norms of their institutional peers, or if they perceive institutional characteristics as coercive pressures leading to conformity. Lattuca and Pollard (2016) emphasize that intrinsic motivation, discontent with the current practices, past experiences and personal beliefs may all shape decisions to engage in change. However, the validity of these claims remains relatively under-explored, and the identity of academics who innovate and the reasons behind their power to introduce innovations remain largely unknown. To address this knowledge gap, this study uses institutional entrepreneurship literature and studies in organization science and management to analyze the characteristics of individuals who innovate in higher education settings. By doing this, this study contributes conceptual developments to the higher education literature for a better understanding of individual-institutional dynamics in HEIs.

Characteristics of institutional entrepreneurs

A key concept used in this study is "institutional entrepreneur" (Garud, Hardy & Maguire, 2007; Battilana, Leca & Boxenbaum, 2009), which functions as a lens for understanding the characteristics of academics who undertake strategic action and instigate transformative changes in their higher education setting. This theoretical framework is distinguished from traditional neo-institutional theory, which fails to recognize the role of individual actors in innovation, positing instead that structure is perpetuated by the social repetition of norms and organizational rules of the institutional environment (Suddaby, 2013).

Institutional entrepreneurship theory highlights how "new institutions arise when organized actors with sufficient resources see in them an opportunity to realize interests that they value highly" (DiMaggio, 1988, p. 14). These actors can be individuals, organizations or even groups of individuals or organizations; but in each case, the stress is on agency (Garud, Hardy & Maguire, 2007). This study argues that academics, as individuals in higher education who manage to "manipulate" highly institutionalized settings and implement transformative and disruptive change at their departments with far reaching implications for the institutions, are IEs in higher education.

According to institutional entrepreneurship theory, various factors enable innovation at the field level, such as the maturity of the institutional field. Fields are defined as communities of organizations and actors "that partake of a common meaning system and whose participants interact more frequently and fatefully with one another than with actors outside the field" (Scott, 1994, p. 56). These fields are bounded by shared cultural-cognitive or normative frameworks or a common regulatory system (Scott, 1994).

As fields mature, they evolve into structured configurations, and IEs can leverage these predefined patterns of social structures and hierarchies when seeking to legitimize change (Maguire, Hardy & Lawrence, 2004). In emerging fields, IEs rely on established categories from outside their fields to legitimize change (David, Sine & Haveman, 2013). As a mature field, higher education is highly institutionalized (Scott & Biag, 2016). However, HEIs are also nested in regional, national or global fields; as such they face pressure from constituents in those fields (Hüther & Krücken, 2016). Their location and positioning in

multiple fields shapes adaptation dynamics and can impact change., thereby providing local actors with the means to legitimize their innovative undertakings.

Institutional entrepreneurship theory has also been linked to the position of an institution within a field whereby peripheral institutions are more likely to instigate change (Battilana, 2006). Other studies have shown that change is more likely to be initiated by central organizations precisely because they are at the nexus of multiple institutional contradictions (Greenwood & Suddaby, 2006). Alternatively, institutional entrepreneurship theory has spurred a multitude of analytical research concerned largely with the characteristics of individuals seen as beneficial for innovation processes, as Figure 3.1 summarizes. Extant research has investigated the role of social skills, such as motivational framing (Perkmann & Spicer, 2007), ability to manage otherwise unconnected groups or brokerage (Fligstein, 1997), and competency in mediating on behalf of mutual interests (Battilana, Leca & Boxenbaum, 2009), as enabling the conditions of institutional entrepreneurship. Studies have also examined how the formal position of the individual in an organization and the individual's ability to exploit institutional contradictions in order to alter existing institutional arrangements (Greenwood & Suddaby, 2006) affect institutional entrepreneurship. As Figure 1 summarizes, formal authority is usually acquired through a formal organizational position (Battilana, 2006). This means that certain positions within institutional structures are considered more beneficial for innovation as they legitimize the actions of individuals and mitigate the costs of innovation due to their direct access to funding (Leca, Battilana & Boxenbaum, 2008).

Concept	Explanation
Past habits (PH)	Awareness of institutionalized habits and routines (Emirbayer and Mische 1998).
Problem framing (PF)	Ability to identify problems in current institutional arrangements (Battilana et al. 2009).
Future outcome (FO)	Ability to conceptualize alternative outcomes that lead to reconfiguration of the institutionalized arrangements (Emibayer and Mische 1998).
Formal authority (FA)	Actor´s right to make decisions (Hardy and Phillips 1998).
Access to finance (AF)	Ability in mitigating cost of change (Greenwood et al. 2002).
Past experience (PE)	Exposure to particular experiences similar to the innovative practices introduced (Battilana et al., 2009) or previous experience from institutional field A which institutional entrepreneurs draw on to instigate change in institutional field B.
Multi-embeddedness institutional fields (MIF)	Awareness of multiple institutional orders (Dorado 2005) or simultaneous engagement in various institutional fields (Battilana 2006).
Multi-embeddedness institutional logics (MIL)	Ability to recognize diverse institutional logics, which Thornton (2004) defines as 'assumptions and values, usually implicit, about how to interpret organizational reality, what constitutes appropriate behavior, and how to succeed' (70).
Motivational framing (MF)	Ability to urge others to participate in change processes (Fligstein 1997).
Brokerage position (B)	Ability to mediate across groups that would otherwise be unconnected (Battilana et al. 2009).
Social capital (SC)	Drawing on social capital to attain resources (Jakobi 2013)

Figure 3.1 Summary of the characteristics of IEs as identified by literature

Other characteristics often recognized in IEs are their abilities to recognize institutionalized habits (past habits), identify insufficiencies in current institutional order (problem framing) -- usually as a consequence of embeddedness in multiple institutional layers -- and predict future actions which will impact a future outcome (Emirbayer & Mische, 1998). Recent studies on IEs have asserted that success for innovation increases if IEs use and rely on their social networks. Social ties form social capital, which facilitates opportunity recognition, information dissemination (Davidsson & Honig, 2003), and the identification or collection of resources (Putnam, 2000), thus increasing legitimacy for collective action via networks. These findings suggest that, apart from optimal field conditions, the individual characteristics of IEs and their ability to use the social capital available in their networks are also significant variables for the success of innovative endeavors. This abundant literature provides a framework for an analysis of the characteristics of individuals in higher education who change teaching and research practices by transforming and disrupting the existing institutionalized order.

Research design

Data collection and sampling

We conducted a qualitative case study based upon a relatively small number of cases for the comparison of similarities and contrasts (Collier, 1993). From an initial database of 30 interviews, collected as part of a research project on curricular practices (teaching and

research) and changes in pedagogical approaches in universities of applied sciences in three countries[14] (Portugal, Netherlands and Germany)[15], we selected three individuals who could be identified as IEs. Three additional interviewees were selected by convenience with them. The authors were familiar with and/or have worked in the Dutch and/or Macao and Hong Kong higher education settings; this facilitated the recognition of individual innovators, their innovation as disruptive and transformative, and the institutional constraints in fostering such changes. Figure 3.2 shows the characteristics of the higher education systems of the interviewees, as well as the type and level of innovation they brought, the constraints they faced and their positioning in the HEIs at the time of the innovation.

[14] Universities of applied sciences, also known as polytechnics in Portugal, *hogescholen* in the Netherlands, *fachhochule* in Germany, and Cegeps in Canada and the U.S., are professional tertiary educational institutions which function as part of binary (or dual) higher education systems alongside universities. They provide practical, hands-on learning about the profession and in close interaction with the professional field, mostly at the undergraduate level (see Frederik et al., 2015; Hasanefendic, Heitor & Horta, 2016).

[15] The 30 interviews were conducted with the Deans of Schools of Technology and Digital Media and Creative Industries, Teachers and Teacher/Researchers and Managers from two Dutch universities of applied sciences, the President, Vice Presidents, and Teachers from two Portuguese universities of applied sciences, and a professor and teacher from a German university of applied sciences. This study resulted in a recent publication where the methodology is broadly explained (see Hasanefendic, Heitor & Horta 2016).

	Country characteristics	Higher education characteristics	No. of students	Innovation	Level of innovation	Constraint	Position of the individual at the time of innovation
N1	Netherlands Population: 16,8 million (2014). - GDP (nominal - IMF): € 662.770 billion (2014). - Population with a tertiary education degree (18-58): 28% in 2012, out of which 22% are from universities of applied sciences	- binary higher education system with research universities (13 institutions; government grant funded) and universities of applied sciences (43 institutions; mostly government grant funded)	In 2015, the estimate was 420.000 at universities of a applied sciences and 240.000 at universities	- creation of an innovative undergraduate entreprenеurship bachelor program at university of applied sciences that is based on a demand-driven and assessment-based approach to learning where students determine what they learn	Program	National accreditation system Diverging beliefs of departmental colleagues and their suspicion about the new program and its success	Program manager and Curricular manager at a university of applied sciences
N2	see above	see above	see above	- creation of an interdisciplinary undergraduate program in science, business and innovation at a university	Program	University governance and faculty and departmental funding Resistance from faculty members	Retired professor and former Rector; consultant in program development
HK1	Hong Kong Population: 7,4 million (2014) GDP: € 259.610 billion Population with a tertiary education degree: 29.8% with postsecondary degree (including postsecondary schools and higher education institutions)	- 19 local degree awarding higher education institutions, eight of which are funded through the Government. Seven of the eight are universities and 1 is a teacher training institution.	In 2014-15: 87.600 full-time students and 3.900 part-time students enrolled at publicly funded undergraduate and postgraduate courses.	- development of a comprehensive paradigm of learning appropriated as the main paradigm of curricular reforms of undergraduate curriculum for teacher education	System	Beliefs of teachers who would be affected by change. Uncertainty of the teachers who would be affected by change	Professor and consultant on reforms in higher education
M1	Macau Population: 607.000 approximately (2013) GDP: € 46.23 billion (2013) Population with a tertiary education degree: /	-Macao has 10 tertiary educational institutions. Four of them are public and six are private.	During 2013-14, there were 1.941 teaching staff and 29.521 registered students.	- setting up a research infrastructure in class which significantly impacted postgraduate education at a university and in the country	Course	University governance and funding	Professor and Vice Rector at the university
G1	Germany Population: 80,7 million (2014) GDP: € 2.904 trillion (2014) Population with a tertiary education degree: 18% of university graduates; 5% are graduates from universities of applied sciences	- binary system with universities (incl. universities of art and music;166 institutions) and universities of applied sciences (221 institutions)	Current student population is 2.4 million.	- setting up a strategic approach to business and innovation in curriculum for business and marketing students at a university of applied sciences	Program	Departmental and disciplinary norms and values Disproval and resistance from departmental colleagues	Professor at a university of applied sciences
P1	Portugal Population: 10,4 million (2014) GDP: € 173.044 billion (2014) Population with a tertiary education degree: 26% from both universities (majority) and polytechnics	-binary system with 15 public universities and 15 public polytechnics. There are also 13 private universities and two private polytechnics	In 2013 there were 362.200 students in higher education in total; 242.874 in universities and 119.325 in polytechnics	- introducing new practice based and problem solving approaches in master courses at a university and reforming the higher education system towards a more participatory and inclusive system	Course	University bureaucracy Resistance from departmental colleagues	Professor at a university

Figure 3.2 Descriptions of higher education systems and the curricular innovation. Sources: Netherlands: www.government.nl.com; www.cbs.nl; http://ec.europa.eu/: Hong Kong: http://www.gov.hk/ ; Macau: https://www.cia.gov/ ; Germany: http://ecahe.eu/w/index.php/Higher_education_system_in_Germany; www.europa.eu/countryfiche; http://www.hrk.de/activities/higher-education-system/; Portugal: http://www.dgeec.mec.pt/np4/np4/96/%7B$clientServletPath%7D/?newsId=145&fileName=EE2014.pdf

The first criterion for selecting individuals was related to the type of higher education innovation introduced. We analyzed only the characteristics of those individuals who reported introducing disruptive and transformative innovation in curricular practices and pedagogical approaches. These approaches have been recently documented in literature as novel, following calls for teaching and research activities produced in the context of application, usability and transferability of knowledge to societal actors (see Hasanefendic, Heitor & Horta, 2016). They are characterized by real life experience, problem solving activities and group project work inclusive of external partners in short-duration learning. This suggests that practices were legitimized in a field outside the one in which our IEs were embedded. These practices may not be standard in some higher education settings, as one

would expect, as there may be constraints due to the institutional or system context of their implementation (Porter & Graham, 2016; Walder, 2015). Actually, some of the innovations are considered non-innovations, or even trivial, in other contexts, but within the setting in which they occurred they were *disruptive* and *transformative*. Following disruptive literature on innovation in learning (e.g. Banerji, 2015) and transformational change in higher education (Sklad et al., 2016; Iyer-Raniga & Andamon, 2016), disruption in the context of higher education is defined as a process by which a new way of learning, teaching or educational organizing is introduced under conditions of institutional and environmental constraint (see Ariss & Deilami, 2012, on degrees and types of innovation) or in higher education settings which do not welcome change. Disruptive innovation involves the eventual transformation of ways of learning, teaching and/or organizing into (because of their convenience and relevancy) dominant paradigms within the auspices of their settings (see Christensen & Eyring, 2011). What frames the very notion of disruptive and transformative pedagogical innovations is, therefore, the fact that individuals have to navigate through prevailing norms and values in their universities, departments and/or disciplines in order to legitimize their innovative changes.

This was the second criteria for our case selection as all selected individuals had to overcome some constraints in the implementation of innovation (see Figure 3.2). For example, N1 told us that he was responsible for the creation of an innovative undergraduate entrepreneurship bachelor program with demand-driven and assessment-based approaches to learning where students determine what they learn. This type of curriculum was different from the accepted standard and challenged not only the accreditation system, but the beliefs of colleagues at the departmental level, many of whom refused to participate. N2 was engaged in and managed the creation of an interdisciplinary undergraduate program in science, business and innovation at a university where he encountered governance and funding (institutional) challenges, as well as resistance from other professors, departmental heads and faculty deans. P1 innovated pedagogy mainly at course level and mentioned encountering few constraints as innovation was on course level, though resistance was met, mostly from other departmental or faculty colleagues and university bureaucracy. This is consistent with a higher education system that is still relatively insular and in the process of opening-up to societal demands (Rosa & Teixeira, 2014). M1 innovated at course levels by

introducing research infrastructure in postgraduate education which eventually became accepted at the system level. This process was, however, restrained by university governance, funding and required renegotiation among colleagues. G1 was responsible for setting up a strategic approach to businesses, leading to innovations in curricula at program levels, but faced disproval from departmental colleagues. HK1 developed a comprehensive paradigm of learning, appropriated as the main paradigm for curricular reforms, innovating undergraduate curriculum for teacher education at system level[16]. This academic faced several obstacles, among which the particularly challenging task of legitimating the new paradigm among colleagues.

The first author undertook open-ended interviews with the selected academics lasting from 45 to 90 minutes each. The interviews took place both in person and over Skype for a period of about two months in 2014. She elicited information about the innovative process, constraints and sanctions which were involved in the process of innovation design and implementation. Then, inquiries were made about the setting in which innovation occurred, the personal traits of the individuals, their motivation for change, the positions of individuals within institutional settings, the participation of others in innovation, how the innovation was implemented, what they experienced as enabling factors for change, and the novelty of the introduced change and its impact.

Data analysis

Transcriptions were analyzed using the constant comparative method (Merriam & Tisdell, 2015). In this process, the text is broken into meaningful units and coded for content based on our theoretical framework. The analysis, therefore, focused on identifying common individual characteristics of all selected cases, which we also co-related to the characteristics ascribed to IEs as found in the literature. Figure 1 outlines the common characteristics ascribed to institutional entrepreneurs which we synthesized from the institutional entrepreneurship literature. We focused on these characteristics in the analysis of the interviews to find commonalities; for example, an institutional entrepreneur in HEIs can mitigate the costs of change and access funding sources with the same ease as a non-academic institutional entrepreneur. We did this in order to understand whether

[16] The innovations led by the interviewees in Hong Kong and Macau were researched and led to published articles: see Horta & Martins, 2014, and Cheng, 2002.

entrepreneurs in higher education settings have similar characteristics to those in non-academic environments, so as to better grasp the extent to which the actions and characteristics of institutional entrepreneurs in HEIs (since they act in highly institutionalized settings) differ from others.

We therefore adopted an abductive approach to data analysis (Locke, Golden-Biddle, & Feldman, 2004; Reichertz, 2007), where the goal is to explain observed characteristics related to the phenomena through a set of previously defined characteristics. This permits us to know about and advance an understanding of the phenomena in the selected field and is especially useful when the phenomena under analysis are not sufficiently explored or addressed in the field.

Findings

Figure 3.3 outlines the six characteristics common to all cases. These include: motivation to change institutionalized practices, interest in change, field experience, multi-embeddedness, the authority to act, and the strategic use of networks. These characteristics were related to those that have already been elaborated in literature on institutional entrepreneurship (Figure 3.1) where individuals engaged in change processes. The following discussion presents these characteristics in related pairs.

Characteristic	Concept from institutional entrepreneurship literature
Motivation to change institutionalized practices	*Past habits (PH)*: Awareness of institutionalized habits and routines and motivation to change them (Emirbayer and Mische 1998).
Interest in change	*Problem framing (PF):* Ability to identify problems in current institutional arrangements and perception of necessary changes (Battilana et al. 2009).
Field experience	*Past experience (PE):* Exposure to particular experiences similar to the innovative practices introduced (Battilana et al. 2009) or experience in the institutional field which enabled conceptualized of the need for innovation.
Multi embeddedness	*Multi embeddedness institutional fields (MIF):* Awareness of multiple institutional orders (Dorado 2005) or simultaneous engagement in various institutional fields (Battilana 2006).
Strategic use of networks	*Social capital (SC):* Drawing on social capital to attain resources (Jakobi 2013)
Authority to act	*Formal authority (FA):* Actor´s right to make decisions (Hardy and Phillips 1998).

Figure 3.3 Characteristics of individual academics who innovate as IEs

Motivation to change institutionalized practices and interest in change

Motivation to change institutionalized practices and interest in change are somewhat interrelated common characteristics. Motivation to change emerges from the perception that academics had about institutionalized habits and routines, and interest in change encompasses their awareness of the problem in the current institutional order. In IE literature, motivation is positively associated with innovation (Greenwood & Suddaby, 2006). Dominant actors in the field may have the power to change current institutionalized practices, but if they lack the motivation to champion change, success will be unlikely (Garud, Hardy & Maguire, 2007). All six academics referred to current curricular practices as obsolete, considering the need to adapt the learning processes to keep up with rapidly changing socio-economic contexts. For example, P1 identified this situation as a big problem: "*This traditional way of learning, where the professor knows everything and the student knows nothing -- the idea is that student goes to classroom to learn from someone that knows more than him or her. Teachers are not accustomed to not knowing answers to student questions … but if I do not know how to answer, I say simply that I do not know. Nowadays, students do not need to go to the classroom to listen to professors; you can get all of the information online; read a book. What I believe is that in classrooms, students and teachers should exchange ideas.*"

HK1 also exemplified the problem of current institutionalized teaching and learning practices at universities which motivated change: "*Our curricular reform is based on the understanding that the society has changed and that the core business of education is learning. People do not do what they learn nowadays … and we are not giving them the actual learning experience they deserve. This would not be a problem in the past as you got a job based on credentials; you do your job, follow the rules. Now you are on your own, units are small, and you need transversal skills*."

M1 referred to the "*absence of research or culture of research*" as an institutionalized practice. This is seen as problematic as "*research creates knowledge and informs action. It is a process of responding to the needs of the external world by improving it*". For M1, motivation for change and interest in change arose from the fact that the absence of research practice inhibits both regional and national socio-economic development and the engrained capacity of students to think critically about subjects they would deal with in their future workplaces.

In the case of N2, the interest in innovation was framed by the university: "*The university realized that subjects such as physics, chemistry and mathematics were not getting enough students, and when you do not have enough students, you do not get money from the Government. So we were pushed to attract more students, otherwise we would have been cut.*" N2 created a new interdisciplinary program, "*something unique"*, which was based on connecting science education with entrepreneurship and introducing courses from a different educational field: "*Gamma University also has a similar program, but it is not coherent; students can choose how to combine science with business; but at the Beta University it is all unified*". The interest in creating such a program was not merely financial, as N2 mentioned: "*We wanted to show students the value in studying science"*, particularly by introducing them to the concepts of innovation and the dissemination of scientific innovation: "*Innovation is everything that has successful market introduction so this is what we introduced first."* The new curricular program attracted a significant number of students and has been an example for others in the university who are trying to foster interdisciplinary programs with innovative outputs within their fields.

Field experience and multi-embeddedness

IE theory specifies that individuals' embeddedness in multiple fields or their consciousness of multiple institutional logics, which Thornton (2004) defined as ''assumptions and values, usually implicit, about how to interpret organizational reality, what constitutes appropriate behavior, and how to succeed'' (p. 70), matters for innovation. Our analysis showed that all six academics were exposed to different institutional settings (they either studied or taught in these different higher education settings in different countries) with particular logics, but still within the same field. At the same time, some of them were also working outside academia, or had worked closely within the private sector (N1, G1) or were involved in policymaking at country level (HK1, P1). They explicitly mentioned how they drew on the logic stemming from a different institutional setting to organize and undertake changes in their own institutional settings. N1 reflected on the "*lessons with a professor, who wrote about competence profiles,"* which N1 "*used to structure a profile of the new curricular program."* HK1 drew on both "*long term research in the area of education*" as well as "*several examples from the industry that are illustrative of fundamental change necessary in the organization of the education system."* N2 was also very specific about providing inspiration

for the organization of an innovative curricular program: "*I was a visiting scholar in an Alpha University, in the Department on Science and Technology Policy, and I had experience from the way research and teaching been done there.*" M1 refers to the type of "*training provided where I studied, did my masters and doctoral degree, as well as my research stays in other countries*" as significant in understanding the relevance and urgency of the innovational approach to curriculum. Jointly, these findings show that field experience and multi-embeddedness provide multi-level knowledge which is brought into the institutions where the academics worked and both instigated interest and provided resources for changing traditional curricular practices.

Authority to act and strategic use of networks

Authority to act was another common characteristic in the process of innovation, and it was closely connected to the ability to make decisions on how and when to implement innovations, as well as whom to involve in innovation implementation. In the literature on institutional entrepreneurship, IEs usually hold central positions within institutions which provide them with high degrees of legitimacy and power in institutional structures (Battilana, 2006). In our analysis, some academics claimed that they were central players and "*could connect the teachers with the professionals*" (N2), which helped in the innovation process. N2 mentioned that he had support from two key persons in the institution and that "*these two (…) supported everything in the beginning and, together with me, we appointed some staff members, Jack and Jill, who both had industry experience, and that is why they were hired*". Academics situated in central positions within their institutional structures also held prominent positions in the midst of their social ties or "social networks" (Hanneman & Riddle, 2005) where they could connect with others, centralizing them in innovation and attributing them with power over relations with others.

While not all academics were in these positions, they still had the authority to act. This means that peripheral actors, who lack power, could also innovate. These academics acquired the power necessary to undertake disruptive changes through the social capital of their networks. N1 and HK1 were not in central positions while pursuing their innovation drives, resulting in limited decision-making power. Despite the initial lack of power, they could still act because they were granted permission by someone else. This other authority-holding academic was in a greater position of power, and, at the same time, supported the

innovation. Such individuals confer their authority through common social networks. In relation to this, N1 stated: *"I was allowed to do an experiment with a group of people to start a new bachelor program. Minister of Education gave us accreditation in 1995. I was responsible for this, and my boss the Rector said he did not understand what I was doing but he had faith in the way I was doing it".* Being part of the network was also key for HK1: *"I was not directly involved in the curriculum reform (…), (the leader was a banker) but I paved the way of the curriculum reform, or set the guidelines or underpinned curricular changes by principals that can be understood by everybody (…) and fortunately my colleagues in this process follow the same line of thought as I did."*

These cases indicate a lack of power due to peripheral positions that is countered by support from someone in a common network with a central position within the institutional structure. This in turn grants "authority to act" through the network to the academic implementing the innovation (see Maguire, Hardy & Lawrence, 2004; Batillana, 2006). In this way, they used their network strategically, as the individual relied on social ties or relationships with other actors to gain legitimacy for innovation. This demonstrates how decision making (via authority to act) can be granted to these academics via relations in their social networks.

Discussion and conclusion

In this article, academics who introduce innovation in their departments and/or institutions are analyzed though the identification of characteristics as enabling factors for fostering disruptive and transformative changes in pedagogical approaches and curricular practices in diverse higher education settings. Largely, HEIs are urged to innovate their teaching and research practices to complement turbulent employment markets and shifting socioeconomic needs (Harvey, 2010), as well as to adequately train the workforce (Alexander, 2000). These innovative changes are underway in many countries worldwide with the support of local government and under national frameworks (e.g., Pinheiro & Antonowicz, 2015). However, some national regulations and intra-institutional norms, values and routines are not as forthcoming of disruptive institutional changes (Marshall, 2010).

So, how *does* innovation occur in these settings? By embedding our study within the theoretical framework of institutional entrepreneurship, we show that IEs can be found in higher education and that they have a role in introducing innovation within their departments and/or institutions which are not forthcoming of change (DiMaggio, 1988). By using the abductive method, we inferred six characteristics for IEs in higher education by associating these characteristics to those commonly characterizing IEs in non-academic settings that are not highly institutionalized.

The research findings presented in this article point to the relevance of six individual characteristics to the ability of higher education IEs to successfully implement innovative change. These are motivation to change institutionalized practices, interest in change, field experience (together with significant knowledge of the field), multi-embeddedness (which stems from working in different settings in or outside the field), authority to act and strategic use of networks.

The analysis of interviews showed that motivation to change the institutionalized curricular practices was intrinsic and came from the individual's interest in several issues, such as how students were taught and who participated in education, rather than a solely extrinsic motivation and short-term benefits of innovation on the institutional level. These findings were encouraging, especially considering the recent "output mania" in higher education (e.g., pressures for performance through set indicators), as indicated by managerialism and tight regulations which foster extrinsic motivation while minimalizing intrinsic motivation (Ko, 2001). Intrinsic motivation, however, seems to be key in driving innovation in higher education, as our study shows: IEs frequently mentioned it as a reason for deciding to initiate innovation and change the institutionalized practices at their departments and/or institutions.

This finding is also associated to IEs' interest in change, which was realized because of the experiences and multilevel knowledge they gained by being embedded in different higher education fields, as a part of international or disciplinary networks, as well as in industry or policy. This finding highlights the relevance of exposure to different institutional environments and underlines the critical importance of mobility as a driver for change in higher education (which is also related to changing values and mentalities). This is aligned with recent studies on the negative consequences of academic inbreeding, or the concept of

immobility, whereby institutions hire their own PhD students as staff (Horta, 2013). The multi-level knowledge provided IEs with both the acknowledgement of the problem in their institutionalized settings and the understanding of how innovation can be achieved under such conditions. This suggests that the innovative motivation of these IEs was socially constructed by a growing awareness of specific issues as previously "unseen" challenges and the recognition of possible solutions to these challenges as derived from learning experiences in multiple and diverse environments (experiencing negative and positive benchmark cases from which to draw conclusions).

Academics engaged in promoting change in higher education also strategically use and draw upon their social networks for the acquisition of influence in order to garner support for change. Whether academics were in central positions in institutional structures or were peripheral, they relied on social capital in their social networks for success in adopting innovations. This signaled that IEs in higher education were not just equipped with a certain skill-set for innovation, but they managed to undertake innovation if they could connect with others in their institutions and strategically use the social capital available in their networks to achieve their goals. In this regard, the building of social networks inside and outside their HEIs is of importance. For example, the building of – and occupying a central position within – external networks of relevance, such as international and/or national academic and scientific associations, can attract the reputation capital necessary to facilitate internal change (Horta & Patricio, 2016) by fostering the IEs position in the HEIs internal networks. However, it is probable that relying simply on an external network would be insufficient to drive change in the HEIs (because the relations where the IEs sourced their social capital would be external to the institution and, thus, perceived as alien), although there are significant benefits of such networks in innovative breakthroughs external to the organization (see Bercowitz & Feldam, 2011). External networks also provide access to a variety of resources and knowledge which positively affects innovation. On the other hand, simply building centrality on internal networks does not ensure innovation (e.g. Powell & Grodal, 2005) as this process assumes consensus and harmony that is largely seen as an antithesis of change.

The issues exposed above further the dialogue about the role of individuals in institutional innovation and processes of endogenous change within HEIs. HEIs are often conceptualized

as institutionalized settings where innovation is unlikely and the perpetuation of the status quo is preferred (Weick, 1976). HEIs are also conceptualized as places where individual members are highly constrained by both external environmental pressures and internally accepted norms and values and innovation is particularly driven by academics with certain skills and characteristics. This research highlights the importance of participation by academics with certain skill-sets in networks for the fostering of institutional innovation, thus pointing out the often-overlooked role of not only individual innovators themselves but their characteristics which influence innovation. This is particularly important in current higher education settings which demand greater flexibility and adaptability to changing environments, underlining the need to focus on two key institutional policy issues for HEIs:

(1) the need to restructure HEIs from models akin to a professional bureaucratic model (typical of the industrial age and still to a very high extent present in most universities in the world) to adhocracies (using Mintzberg's terminology; Mintzberg, 1992) fostering flexibility, adaptability, and the development of aligned levels of decentralization, granting greater individual autonomy (which is required to deal with growing illities impacting higher education systems and societies alike; Heitor & Horta, 2016), and

(2) the need to rethink academic recruitment and career advancement processes, highlighting the role of mobility and the purposes for which academics are hired. In the context of an uncertain society to which HEIs need to adapt while remaining competitive in their global environment (see Christensen & Eyring, 2011), the definition of what an academic is may already be undergoing a substantial transformation (Shattock, 2014). Academics may be hired from a perspective where an adaptable division of labor may determine the goals and outputs expected from each academic. This will require a change in academic evaluation processes and their adaptability to new times and challenges, but will also require them to become increasingly institutional entrepreneurs in order for them and the HEIs employing them to survive.

Future research agenda

This article is a first attempt at researching the characteristics of individual institutional entrepreneurs (IEs) in higher education settings and follows a small number of cases designed to contribute to the field of higher education (Eisenhardt, 1989). First and foremost, this paper has proved an influential role for the characteristics of individuals when explaining innovation in HEIs. Thus, future research should move beyond studies of the institutional environment alone. While assuring that similar innovator characteristics are found in different contexts, there is also need for a more nuanced contextualization of individual innovators. Future studies might also explore how the combination of characteristics of academics, as identified in this study, contribute to their positions in networks or network structures (Emirbayer & Goodwin, 1994), as they might also distinguish different conditions that lead to innovative outcomes. For example, a complementary quantification of a network of IEs would be beneficial in addressing the flow of information on innovation between network actors (Borgatti, 2005). It would determine the participation of all actors and the strength and relevance of their social ties in relation to IEs in higher education. Future studies ought to explore the behavior of such individuals which positively influences innovation among a higher number of participants (also including those who were not involved in any innovative undertakings).

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CHAPTER 4

Professional field in the accreditation process: examining IT programs at Dutch universities of applied sciences[17*]

**Note: The names of the authors have been presented in alphabetical order. The first author was responsible for the idea for the paper, the data analysis and results, the second for the introduction, the theoretical framework, discussion and conclusion, whereas the third author was consulted on the overall text and discussion and conclusion.*

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Abstract

In this paper, we analyze 53 Dutch accreditation reports in the field of information technology (IT) to assess the mechanisms of the reported involvement of the professional field in the undergraduate programs of universities of applied sciences. The results of qualitative content analysis reveal a coupling effect in reporting on mechanisms of interaction. Although the involvement of the professional field is tightly coupled with the undergraduate programs at universities of applied sciences at the strategic level, there is an underrepresentation of university-industry interaction on an operational level, which suggests the need to explore the actual interaction taking place between the professional field and the programs. Simultaneously, our results indicate that accreditation reports are not able to provide a holistic picture of professional field engagement in the curriculum at undergraduate programs at the operational level, which questions their role in acknowledging the role of industry in shaping and achieving intended learning outcomes. Perhaps policymakers should consider introducing other tools or standards for addressing the outcome of the engagement and the responsiveness of the programs at UAS to the professional field.

Introduction

As a quality assurance mechanism, the accreditation process accounts for minimum threshold standards of quality in teaching and research (Blackmur, 2007) and legitimizes institutional operationality (Prøitza, Stensaker, & Harvey, 2004). Within this context, the accreditation process usually addresses the intakes of the Government and, to a certain extent, the academia (Stensaker et al., 2011: Serap and Cress, 2014) in terms of whether the institution qualifies for a certain status (Välimaa, 2004). Employers and students are rarely mentioned, despite their obvious role in accountability and transparency of the process (Santiago et al., 2008). Recent policy initiatives have emphasized that both internal and external stakeholders should play a greater role in the process of accreditation. For example, "Bologna" specifies that students, as internal stakeholders, should impact the development of institutional strategy, policies, and procedures (ENQA, 2005). Santiago et al., (2008) also argue that their involvement in the "design and implementation of quality assurance activities is important from the perspective of accountability to society at large" (p. 281). Although the role of students in quality assurance has been increasing, the professional field—which includes employers within a specific occupational field—still reportedly plays a minimal role in these processes in most countries around Europe[18] (Santiago et al., 2008). The involvement of the professional field in quality assurance and the reported implications of industry collaboration in curriculum programs have been rather underexplored in the literature (Plewa, Galán-Muros and Davey, 2015). This goes against the attention that the interaction with the industry has received both in practice (e.g. Davey et al., 2011) as well as scientific studies (e.g. Plewa, Galán-Muros, & Davey, 2015; Hasanefendic, Heitor, & Horta, 2016).

In the Netherlands, one of the formal requirements to receive accreditation of undergraduate and graduate programs is to show that the program meets the requirements of the professional field (NVAO, 2011; NVAO, 2014). The undergraduate programs at the universities of applied sciences (UAS) in the Netherlands take the professional field into account to a large extent (Leisyte et al., 2013; Kolster and Westerheijden, 2014), as they

[18] The exception are professional accreditation schemes in the United Kingdom and Portugal, where the associations of employers are conditioning new entrants into professional practice (see Schwarz and Westerheijden, 2004).

participate in formulating 'domain competencies' for broad subject areas (NVAO, 2008, p.8). This greatly increases the transparency of the quality of programs (Schwarz and Westerheijden, 2004), but research is unclear on how and to what extent are these external stakeholders actually participating in shaping learning outcomes (Santiago et al., 2008, p.283). This leads us to our research question, which inquires about the mechanisms of engagement of the professional field in undergraduate programs and its contribution in shaping intended learning outcomes at UAS.

We focus on the UAS where linkages with the professional field, although part and parcel of the institutional tissue, have been rather unexplored. Traditionally, UAS offer professional education (Huisman, 2008; Jongbloed, 2010), which is concentrated on regional and local labor markets. Their interaction with companies has intensified over the years with the introduction of the official role of conducting research. In particular, there is evidence of pedagogical innovation, emphasizing problem-based learning and short-term project-oriented research, and growing social and economic landscape entrenchment (Hasanefendic, Heitor, & Horta, 2016). In this light, it is interesting to explore how the interaction with companies is structured and what are the implications for curricular program development.

In order to address these issues, we analyzed the reported interaction of IT undergraduate programs and the frequency of engagement with the professional field at both strategic and operational organizational levels (Weick, 1976; Bromley & Powell, 2012). The strategic level is related to the managerial or policy aspect of collaboration and refers to the extent to which the professional field participates in defining the learning outcomes of programs, or the extent to which it is consulted in curriculum design and delivery (Davey et al., 2011). We define the operational level as activities related to the professional field (e.g. companies) embedded in the curricular program in teaching and research practice. The majority of studies addressing the interaction between higher education institutions and the professional field (e.g. Davey, 2015) examine the concrete outputs and implications of their relationship, rather than focusing on the interplay between the mechanism of interaction at both strategic and operational levels. The nature of the types of collaboration at the two levels (strategic and operational) and the mechanisms involved presupposes a kind of 'coupling' (Weick, 1976) with the professional field. It is the coupling between the

professional field and the undergraduate programs at the two levels, as discerned from accreditation reports, that is the central topic of this study.

This contribution is structured in the following manner: In the next section, we present an overview of literature on quality assurance and focus on the accreditation process to specify the manner in which involvement with the professional field in programs is evaluated in the Dutch context. Thereafter, we introduce our rationale for studying the coupling between the professional and undergraduate programs as reported in the accreditation reports. In the method section, we focus on the method of analysis and introduce our method of qualitative content analysis to understand the coupling dimensions as distinguished in the accreditation reports. This is followed by a presentation of the results and the discussion. The conclusion provides an overview of our most relevant findings and the implications for future research.

Accreditation in the Netherlands: an overview of the formal procedure

Accreditation is a government policy mechanism regulating the quality of higher education institutions, programs, and modules of study in higher education. As such, it is one of many activities designed to evaluate, monitor, and enhance the quality of higher education (Schwarz & Westerheijden, 2004; Santiago et al., 2008). In certain European countries, accreditation is mandatory and concerns both the evaluation and monitoring of the quality of the institution and its programs (e.g. Norway, Portugal, and Switzerland). For example, in the Netherlands, periodical evaluations of programs are organized by an independent Review and Assessment Agency (VBI), which are then accredited as official degrees by the Nederlands-Vlaamse Accreditatie Organisatie (NVAO), the Dutch-Flemish Accreditation Organization (Scheele, Limbach, & Rijcke, 2006).

The current accreditation process in the Netherlands is undertaken around four standards[19] on which sufficient judgement must be attained to be granted accreditation (NVAO, 2014). These include a) intended learning outcomes, where the programs need to show how they

[19] The accreditation reports in this analysis are from the period before 2012 and they are based on three standards. Changes to the standards were introduced in 2014 and they concern the division of the standard 'assessment' into two separate standards, namely, 'assessment' and 'achieved learning outcomes'.

tie in with the international perspective of the requirements of the professional field; b) teaching learning environment, in which attention is paid to the content and structure of the curriculum, services, and facilities provided by the institution that help in achieving learning objectives, as well as the quality of staff; c) assessment, which shows whether the program has a valid, reliable, and transparent assessment scheme, and d) achieved learning outcomes, which can be demonstrated by examining final projects, tests, performance of graduates in actual practice, etc. (NVAO, 2014; Santiago et al., 2008). These four standards answer the following three questions regarding the program, which helps to evaluate its quality: 1) What is the aim of the program? 2) How are the aims realized? 3) Have the objectives of the program been achieved?

The VBI forms an assessment panel composed of one student representative, one professional, and one higher education representative, apart from the chairman and secretary positions (NVAO, 2011; NVAO, 2014). The panel drafts a report based on the documentation it receives from the program (see Table 4.1) and the on-site visits to the institution. Accreditation reports are comprehensive evaluations of both the strategy the program undertakes in educational provision, and practice in teaching and research. In other words, the input in the report on the engagement with the professional field is usually depicted in terms of engagement with the professional field in a variety of strategic tasks, as well as in the form of concrete teaching and related research practices implemented in the curricular program. For example, research partnerships and collaboration in education, research, and promotional activities of the region are often mentioned. The report also elaborates on the outputs of this strategic collaboration by providing examples of student engagement in projects and their active participation in the professional field throughout their studies. This information facilitates the analysis of the interaction of the curricular program with the professional field that is reported at the strategic level and enables an observation of the interaction as it unfolds via multiple teaching and research practices at the operational level.

Basic data concerning the programme

1. Administrative data regarding the programme and the institution
2. Quantitative data regarding the programme

Required appendices to the critical reflection

1. Subject-specific reference framework and the learning outcomes of the programme;
2. Overview of the curriculum in diagram form;
3. Outline description of the curriculum components, stating learning outcomes, attainment targets, teaching method(s), assessment method, literature (mandatory/recommended), teacher and credits;
4. Teaching and examination regulations;
5. Overview of allocated staff with names, positions, scope of appointment, level and expertise;
6. List of the last 25 final projects or the final projects of the past two years (or portfolios /projects demonstrating the exit levels attained by the students);
7. Overview of the contacts maintained with the professional field (if relevant);
8. Report on the institutional quality assurance assessment.

Documents made available during the visit

1. Reports on consultations in relevant committees / bodies;
2. Test questions with corresponding assessment criteria and requirements (answer models) and a representative selection of actual tests administered (such as presentations, work placements, portfolio assessments) and assessments;
3. Representative selection of final projects, selected by the panel, of the past two years with corresponding assessment criteria and requirements;
4. Reference books and other learning materials;
5. Summary and analysis of recent evaluation results and relevant management information;
6. Documentation regarding teacher and student satisfaction.

Table 4.1 Overview of documents for accreditation

Coupling with the professional field: a higher education perspective

In order to delineate a set of conclusions on the nature of interaction reported on the strategic and operational level we deploy the theoretical perspective of 'loose' coupling introduced by Weick (1976) and, more recently, Orton and Weick (1990). These authors refer to autonomous and independent units embedded within a larger system as 'loosely coupled' systems. In loosely coupled systems, the actions of one unit may have little or no effect to the other unit or even the overall system. The basic underlying logic is that, unlike tight coupling which presupposes highly integrated and responsive systems and decoupling which refers to the opposite alternative, 'loose coupling' indicates that the system is less robust and units are free to adjust accordingly to change without requiring a transformation

to the entire system (Orton & Weick, 1990). This theoretical concept gives us leeway to understand the extent to which the professional field is engaged in shaping learning outcomes at the strategic level and how is the interaction represent at the operational level.

Literature has substantiated proof of the existence of coupled systems, either within organizations or outside organizations, creating interdependent partnerships where misalignments are present (Soh & Sia, 2004; Bromley & Powell, 2012). Such literature always emphasizes the process of mutual adaptation towards some form of eventual alignment (see Berente, 2009; also Fusarelli, 2002). In higher education literature, curricular program alignments with the professional field are considered with caution, despite the increased interest in their relationship (Teichler, 2007; Leisyte, et al., 2013). For example, some scholars are rather critical regarding the new role of industry in higher education and its influences on traditional higher education structures (Alajoutsijarvi, Juusola, & Siltaoja, 2013; Kauppinnen, 2012), as well as roles of academia in changed higher education settings that emphasize increased collaboration with companies (e.g. Hazelkorn & Moynihan, 2010). On the other hand, the shift towards a market-oriented higher education and growing industrial stakeholder involvement does not have to imply that universities are forced to displace their traditional activities (see Ylijoki, 2003). For example, industrial sponsorships are regarded as highly effective for enhancing the quality of education of students and enabling them to pursue their scientific interests (Mendoza & Berger, 2008). Simultaneously, industry engagement in higher education systems has become crucial in shaping effective national innovation systems, which rest on the interaction between universities and companies and other institutions in the environment (Nelson, 1993).

Existing literature testifies two things regarding the increased coupling between the professional field and higher education: a) that it is destructive, thereby leading to the dissolution of traditional university structures (see Nickolai et. al., 2012); and b) that it is instructive, or stimulates innovation for economic and scientific growth (see Etzkowitz & Leydersdorff, 2000), but also enhances institutional growth, transformation, or evolution (Marginson & van der Wende, 2007).

Universities of applied science have traditionally been rather tightly coupled with the professional field. They originated with mergers of industry institutes and commercial institutes in the late 1970s and the 1980s (e.g. Portugal) as a result of a country's transition

from agricultural to industrial production (Baker, Boser & Householder, 1992). Some are more recent institutions, e.g. in Finland and Switzerland. Until now, their main task was to provide teaching activities for professional purposes, and yet, some ten years ago research activities started playing an increasingly important role. Hasanefendic, Heitor and Horta (2016) show that such training at these institutions involves a relatively high involvement of regional industry in skill building. For UAS this is the goal, as they have traditionally positioned themselves closer to the (regional) labor markets and industry (Sandelin et al., 2012), and responded swiftly to changes in them (EU Skills Panorama, 2014). Due to this knowledge we expect that the coupling with the professional field be tight on both the strategic and operational level.

Methodology

Our analysis draws on a systematic comparison of accreditation reports drawn up by the accreditation panel on existing undergraduate programs in IT at Dutch UAS obtained in the period 2010–2012. This is the period in which the most recent evaluations of the IT curricula have taken place. This data collection is supplemented with our experiences and observations as either researchers or professionals in the field of higher education and quality assurance in the Dutch context. We have included our observations in the discussion of the results obtained and based our conclusions, apart from the findings, on experience from the field.

We used all of the accreditation reports from the 53 undergraduate IT programs across 22 UAS in the Netherlands. Since the IT field is divided on the basis of a particular curricular focus, the reports are evaluations of the information science undergraduate program (n = 20); business IT, and management undergraduate program (n = 18); (technical) computer science undergraduate program (n = 15). The choice behind studying the IT sector comes from its growing in importance in the Dutch context in the past couple of decades (Cucchiarini, Daelemans, & Strik, 2001; den Adel, Blauw, & Entzinger, 2003; Gillebaard et al., 2014), where the shortage in the number of people trained in the IT sector was often discussed (Frederik, 2013; CBS, 2013).

We performed a qualitative content analysis (Hsieh & Shannon, 2005) as a technique which provides meaning to the content of text data and complies with the naturalistic paradigm. The naturalistic paradigm is a non-positivist approach to research, whereby one relies on subjective interpretations of reality (Lincoln & Guba, 1985) or portrays reality as internally constructed by the researcher by identifying emergent themes and patterns. Further, generalizations from this study relate to the particular context under analysis—in our case, the coupling between the professional field and undergraduate programs at UAS in the Netherlands; however, we also propose implications for the accreditation procedure.

In order to systematically interpret meaning from the accreditation reports, we developed categories for analysis (Hsieh & Shannon, 2005), which served as reference during the process of content data synthesis. These have been developed from existing literature on university-business collaboration (see Davey et al., 2011) and then updated on the basis of the analysis we undertook on identifying the mechanisms of engagement of the professional field in undergraduate programs. Here, our observations and experiences were crucial and provided clearer conceptualization of the mechanisms of coupling. The categories are represented in Table 4.2 as strategic and operational mechanisms that govern the interaction of UAS and the professional field.

Mechanisms for coupling on the *strategic level*	*Mission, vision, policy*	Collaboration with IT industry is a part of policy and strategic agenda of the program and the institution
	Governance	Professionals from IT industry field in Boards and Committees in universities of applied sciences
	Curriculum development and delivery	IT industry involvement in regular discussion on trends in the profession and strategic involvement in education and training
	Quality assurance / evaluation	IT industry involvement in regular (e.g. annual) evaluation of the curriculum (quality management)
Mechanisms for coupling on the *operational level*	*Research partnerships*	Developing joint research projects that include student participation
	Mobility	Exchange of teaching staff in collaboration with the industry; also includes the exchange of professionals
	Lifelong learning	Collaboration between IT industry partner and the UAS in training teaching staff
	Entrepreneurship	IT industry is involved in entrepreneurial activities, supporting spin off creation

Table 4.2 Overview of mechanisms by which universities of applied sciences and the professional field interact

We used trigger words (vocabulary on university-business collaboration; see Table 4.3) to allocate content to the selected category. Whenever a word was encountered in the content, it would be flagged and the relevant portion of the text was then allocated to the category. The work was done in Excel and the flags were manually checked for validity of the content allocated to categories.

By using pre-existing categories to classify our data, our approach to qualitative content analysis is considered as 'directed' (Hsieh & Shannon, 2005, p. 1278). The goal of this

approach in content analysis is to extend research by relying on a set of already established variables and codes which may serve as the focal point for analysis. We relied on a pre-established set of categories to describe possible ways of interaction with the professional field and discern whether this interaction was occurring at a strategic or operational level. After the initial classification of relevant text into categories, we verified the frequency of reporting of the interaction on both the strategic and operational levels, that is, we measured the degree of coupling. The degree of coupling can have several dimensions, and the looseness can be captured by words such as 'frequently', 'intensely', 'probably', and 'negligibly' (Weick, 1980, p.5). We defined the mechanisms of interaction and the frequency of reporting on the interaction at both the strategic and operational levels, which denoted the degree of coupling.

Dutch	English
missie visie beleid onderzoek gast ondernem* train werv* project overheid minister subsidie sponsor, raad, werkveld, curricul*, kwaliteit	mission vision policy research guest enterpr* train recruit* project govern* minister subsidy sponsor council field curricul* quality
*) parts of words used.	

Table 4.3 Trigger words used to analyze accreditation reports

Strategic level of coupling

Table 4.4 presents the results of qualitative content analysis of 53 accreditation reports and the mechanisms for coupling at the strategic level. Coupling at the strategic level implies that the professional field is highly represented in policy and strategic discourse as well as given a prominent role in shaping learning outcomes. We observe that the coupling with the professional field becomes visible and is reported frequently in four strategic mechanisms: a) curriculum development and delivery; b) governance, c) mission, vision and policy; and d) quality assurance/evaluation.

Curriculum development and delivery is the most frequently reported mechanism of coupling with the professional field. It relates to industry involvement in regular discussions on the trends in the profession, by a number of different outputs, and strategic involvement in education and training. For example, majority of the programs emphasize that they have made arrangements with some companies to incorporate guest lectures and seminars with professionals where student work is presented as a regular part of student training. Additionally, programs refer to working visits by professionals and weekly colloquiums as a regular learning strategy. Other examples include agreements with companies to provide internships and regular training for students throughout the program. Some programs have even developed strategic partnerships with companies, which involves professional mentorships during the course of internship, exchange of professionals and students, and joint projects. Simultaneously, the programs also maintain their knowledge networks comprising professionals and companies in the field, which enables transfer of professional or field knowledge to the curriculum.

At the level of governance, the coupling between the professional field and undergraduate curricular program is also very profound. Almost 90% of all the accredited programs show governance as the main mechanism of interaction with the professional field. In other words, there is a strong presence of stakeholder representatives of the IT industry at managerial levels in UAS in the Netherlands.

		Total		Information science		Business IT & management		Computer science	
	N=	53		20		18		15	
Mechanisms for coupling on the *strategic level*	*Mission, vision, policy*	40	75%	16	80%	12	67%	12	80%
	Governance	47	89%	18	90%	16	89%	13	87%
	Curriculum development and delivery	49	92%	18	90%	16	89%	15	100%
	Quality assurance / evaluation	38	72%	14	70%	12	67%	12	80%

Table 4.4 Mechanisms of coupling on the strategic level and percentage of reporting in total and by field of the IT program

An example of this coupling is the inclusion of professionals from industry in advisory boards or councils, establishment of professional committees or boards of external experts, and groups which provide feedback on the choices made in the educational program. For instance, one of the programs reports that they keep up with the national developments in the IT industry by appointing professionals from the industry in the Advisory Council, Professional Committee, and the Board of External Experts. These professionals have a role in discussing current developments in the field and, if necessary, suggest their embedding in the curriculum. Our analysis suggests that one or two members of these bodies are former alumni. Similarly, other programs rely on reports from the Professional Committee on the role of industry in education. In almost all the cases, the boards, councils and committees meet regularly three to four times a year.

Mission, vision, and policy is a mechanism, which is incorporated in almost all of the programs. It involves drafting documents such as strategic reports, technological plans, and business plans in consultation with professionals. For example, certain programs conduct comprehensive regional, national, and international studies to collect knowledge on latest developments in the field and the labor market. The documents provide input in the

discussion regarding the position of the training and the update on final qualifications. There are also policies at program levels, which specify that certain programs, being a part of concrete research clusters, must work closely with the professional field. Programs also opt to incorporate the contacts of companies in their policy and market development plans and urge teachers to foster liaisons with these companies.

The involvement of industry in quality assurance/evaluation is the fourth mechanism of interaction with the professional field at strategic levels. Between 67% and 80% of the programs use the interaction with the industry in compliance with formal requirements to evaluate the study program (quality management). Our results show that certain programs organize regular meetings with advisory boards or councils or similar bodies of professionals to discuss the results of evaluations by considering the (degree of) involvement of the professional field, while others use a (bi) annual survey for evaluation of the professional orientation of the course, or occasionally even both.

Operational level of coupling

Table 4.5 exemplifies the coupling of UAS with companies on operational levels. In other words, it provides examples of practice in IT undergraduate programs where the output of strategic collaboration with companies is obvious. The mechanisms, which imply involvement with the professional field, are a) research partnerships, b) mobility, c) lifelong learning, and d) entrepreneurship.

The results indicate a relatively low percentage of reporting on the outcomes of strategic arrangements for interaction with the professional field. Among the identified mechanisms, research partnership has the most significant result. Under research partnership we have grouped those examples that include research and development (R&D) projects between companies and the program as well as commercialization activities. Students actively participate in these projects and are assessed on their performance. For example, on average, 25% of all programs report that they collaborate with companies in R&D. These collaborative efforts are usually described as contract research, R&D consulting, cooperation in innovation, and joint academic publications. Additionally, as a best practice approach, one program describes its collaboration with regional companies on external projects and local companies to produce IT services in healthcare, as well as with regional

consultative bodies; it also emphasizes its cooperation with the company Infosupport, which is renowned in the Netherlands for Microsoft Release Management. Student engagement and active participation in these projects is detailed as coursework and a part of one semester research assignment.

An example of active students' participation is also the participation in 'software factories', usually in the fifth semester of their undergraduate program. Software factories are described as collaborative hubs between the Dutch and German companies where students work on a number of joint assignments and projects under teacher supervision. In this way, students are either involved in finding solutions for concrete company problems, or they work in a team, with other students and teachers in fulfilling the obligations of a joint project. Students are reportedly engaged in the professional field throughout their educational training, and especially in internships and graduation projects where interaction with the field is more pronounced.

With reference to company involvement in the commercialization of R&D results, just a few UAS specify that the collaboration yields spin-offs, disclosure of inventions, patents, or licenses.

		Total		Information science		Business IT & management		Computer science	
	N=	53		20		18		15	
Mechanisms for coupling on the *operational level*	*Research partnerships*	13	25%	6	30%	4	22%	3	20%
	Mobility	5	9%	2	10%	2	11%	1	7%
	Lifelong learning	5	9%	3	15%	1	6%	1	7%
	Entrepreneurship	5	9%	3	15%	1	6%	1	7%

Table 4.5 Mechanisms of coupling on the operational level and percentage of reporting in total and by field of the IT program

According to the accreditation reports, only 9% of the programs use mobility to report their involvement with the professional field. Mobility refers to teacher career placements in companies, but it also suggests the possibility of a professional to teach at a UAS for a fixed period of time. Many programs practice mobility between teachers and companies in order to reduce dependence on the labor market. For example, they regularly practice exchange of professionals where an employee of a selected company can opt to teach for a year in the program. Simultaneously, one of the lecturers works for the same period in the company. Thus, new knowledge and new experiences benefit both parties.

Reports indicate that there is some cooperation with the professional field in lifelong learning programs as a form of providing continuing teacher (staff) education. For example, some programs report that they allocate an annual budget for training of their teachers and staff. Training usually includes education seminars, participation in knowledge exchange networks, and internal and external workshops. External workshops are usually organized in companies in which the teacher specializes in a certain subject.

Promoting entrepreneurship is reported by only 9% of the programs and involves the creation of a culture that is conducive for entrepreneurship. Entrepreneurship is stimulated by several programs—for example, in one program, students can choose to enter the contest entitled 'Enter Prize' and combine a regular IT program activity with running their own business. In this manner, they are able to function as independent entrepreneurs and study simultaneously. Entrepreneurial activities are usually facilitated by external funding, and students are also supported by industry professionals from the field. In the same line, there are programs which organize entrepreneurship and innovation specialization courses where students' progress is accompanied and evaluated by the representatives from the professional fields. Some students also get an opportunity to showcase their business ideas and get initial funding for their start-ups by the companies involved in the course. In the likelihood of such a scenario, students can do their final thesis in their start-ups or taking their start-up as a case study for analysis.

Discussion

Tables 4.4 and 4.5 detail the coupling between the undergraduate programs of UAS and the professional field by specifying eight different mechanisms of interaction. These mechanisms exemplify the strategy of collaborating with the IT industry and outputs of this collaboration in teaching and related research practice. The 53 programs use different combinations of mechanisms to ensure the coupling, but the degree of coupling varies (Weick, 1976; de Caluwé, 2012) when we examine the levels closely. It shows that coupling is considerably tighter at the strategic level than at the operational level. In other words, coupling at the strategic level is reported by a majority of the programs, which is sufficient to provide a minimum threshold of quality (NVAO, 2011; NVAO, 2014) and foster public legitimacy of the quality of the programs.

On the other hand, the dynamic interplay between the professional field and the programs at UAS is not succinctly acknowledged at the operational level, if we consider the significant interaction at the strategic level. Interactions at the operational level, in projects and internships, are of importance but only reported as 'evaluative practice' (Bromley & Powell, 2012) of formal policy engagements.

An acceptable level of quality is not only defined at strategic levels but concerns the activities that take place at operational levels. For example, accreditation reports address the content and structure of the curriculum and, in contrast, achieved learning outcomes by examining final projects or the involvement and performance of graduates in actual practice. These insights provide both inputs and outputs of intended learning strategies, and from our analysis it is evident that the professional field is involved in shaping the strategy for teaching and research; however, the outputs of collaboration with the professional field are obscure. In addition, the mechanisms of interaction at the operational level are merely shown as best practice or exemplary cases of collaboration with the professional field. The operational level of coupling as discerned from the accreditation reports is loose, and we question whether the coupling is actually tighter.

One explanation for this difference in coupling is found in the type of documentation provided to the accreditation panel by the program during the process. The documentation which we have mentioned in Table 1 contains considerably more information that is pertinent to the strategic level. The difference in coupling may also be explained by the accreditation procedure that the panel has to follow. The panel evaluates the overall learning objectives of the program, then identifies the methods by which the objectives are incorporated in the program, and finally verifies the results of the methods in achieving learning objectives. Usually, the results are only exemplary cases of the methods undertaken, or in our case, the strategic arrangements of collaboration with the professional field.

These issues also relate to the question of effectiveness of accreditation and its impact on institutional structures (Cardoso, Rosa, & Stensaker, 2016; Stensaker et al., 2011). Our research has shown that the accreditation procedure is unable to capture the full dynamics of the process that underpins learning in an undergraduate program at UAS, and in relation to the involvement of the professional field. This suggests that the outputs of accreditation are not a complete representation of the activities underlying the undergraduate program. In part, we have seen that the practical activities which signal collaboration with the professional field are not extensively elaborated. On the other hand, there have been many developments in the UAS in the Netherlands which have fostered and incentivized a research culture which is strongly inclusive of social and economic stakeholders (see

Hasanefendic, Heitor, & Horta, 2016). For example, the Netherlands has stimulated regional research collaboration with small and medium enterprises by establishing the position of lectors as human intermediaries between the external and internal world of the universities (Huisman, 2008). The RAAK program is an initiative by the Dutch Ministry of Education which grants funding to projects and networking between UAS and regional companies in public and private sectors (OECD, 2014). More recently, the Government has been supporting collaborative advances between the UAS and the professional field by allocating funding from newly opened Centers of Expertise (since 2011) (Deuten, 2013). Based on this knowledge, we expect that the engagement of the professional field at the operational level become more prominent rather than merely illustrative. Simultaneously and reflecting on the socio-economic relevance of UAS as institutions providing specialized training in collaboration with local or regional external stakeholders (Hasanefendic, Heitor & Horta, 2016), the accreditation process does not emphasize professional field engagement in shaping and achieving learning outcomes. Currently, the accreditation procedure does not provide a realistic picture of the developments in training and education provided in undergraduate programs at UAS, and it is due to this underrepresentation of the professional field in practice.

Conclusions and implications

This study made an inquiry into the engagement of the professional field in undergraduate IT programs at Dutch UAS, and their role in shaping learning outcomes. Our research has shown that the intakes of external stakeholders, which should be addressed by the accreditation process (Cullen et al., 2003), are well exemplified at the strategic level but illustrative at the operational level. This implies that although the professional field participates in shaping learning outcomes, we cannot address the extent to which the agreed-upon learning outcomes have been achieved. Future studies should address the in-depth interaction with companies at more practical levels to compare to these findings and suggest improvement of existing quality assurance mechanisms.

Ultimately, as quality assurance mechanisms, accreditation reports are not able to provide a holistic picture of the outcomes of ties that the program forges with the professional field, which leads us to question the contribution of the interaction with the professional field to

the overall quality of the program. Perhaps policymakers should consider introducing other complementary tools for addressing the quality of the programs in relation to their engagement and responsiveness to the professional field, using current accreditation procedure solely as an administrative mechanism to ensure that agreed-upon elements for higher education programs have been met. Introduction of new mechanisms seems necessary if the diversity in the Dutch higher education sector is to be maintained. In a society where massification of higher education has been occurring at an unprecedented rate and where labor markets are becoming increasingly global and turbulent, there is a need for quality assurance mechanisms to address the changing demands for training and education. As a consequence, accreditation increases in importance. It should control for quality in the higher education landscape, while at the same time promoting its diversity and acknowledging new trends, or complementing the practices in higher education institutions, which may fall out of the focus of the established standards of accreditation. Our study shows that current accreditation procedure does not account for the diversity of the Dutch higher education sector as it does not acknowledge, to its full extent, the industrial stakeholder engagement at UAS, despite the tradition of these institutions in collaborating with industry in providing specialized training.

While our study provided some relevant findings, we are also aware of several limitations. First, this study is only concerned with the undergraduate programs of UAS in the Netherlands. Future research should compare the evaluation of programs at universities to understand whether the engagement of the professional field in the undergraduate programs at UAS is more explicit and more embedded in the curriculum. These findings can contribute to understanding the diversity between the two higher education structures, particularly when boundaries between the two are becoming blurred (Huisman and Kaiser, 2001).

Second, we only used the accreditation reports prepared by the panel to understand the relationship between the professional field and IT programs. These reports are prepared on the basis of the documentation in Table 1. Undergraduate programs in the Netherlands also prepare self-evaluation reports and these might provide additional valuable information on the coupling of the program with the professional field. Ultimately, a more qualitative focus to researching this phenomenon should be adopted. Interviews and focus groups are

optimal methodological approaches for a more in-depth exploration of the complexity underlying the interactions. They are commonly used when insufficient information is obtained regarding the study phenomenon or where more detailed insights are required (Gill et al., 2008), such as it seems to be the case in understanding the engagement of the professional field in programs at UAS.

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CHAPTER 5

When organizational identity guides change: A case of Dutch university of applied sciences and the new research mandate[20]

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[20] An improved version of the paper has been resubmitted to Higher Education Research and Development

Abstract

This paper examines the role of organizational identity in response to the new research mandate at a Dutch university of applied sciences. By analyzing perceptions of research practice as revealed by organizational members (e.g. lecturers, researchers, Heads of Departments, Deans) of a Dutch university of applied sciences, the paper shows that the organizational members are defining and practicing research by imprinting central, distinctive and enduring elements of their collective organizational identity. This suggests institutionalization of organizational identity as organizational members collectively perceive and draw upon the same identity elements in the process of adaptation. The paper further explicates why this might be the case.

Introduction

For the most part, higher education literature has challenged higher education organizations to respond to new external demands through isomorphic activities (Ramirez, 2006). Isomorphism is defined as a process by which organizations in the same national context become increasingly similar as they mimic each other in response to new demands to achieve legitimacy and respective resources in the environment (Dacin, 1997). Consequently, responses are a result of legitimization forces in national contexts, brought about by diverse political and social institutions (see Deem et al., 2008). Recent research, however, emphasizes how higher education organizations are active participants in their national contexts (see Fumasoli & Stensaker, 2013), responding to new external demands as a consequence of unique organizational properties (Kodeih & Greenwood, 2014). For example, organizational structure and governance influence the way in which organizations attend to the multiplicity of demands arising from their environment (Greenwood et al. 2011). Similarly, organizational status (Brankovic, 2017) and identity are said to condition adaptation and responses to prevailing policy pressures in higher education (see Weerts et al. 2014). In particular, organizational identity has been explored in relation to strategic responses to policies and exogenous changes in higher education organizations (Stensaker, 2004). Organizational identity is defined through the characteristics of an organization that its members perceive to be central, distinctive, and enduring in an organization when past, present and the future are taken into account (Albert & Whetten, 1985; Whetten & Godfrey, 1998). It lends insight into the character and behavior of organizations and their members and is seen as a powerful tool which organizations utilize to manage change and the implementation of new practices. Despite its obvious relevance in processes of change, organizational identity has not been sufficiently explored in relation to higher education organizations (Stensaker, 2015). In particular, its role in the processes of change and responses to new external demands in higher education has been less understood (Weerts et al., 2014). This paper seeks to advance existing studies of the role of organizational identity in change processes and reactions to new external demands by studying the response of organizational members of a Dutch university of applied sciences (UAS) to the new research mandate.

Universities of applied sciences (UASs) are part of binary higher education systems and provide professional education, often defined in relation to regional needs (Kyvik & Lepori, 2010). Some ten years ago, as part of a broader European research agenda, national governments imposed a research mandate upon UASs. Research at UASs was understood as beneficial to professional practice, quality of education and the professionalization of lecturers and was to be achieved through collaboration with the industry and small businesses, contributing to regional upgrading and smart specialization (Hasanefendic, Heitor & Horta 2016).

The analysis in this paper centres around the perceptions of lecturers, lecturer-researchers, researchers and managers (Heads of Departments, and Deans, etc.) from two schools at a Dutch university of applied sciences about their research practice. The investigation of these perceptions essentially has two goals: first, to discern organizational identity within the UAS, and, second, to show how organizational identity is used to characterize and give value to new practices and identify the conditions under which this occurs, following similar approaches (see Degn, 2016).

This paper is organized as follows: in the next section, I provide the rationale for the study and a synthesis of relevant theory and literature. Then I describe the research setting and methodology. The findings extend the understanding of the role of organizational identity in responding to new demands and change processes in higher education by showing that the Dutch UAS is adapting to the new research policy by *imprinting*. *Imprinting* arises as a strategic tool by which organizational members at UAS associate to the central, enduring and distinctive elements of their collectively understood organizational identity to the new practice. The discussion and conclusion sections elaborate on the relevance of these findings in the study of organizational identity in higher education and suggest practical implications for higher education management in coping with new demands.

Organizational identity and consequences on organizational behavior in higher education

In recent higher education studies, organizational identity has been presented as fluid undergoing change and/or reinterpretation when the higher education organization is faced with new external demands. For example, Stensaker (2004) showed that higher education organizations transform their identities when faced with new external demands. More recently, Fumasoli et al. 2015 emphasized "the 'unavoidable' new identity" (p. 24) resulting from the reinterpretation of a traditional identity of a higher education organization faced with new external demands. These emerging studies about organizational identity in higher education delineate organizational identity as unstable and a result of constant negotiation between organizational members (Dutton & Dukerich, 1991). Organizational identity is then a result of ''shared emergent beliefs about central and distinctive features of an organization'' (Ravasi & Schulz, 2006, p. 436). This implies different, and multiple interpretations of identity within organizations (Foreman & Whetten, 2002) and incongruence sometimes emerges between what Deans for instance think the university is and how the faculty defines it for themselves (see Degn, 2016). Under such circumstances contestation and conflicting ideas about legitimate practices emerge and organizational identity is renegotiated until an institutionalization at field level is achieved (Greenwood et al., 2011).

Fields are defined as communities of organizations and political and social institutions "that partake of a common meaning system and whose participants interact more frequently and fatefully with one another than with actors outside the field" (Scott, 1995, 56). Political and social institutions provide legitimate institutional identity elements that guide organizational members and establish central, distinctive and enduring elements of organizations (Scott, 1995). In fields of higher education, these institutions are the government, the ministry of education or science, the accreditation agency, the funding agency and any other body that is relevant to the university or UAS's functioning (Scott & Biag, 2016). In some fields, there is a perceived disagreement among institutions about what is legitimate organizational behaviour, often leading to a lack of institutionalization of organizational identity and weakening the perception of what the central, distinctive and

enduring identity elements are that organization members draw on to define who they are as an organization (see Kodeih & Greenwood, 2014). This influences organizational members' reactions to new demands, as it impairs their ability to draw on central, enduring and distinctive elements in response to change and leads to diverse reactions and outcomes. For example, Kodeih & Greenwood's (2014) analysis of the adaptation of four French higher education business schools to demands to internationalize their management education found that schools adapted to this demand in different ways and changed or aligned their organizational identity in the process. Their work pointed to the role of complexity in the national higher education field surrounding the new demand which lacked legitimate institutional elements and impeded the schools to draw on them in adopting the new demand which exacerbated organizational identity fluidity.

Similarly, in a study of Portuguese polytechnics' responses to new research policy, Hasanefendic, Patricio & de Bakker (2017) found that organizational members could not articulate the central, distinctive and enduring elements of their organizational identity due to a lack of consensus in the field among political and social institutions on legitimate organizational behavior. In such a field, there were several legitimate institutional identity elements that organizational members could draw upon which lead to deinstitutionalization of identity at the field level; consequently, several interpretations of the central, distinctive and enduring elements guiding organizational behavior were enabled. Under such circumstances, academics and managers did not make sense of the new demand in the same way; they turned to their personal understanding of how the new demand should be dealt with, leading to debate and conflict over preferred outcomes and responses (see also Winter & O'Donohue, 2012).

Alternatively, when political and social institutions provide coherent and compatible legitimate institutional identity elements about the role of an organization, how it should behave in the field and how it should adapt to new external demand, then the fields are perceived as stable. Therefore, in stable fields, collective understanding of identity is less prone to change as the central, distinctive and enduring elements are understood by relevant political and social institutions in a coherent way, providing congruent rules, norms and values for legitimate organizational behaviour collectively understood by organizational members (Greenwood et al., 2011). This voids identity ambiguity (Greenwood et al., 2011)

and contributes to the institutionalization of organizational identity at field levels (Glynn, 2008), which then serves as a tool and guides organizational members in responding to new demands (Hatum et al., 2012; Gioia et al., 2010). In these situations, organizations are said to draw on "explicitly stated views of what an organization is and represents….and influence its members' perceptions of central, enduring and distinctive features of the organization'' (Ravasi & Schulz, 2006, p. 435). In such a scenario, organizational members share a collective understanding of their organizational identity and respond to new demands by *imprinting* central, distinctive and enduring elements onto the new demand (also see Kroezen & Heugens 2012). At the same time, organizational members also engage in the process of socialization where collective organizational identity is referenced when a new demand is made upon the organization (Bauer et al., 1998). Socialization typically includes orienting a newcomer through, for example, on-boarding programs about how the new demand should be practiced or accomplished, what its relevance for the organization is and what it means for the organization. In this way, the newcomer is presented with -- and in a way is forced to accept -- the prevailing and standardized norms and values that guide the organizational behavior; this also helps with adapting to the new demand (Wanous, 1992). But socialization also includes influencing current employees (e.g. via training programs) to better distinguish the difference between values and norms -- as well as practices -- that are central and non-central to the organization (Hayashi, 2013).

Given these recent advances in understanding organizational identity in higher education, it seems that salience of organizational identity in response to new external demands is analogous to the conditions in the field. Arguably, organizational identity acts as a guiding tool for organizational members in responding to new demands to the extent that organizational members and the organization perceive stability in their fields, especially clarity and coherency among political and social institutions regarding legitimate organizational behaviour, but also in relation to the new demand. Field conditions therefore seem to influence the perception of organizational identity and consequentially affect the possibilities of organizational members to utilize organizational identity as a tool in responding to new external demands.

Research setting

The present study focuses around a Dutch UAS (see Table 5.1 and Table 5.2) and analyses the perceptions on research practice simultaneously from lecturers and managers in two schools to explore the role of organizational identity in responding to the new research demand.

UAS	School A	School B
Departments	4	4
Students	8666	6460
Enrolments (1st year)	1939	2405
Total teaching staff	300	373
Teaching staff with master degree	65.7%	65.1%
Administrative staff	27%	27%
Scientific publications in 2015	26	56
Professional publications in 2015	36	40

Table 5.1 Description of the two Schools

UASs in the Netherlands are traditionally characterized by their connectedness not only with the region, local community and industry, but also with specialized and professionalized education, which represent central and enduring characteristics of these higher education organizations (Andriessen & Schuurmans, 2017). They are focused on the transfer of knowledge and skills in close cooperation with professional practice (Huisman, 2008), which enhances their distinctiveness from universities. This distinctive "identity" is also supported by current political and social institutions (e.g. the government, funding agencies and accreditation agencies), which provide both coherent institutional elements for UASs regarding legitimate practices in their higher education field and essential resources. For example, the Government and other political and social institutions supported the development of strategic research agendas through a variety of policy mechanisms (De Boer, 2017).

Another example is the position of *lectors*, as well as specific research funding specifically targeting UASs under an initiative called Regional Attention and Action for Knowledge Circulation (RAAK), lectors are individuals who have both professional and, in most cases, academic experience. They are expected to contribute to knowledge transfer, acquire contracts from third parties and develop professional networks in their domain (see Hasanefendic, Heitor & Horta, 2016). RAAK is a funding program designed to stimulate regional collaboration between UASs and businesses, especially small and medium sized businesses, and public institutions, with a view to developing joint innovation activities and stimulating knowledge exchange and circulation (Jongbloed, 2010). The idea behind these policy mechanisms is to appropriate the research practice to foundations of UAS's education which entails knowledge about the professions and preparation for direct labor markets entrance and thus is different from universities. The role of these mechanisms, therefore, extends beyond functionality as they signal clarity on the role of the UASs in research, which is closely associated to the extension of their traditional organizational identity (Andriessen & Schuurmans, 2017; De Boer, 2017). Beside some organizational variance, UASs display a remarkably consistent and uncontested frame of reference on the nature and place of research in the organization; they describe to their field as providing coherent rules and norms which guide their behavior in accomplishing the new research mandate (De Weert & Leijnse, 2010).

	UAS
Founding year	1993
Students total	cc. 49.000
Nb. of schools	7
Programs	70 bachelor, 14 master and 5 associate degree programs
Teaching and research staff	2172
Nb. of lectors	42
Lecturers with research time	274
Scientific publications per year	286
Professional publications per year	328
Nb. of centers of expertise (research centers for the UASs funded by the Government)	7

Table 5.2 Descriptive statistics on the UAS from 2015

Methodology

The UAS was selected based on ease of access and the schools based on disciplinary and organizational differences where it was considered that the research practice might thus be significantly different (Yin, 1994). School A and School B (see Table 5.1) provide education which is oriented towards fundamentally different professional fields (School A is technical and engineering while School B caters for digital media and communications). Table 5.1 also shows that the two schools differ in the number of students, staff and publications. For instance, School B has fewer students and more teaching and research staff and publishes more scientific publications.

Phase	Sources	Data analysis	Data use
Phase 1	Review documental data and website material: promotional material advertising undergraduate and master programs, report on research practice (School A and B), audit Committee's report about research from School A Interview transcripts from five interviews (School A) Summaries from two focus groups with representatives of the UASs, Council of UASs (Vereniging Hogescholen)	Exploratory analysis	□ Familiarization with the research practice at UASs □ Understanding policy mechanisms driving research for the UASs □ Exploring legal and regulatory frameworks for research (field conditions) □ Identifying organizational strategies regarding research □ Identifying possible factors conditioning research practice □ Providing information for the interview protocol of phase 2
Phase 2	Semi structured interviews with lecturers, lecturer/ researchers, researchers, lectors, Head of Departments and Deans of two Schools School A: 8 interviews School B: 7 interviews TOTAL: 15 interviews + 5 from phase 1	Coding with Atlas.ti	□ Understanding perceptions about the UASs, research practice and importance of research for UASs □ Exploring whether research affected the traditional way of work at the UAS, benefits and outcomes of research practice □ Evaluating presence of contradictions regarding research, disagreement with current policy mechanisms driving research in the field □ Examining organizational members' approval or disproval of research practice: What would they change and how does it relate to their understanding of the UASs education?

Table 5.3 Data typology

Data for this study was collected in two phases and through various means in order to limit bias and increase validity and robustness of empirical data (Eisenhardt & Graeber, 2007; see Table 5.3). The results from the first phase characterize experiences and perceptions within the Dutch field of higher education and framed the interview protocol (focused on perceptions about the UASs and research practice) which was used to conduct the further 15 semi-structured interviews at two schools in November-December 2015. The total number of interviews thus amounted to 20. Respondents were key organizational members or

informants[21] initially surveyed in the first phase of the fieldwork and then through the use of snowballing. The interviewed members came from different levels in the organization so as to account for a generalizable articulation of organizational identity (see Table 3). In case study research it is particularly important to use numerous and highly knowledgeable respondents who view the focal phenomena from diverse perspectives (Eisenhardt & Graeber, 2007). It also provides more validity to the findings as we can observe whether they are simply idiosyncratic to a single case or consistently replicated by several cases (Eisenhardt, 1991). Each interview took between 45 and 90 minutes and focused on diverse questions about the shared understanding of the central, continuous and distinctive elements that guide the behavior of UASs and the new research mandate (see Table 5.3).

Data analysis

All interviews were recorded and transcribed verbatim, then coded first according to emerging concepts and then according to common themes found in literature (Gioia et al. 2013). The author conducted an inductive, interpretative qualitative analysis of the interview data and relied on key methodological references in the iterative process of coding. This particular method of analysis proposes a constructivist approach to science, whereby meaning and sense are constructed rather than simply presented in context. Interpretive researchers usually attempt to understand phenomena by accessing the meanings that participants assign to them (Strauss & Corbin, 1998). In this study, therefore, research is analyzed as a product of interpretations, interventions and individual decisions. This means that perceptions, observations, ideas and expressions assume a key role in the detection of organizational identity and its subsequent analysis in the process of understanding and defining research practice.

Atlas.ti software was used to code 20 interviews in first order concepts. These concepts are representations of selected quotations and paraphrase the main meanings of quotations as found across the 20 interviews. They center around the informants' perceptions of their organizations and aim to uncover norms, values and practice central to the organization and whether they are enduring and distinctive. At the same time, they reflect the opinions and practice of research and relate to norms and values about the organization. After revising

[21] Please note that I refer to the interviewed organizational members as informants in the findings section of the article.

emerging first order concepts, the author engaged in a dialogue between theory and data as is common in this form of research (Eisenhardt, 1989; Ragin, 1994). The analysis of the interviews revealed a collective understanding of organizational identity, as organizational members clearly articulated central, distinctive and enduring legitimized identity elements in their field, but also showed how it plays a crucial role in framing experience and responses to the new research mandate in both schools. Then, insights from each school were compared in order to identify how this collective identity played out in the way organizational members from two schools responded to the new research role. First, it appeared that there were no deviations from collective understanding of organizational identity, and, second, there was a common understanding of research as an extension of a collectively understood identity. Based on theory, the first order concepts were refined into overarching second order categories (see Figure 5.1) which showed how collective organizational identity was signaled and also second order categories which showed the way research was practiced and what characterized it. A final step in the analysis of data consisted in the abstraction of second order categories into two thematic dimensions which reflected the relationship between the organizational identity and the practice of the new research mandate by two schools.

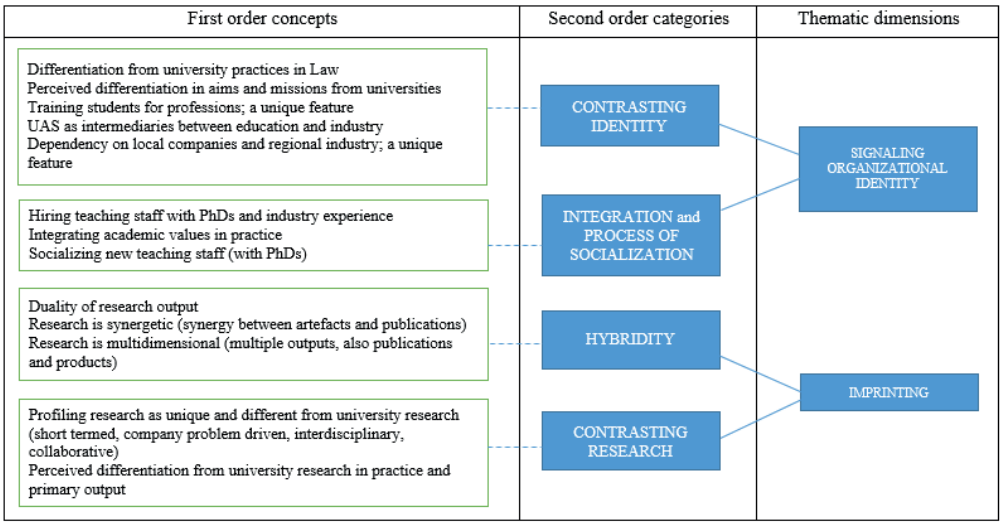

Figure 5.1 Data structure

Findings

Signaling organizational identity by contrasting identity

From the onset, it was obvious that our informants had a clear idea of what their organization is not. Informants from both schools emphasized current rules and regulations which guided the behavior of their organization through contrasting or differentiating between the universities and UASs in the Law.

> *They are differently defined in the Law and have a different status. We are very different from universities; we do not wear togas, we cannot be called professors in Dutch, nor do we have prof. in the title. The tertiary education is in general split into two, and we have main body of education concentrated in the bachelor or undergraduate study* (Lector, School A).

The informants emphasized that they differ from universities by their mission: *"shaping the modern professionals"* (Lector, School A) and training *"people to be able to cope with challenges in the industry in the next 10 to 15 years"* (Head of Department, School A). Their collaboration with the industry is done *"in a more explicit way"* (Lecturer-Researcher, School A) and their educational programs are *"defined in collaboration with the industry"* and through *"feedback from industry"* (Head of Department, School A). This was contrasted with a university education where problems predominantly came from theory or were formulated in class by the professor:

> *That situation is clear. We have universities and the type of research is fundamental; we work on concrete problems of professions and how they can be solved. When you work at universities of applied sciences, you need to ask the situation of your surroundings, community* (Dean, School A).

The informants also emphasized that the main task of their organization was to teach: *"it is education and teaching first and then research"* (Researcher, School B). This statement is supported by the low percentage of teaching and research staff actually involved in research (13% for the entire UAS, as shown in Table 2). Furthermore, they highlighted that, unlike at universities, teaching at the universities of applied sciences is done mostly by *"professionals …who teach students and show them how things work in real life"* (Lecturer, School B):

I ask the companies if we are teaching the students the right things, I need to teach them what the developments in the industry are and if there is this closeness. You do not have this at the university (Lector, School B*).*

Signaling organizational identity through integration and the process of socialization

Informants from both schools were also very specific about the way they collaborated with professionals in the field and their local community. In fact, they emphasized that they depended on the professional field and industry to guide them in the educational and learning process and that they saw them as partners in education:

We have a lot of contacts with the industry. We try to address the short and medium term demands for the industry. We have feedback from industry into our curriculum, and this curriculum is also designed with the people from the industry (Researcher, School B).

The informants told us that they liked *"to work with the professionals"* (Researcher, School B), claiming that this close collaboration enabled them to understand the *"real needs in the industry"* (Lector, School A), expectations from employees, and *"the situations students might encounter when they start working and the challenge of modern workplaces"* (Lecturer, School B). In this way, the Schools were integrating the central norms and values from the professional field into the classrooms as the professional field influenced the informants in their design of the curricula and practices.

At the same time, *"the universities of applied sciences are having an influx of academic norms, by having an influx of people with the PhD"* (Lectors, School A). The informants saw these individuals as a threat because they were influenced by academic norms and values:

Well luckily we do not have many of these people here. I say this as a majority of our lecturers are from the professional field and the researchers we have most worked in the industry and have a PhD (School A, Lecturer/Researcher).

Informants saw academic norms and values as undermining the central and distinctive organizational elements which had to be managed: "*The difference here is clear, and anyone who has this scientific background will not be able to maintain their scientific or academic views if they want to survive as the behavior will not be seen as desirable by the colleagues. But we*

do appreciate their scientific background and use it to build research methodologies which are valid when we analyze problems" (Lector, School A). The informant furthered this argument by noting that: *"the people with the PhD here get integrated; they need to. The culture we work in is so much entrenched with the applicability of knowledge that they need to redefine their views of how research is valued here, what is the meaning of research, to redefine their mind-set. (….) In academic life, the meaning is given by academic institutions worldwide, and these sets of norms here are in a different order. If it is not applicable, or influencing technology then for us there is no meaning …"*.

The informants were also specific in highlighting that "*individuals with a PhD*" never work alone, as their teaching and research strategies are developed in group and as a part of a group. For example, they have to work in teams with other lecturers and individuals from the professional field or community in research, as the development of individual lines of research is not permitted. They also have to attend professional conferences to meet and talk with individuals from the industry in order to understand developments in the professional field. At the same time, they were not only evaluated by the number of publications, but, in the case of a research contract, what counted most were the number of problems solved, the update in the curricula, the number of projects, and the money they raised for projects, as well as professional publications, reports, workshops or master classes for people from the industry. These examples suggested that researchers who have academic backgrounds (or have done a PhD) underwent some sort of a *process of socialization* where they "learned" the central and distinctive elements that guide their organizations.

This section shows that central, distinctive and enduring identity elements which guide behavior within the UAS were collectively understood by organizational members and consistently signaled by making contrasts to universities and focusing on the integration of norms and values that underpin the professional field in education. This influenced research practice as shown in the following section.

Imprinting

This section explains the process of imprinting as a strategy used by organizational members in response to a new demand whereby they draw on central, distinctive and enduring elements of the organizational identity. Imprinting was signaled through *hybridity* and *contrasting research* as the consequences of the imprinting process and resemble contrasting and integration as ways in which organizational identity was signaled.

Hybridity and contrasting research

Research at the two schools was defined as *"a sort of a hybrid research"* (Head of the Department, School B). For example, a Lector from school A mentioned that research practice was *"combining practice with theoretical knowledge and application"* and that the goal of UASs research was to *"draw on scientific methodology and make sure there are scientific justifications in solving real and concrete problems which the companies can benefit from"*. Hybridity is defined through the integration of different logics, practices or identities in single organizations (Battilana & Lee, 2014). In the case of the two schools, they argued that since the research was always based on joint efforts between lectors, researchers, lecturers, students and external societal and economic stakeholders, different norms, values and interests had to be integrated and mediated in research practice. In general, research was multiparty as it was done in *"teams or groups of people (….;) these are lecturers, researchers, lectors and other staff and they work with industry, the companies in each of the themes and ask questions on what are the current problems and how can we as institution assist in helping to solve that. Our students are indirectly involved in these projects via research programs"* (Dean, School A).

The perceived outputs of such research were consequently *"multidimensional"*, or served multiple interests where *"lectors are expected to publish in journals or produce reports and try to achieve solutions to problems of the municipality and companies"* (Dean of School A). Students *"build their skills necessary for work by working on these problem-solving activities and closely with companies. Lecturer that participate learn how to improve their teaching and update their curriculum. And companies have a problem solved for no costs, or almost no costs…so it is cost effective*" (Dean of School B).

Research hybridity reflects the integrative nature of the organizational identity of the UAS as it incorporates the values and norms of the professions by collaboration with industry and the community at large on problem solving activities that are happening in real time.

Research was also defined, in contrast to universities, as *"different than basic research"*, where they *"try to solve problems of the real world"* (Dean, School B). Research was interdisciplinary as a result of a problem solving orientation, whereby problems were found in professional contexts that were inevitably complex, where variables were not controllable, and where multiple constituents were involved:

> *Our research always involves a combination of people that understand fashion, what computer scanning is, people who are aware of user designed interface and people who are really into physics and understand what warmth and heat is so that how clothes can be used. These type of people work together in certain projects, so you might say they are very interdisciplinary and we have diverse number of skills and competencies in one project* (Dean, School B).

The boundaries of this research are not *"identified in some literature like at universities, but aim to provide solutions, spin offs or products to concrete issues in the real world" (*Dean, School B). In the words of the Head of Department from School A, this differed from the university research:

> *You see that at universities they start with fundamental research. Fundamental research is often monodisciplinary. You focus on one thing and then go to multidisciplinary options. And the focus is on validating or developing theory. Applied research starts from understanding day to day business and from there you get a lot of questions that can be solved. It is not about developing new theory, but applying new knowledge and insights on how theory works on the work floor.*

Similarly, to how informants contrasted organizational identity to universities, they also contrasted research practice to university research. In fact, they argued that their research had to incorporate the norms, values and interests of the professional field as a stakeholder in education which differs from what is expected from research practice at universities:

> *Whereas in the academic world you would get a pull to publish, the companies we work with are not interested in publication at all. So we really have two audiences, and balancing that is*

much more complex than at the universities. It leads to this divergent profile: you need to be able to talk to industry but also have a feeling for journal papers (School A, Lector).

Discussion and conclusion

This paper examined the role of organizational identity in responding to a new research mandate at a Dutch UAS. The findings revealed that organizational members at two Schools within a Dutch UAS relied on organizational identity in understanding and practicing research. Specifically, the findings of this paper illuminated the way that the organizational identity of the UAS was signalled by organizational members through *contrasting identity* and *integration* and maintained through the *process of socialization*. The latter suppressed the influx of those norms and values within the UAS which were not compatible with the central and distinctive elements of the organizational identity, thereby representing a threat. Organizational members engaged in the process of socialization and imposed the organizational identity of the UAS onto these individuals with the PhD and who were associated to academic settings, norms and values. This means that there were no apparent individual contestations from the collective understanding of organizational identity, as evidenced in universities, between managers and faculty (Degn, 2016), as well as at UASs (Hu et al., 2015). Organizational members on different positions and with different functions (also in different disciplines) were consistent in defining, practicing and understanding the role of both the UAS and research for the UAS sector. The very process of socialization that took place at the UAS minimized possible contestations and enhanced the endurance of central and distinctive organizational identity elements.

Organizational identity functioning as a frame of reference and guiding tool is sometimes considered a risk as it can constrain the process of adaptation to new demands and influence change processes perpetuating the status quo and advocating organizational inertia (see Cayla & Peñaloza, 2012). However, the findings presented in this paper suggest that organizational identity was used as a tool to shape research practice as unique for the sector, reflecting the identity of the sector, and thus perpetuating the essential diversification of the higher education system in the Netherlands. Organizational identity was a critical resource for UAS's organizational members as they made sense of and gave sense to the new research mandate.

At the same time, the analysis also underscored the role of field conditions in this process. Extant research has shown that conditions in the field and consensus on legitimate identity elements among political and social institutions within the field influence the perception of organizational identity (Kodeih & Greenwood, 2014). This analysis has shown that research activities were coherently defined for the UAS and supported by national policies and regulative and funding mechanisms to separate from university research. This means that organizational members at the UAS did not identify contradictions in the field between relevant social and political institutions on research practice. On the contrary, organizational members drew on social and political institutions in defining their organization and understanding the new research mandate. Furthermore, all organizational members (e.g. deans, lectors, lecturers and researchers) were consistent in elaborating the central and distinctive elements of the UAS and its research practice as also identified by political and social institutions in the field. There were no perceivable "deviations" regarding roles and behaviours for the UASs identified by the political and social institutions in the field. Organizational members' understanding of the UAS was also consistent with identified rules and behaviour by the institutions in the field. Organizational identity was represented as an *institutionalized* attribute of the UAS and functioned as a tool in defining and practicing research in both disciplinary different schools through the process of *imprinting*. Imprinting emerged as a strategy which organizational members used to manage and respond to the new mandate by relying on central, distinctive and enduring elements of their collectively perceived organizational identity.

These findings help enhance the understanding within higher education of the role of organizational identity as a response to new external demands while also recognizing that identity is not always renegotiated in times of change. More importantly, the findings suggest that this is dependent on field conditions. Organizational identity can function as a guide for organizational members as they respond to new external demands, if and when there is a perceived consensus on legitimate identity elements between political and social institutions in the higher education field. However, these claims should be taken with limitations. The analysis did not comprehensively explore field conditions nor dynamics from the perspective of organizational members, topics of potential further research. There seems to be a relative link between the experience of the higher education field and

organizational identity, requiring further understanding in studies on higher education change. The analysis could only suggest that stability in the field aided in the institutionalization of identity, and a strong collective sense of UASs. However, it could not affirm with certainty that field stability is directly correlated to institutionalization of organizational identity. Future studies should therefore consider field conditions and organizational identity simultaneously in addressing responses to new external demands and comprehensively elaborate on their interdependency and significance for organizational outcomes in times of change.

Furthermore, higher education managers and policymakers should consider these findings as critical in developing strategies to implement change or a new demand successfully in higher education organizations. First, they should consider that organizational identity seems to be a powerful tool in guiding organizational change processes. Second, they need to understand that in order for organizational identity to *de facto* function as a tool, it seems that field conditions need to be *perceived* as stable and provide coherent and consistent legitimized elements of institutional identity that organizational members can draw on in order to construct a collective understating of central, enduring and distinctive elements that will guide their behaviour.

The analysis also unveiled an "emergent" research identity for UASs, reflecting the organizational identity of the UAS as defined by members of the two Schools and solidifying its distinctive nature as different from university research. Research at the UAS was defined as multiparty and multidimensional, which invoked hybridity and real, short term interdisciplinary problem solving, as contrasted with university research. This adds to current knowledge on the new research mandate for UASs which has so far been discussed only in relation to its consequences, funding mechanisms, and policies for development.

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CHAPTER 6

Heterogeneous responses of Portuguese polytechnics to new research policy demands[22]

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Introduction

In this chapter, we examine the heterogeneous organizational responses of two polytechnics in Portugal to new research policy demands in higher education. The research demands were developed as part of the new European policy agenda aimed at transforming the European Union into the most competitive and dynamic knowledge economy in the world (Amaral & Magalhaes, 2004). Polytechnic institutes and Universities of Applied Sciences were asked to "accommodate societal demands by linking professional practice and education through innovative research" (De Weert & So, 2009, p. 34). Research was expected to be innovative by promoting cohesion within the region and engaging local industry in short-term projects (Hasanefendic, Heitor and Horta, 2016), while at the same time advancing the professional curriculum (Jongbloed, 2010). Despite calls for distributive knowledge production through research, recent studies have shown that basic research practices seem to be dominant in some polytechnics (Holmberg & Hallonsten, 2015), and that even when research is interpreted as applied, short-term and regionally relevant in national higher education settings, polytechnics seem to be responding to these new demands in different ways, leading to the heterogeneity of organizational responses (see Hasanefendic, Heitor and Horta, 2016; Hasanefendic, Patricio, de Bakker, 2017).

Different organizational responses within higher education systems have been examined mostly from a policy perspective. Studies have, for instance, looked at how European policies and global trends have been disseminated and adopted in national higher education systems (e.g. Patricio, 2010) and accounted for differences due to national specificities (e.g., Amaral et al., 2013). At the same time, recent work has stressed how internal organizational attributes, such as organizational identity (Fumasoli & Stensaker, 2013) or tradition (Sam & van der Sijde, 2014) also influence organizational responses to new policy demands. Collectively, these analyses of the ways in which higher education organizations have responded to new policy demands have reinforced the idea that heterogeneity is a result of differences across national higher education systems. At the same time, organizational heterogeneity has also been explained as a result of organizational attributes which function as filters of new policy demands and contribute to differences within the same higher education systems (Fumasoli et al., 2015). Notwithstanding the importance of these different perspectives, we argue that these studies tend to underestimate the role of the

national higher education field and the way it shapes organizational responses. Recent research indicates that institutional players in a national higher education field are playing a significant role in shaping organizational experiences, while contributing to heterogeneous organizational responses (e.g., Hüther & Krücken, 2016; Scott & Biag, 2016; Frølich et al., 2013).

Drawing on new institutional theory, a field is defined in this chapter as an aggregate of institutions (field actors) and organizations "that partake of a common meaning system and whose participants interact more frequently and fatefully with one another than with actors outside the field" (Scott, 1995, p. 56). It is characterized by institutional pluralism where organizations are faced with multiple institutional prescriptions from different field actors (Meyer & Höllerer, 2016). Organizations, therefore, are expected to adhere to institutional prescriptions from diverse field actors. This is relatively unproblematic as long as these prescriptions are congruent, compatible or harmonious as this makes the field stable by advancing clear regulatory, normative and cognitive frameworks (Greenwood et al., 2011). However, field actors may also disagree on what is desirable organizational behavior, especially in times of change, in which case incompatibility and contradiction among different institutional prescriptions will be a consequence, leading to organizational experience of complexity in the field (Greenwood et al., 2011). Following these insights, we inquired as to how the organizational experience of the conditions in the Portuguese higher education field influences polytechnic responses to the new research policy.

To address this research question, we interviewed and analyzed the responses of teaching staff, Deans of Schools, Directors of courses and study programs, and the Presidents of two polytechnics in Portugal. Their responses showed that the higher education arena was experienced as a complex field characterized by a lack of consensus among the main field actors. The complexity of the field was also manifest at the macro level of analysis with regard to discrepancies in the legal framework and the ambiguity of research and funding practices. Policy ambiguities and uncertainties were reflected at the micro level in individual behavior, further contributing to the complexity of the field. Through the presentation of two case studies, we illustrated different strategic responses of polytechnics as either "wannabes" or hybridizers. These two responses were enabled by the experienced field complexity and represented organizational aspirations for strategic positioning in the field.

This study hoped to contribute to the higher education literature by referencing organizations as strategic entities that strategize and maneuver within a complex field.

The remainder of the chapter is divided into five sections. The following section discusses the theoretical context, whereas the subsequent sections present our research setting, findings, discussion and conclusion, with a future research agenda.

The higher education field: complexity and organizational responses

The higher education field is composed of diverse postsecondary educational organizations oriented towards multiple teaching, research and third stream missions while serving a wide range of students (Scott & Biag, 2016; Popp Berman & Paradeise, 2016). These organizations operate in highly institutionalized environments (Scott & Christensen, 1995) and are driven by cultural, cognitive, normative and regulative prescriptions (Harris, 2013). These prescriptions are provided or formulated by field actors who constrain or support higher education organizations in accomplishing their goals, while providing resources and legitimacy (Harris, 2013; Scott & Biag, 2016). These actors are national or international regulatory groups, governmental agencies, funding agencies, professional and trade associations, special interest groups, and the general public, among others (DiMaggio & Powell, 1983). Over time, this field is said to become influenced by a set of isomorphic regulatory (e.g., defined by law, rules and regulations at the macro level), normative and cognitive (internalized by individuals in daily work practices at the micro level) prescriptions that guide action and ensure legitimacy, eventually leading to organizational homogeneity (DiMaggio & Powell, 1983). Institutional isomorphism refers to the way that organizations become more similar because they co-exist in similar environmental conditions and follows the same rules and norms to attain legitimacy (Dacin, 1997). For example, higher education organizations in Europe were expected to implement the Bologna structure and to modernize teaching and research practices in order to contribute to the development of the European Higher Education Area (Teixeira, 2016).

To remain competitive, national governments enforced the mechanisms of Bologna in the national higher education fields in the form of regulatory prescriptions such as laws and policies, as well as through national systems of funding, evaluation, accreditation and other

quality assurance mechanisms to control academic programs (Cardoso et al., 2015). These prescriptions were enforced in order to "fine tune" the behavior of higher education organizations, and they were applied to universities and polytechnics alike. As a result of these isomorphic pressures, the common assumption was that the organizations in the higher education field would respond to these new demands, guided by the dominant and coherent regulatory prescriptions, which in turn would lead to similar organizational outcomes (Scott, 1995).

However, fields do not always provide coherent and dominant regulatory, or normative and cognitive frameworks for organizations to follow in order to secure legitimacy in response to a new demand; fields can also be spaces for contestation and disputed arenas (Zietsma et al., 2017). This means that field actors provide contradictory, unclear and even misleading prescriptions for organizations to follow regarding the new demand, which affects the dominant and coherent understanding of regulatory, normative and cognitive frameworks, while contributing to incompatibilities between them (Greenwood et al., 2011). In these instances, organizations experience their fields as complex, face identity ambiguity and may engage in interest-driven struggles with field actors to make sense of the process (Hoffman, 2001). They may dispute different interests that are relevant for achieving their own specific organizational goals, leading to heterogeneity of organizational responses to the new demand (e.g., Bertels & Lawrence, 2016).

Considering the multiplicity of new demands entering the higher education field with globalization and neoliberalization policies, and with the implementation of national policies concerning funding, research and governance to stimulate European and global competition, it can be expected that polytechnics and universities experience their higher education field as increasingly complex. Scrutinizing the higher education field as a complex domain, in which organizations engage in reinterpretations of the field and see opportunities to define and follow their own interests simultaneously, is a useful avenue to explore in aiming to understand heterogeneous organizational responses in higher education. Toward this end, we explore how two Portuguese polytechnics responded to the new research policy by investigating how they experienced specific field conditions in which they are embedded and how this experience shaped their responses.

Research setting

Portuguese polytechnics originated in the 1970s as a way to train the labor force, through the mergers of smaller industrial or commercial institutes, and thus help qualify the under-educated Portuguese population (Leão, 2007; Urbano, 2011). Higher education was no longer a privilege of the wealthy and few, but rather became an opportunity for many to contribute to the economic and social development of the country (Simao et al., 2004). Since then, 15 public Portuguese polytechnics and five non-integrated schools have provided alternatives to a traditional university education (A3ES, 2012). Polytechnics and non-integrated schools have been training students for professions and providing education based on the practical application of theoretical knowledge for several decades (see Hasanefendic, Heitor & Horta, 2016). Recently, however, the Government has required polytechnics to undertake research activities. So as to not confuse the research activities of polytechnics with those of universities, the legislation enacting the requirement identified research for polytechnics in the context of applicability, usability and transferability of knowledge to societal actors (e.g., Law nº 49/2005; Law nº 62/2007; Decree Law nº 207/2009). However, and in spite of the explicit policy requirement, the government delayed introducing mechanisms to promote this research practice in Portuguese polytechnics. This means that research is still largely defined within the context of universities by other field actors such as accreditation and funding agencies, which are oriented towards scientific production for the advancement of knowledge. In this context, research is still measured by the number of publications, number of citations and the impact factor of journals. Whereas legal measures and policy discourse in Portugal encourages diversification of research roles, missions and practices between the university and polytechnic sectors, the mechanisms to foster this diversification are absent (Fonseca, 2001; Urbano, 2011), and in their absence the ambiguity of research practice is furthered. This situation has led polytechnics to respond to the new research mandate in different ways.

Case selection and data collection

In order to explore how heterogeneity emerged in such a context and what role the field played, we studied the general perceptions of research policy in the higher education field, as well as research practices, at two polytechnics in Portugal. The first polytechnic was

situated in a metropolitan urban area close to research universities (PA), whereas the second polytechnic was the major tertiary education provider in a rural part of the country (PB). We chose these two polytechnics as we expected perceptions toward research to be different and the reasons for this difference to be more pronounced. It was hoped that this purposive sampling could help highlight the role of field complexity.

The data were collected between 2014 and 2015 by observations and on-site visits in order to develop a more holistic understanding of the phenomena under study (Dewalt & Dewalt, 2002). We used observations to gain better insight into the context and conditions of the two organizations (see Figure 6.1).

SOURCES	*TYPOLOGY OF DATA*		*DATA USE*
Participant observation and on-site visits	65 pages of written notes (2 A4 notebooks)		Familiarization with the organizational context. Identification of the research setting and interviewees. Understanding of time spent on research in relation to other activities. Understanding the workplace context and differences between the two cases. Validation of findings from the interviews about research practices in both organizations.
Interviews *(98% have PhDs and 2% have some sort of professional experience)*	**Polytechnic A (6 female)**	**Polytechnic B (9 female)**	In depth understanding of the norms and values underpinning the polytechnic sector and research practice. Understanding of the changes in the polytechnic sector and in comparison to universities. Perceptions on the developments and importance of polytechnics in broader societal terms.
Teaching staff and/or Presidents and Vice Presidents of Scientific Councils in their respective Schools (usually dual roles)	13	9	
Deans of Schools /Vice Deans (some still teach)	3	8	Collecting perceptions about the role of research as defined in the law and other regulations, the practice of research, the understanding of research at the polytechnic, and how it might have changed their traditional way of work.
Vice Presidents, Pro Presidents of the Polytechnic	3	4	
Documental data			
Laws and Decree-Laws	Law nº5/73 of the 25 of July; Decree-Law n.º402/73 of the 11 of August; Decree-Law n.º427-B/77 of the 14 of October; Decree-Law n.º513-T/79 of the 26 of December; Law n.º46/86 of the 14 of October; Law n.º54/90 of the 5 of September; Law nº62/2007 of the 10th of September and Decree-Law n.º 207/2009.		Triangulate data and support information emerging from interviews.
Website data	http://www.a3es.pt/; http://www.fct.pt/index.phtml.pt		
Online newspapers	Publico, Expresso, TSF Radio Noticias		

Figure 6.1 Typology of data

Semi-structured interviews - 19 in Polytechnic A and 21 in Polytechnic B – were conducted which took place in six Schools in Polytechnic A and four Schools in Polytechnic B. We interviewed teaching staff, Directors of Programs, Deans of Schools, Pro Presidents and Presidents and Vice Presidents of each polytechnic. The Schools are organized according to discipline (e.g. engineering, music and arts, health, management of technology, agriculture). Interviews lasted between 60 and 100 minutes. The goal was to interview a diverse group so as to achieve greater validity of the data obtained. The second source of

data consisted of government legislation, higher education regulations, official website data, online journals and newspaper articles. Both interview and documental data was analyzed by using the Atlas.ti qualitative data software.

The process of data analysis was iterative (Lincoln & Guba, 1985), following a constant comparison technique (Glaser & Strauss, 2012). The aim was to capture respondents' experiences, views and interpretations of the polytechnics, their experience of the higher education field and their new mission of research in the national higher education field. Open coding was conducted by labelling and paraphrasing quotations; as the data was analyzed, additional concepts and codes were applied, suggesting that the phenomenon was more complex than expected. For example, whenever we found quotations such as "society values university education higher" or "we are perceived as lower quality and second hand institutions," these were coded as the "underdog position of a polytechnic". This was not one of our initial concepts from theory, but it bore relevance to the specific case. Some of these open codes were analytical, whereas others were descriptive, and referred to concrete events, activities, or people.

Once this stage was done, we proceeded by naming or renaming the codes, adding new ones, or removing others, eventually merging several codes into families or second order categories (Gioia et al., 2013). The last step in our analysis involved the establishment of central categories or aggregate dimensions and relating them to other second order categories (see Figure 6.2). Reliability was assured by using multiple data sources, and validity was checked via continuous analysis of data or by going back and forth between interviews and other types of data sources (Glaser & Strauss, 2012).

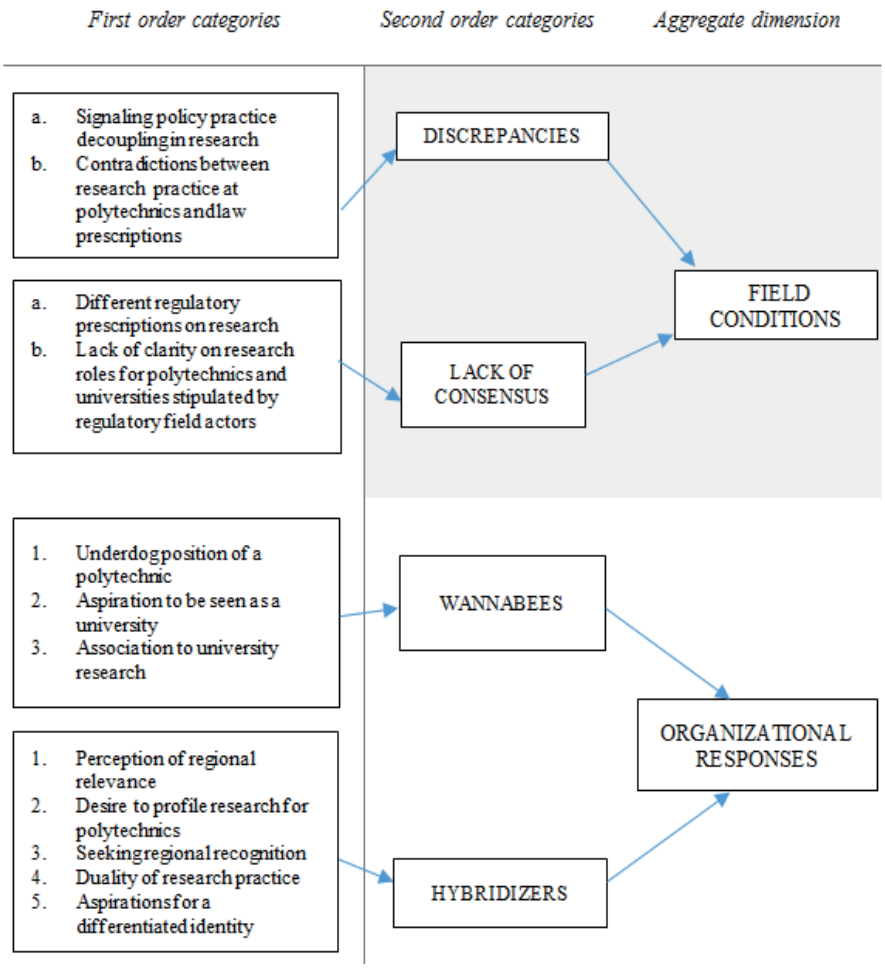

Figure 6.2 Data structure

Findings

Field conditions

The findings of this chapter start by detailing the respondents' experience of the higher education field. The following two field conditions, discrepancies and lack of consensus, were explicit in analyzing the respondents' answers to questions regarding the new research policy.

Discrepancies

From the start, respondents emphasized a discrepancy between prescriptions stemming from regulatory field actors that monitor and promote research activities in polytechnics and the practices and norms concerning research which guide individual behavior in organizations. For example, research was for the first time broadly defined as a task for polytechnics in Decree Law nº 49/2005, with the specific aim of differentiating universities from polytechnics, as seen in the following translated section:

> *University education aims to promote research and knowledge creation, seeking to ensure solid scientific and cultural preparation and technical training for the performance of professional activities;*
>
> *Polytechnic education aims to promote applied research focused on understanding and solving real problems, and to provide solid cultural and technological skills of higher education quality. It seeks to foster innovative and critical thinking and produce scientific knowledge of theoretical and practical implications or with direct applications to the professions* (Decree Law nº 49/2005).

The current Decree Law nº 207/2009 enforced the 2005 disposition about applied research at polytechnics by stipulating that all teaching staff at the polytechnics were required to do research which creates "cultural value and involves experimental design" (Art. 2A). In terms of research duties, the Decree further underlined that the teaching staff at polytechnics should "develop cultural and scientific knowledge through research projects which are both scientific and technical and attend to the needs of society" (Art. 30A). These regulatory prescriptions provided guidelines for infusing work practices with norms and values for polytechnic teaching staff and managers to follow. They also served to differentiate polytechnics from universities in a binary higher education system and thus provide legitimacy. Yet this was not the case.

Our respondents were highly influenced by the university setting and transposed the practices acquired there to the polytechnic sector, in teaching and later also in research. One respondent emphasized: "*I taught at the university in 1991 and I use the same method to teach here. So with respect to teaching there is no difference and in terms of research for me there is no difference*" (PB, Interview 13). When polytechnics were created, they hired

graduates with bachelor's degrees from universities and started offering classes (observation and field notes). As another respondent argued, "*people training here are also formed at universities. They had to do a PhD in a university. When they came back to the polytechnic, they naturally wanted to make their subject more university-like*" (PA, Interview 7), and they did the same when research became an official mission, which means that it is "*the university that formed the polytechnic education*" (PB, Interview 6).

The respondents mentioned that they were not able to provide up to date "professionalized" courses and that their link with the professions was generally weak. Despite the focus on professions, practicality and problem-solving activities in teaching and research, which should serve the needs of society and ensure "*closeness with the professional field through research*" (PA, Interview 16), there were "*actually no differences with the universities*" (PB, Interview 5) in terms of research as the law(s) defined with regard to teaching practices at polytechnics. This also proved critical in shaping research practices that were influenced by the training and tradition of research transmitted by universities. Therefore, it is not unusual that our respondents emphasized that they could not "*understand what they (the Law) want from us*" (PB, Interview 15) and that they "*only know what we learnt at universities*" (PA, Interview 17).

Lack of consensus among regulatory field actors

When research was first introduced as an official mission of polytechnics in Portugal, it was stipulated as 'applied' and distinct from the type of research that was carried out at universities. Research was defined within the framework of practical application, whereby "*projects with regional industry, community outreach activities and problem solving practices*" (Noticias de Instituto Politecnico de Lisboa, 2 June 2011) were stimulated. As with other polytechnics in Europe, research was supposed to improve the educational provision of professionalized practices through interaction with regional industries (Kyvik & Lepori, 2010). However, this newly identified role for polytechnics was not understood in the same way by all regulatory actors in the Portuguese higher education field, which jeopardized its legitimacy. Our respondents were very clear about the contradictions between the way Decree Law nº 207/2009 defined research and the way the current *Statute on Teacher*

Careers at Polytechnics, regulated by the same Decree Law nº 207/2009 undermined this research role. As one respondent underlined:

> *I need to do research, the academic type. If I apply for any other job in academia, or at another polytechnic, I will lose out if I do not have papers published. But the same Law tells me to do research projects with companies which in most cases cannot and do not result in publications* (PA, Interview 6).

The current *Statute on Teacher Careers at Polytechnics* also stipulated that when members of the teaching staff are following career paths leading to promotion to other categories and the earning of higher titles, they must show scientific qualities that are measured by high impact publications in international journals. One respondent mentioned: "*If you do not have publications, you do not have enough to advance in your career*" (PA, Interview 6). This regulation thus legitimized publications as research outputs relevant for advancement in an academic career, thereby seemingly contradicting the desired outputs of research as an applied, practical and problem-solving activity.

Further, one respondent mentioned that "*the type of research they want us to do is bullshit; I mean, they say one thing, but then they evaluate me on something else*" (PA, Interview 5). For instance, the National Accreditation Agency, which is responsible for the approval and evaluation of polytechnic undergraduate and graduate programs, as well as the Portuguese Science and Technology Foundation, evaluated and measured scientific quality predominantly based on publications. For example, in order for Master programs to obtain accreditation, the National Accreditation Agency expected that polytechnic teaching staff involved in these programs have both doctoral degrees and a proven research record. The number of publications measures this research record. One respondent explained: "*To get a course accredited, you need to have a certain number of PhDs in the course, and the publications matter then as well. So we need to do it*" (PB, Interview 1).

When the polytechnic teaching staff applied for funding through the Portuguese Science and Technology Foundation, "*the funding and evaluation criteria seemed to evaluate based on publications*" (PB, Interview 5). Staff "*has to take into account what the funding agency and the national system want. So we have to publish. We can only be successful if we are recognized by these institutions*" (PB, Interview 6).

Our respondents stressed that "*the Government seems to be forcing us to do things differently from universities" while "the funding agency only cares about publications, or research experience*" (PA, Interview 11). For example, one respondent explained that it was important that she had "academic experience" when seeking a grant: "*The Portuguese Science and Technology Foundation will not give a grant just to a teacher from a polytechnic; they need to see that you have a researcher profile and that you know how to do research in a university way*" (PA, Interview 15). Polytechnics have to "*compete with universities for research money; there is no special call just for polytechnics*" (PB, Interview 1).

A respondent from PA described this lack of consensus on research for polytechnics among regulatory field actors this way: "*Whereas the funding agency, the accreditation and the career statute assess and evaluate research production based on generally accepted scientific criteria*", by contrast, "*the Law aims for diversification by defining research as practical, project based*" (PA, Interview 11). Generally, aiming to develop research as prescribed by law is difficult, as the national accreditation and funding agencies only classify polytechnic practices as "good or excellent" if they can "*show publications potential and do not consider that I worked on projects with companies in the region*" (PA, Interview 11). The problem is that these field actors did not legitimate the "other", output so polytechnics refused to do it.

Organizational responses

Experiencing discrepancies and lack of consensus in the field about research influenced our respondents' practice of research. In fact, our findings showed that the respondents from the two polytechnics were practicing research differently from one another. Their heterogeneous responses were not exclusive, but signaled organizational strategies enabled by the complex experiences they encountered in the field.

Wannabes

Throughout the interviews and based on the field notes of the first author, PA respondents were consistent in showing that the way they did research was the same as universities. They further justified their research activities by referring to the prescriptions stemming from the *Statute on Teacher Careers at Polytechnics*: "*When we are evaluated for our performance [or] research or want to advance in the career, we follow the same rules as universities*" (PA, Interview 16), while on other hand, they undermined the current

stipulations in the laws about research at polytechnics. Lack of consensus in the field enabled the choice to reject some prescriptions while attending to others. Additionally, they emphasized that they have done their PhDs, and were a part of university research centers as one of the respondents explained: "*My research group is in a university so we do whatever they do. So we follow their group and lines of thought and publish together*" (PA, Interview 17).

The PA respondents interviewed in our study seemed to have been highly influenced by the norms and values that prevail in universities and emphasized that they had to "*produce indicators that are accountable for measuring research, which are publications in scientific journals*" (PA, Interview 7). They underlined that their organization financially encouraged this output and that it is crucial to "*publish in scientific journals. We stimulate this*" (PA, Interview, 17). The majority of our PA respondents emphasized that, in an effort to be considered a university, their organization promoted research activities that increased scientific excellence, and matched universities:

> *We incentivize paper publications; we give a prize to the author hat had best publications or was most cited. We also encourage doing a doctoral degree for teachers* (PA, Interview 16).

In this sense, the patterns of attempting to show they do the same research as universities while not actually being called such prejudices them in the field as they are seen as less valuable and even eventually marginalized by society, indicating a "wannabe" (a colloquial combination of the words "want to be") conformity, as highly popularized by Tuchman (2009). "Wannabe" conformity refers to attempts by universities to achieve success in a corporatized world of higher education (Tuchman, 2009). It also points to an overarching logic of compliance in higher education. Respondents stressed that they wanted to be called 'universities' since they practice the same research and emphasized that currently they are not considered to be as good as universities because "*the culture is not aware that polytechnics are as good as universities*" (PA, Interview 4).

The President of PA polytechnic recently highlighted that polytechnics should seek equality with universities, not just in practice but also in law, and confirmed that "*PA has met all the conditions necessary to be granted the status of a university*" (Diario de Noticias, February 2015). This would suggest that PA wanted to minimize the discrepancies experienced in the

field and assimilate to universities. PA also recently abandoned their membership in the Portuguese Polytechnics Coordinating Council (CCISP – Conselho Coordenador dos Institutos Superiores Politécnicos). In line with this statement, the PA President reasoned that withdrawal from the Portuguese Polytechnic Coordinating Council was necessary because they were very different from other polytechnics and were more like a university. Abandoning the Council, therefore, was considered a necessary "strategic move" in order to express their determination in becoming recognized and legitimated as a university, thereby removing the existing cultural or societal prejudice against them as a polytechnic.

Hybridizers

Respondents from PB emphasized that their research practices were influenced by university norms and values:

> *Our teaching staff has studied at a university, and they all did their PhDs in the university. So this has definitely influenced the way they do research. And also, the recognition of research followed that; so to recognize that what you are doing is scientific and good you have to do classical university research. So what our teachers were expected to do is publish papers and have PhDs. So you see, it is both their tradition -- that is how they were trained -- and it is also the environment that reinforces and legitimizes university-type research. This is not our evaluation. This is system evaluation…This is what matters for them. So we need to do it*… (PB Interview 1).

At the same time, our respondents also emphasized that they are doing "other" research which reinforced projects with local companies and, in particular, impacted the community and region in which the polytechnic is situated:

> *Well, some 10 years ago, when the research became an official mission and we had to all do PhDs, etc., we were doing research that was serving the purpose of universities … But now our teachers have to look at the region. We have a few quite good groups working in applied research in different areas, food technology and agriculture, also technology linked to the development of agriculture*…. (PB, Interview 4).

As the only educational provider in the region, or as one of the members of the teaching staff calls it: "*a polytechnic off the beaten track*" (idiomatic translation from Portuguese "um

politecnico no meio de nada"; PB, Interview 10), PB was described as a polytechnic which did not have to compete directly with universities, but rather shared a social responsibility to its region:

> *We are very open to the community.... I think this is very important and is the main objective of this polytechnic. We want to improve things in the region and construct new companies and industries* (PB, Interview 10).

A member of the teaching staff argued, "*the biggest difference in the type of research we do here and the one they do at universities is that we accept to do research that is important for solving the problems of small industry and companies in our region*" (PB, Interview 6). This respondent furthered this argument by specifying that the goal of such research is to help "*companies in a short period of time, not in ten or twenty years. If we specify that applied research is something that is valuable for companies some ten years later, then we will not have any advantage. If we think of applied research as short term research with immediate application, then we are contributing a lot*". Research at PB was, therefore, described as problem solving "*and economically and socially developing the region*" (PB, Interview 4). For example, one respondent explained how:

> *We tend to investigate things that are concrete, that the community needs, where we can give answers to local problems. Research in a polytechnic is the development of scientific activity that responds to problems found in the region. The one who identifies the problems can be the teacher, as our teachers are very close to the region and usually have some connection with the economic aspect of it -- either via a relative or a friend or are themselves involved in the production. Or the problem can also be identified by the producer, the outside community, or both* (PB, Interview 15).

The emphasis in this research is the combination of the scientific approach and community relevance, as seen in the following response:

> *Well, we do a lot of research and publish a lot, and this research is always related to our region and regional products. We have a website in English where we make all of our research available to the public* (PB, Interview 9).

Almost all PB respondents referred to "*collaboration with local companies*" (PB, Interview 5) and "*integration of traditional ways of doing research with practice, or practical research. We*

are crossing some boundaries, but this is difficult" (PB, Interview 12). This difficulty was related to funding, as it supported university or scientific research and output. What the respondents emphasized is that they felt they had to simultaneously concede to both the prescriptions about research practice stemming from the laws, and the rules as stipulated by other regulatory field actors concerning research such as the funding agency or the *Statute on Teacher Careers at Polytechnics*. They undertook practical, applied research in collaboration with local industries in the region and did scientific research to obtain funding and advance in their careers. This indicated what we refer to as hybridity.

Whereas respondents felt this was an obligation due to specific field conditions, they also emphasized that this integration of practical and scientific research was a way for them to be "*different from universities*" and positon themselves in the field as "*regionally oriented or solving problems of local companies in our region" rather than competing against universities in the field* (PB, Interview 1; also TSF Radio Noticias, 28th of August, 2015). Respondents from PB contended, "*the polytechnics are motors of regional development as they make sure these remote rural areas advance. But they are also dependent on the region*" (PB, Interview 8). As one member of the teaching staff reported: "*People are aware that if we do not do community outreach work, maybe the institution will have to close*" (PB, Interview 6).

These reactions from our respondents reveal that the region itself, as an economically, socially and territorially unique area, was seen as an important actor in the field. Region is an important source of legitimacy and resources for the functioning of PB. Regional funding is also an important means for ensuring this type of practical, applied and regionally embedded research.

Discussion

To date, there has been substantial empirical evidence that responses by higher education organizations to new policies are varied or heterogeneous (Berg & Pinheiro, 2016, Canhilal et al., 2015). Yet most higher education literature considers that higher education organizations either filter new policies due to organizational attributes or adopt them irrespective of the conflict or incompatibilities in national higher education fields (also see Frølich et al., 2013). By adapting a theoretical framework to analyze the dynamics and interplay between actors and organizations, we sought to apply insights from field theory

and recent work on complexity in fields to offer a more comprehensive understanding of the conditions influencing organizational behavior in higher education. We examined how polytechnics in Portugal responded to new research policy demands by focusing on the organizational experience of field conditions as influencing heterogeneous organizational responses. In this way we heeded the call for more empirical studies on how higher education organizations interpret and respond to their environments (e.g., Frølich et al., 2013; Lepori, 2016).

Our analysis revealed that complexity in a higher education field was experienced in two distinct ways. First, there were discrepancies between field frameworks. The analysis revealed a discrepancy between laws which prescribe rules for polytechnic organizations (and their research practice) and normative and cognitive prescriptions which guide the teaching staff at the polytechnic in their daily work practices. These prescriptions were not compatible. This indicated a lack of connection, or a "disassociation", of individuals in polytechnics from the rules and regulations prescribed in the law. This finding coincides with recent work by Bertels and Lawrence (2016) and Lepori (2016). Their work shows how individuals' views on a new demand might not correspond with those of the regulatory field actors. For instance, different individuals might have different understandings of the policy because of the backgrounds, experiences, etc. which shape their normative and cognitive frameworks. But this understanding might be incompatible with how regulatory field actors define the new policy. Such incompatibilities indicate micro and macro level factors contributing to complexity in the field (Degn, 2016). In other words, complexity at the field level is exacerbated by discrepancies between prescriptions at macro-levels (stemming from regulatory field actors) and the micro-level that guide the behavior of individuals and give meaning to their work practices.

Furthermore, the field was also characterized as lacking consensus as regulatory field actors enforced ambiguous institutional prescriptions regarding research for the polytechnic sector. This made it virtually impossible to develop a coherent regulatory field framework concerning the new practice and underpin it with normative and cognitive prescriptions that would guide organizations in this new task. A coherent regulatory field framework is essentially underpinned by normative and cognitive prescriptions that encourage or reflect consistent organizational behavior and provide field stability (Smith & Tracey, 2016). This

indicates that uncertainty and ambiguity generated at field level resulted in a framework deficiency for organizations seeking legitimacy and recognition, enabling, however, several ways of attaining legitimacy (see also Raaijmakers et al., 2015). All these factors contribute to complexity in the field.

This analysis also explains the different strategic ways in which polytechnics responded to complexity in their field. Our analysis shows how PA emulated those organizations in the field considered "legitimate" and having research practices legitimated by some (but not all) regulatory field actors. PA followed this practice because it aspired to become a university, and therefore followed the university model, making clear that they do the same type of research as universities. Complexity in the field allowed PA to make such strategic rational choices based on its "best interest"- a practice we termed 'wannabe'.

On the other hand, PB conducted "legitimate" research, similar to universities, but also developed other types of research related to regional issues and solving regional problems, as recommended by government policy and legislation. In this way, PB compromised and conceded to prescriptions stemming from regulatory field actors, unlike PA which conformed to only those prescriptions which were also legitimate for universities. PB saw the region as an additional source of resources and legitimacy; we termed this "hybridizing." Rather than opting for one institutional prescription, PB integrated and incorporated different prescriptions and sources of legitimacy. In this way PB strategically positioned itself in the field and maneuvered different institutional prescriptions.

In the wider literature, strategizing and maneuvering have been identified as key elements in response to changes in the legal, social and political environments (Frølich et al., 2013; Delmas & Toffel, 2008; Smets et al., 2012). But so far, higher education studies have been approached mostly from the perspective of universities (Frølich et al., 2013). Strategizing in higher education has been related to keeping up with national and international competition by incorporating global trends at universities, and thereby acquiring acceptability as a national higher education player in the field (Frølich et al., 2013). This leads to the incorporation of similar elements by universities and points towards convergence as a response to new policy demands (e.g., Morphew et al., 2016). But the Portuguese polytechnics studied engaged in strategizing and defined their own research missions. We argue that the experience of complexity at the "local" field level enabled

polytechnics to differently strategize and define their responses to policy demands. These strategic responses, while enabled by the experience of complexity in the field, seem to have been influenced by the organizational interest in positioning in such a field. Position in a field has been connected to strategizing, and is also found in complex fields (Greenwood et al., 2011). For instance, higher education organizations might use complexity in their fields to strategically advance their position in the national higher education field (see Kodeih & Greenwood, 2014). Similar findings are emerging in the work of other higher education scholars working on universities. For instance, a working paper by Cattaneo et al. (2017) on competition and diversification at Italian universities in the post-2008 financial crisis points out that even universities do not necessarily adopt similar strategies when coping with global external demands and may even adopt quite different strategies, depending on local competition. This work seems to point to the importance of local field-level dynamics in shaping organizational strategies in response to new, especially global, demands.

Conclusion

This study contributes to the understanding of how conditions in the higher education field influence organizational responses to new policy demands. First, we have shown that organizations can experience their higher education field in a complex manner, based on macro-micro incompatibilities and the multiplicity of legitimacy sources. Second, we explored two distinct organizational responses to the emerging research policy demands in a complex field: assimilating ("wannabes") and hybridizing. These organizational responses resulted from different maneuvering strategies to new research policy demands. More responses are likely since complexity in fields can give rise to divergent responses, requiring organizations to pay more attention to local dynamics by further developing strategic aptitudes and capacities.

Raynard (2016) argued that complexity could either be purposeful or be a consequence of field actors who seek to appropriate the stability or purposefully prevent the stability from being achieved in the field. Revealing the sources of complexity in detail was beyond the scope of our study as we focused on heterogeneous organizational responses to field-level changes. Nevertheless, it is an interesting issue for further research in studies of higher

education. Future research that looks into more cases in similar fields and explores different responses, as well as that which investigates the dynamics of complexity in higher education fields is encouraged.

Our study also raises questions relevant for policymakers. Higher education policy has been greatly influenced and defined at the European or international level. National or local field conditions have tended to be relegated to a secondary role or even ignored. But national field conditions have consequences for the implementation of policy. Complexity on the local field-level seems to allow higher education organizations to be more flexible, encouraging strategic potential and action based on organizational interest and interrelation with local actors. The capacity of an organization to strategically deal with uncertainty and ambiguity brought about by complexity in fields can be an advantage in the dynamic and changing atmosphere of global higher education (Hüther & Krücken, 2016).

Policies defined at supranational levels will not necessarily yield similar impacts or have the same results when applied in varied and multiple areas. Rather, these policies will be interpreted within the limitations and context of the organizations and their interests as they strive to retain their role as strategic agents in their local fields (also see Cattaneo et al., 2017). This means that policymakers should shift from fostering universal policy solutions that promote higher education competitiveness at global levels to designing policies that take into account more local field dynamics and organizational dimensions.

CHAPTER 7

Conclusion

General discussion

This dissertation provides an in-depth and comparative understanding of non-university higher education organizations' responses to new policy demands. Specifically, it examines how Dutch *hogescholen* and Portuguese polytechnics responded to demands to innovate in education and implement the new research mandate and why their responses differ. It examines the responses from a qualitative perspective, embedding the results within several conceptual streams of new institutional theory. The following sections discuss the main findings from the five empirical chapters and explicate the role of experienced field conditions and organizational characteristics in achieving diversified outcomes in the Dutch and Portuguese cases. The sections advance the understanding of conditions which influence organizational behavior in higher education and reflect on contributions to higher education literature, a future research agenda and policy of the non-university higher education sector.

Field conditions and organizational responses

In combination, the five empirical chapters challenge assumptions about institutional isomorphic pressures in higher education fields and expected homogeneity across organizations in the same higher education sector as they respond to new policy demands. The results of this dissertation point to diversity in non-university higher education's responses to new policy demands and attribute this diversity to the organizational and individual experience of national higher education field conditions. Following other studies on institutional fields (Greenwood et al., 2011; Villani & Phillips, 2013; Pache & Santos, 2010), this dissertation finds that higher education fields can be experienced differently – identified as complex in the Portuguese case and stable in the Dutch case. Unlike in literature on organizational environments and environmental uncertainty (see Daft, 1997; Duncan, 1972; Pfeffer and Salancik, 2003) where stability and complexity characterize the dimensions of environmental structure and dynamics in relation to an organization (e.g. stability refers to whether the environment is susceptible to change or not and complexity to a number of dissimilar or complicated elements an organization has to deal with), my dissertation focuses on organizational experience of their environment. This is also a critical difference with previous work on fields which emphasized

that complexity refers to the composition of the field and the interrelations, networks among social and political institutions and coherency among their understanding of field issues (Hinings, Logue & Zietsma, 2017), all of which align to create field stability (Levy & Scully, 2007). For example, Litrico and David (2016) emphasize the struggles between and among social and political institutions on contentious issues which contribute to field stability. Their work points to the dynamic activity in the field among social and political institutions when new issues or demands are discussed. Similarly, Furnari (2016) addresses how social and political institutions use resources from other fields to lobby for settlement on issues in their field and effectuate field stability.

My dissertation makes a reference to experienced stability and complexity in fields as organizations and individuals have different understandings of the congruence and coherency among regulatory, normative and cognitive prescriptions stemming from multiple political and social institutions regarding a new policy demand. The dissertation in this way heeds to calls for more empirical studies on how higher education organizations interpret and respond to their environments (e.g., Frølich et al., 2013; Lepori, 2016). On the one hand, the organizational experience centers on the dimension of perception. The perception of consensus among the multiple political and social institutions that provide regulatory, normative and cognitive prescriptions on how an organization should behave to be perceived as legitimate in the field and attain certain resources and status (Scott & Biag, 2016). On the other hand, it centers around discrepancies between organizational and field level understanding on legitimate behavior or incongruences between individual perception on legitimate behavior and field level constraints and opportunities. This organizational perspective of field dynamics has been especially downplayed and absent from research into organizational responses to new demands and change in higher education until now (see exceptions Popp Berman & Paradeise, 2016). Based on the theoretical insights from new institutional theory, this dissertation's findings advance the idea that the non-university's experience of the national higher education field shapes organizational understanding of the new demand. Organizational and individual responses to new policy demands are therefore not directly shaped by the field (structure and dynamics) as previously assumed (Scott, 2013; Greenwood et al., 2011; Weerts et al., 2014). Instead,

organizations and individuals react to new policies based on their experience of their national fields.

Dutch hogescholen in stable fields

Dutch *hogescholen* experienced their field as stable (Chapter 2 and Chapter 5). Although they received prescriptions form multiple political and social institutions about the new demands and adhered to them in order to be seen as legitimate and obtain resources, these prescriptions showed consensus and were coherent in providing norms and values for organizational and individual behavior and in defining the regulations, norms and values associated with the new research mandate and innovation in education, which decreased complexity (Chapter 2 and Chapter 5). For example, when the research mandate was introduced, the Dutch government implemented policies to secure a diversified role of research for the *hogescholen* in the field. The Government established a separate funding body to advance research oriented towards improving student professional skills, in collaboration with companies and oriented towards problem solving activities. At the same time, they created governance policies for the hiring of specialized staff, or lectors, at *hogescholen* to advance this role of research and recently stimulated the creation of intermediary organizations to promote research at *hogescholen* to the companies and society through Centers of Expertise. In 2009 a system of quality assurance for research at *hogescholen* was introduced by the Validation Committee Quality Assurance (in Dutch, VKO: Validatiecommissie Kwaliteitzorg Onderzoek) in association with the Council for Hogescholen (or Vereniging Hogescholen in Dutch) to review practice-based research activities and assure that research at *hogescholen* differs from university research (De Boer, 2017). In other words, the political and social institutions in the Dutch field of higher education did not provide incompatible or conflicting policy prescriptions on research, but rather showed a coherency in stimulating the traditional roles and identity of *hogescholen* which maintained field stability. The research mandate was not perceived as a threat to the established norms and values that guide organizational behavior but as an extension of their functioning (Chapter 5 and Chapter 2). Research activities were therefore an integral part of teaching and undergraduate curricular assignments, with the aim of training students to become more informed, relevant and efficient workers in their professions (Chapter 2).

Hogescholen were also collectively recognized by diverse political and social institutions as higher education organizations different from universities and providing professionalized education in close collaboration with industrial and societal stakeholders. They were associated with training students for the professions and delivering curricula in collaboration with professions and professionals (Chapter 4). Political and social institutions seem to have perceived *hogescholen* as organizations at the core of university-business cooperation and, although traditionally organized around collaboration with regional or local businesses, they now *partner* with local businesses and community in shaping educational outcomes through integrative research activities (Chapter 4). This translated into an intermediary function of *hogescholen* in Dutch higher education systems (Chapter 2). These features represented central, continuous and distinctive elements that also formed the *hogescholen's* organizational identity. *Hogescholen* drew on these elements when describing who they were as an organization (Chapter 2 and Chapter 5). This suggested that there were no discrepancies between organizational and individual understandings of organizational behavior and that their identity was institutionalized as the field supplied legitimated institutional meanings that constituted the core elements of their organizational identity (Glynn, 2008).

In responding to new demands, *hogescholen* drew on these core elements to interpret the new demand and imprinted them into the new demand (Chapter 5). Therefore, Dutch *hogescholen* relied on their institutionalized organizational identity in responding to the new demands. Chapter 5 showed that the core elements of the organizational identity were imprinted[23] onto the new (research) mandate and through research practice. This contrasts with many studies on organizational identity, even in higher education, which address identity as fluid and changeable in response to new demands (Gioia et al., 2010). Identity is said to change when new demands enter the field, first because there is a disparity between current identity and the values and norms underpinning the new demand. Second, there are incongruences between current identity and ideal or aspired identity which can be represented in the new demand. In other words, when a new demand enters the field, it might be seen as an opportunity to change current identity to an aspired model (Kodeih &

[23] Similar to grafted (Glynn, 2008), the term "imprint" is used as organizational members used their understanding of the central, continuous and distinctive features of the organization and attached it to the new research mandate. Grafting relates to the organizational profiling of identity by relying on institutional elements that are defined at field levels.

Greenwood, 2014). In my analysis, the Dutch *hogescholen* did not change their identity, but instead worked with it to adopt the new demand. For example, they looked to their central, continuous and distinctive elements when describing the practice of research (Chapter 5). For that reason, research practice was always described as driven by the industrial or company stakeholders or the community problems (and never the teacher or researcher-lector alone) and in service of education (Chapter 2, Chapter 4). Consequentially, research was always multiparty and multidimensional, or effected more than one output. For instance, company stakeholders participated for essentially two reasons: to become informed about the newest graduates, whom they might later hire to work in their companies, and to solve problems which require some more sophisticated innovative solutions. In the latter case, the companies and local industrial producers often work with *hogescholen* on experimental projects (e.g. home cheese making machine). Lecturers that engaged in research activities updated their knowledge in the profession and developed their research skills as each project is based on rigorous methodology. Students got a first-hand experience of work life, time management, working in teams and managing several diverging interests of multiple stakeholders. This lead to different research objectives, giving research various dimensions and outputs (Chapter 2, 3).

Moreover, research at *hogescholen* differed from basic research whose primary purpose is the advancement of knowledge for its own sake and producing generalizations (Bentley et al., 2015). Basic research is an activity that continues to define academic work at most research universities around the world, including the Netherlands (Bentley et al., 2015). However, some approximation to this research was also present in non-university higher education organizations (Christensen & Newberry, 2014), which contributed to hybridity of research. Research hybridity at Dutch *hogescholen* was achieved by mixing traditional research activities with practice oriented research. This was a consequence of hiring research staff with PhDs as well as lectors who have PhDs and are associated with universities (Vereniging Hogescholen, 2016). This was seen as a strategic move to strengthen the credibility of *hogescholen* research and achieve "scientific legitimacy" which was necessary if collaboration with universities was to be fostered (Andriessen and Schuurmans, 2017). This collaboration is proving critical for *hogescholen*, as it is highly

incentivized in policy and funding research opportunities by the Dutch government (van Gageldonk, 2017; Huisman, 2008).

Based on these findings, I deduce that when organizations experience their field as stable (because they do not experience lack of consensus between political and social institutions nor discrepancies), organizational identity is formed from core institutional elements defined at field levels. This institutionalized identity then guides organizations in adapting and responding to new demands.

Future research in higher education should address this topic more systematically as research into the dynamics of organizational identity has so far narrowed down the importance of field conditions on change and formation of organizational identity. Organizational identity has largely been presented as a *fluid attribute* of universities when faced with adaptation to new policies (e.g. Stensaker, 2004; Fumasoli et al., 2015). For example, organizational identity has been explored in relation to adaptation processes to policies and exogenous changes at universities in higher education (Stensaker, 2004) and reinterpreted and/or transformed under such circumstances (Fumasoli et al., 2015). Less attention has been paid to the experience of the field in influencing organizational identity, as well as to its relation to change and adaptation processes. It appears critical to understand what influences organizational identity perception in order to be able to coordinate changes and adaptation to new demands in higher education more successfully.

Simultaneously, in responding to new demands, Dutch *hogescholen* showed coupling mechanisms at play in such a stable field. Due to the multiplicity of prescriptions in their fields, or assumed complexity in the higher education field, the idea is that universities and other higher education organizations are loosely coupled organizations (Musselin, 2007; Pinheiro & Stensaker, 2014). In the case of Dutch *hogescholen*, in responding to demands to innovate in education, the organizations exhibited tight coupling at strategic levels but loose coupling in practice (Chapter 4). For instance, Dutch *hogescholen* were expected to make sure that their curricula tie in with the demands of the professional field and follow developments in these. They could show this in the accreditation reports by reporting on the activities and their frequency of engagement with the professional field.

Hogescholen reported that they assured a connection with the professional field by inviting people from industry in their boards, or at curricular planning meetings, etc., but rarely informed these practitioners of activities such as project engagement and participation in curricula by the companies, which represented a large part of their current curricular activity (Chapter 2). The tight coupling on the strategic level assured the Dutch *hogescholen* legitimacy in the environment, and the loose coupling at the practice levels assured their autonomy and strategic organization around external demands. However, this meant that the observable responses of Dutch *hogescholen* to new demands do not always reflect practice, which leads to what is called *decoupling* (Bromley & Powell, 2012; Misangyi, 2016). The findings also highlighted that not all higher education organizations are loosely coupled at all levels (also see Rundshagen et al., 2015), but seem to selectively couple (Skelcher & Smith, 2015).

Both *decoupling* and *selective coupling* are identified as strategies that organizations use in complex fields to manage change (Misangyi, 2016; Skelcher & Smith, 2015; Greenwood et al., 2011). These strategies serve as viable responses by which organizations intentionally avoid conforming to institutional pressures (Oliver, 1991). But it does not always have to be the case. In a recently published article, Misangyi (2016) advances the idea that decoupling intentions are not always strategic. The author links the decoupling of expected practices to the multiple possible intentions that give decoupling its meaning. Translating this idea into the dissertation's findings, it can be argued that Dutch *hogescholen* were not responding strategically to the complexity surrounding the new demand by decoupling, but following the rationale of accreditation. In accreditation, reporting on strategic level takes precedence over reporting in practice as the report only elicits examples of the strategy (Chapter 4). Therefore, organizations will only exemplify the strategy to provide evidence of its implementation and satisfy the accreditation criteria. This can explain why we observe decoupling in practice when reporting on the activities and frequency of engagement with the professional field; it does not function as a strategy to deal with complexity surrounding the demand but rather an unintentional consequence of reporting about quality assurance of programs in stable fields. The view taken in this chapter suggests that future decoupling researchers should not stay agnostic as to whether or not it is intentional, and aim to find reasons why this is the case, beyond simply ascribing it as a result of complexity in the field.

Higher education researchers in particular should explore the experience of field conditions by organizations prior to addressing decoupling as a strategy in responding to change. Uncovering further interrelations between the experience of field conditions and (de)coupling mechanisms and their consequences to organizational outcomes can advance theories on change and responses to new demands in higher education and contribute to better understanding of intended consequences of policy initiatives.

Portuguese polytechnics in complex fields

Portuguese polytechnics experienced their field as complex (Chapter 6). They operated in an environment of incompatibility and contradictions among political and social institutions (lack of consensus) and discrepancies between organizational understanding of the new demand and the field level understanding of the legitimate organizational behavior regarding the demand (see Chapter 6). This means that there were multiple alternative appeals to legitimacy which contributed to high fragmentation of prescriptions to guide organizational behavior and the lack of centralization in the field. For instance, the different laws introduced to support a diversified research mandate for the polytechnics were not coherent and prescribed different goals for polytechnic education in general. Then, there were discrepancies between the prescriptions in the law on research and innovation in education and the rules of funding agencies when granting funding for research. The main criteria for research were the same for both universities and polytechnics when funding was sought, yet the research mandates in the law defined research as different. Similarly, the national accreditation agency stressed elements of research which were differently defined in the law (Chapter 6). Experiencing such complexity in the field offered polytechnics strategic opportunities to adapt and respond to new demands. Strategizing has been identified as a key response to changes in the legal, social and political environments (Frølich et al., 2013; Delmas & Toffel, 2008). It has recently been associated with field complexity (Ocasio & Radoynovska, 2016), highlighting how incompatible and conflicting prescriptions from political and social institutions are not serving primarily as constraints to which organizations must respond (Greenwood et al., 2011), but offering strategic opportunities (Durand et al., 2013). Therefore, complex fields are said to generate opportunities for strategic choices leading to differences in organizational outputs (Durand, 2012).

Strategizing in higher education has been related to keeping up with national and international competition by incorporating global trends at universities, thereby acquiring acceptability as a national higher education player in the field (Frølich et al., 2013). This supposedly leads to the incorporation of similar elements by universities and stimulating convergence in response to new policy demands (e.g., Morphew et al., 2016). But the Portuguese polytechnics engaged in strategizing and defined their own research missions (Chapter 6). For example, there was no one way of practicing research, and I deduce that this diversity was both enabled by the experienced complexity in the field surrounding the new mandate and defined by strategic organizational choices in navigating this complex field. I draw on Gibbons' et al. (1994) model of knowledge production to better exemplify the different types of research observed in the Portuguese case. Gibbons et al. (1994) define Mode 1 research as traditional knowledge production processes found at universities. An example would be a research project where a scientist or group of scientists work on disciplinary problems. Mode 2 is socially distributed, application-oriented, and trans-disciplinary. An example would be a network of university partners with different disciplinary backgrounds collaborating on an application-oriented problem with other stakeholders from industry or other public institutions. Mode 3 is context-focused and problem-driven research which originates as an initiative from the industry, company, or community and aims at concrete, implementable and tangible outputs rather than generalizations (e.g. see Carayannis et al., 2009). The difference with Mode 2 is that problems are always defined by industry, and concrete applicable outputs are always accomplished. Mode 2 usually leads to more generalizable knowledge production that aims to shift, redefine and innovate in industry than concrete outputs that solve problems for industries (Gibbon et al., 1994).

My research showed that some polytechnics aspired to become universities and strategically associated research to a Mode 1 of knowledge production. Their research practice was driven by the problems in the disciplinary field and usually developed through bachelor's or master's thesis work. This situation resembled universities where a student picks a topic and does several analyses using rigorous scientific methodologies to advance the knowledge in the topic and embeds the results in existing literature and theory (Chapter 6). Sometimes the thesis resulted in the creation of products or solutions that might be

useful for the region or companies, but this was not a main goal of such research practice (Chapter 2). At the same time, they also engaged in Mode 2 type of research activities. which were fostered through research projects with university or industrial partners and funded by the Portuguese Science and Technology Foundation. They were driven by professors from universities or teaching staff at polytechnics with extensive theoretical knowledge of the disciplinary field and industrial knowledge. They were accompanied by high scientific standards, followed a rigorous methodology and formulated with consideration of application to the industry. However, these projects were scarce as the funding is highly competitive and the criteria for evaluation were the same for universities and polytechnics (Chapter 6). The polytechnic I analyzed associated with these two type of research for a purpose: to be seen as a university. They assumed associating with these two types of research would grant them scientific legitimacy and position them in the field as universities. In this way, they strategically opted to do research in collaboration with universities or which highlighted university tradition. At the same time, the field enabled them to practice research activities selectively due to the existence of multiple prescriptions regarding research practice for polytechnics.

On the other hand, some polytechnics were developing and advancing research activities with a regional focus that were practical and short termed and had problem-solving outputs, similar to the Mode 3 type of knowledge production, besides practicing Mode 1 and Mode 2 types of research (Chapter 2). This is not the most common way to practice research among polytechnics, but it showed that research activities were increasingly being developed in consideration of the impact or consequences for regional companies or community development (see also Mourato, 2014). These research activities also dealt with precise, concrete problems of regional companies and the local community where the goal was to use students to design solutions in shorter periods of time. With this said, the research was short-termed, and the majority of students who participated in such research activities were enrolled in short cycle courses (Chapters 2 and 6). These short cycle courses then provided a model for experimentation and innovation in education which focused on problem solving and practice-based activities and involved regional stakeholders through a myriad of research activities (Chapter 2). This showed that the new research mandate also created opportunities for innovation in education in Portuguese polytechnics that allowed them to

be closer to their local community and regional industry and enabled the polytechnics to be flexible, even in an environment characterized by high levels of uncertainty.

Finally, these polytechnics hybridized research practice in this way. By integrating a Mode 1 and Mode 2 types of knowledge production on the one hand, and Mode 3 on the other, these polytechnics essentially combined research practices with different purposes, goals and, ultimately, identities. Hybridity is defined as the amalgamation of different practices or identities in a single organization (Battilana & Lee, 2014). Hybridity has been considered a powerful organizational strategy in navigating complexity (e.g. Skelcher & Smith, 2015). The higher education field in Portugal signaled multiplicity of different prescriptions in research practice for polytechnics --and legitimacy of all three modes of research in particular -- and some polytechnics opted to integrate all available prescriptions instead of selectively associating to one mode. This suggests that some polytechnics used hybridizing as a strategy to manage experienced complexity in the field.

Taken together, these findings pointed to strategic differentiation in complex higher education fields. This means that experienced complexity in the field influences strategic organizational choices. Due to the existence of multiple legitimacy sources and prescriptions on research practice, polytechnics saw in the new demand an opportunity to redefine their strategic position within the field. Unlike previous studies in higher education which associated strategizing with competitiveness, whereby competition in the field causes strategic choices and most often leads to homogeneity (Frølich et al., 2013), I associated experienced complexity in the field with strategic choices of higher education organizations leading to diversity.

Although these findings are interesting, they are at the same time insufficient in fully explaining strategizing in higher education. The findings only point to the role of the experience of the field as initiator of strategic action, but do not explicate the reasons behind the undertaken strategy; so why does one polytechnic strive to be similar to a university and another to be hybridized? For instance, I was not able to address why hybridizing was chosen as a strategy, just that it was a strategic choice to manage complexity. A better integration of field theory with strategic management scholarship might assist future studies in exploring heterogeneous responses to new demands, while better explaining strategizing in higher education.

Strategic agency as a response to new demands: the role of micro macro incongruences in experiencing field complexity

Simultaneously, my dissertation stressed the importance of individuals' experiences with the field of higher education in non-university higher education organizations and their role as initiators of strategic agency in response to new demands. Strategic agency is defined as an "organizational action concerned with the formation and transformation of organizations, fields, and the rules and standards that control those structures" (Lawrence 1999: 168). Theoretical and empirical studies have, as a rule, found that strategic agency is constrained by the field. In particular, field complexity adds constraints to organizations' and individuals' behavior, since it poses expectations from additional audiences, all of whom must be satisfied for legitimacy (Pache & Santos, 2010). Yet it has also been argued that complexity in the field reinforces strategic agency because of the lack of centralization of institutional prescriptions (e.g., Maguire et al., 2004). In addition, the multiplicity and contestation of different institutional prescriptions offer opportunities for strategic actors (Hallett, 2010; Bévort & Suddaby, 2015). But all of these studies regard complexity and stability in the field as compositional and structural features without taking into account the effects of strategic agents on the situation in their respective fields.

My research showed that individuals who acted as strategic agents experienced their fields as highly institutionalized and incongruent to their cognitive understanding of educational systems (Chapter 3). This seems to have contributed to their experiencing of complexity in the field, though at a micro level. Most of the time, complexity in the field is thought of as incompatibility and contradictions among prescriptions stemming from political and social institutions, or external stakeholders to an organization (also Chapter 5 and Chapter 6), but my findings show that complexity can originate from incongruences among micro understanding of the higher education field. Recent studies in higher education literature advance the idea of these micro "macro" (in other words, field) incongruences which influence organizational outputs. For example, Degn (2016) focuses on the academics' perception of the new institutional demand as an identity threat which therefore creates conflict with the prevailing or dominant logic at field levels regarding the new demand, leading to diversified outputs in organizations. These studies are relatively nascent in the higher education literature, but point to the role of individuals and their understanding of

field conditions in shaping organizational responses. This adds another dimension to my dissertation, whereby micro elements play a considerable role in organizational responses to new demands as individuals might perceive the prescriptions in the field as incongruent to their understanding of the new demand which influences organizational outputs. It also suggests that complexity in fields is not sourced only by incompatibility of prescriptions stemming from political and social institutions to the organization, but can be created if individuals in organizations do not perceive their environment as congruent with the cognitive norms and values that guide their behavior. Future research should unpack the relationship between individual cognitive norms and values that guide their behavior and macro prescriptions in the field that relate to how their (in)compatibility influences outcomes, adding yet another important dimension to research on fields in higher education and new institutional theory and their influence in organizational responses to change and new policy demands.

Limitations and future research agenda for higher education

This dissertation has several limitations. First, there are theoretical limitations as I was not able to address the emergent theoretical concepts in equal strength in both case studies. For example, while the concept of organizational identity was the focal point for analysis of the responses at Dutch *hogescholen* (Chapter 5), and its significance shown in shaping responses and relative to the experienced field stability, it was not succinctly addressed in the Portuguese case. Although identity ambiguity was a prominent analytical finding in the Portuguese case and a result of experienced field complexity (Chapter 6), it was not a central concept in explaining the responses of Portuguese polytechnics.

Similarly, coupling mechanisms were not addressed for the Portuguese case directly. I could deduce that selective coupling was present in the Portuguese case, as one of the strategic responses of Portuguese polytechnics was related to hybridizing. Hybridizing is a selective coupling strategy by which organizations cope with field complexity (e.g. Pache & Santos, 2013). However, the dissertation was not able to delve deeper into this topic nor explain its implications for outcomes. Consequently, strategizing was elaborated extensively in relation to complexity in the Portuguese case as it resulted from data gathered in response to the new research mandate.

Future studies in higher education should aim to investigate interactions among experienced field conditions, organizational identity, coupling mechanisms and strategizing in addressing responses to new demands in a more consistent way. Although the lack of consistency in addressing these theoretical concepts jeopardized generalizations in this dissertation, they nevertheless pointed to some interesting linkages between these concepts that should be explored further. I argued, for instance, that organizations which experience their fields as stable, such as the Dutch *hogescholen*, were characterized by institutionalized organizational identity, which they relied on to perform research, and unintentional decoupling in response to demands to innovate in education. On the other hand, Portuguese polytechnics, which were embedded in complex fields, were characterized by identity ambiguity, strategizing in responding to the new research mandate, and, possibly, the lack of institutionalization of organizational identity and selective coupling (Chapter 2 and Chapter 6). Further research should devote to, perhaps quantitatively, understanding and testing these propositions in a higher number of countries and with a higher number of organizations (both universities and non-universities -- and other settings perhaps) from each country to contribute to theory building. It would be interesting to understand for the future analysis of organizational responses in higher education whether the experience of complexity (at either organizational or individual level) in the national field mediates organizational identity, (de)coupling mechanisms and strategic choices, and/or moderates organizational responses in universities equally as for non-university higher education organizations. Universities differ from non-university higher education in terms of their origins, tradition, and strategy (e.g. Maassen et al., 2012), but could also show different interpretations of organizational identity, way of experiencing their field, the very structure of the field and the policies that affect them. It would be interesting to see if for the university sector the field plays such a role in responding to policy and how it mediates organizational characteristics. Studies in this future vein would significantly advance the field of higher education, but also contribute to the development of the new institutional theory and uncover the dynamics among fields, organizations and responses from a higher education perspective.

Similarly, future studies in organization science should perhaps comparatively, and via quantitative models study, study organizations and their relation to fields. Thus far,

research on fields and institutional and organizational change has been dominantly "process-driven, qualitative, and non-comparative" (Micelotta et al., 2017, p. 20), and the emphasis has been upon field structure, composition, classification and dynamics between and within political and social institutions (e.g. Zietsma et al., 2017). The emphasis of new research should be on the *relations* in the field between institutions and organizations in times of change and their consequences for organizational outcomes or responses to change. By focusing research comparatively and with the use of relevant quantitative techniques (e.g. variance models or multilevel analytical techniques), scholars would be able to assess direct relationships of causality between individual actions and field level change, policy changes in the environment and their effects upon organizational outcomes, and the moderating effect of experienced complexity in the field. These comparative and quantitative studies could enhance theorizing with relevance to organizational and institutional change.

Second, my dissertation also faced methodological constraints. I focused on two case studies and decided to compare countries which are economically and socially diverse. Although this is a valid research strategy of a comparative nature (Patton, 2002; Gehman et al., 2017), I find that more cases should be included which differ in the development of science and higher education policies, tradition, investment in research and higher education, size, population etc. At the same time, by undertaking a qualitative approach, it took substantial amount of time to prepare the interviews and gain access to the organizations. As a result, I had interviewed individuals from one *hogeschool* in the Netherlands and two in Portugal and collected documental data about *hogescholen* and polytechnics at national levels. But I did not sufficiently focus on the fields as most of the analysis was organizational and at individual levels. I feel that a more integrative approach is necessary in order to understand the interaction between fields and organizations that goes beyond traditional qualitative methodologies. Alternatively, a field level ethnographic approach would be suitable for future studies on the topic (Zilber, 2014; Zilber, 2015). This approach studies the organization but also the larger context in which it is situated in depth. For example, it identifies the boundaries of the local field and captures relevant field level changes over time, while at the same time deploying various conceptualizations of inter-organizational spheres in order to enrich analysis and interpretations (Zilber, 2014). It offers

explanations of "micro foundations of field level effects - how meaning are negotiated how roles and interrelations are formed and how rules and norms are set" (Zilber, 2014, p. 86). Field level ethnographers also collect, use and rely on a lot of varied data -- oral, spatial, visual, and performative -- and pay particular attention to narratives and discourse which could enrich the understanding of the phenomena that has been lacking in this dissertation.

Policy implications

This dissertation offers several policy implications in an effort to provide national policymakers with suggestions on how to improve diversification mechanisms in their binary higher education systems and strengthen organizational development of non-university higher education in their countries. It considers these implications within the framework of the major findings of the dissertation, which rest on the relevance of organizational and individual experience of national higher education field conditions, or the relations between social and political institutions and coherency among rules, norms and values that they perpetrate in the field.

Regarding non-university higher education in Portugal there are several issues that policymakers need to tackle. The first relates to current legislation, which does not coherently, consistently or precisely distinguish between the university and non-university sectors in Portugal in regards to education and research. In Portugal, legal diversity seems critical for the framing of boundaries of work for the polytechnics and void academic drift. What I mean by this is that different laws which guide polytechnic education need to be coherent and consistent in order to support a clear role and goals of such education in the Portuguese system and very specifically and precisely differentiate them from university education. Although there are laws which regulate the functioning of these organizations, they are inconsistent, vague, and open to reinterpretation, leaving polytechnics ambiguous. Legal regulations regarding the role, mission and characteristics of polytechnic education would be useful also as a guiding point for other political and social institutions that polytechnics depend on.

In relation to this, accreditation, research funding and rules regarding the careers of polytechnic teaching staff need to be changed and aligned with the new legislation regarding polytechnics. The rules of accreditation, funding and careers of polytechnic

teachers should complement and follow the new legal and regulatory framework which supports and enhances the diversifying role of polytechnics in Portuguese higher education.

So far, accreditation rules are not universal but advance academic drift. For instance, one of the requirements to obtain accreditation of a polytechnic program is to show that there is a sufficient number of teaching staff with doctorates and relevant publications in the field. Rules such as these should be thoroughly revised and redacted in more universal or broader terms to complement binary division in the Portuguese higher education system, or at least to avoid gaps which polytechnics could use as a pretext to advance approximation to universities contributing to academic drift.

Additionally, specific (co)funding arrangements should be designed between the government and the local municipality and community aimed at the promotion of Mode 3 research activities at polytechnics. Such funded research projects should always have multidimensional outputs, organize around local company or community problem and involve externals stakeholders and students actively in its accomplishment. This would in no way limit polytechnics from conducting Mode 1 or Mode 2 types of research activities under different arrangements and funding regimes, but it would significantly contribute to linking Mode 3 types of research activities to polytechnic education and foster diversification. Besides, this would add a central and distinctive element to polytechnic education contributing to institutionalization of identity elements of polytechnics at field levels.

Finally, the statute on careers of polytechnic teaching staff needs to be simplified. Levels resembling university career structure should be abolished, as well as the transitioning to the highest level in the career via aggregation examination, which is essentially an academic evaluation of the curriculum (e.g. relevance of research agenda, publications, supervision of master and doctoral students). Moreover, a completely new guideline for evaluation should be implemented, essentially taking into account three elements: teaching quality measurable by student progress, dissertation project work, and teacher evaluation, as well as peer assessment and assessment by external stakeholders with whom the teacher has worked in projects; research capacity which is not measurable solely by the number of publications, but also reports, projects with industry and community, dissemination of findings in the form of professional papers and organization of workshops and tutorials; and managerial work measurable by time spent in administration and organization of

polytechnic work as engaged actors in society. This represents a simplified structure of the core elements of careers at Portuguese polytechnics. Careers should be accordingly structured around these three core elements, but the percentage of engagement in each of the three activities should be left to organizational discretion and arrangement and may possibly vary throughout the years of service.

This means that there would essentially be three ways of entering a polytechnic career, either as a lecturer, researcher or manager, and for the three roles, the percentage of other activities varies. There can also be variation within the three roles. Lecturers could start off with a certain percentage (highest) level of teaching, and this could gradually decrease to give a higher percentage to research and/or managerial duties. Ultimately, this would require flexibility of hiring criteria. In fact, if the position that a polytechnic opens requires a higher percentage of teaching, then criteria should be different than when the position requires a higher percentage of research and management. For instance, for a more managerial position with a small percentage devoted to research and teaching, a doctorate is certainly not valuable, but professional experience in organizations could be seen as a plus. In this way, the polytechnic is given flexibility in hiring professionals from the field who are interested in career shifts and might be of great value to polytechnics to update their curriculum with current developments from industry. Polytechnics should also have the autonomy and a portion of the overall budget reserved for specific staff needs. For example, each polytechnic, or school, should perform an analysis of its strategic plans and future initiatives and then hire staff on temporary contracts (for which the polytechnic defines criteria) to support these initiatives. This proved critical in the Dutch case in relation to hiring *lectors* to promote the new research mandate. In the case of Portugal, temporary contracts could be focused on either part time lecturing, promotion of regional, practice oriented and problem based research or management support (e.g. related to internationalization, marketing, branding). If a polytechnic participates in an applied project with industry and universities, someone with a doctorate and professional experience might be hired for the duration of the project. On the other hand, if a school of engineering, for instance, has a shortage of lecturers because there were more enrolments than predicted, former master's students or individuals with a master's degree could be hired to lecture

bachelor's degree students. Flexibility and autonomy in evaluation and hiring procedures should be considered.

Portuguese polytechnics should encourage collaboration with municipal organizations and local community to co-host and co-organize workshops, specialized master classes or lectures, tutorials for industry or community stakeholders to enhance their skills, implement a new way of working or change technology. Policymakers could for instance support these initiatives by enable tax benefits or exemptions for societal organizations, municipalities and industrial stakeholders if such activities would take place and result in concrete impact in learning of local community or industry. This would enhance their intermediary function in Portuguese society.

Regarding the Dutch case, Dutch hogescholen seem to primarily function and define themselves by relying on diversification mechanisms. At the same time, from the analysis in Chapter 5 it was clear that they were struggling with the entrance of academic norms and values and ways of doing research into their organizations. It is a direct result of research hybridity and is often perceived as a threat (of losing diversifying identity). In order to minimize the sense of threat, but also minimize reliance on diversifying mechanisms to signal diversity, I would suggest that policymakers propose experimental joint degrees between universities and non-universities in undergraduate programs with concrete roles and goals achievable through engagement with each educational type. Additionally, policymakers should financially stimulate research initiatives among industrial stakeholders, university and non-university educational organizations and teams of students from both higher education organizations to work on concrete industry related problems as part of their (under) graduate curriculum and under the supervision of an industrial employee, a university professor, and a non-university member of the teaching or research staff. Such collaborative initiatives are necessary as *hogescholen* can learn from universities about scientific rigor in research and enhance the validity of their findings for industry in other research projects. At the same time, universities can recognize *hogescholen* as a valuable partner with complementary research role in projects which give *hogescholen* more scientific legitimacy in the environment. Besides, such initiatives would also give *hogescholen* a chance to (culturally) profile themselves as unique and different without the

need for policymakers to constantly come up with diversifying mechanisms to make sure that their function is readily transparent and observable for the broader public.

Likewise, Dutch *hogescholen* seem to partner with industry and local companies in all curricular aspects and at all levels. Perhaps they should be cautious in partnering with industry and community. The problems commonly found in industry and community are temporary and short term; although research at *hogescholen* is organized around these problems, and justifiably so, educational programs should not succumb to pressure to be molded based on industry input. Although valuable, the input of industry in co-designing courses and programs with *hogescholen* should function under a strict framework (for which organizations themselves should be responsible) and include a rigorous revision process against the main quality guidelines of the accreditation process to assure that the learning outcomes are of medium to long term relevance for professions.

Both the Dutch hogescholen and Portuguese polytechnics need to work on their internationalization and global partnership strategy. From my research, observations and (mostly) working experiences in both countries, it is clear that non-university higher education organizations are very local and influenced by local dynamics, yet this does not prevent their global outlook. Non-university higher education provides training about and for the professions, as well as the global challenges that professions increasingly face. A global outlook can enhance innovativeness at local levels in professions. For this reason, international partnerships should be more comprehensively fostered between Dutch and (especially) Portuguese polytechnics. I propose that these partnerships go beyond student mobility and encompass setting up dual or joint degree undergraduate programs, research programs advancing practice based and project oriented research, staff mobility during the third year of undergraduate study, and co-creation of short cycle education or associate degrees with local industry in both countries. I believe these initiatives should be funded and set up by the responsible Dutch and Portuguese ministries with the support from the European Commission and the selection process of participating organizations in such initiatives competitive.

Finally, to ultimately foster internationalization and broader outreach, either national or cross border observations for non-university higher education should be established. This body should be funded by the government, or governments, of several participatory

countries with the aim of investigating and documenting local and global dynamics at non-university higher education organizations and functioning as a networking body among different organizations of this educational type. Besides strengthening their diverse role in their national contexts, this observatory would also play an advisory role for the European Commission in shaping European higher education policies to pay attention to increasing diversification of national higher education systems.

CHAPTER 8

References

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