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Towards an understanding of organizational learning processes in development of competences

A. Takahashi ‡

Purpose – to analyze the process of organizational learning in development of organizational competences in two educational institutions that offer Higher Technological Education Courses in Brazil.

Design/Method/Approach. As for the methodology, the nature of the research is exploratory, with a qualitative approach, and a multiple case study method.

Findings. The results made it possible to conclude that there was a learning process at the organizational level, as new knowledge and new practices had been institutionalized. Based on the data found in each case, it was possible to certify that some competences can be built and others eliminated, shaping the dynamic character of the process.

Theoretical implications. It was possible to corroborate the model used (*Patriotta, 2003*) and propose advances to it, towards an understanding of organizational learning processes in the development of organizational competences.

Practical implications. The manager can see competences in dynamics, changing over time and in the context of the organization, according to the events and changes in their objectives, intentions, and strategies.

Originality/Value. We found that organizational learning is the result of the acquisition of a competence that represents this process. Using a metaphor, it was found that the competences of an organization represent the 'DNA' of the organizational learning.

Research limitations/Future research. This paper analyzed two cases only and new case studies are needed to characterize more fully on these results.

Paper type – empirical.

Keywords: organizational competences; technological education; sense making; knowledge; Brazil.

‡ *Adriana Roseli Wünsch Takahashi,*
PhD., professor, professor of management,
Federal University of Paraná,
Paraná , Brazil,
e-mail: adrianarwt@terra.com.br,
http://orcid.org/0000-0002-4738-5273

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На шляху до розуміння процесів організаційного навчання в розвитку компетенцій

Адріана Розелі Вюнш Такахаші ‡

‡*Федеральний університет м. Парана, Парана, Бразилія*

Мета дослідження – проаналізувати процеси організаційного навчання при розвитку організаційних компетенцій в двох навчальних закладах, що пропонують курси в рамках вищої технологічної освіти в Бразилії.

Дизайн/Метод/Підхід дослідження. З огляду на експлоративну природу даного дослідження, застосовано якісні методи, зокрема метод множинного аналізу практичних прикладів (multiple case study).

Результати дослідження. Виявлено процес навчання, існуючий на організаційному рівні, який з'явився в результаті інституціоналізації нових знань і нових практик. На підставі даних, отриманих з кожного практичного прикладу, стало можливим підтвердити, що компетенцію можна як набути, так і втратити. Зміна у компетенціях підтверджує динамічний характер даного процесу.

Теоретичне значення дослідження. Цим дослідженням підтверджено модель, рекомендовану дослідником Патріотта (Patriotta) у 2003 р. Запропоновано варіанти її вдосконалення у галузі розуміння процесів організаційного навчання і розвитку організаційних компетенцій.

Практичне значення дослідження. Менеджери можуть побачити, як компетенції змінюються в часі і різних організаційних контекстах, відповідно до зовнішніх подій і зміни своїх бізнес-цілей, намірів і стратегії.

Оригінальність/Цінність/Наукова новизна дослідження. З'ясовано, що організаційне навчання – це результат поглинання компетенцій, задіяних у цьому процесі. Використовуючи метафору, визначено, що компетенції організації представляють собою «ДНК» організаційного навчання.

Обмеження дослідження/Перспективи подальших досліджень: У роботі проаналізовано лише два практичних приклади, для більш повного опису результатів необхідні нові тематичні дослідження.

Тип статті – емпірична.

Ключові слова: організаційні компетенції; технологічне навчання; змістоутворення; знання; Бразилія.

На пути к пониманию процессов организационного обучения в развитии компетенций

Адриана Розели Вюнш Такахаши ‡

‡*Федеральный университет г. Парана, Парана, Бразилия*

Цель исследования – проанализировать процессы организационного обучения при развитии организационных компетенций в двух учебных заведениях, предлагающих курсы в рамках высшего технологического образования в Бразилии.

Дизайн/Метод/Подход исследования. Ввиду эксплоративной природы данного исследования, применены качественные методы, в частности метод множественного анализа практических примеров (multiple case study).

Результаты исследования. Выявлен процесс обучения, существующий на организационном уровне, который появился в результате институционализации новых знаний и новых практик. На основании данных, полученных из каждого практического примера, стало возможным подтвердить, что компетенцию можно как получить, так и потерять. Изменение в компетенциях подтверждает динамический характер данного процесса.

Теоретическое значение исследования. Этим исследованием подтверждена модель, предложенная исследователем Патриотта (Patriotta) в 2003 г. Предложены варианты ее усовершенствования в области понимания процессов организационного обучения и развития организационных компетенций.

Практическое значение исследования. Менеджеры могут увидеть, как компетенции изменяются во времени и различных организационных контекстах, в соответствии с внешними событиями и изменениями своих бизнес-целей, намерений и стратегии.

Оригинальность/Ценность/Научная новизна исследования. Определено, что организационное обучение – это результат поглощения компетенций, задействованных в этом процессе. Используя метафору, определено, что компетенции организации представляют собой «ДНК» организационного обучения.

Ограничение исследования/Перспективы дальнейших исследований. В работе проанализировано только два практических примера, для более полного описания результатов необходимы новые тематические исследования.

Тип статьи – эмпирическая.

Ключевые слова: организационные компетенции; технологическое обучение; смыслообразование; знание; Бразилия.

Introduction

This study analyzes competences and learning process based on the Resource Based View (RBV). Organizational learning (OL), as a lens (*Prange, 2001*), allows us to approach the acquisition of knowledge by the organization. Yet, learning involves more than the creation of individual knowledge, including its utilization and institutionalization in the organization. The result of OL is the acquisition of a new competence: an ability to apply new knowledge to improve the performance of a present or future activity. Therefore, the assumption that competences are related to OL is implied in this work.

Despite the fact that some authors have shown that there is a relationship between competences and learning, few empirical studies bring evidences that support it. In an attempt to overcome this challenge, this work was aimed at analyzing the OL processes, which occurred at two Higher Education Institutions (HEI), following the offer of Higher Education Technological Courses (HETC) and the demand for certain organizational competences (whether new or not). The sector of High Professional Education was chosen to hold the case studies.

As for the methodology, the nature of the research was exploratory, with a qualitative approach, using a multiple case study method and longitudinal time perspective. At the end, we summarized the main findings of the research. We believe that there has been an effective contribution to the theory concerning OL, which has been supported by empirical research. Thus, it was possible to corroborate the analysis model used (*Patriotta, 2003*) and suggest advances for it.

Research question

The relevance of learning process in organizations motivate the study to pursue the following research question: *How did organizational learning processes occur in the organizations chosen for the study, based on the offer of Higher Technical Courses (CSTs) and their respective demand for certain organizational competencies (new or not)?*

The deconstruction of the competences developed by the HEIs was the path we have found to unveil the learning processes as well as to verify the convergence between the concepts. Few studies in the literature show the relationship between learning and competences, and this study shed light on this research gap.

Theoretical background

In this session, the concepts of OL, organizational competences and their interrelationships are presented, as well as the theoretical model adopted to guide the theoretical and empirical research study.

Organizational Learning

The organizational theory and practice today have been faced with the preaching of knowledge management and OL. *Prange* (*2001*) consider OL a "lens" capable of revealing a state of some aspect of organizational life. A major issue at the heart of this debate is to define the point of inflection, i.e., overcome the challenge of finding three empirical pieces of evidence: (1) if and when there was learning, (2) how it occurred, and (3) what defines it as organizational. These are basic questions of the theoretical formulation on the issue and at the same time, critical to the practice, since they define the scope of the reality the manager can operate upon.

This study is based on some theoretical assumptions. In this section, they are presented by answering, from literature, in the following order: how the concept is adopted (what OL is), the analysis perspective (how to identify and analyze the phenomenon of OL) and the criteria to identify it (how to determine that it occurs at the organizational level).

The early conceptual elements on OL that will guide this research are: a) the study refers to the OL (descriptive focus) rather than learning organizations (prescriptive focus), b) it refers to a process; c) it involves the notion of change, d) its nature is collective and implicates interaction d) it entails the creation and reflection, inquiry and innovation, e) it is related to the dynamics of knowledge; f) it happens due to a situation and social context, being imbued with cultural meanings g) it is based on a shared history in which meanings that are common to the community are constructed.

The theoretical assumptions should also be aligned with different perspectives or encompass combinations of its elements. Some theoretical aspects favor a behavioral approach, others focus on cognitive elements, and still others, that address the socio-cultural interactions. However, the distinction between the cognitive and behavioral approach is inadequate to serve as a basis for defining the OL because it narrows the limits of the phenomenon and obscures the relationship between the two forms of organizational change (*Mezni, & Nicolini, 1995*). The OL is a phenomenon that needs to be examined in its entirety, since it does not involve only the acquisition of knowledge, but also the role that the social construction of OL plays in forming the organization itself; i.e. it includes the cultural perspective (*Cook, & Yanow, 1993*).

The cultural perspective of learning emphasizes that it becomes collective when it is conceived in a social interaction (*Cook, & Yanow, 1993*). This approach to learning is described as: a) learning semantics (*Corley, & Gioia, 2003*), b) as a set approach (*Patriotta, 2003*), and c) as Social Learning Theory (*Elkjaer, 2003*). Thus, OL is not because the company has cognitive structures like humans do, but because it involves actions and social interactions transcending individual cognition (*Weick, & Westley, 1996*).

This approach finds support in constructivist theories of social science and in organizational studies. Some authors have adopted an integrative approach in studies of OL (*Guarido Filho, & Machado-da-Silva, 2001; Antonello, & Godoy, 2010*). In this work, we chose this approach that integrates the concept of OL regarding changes in behavior, in cognition and in the organizational culture.

The conceptual elements and the prospect of OL, which point out what OL is and how to look at this phenomenon, demand criteria options to consider when it occurs at the organizational level. It is a theoretical and epistemological alignment that enables and supports a theoretical and empirical research. Thus, we sought to define the means or mechanisms by which one seeks evidence of learning at the organizational level. The first criterion selected regards the process of change in the organization, since there is a consensus in the literature of OL on this interface (*Fiol, & Lyles, 1985*).

Table 1

Change and learning*

Argyris e Schon (1978)	*Fiol e Lyles (1985)*	*Barr and colleagues (1992)*
Single Loop: incremental improvements *Double Loop:* reflectivity and values *Deutero Learning*: learning to learn	Lower Level: low impact changes, in a certain activity; functional rationality Higher Level: development of abilities, change in the interpretative schemes	Low Degree: incremental changes High Degree: transformational changes, meaningful in the understanding and in the mental models

*Source: adapted from (*Argyris, & Schon, 1978; Fiol, & Lyles, 1985; Barr, Stimpert, & Huff, 1992*).

Small changes, however, can bring about radical changes. This was shown by the study of *Plowman, Baker, Beck, Kuldarni, Solansky and Travis* (*2007*), on the Mission Church. Small changes can interact with other small changes generating a radical change over time. *Gal and Helmann* (*2010*) note that even though the prospect of change in the composition of routines can be seen as a change that results from a process of learning – a proper perspective, since it demonstrates how organizations respond to stimuli, an evolutionary perspective limits the potential explanation of how a routine evolves. According to *Antonacopoulos and Sheaffer* (*2010*), the praxis (current social arrangement) is based on changing aspects of the routine. Thus, learning and unlearning can occur by the creation of new knowledge or by the disposal of obsolete knowledge, which are complementary processes that result in change (*Srithika, & Bhattacharyya, 2009*).

The process of change in learning can occur in different degrees of depth, involving different levels in the organization. These levels can be: individual, group, organizational or even inter-organizational. Therefore, the level constitutes the second criterion for identifying the type of learning that occurred in the organization. Although many authors argue that the OL can be better understood by means of a joint analysis, *Fiol and Lyles* (*1985*) and *Weick* (*1991*) point out that much of the literature of individual learning does not apply directly to the studies of OL, since individuals and organizations are different types of entities. The collective learning is different from individual learning combined, because it is not an aggregation of individual learning (*Cohen, 1991*). It requires processes of sharing and interaction. Some works explore more specifically the relationship between the individual and OL, such as *Crossan and colleagues* (*1999*) and *Sanchez* (*2001*).

In this study it is assumed that the learning, to be considered of organizational level, should be collective, occur in the social interaction involving dynamically the diverse levels, refer to the process of sensemaking, be awoken by events, and be related to the history, to the values and to the aspirations of the organization. Therefore, the focus of the discussion of OL in this work migrates from the point of identifying the articulation or conversion between levels (becoming) to the question of identifying evidence (being) organizational.

The third criterion is a category which is inherent in OL, another point of consensus in the literature: organizational knowledge. There are a multiplicity of approaches and concepts because it is a difficult term to define. *Prange* (*2001*) emphasized the convergence of OL that leads to some kind of knowledge referred to as routines by *Cyert and March* (*1963*) and *Levitt and March* (*1988*), as knowledge base by *Duncan and Weiss* (*1979*), as theories of organizational action by *Argyris and Schon* (*1978*), as cognitive systems by *Hedberg* (*1981*) or as collective mind by *Weick and Roberts* (*1993*). Among the studies on knowledge, the typology of *Nonaka and Takeuchi* (*1997*) was considered the most popular (*Easterby-Smith, & Lyles, 2003*).

However, *Prange* (*2001*) noted that studies of OL-related knowledge have neglected the processes of knowledge generation and linking these processes with the results. But perhaps one of the most important critical studies of OL and knowledge has been made by *Patriotta* (*2003*): it draws attention to the fact that current theories of knowledge seem to favor the creation of knowledge rather than the dynamics of institutionalization. The author stresses that the to incorporate knowledge into organizational mechanisms as stable structures, routines, procedures, artifacts, implements technological and cognitive maps, is a precondition for effective organizational performance. In this sense, the knowledge is less related with competition and performance, and more with *sensemaking*, existence and ontology (*Patriotta, 2003*).

Therefore, organizational culture and institutionalization permeate the process of OL. *Scott* (*1995*) sees institutionalization as a process and as a variable. As *Tolbert and Zucker* (*1998, p. 201*): "A structure that has become institutionalized is the one considered by members of the social group as effective and necessary, it works therefore as an important driving force of stable patterns of behavior." This theory suggests that organizational culture and practices are not the result of a self-learning process, or at least not exclusively, but that emanates from what is institutionally rooted in society. For Child and *Heavens* (*2001*), the implications of these considerations are profound for the OL, not only because they suggest that organizational practices are supported by rules and conventions that have social approval, but that practices related to OL are designed from what is legitimate in terms of being institutionally defined.

However, the deinstitutionalization process can also occur, being the "process by which the legitimacy of an institutional or organizational practice is stabilized, depleted or discontinued" (*Oliver, 1992, p. 564*). Thus, the interplay between institutional and cultural elements and learning becomes explicit and seems to help in understanding its process within the organization. *Berend and Lammers* (*2010*) studied the OL in an international bank with European roots on the model of *Crossan and colleagues* (*1999*) and found times when the learning trajectory was interrupted and microprocesses were discontinued. Proposals for changes in reward systems and issues of policies and power blocked the learning process.

Integrating the Concepts of OL and Competences Development

The literature has shown evidence of integration between OL and organizational competences. For *Hamel and Heene* (*1994*), the slow and steady accumulation of learning is the core of competences. The result of learning is the development of organizational competences or acquiring a new competence (*Weick, 1991*). *Barbeschi and Chiesa* (*1994*) point out that learning is the process that allows a continuous adaptation of competences in the light of experience and information. The OL presents itself as a key to understanding the development of competences. And the development of competences is one way to understand the processes of OL.

In general, the idea of competences emerged from the work of *Penrose* (*1959*) and the evolution of the so-called RBV (*Wernerfelt, 1984*). The concept of competences gained strength from the concept of core competence formulated by *Prahalad and Hamel* (*1990*), which is the ability to combine, mix and integrate resources, products, and services. For *Mills and colleagues* (*2002, p. 19*): "An asset is something that the organization owns or has access to, even if temporary. And it is from these resources, tangible or intangible, that competence is built. Among the many classifications of resources found in the literature, we opted by the classification of *Mills and colleagues* (*2002*), in which resources can be tangible or intangible: physical resources, financial resources, knowledge, competences and experience, systems and procedures, cultural resources and values; resource networks, and dynamic resources (important resources for change).

Hamel and Heene (*1994*) point out that the notion of core competence contributes to the already existing theories of strategy and competitivity, being more of a *yang* opposing the dominant and current *yin* of the strategic theory, i.e, it consists of an additional lens to see the issues of competitivity and performance of the organization. To *Drejer* (*2000*), the concept of competences is only the latest, but perhaps the best of a number of concepts to explain the company's competitiveness.

The concept of event (*Zarifian, 2001*) points out that professional competence cannot be used only associated with the implementation of tasks in jobs. For the author, event is some sort of unexpected occurrence that springs from the problems caused by the environment, which puts innovation into motion. This concept is important because it allows for the setting of a baseline for the research. *Machado-da-Silva, Fonseca and*

Crubellate (*2005,p. 32-3*), when referring to the methodological designs for empirical research that meet the requirements for a systemic-process approach, point out that: "Pictures of a social setting, typical of a cross section, may constitute the first step in a process of historical and longitudinal research to unveil the film that led to that setting."

Isabella (*1990*) and *Beck and Plowman* (*2009*), when dealing with rare events, add occurrences to understand factors such as creation of meanings, discontinuity of routines, change, sensemaking and learning, resulting in changes in the institutionalized values. *Christianson, Farkas, Sutcliffe and Weick* (*2009*) points out that the latent potential for recombination of responses experienced (routines) does not become conscious until an interruption calls attention to the process. Or, in the terms of *Jett and George* (*2003*), events are discrepancies that disrupt the processing of information related to the task, being perceived as inconsistencies between the knowledge and the expectations about what will occur in the environment.

Mills and colleagues (*2002, p. 9*) relates competence to the performance of activities necessary to the success of a company. The organization may have a certain strength or an activity of high or low competence, depending on whether it outperforms most of its competitors in a competitive factor that customers value or if it is below the performance of most competitors. Given this, the authors define competence as a way of describing how well a company performs its activities required for success. These competences should be seen as a variable instead of an attribute, i.e., something the company has a certain degree of and not something the company has or does not have. To assess the competence of the organization, the authors developed a five-point scale considering the competitors, ranging from very low to very high.

A relevant consideration on the competences is made by *Le Boterf* (*2003*) stating that organizational competence is not equivalent to the sum of the capacities of members, but the result of cooperation and synergy between them. The synergy from the Greek, is composed of *syn* (together) and *ergos* (work), and so it is a value and not a sum. This is a crucial argument that distinguishes levels of analysis as far as competences are concerned.

Among the types of competences identified in the literature (e.g., *Zarifian, 2001; Drej, 2000*), we chose *Mills and colleagues* (2002) typology, that classifies them as: core competence, distinctive competence, organizational competence or of business units, support competences and dynamic capabilities. The authors stress the importance of evaluating both technical and support competences, and decompose the constituents of each type of competence, to understand the organizational competences. The model designed by this author was adopted since it is one of the few to establish categories of competences already used in similar studies.

Thus, competences are not necessarily static, although they tend to persist despite the entrances and exits of individuals. They are embedded in systems, mechanisms, and structures of the organization, and diffuse in people, technologies, and structures (*Turner, & Crawford, 1994*). Competences can both be developed or dwindle over time, and this might not even pose a problem for the organization as long as that power has lost its importance. The *reshaping competences* as called by *Turner and Crawford* (*1994*) allows for change and remodeling of activities. From this dynamic view of competences, *Sanchez and colleagues* (*1996*) and *Sanchez* (*2001*), when studying the dynamics of competition based on competence and competences development, present the concepts of maintenance, construction and leverage of competences. According to the authors, the change of organizational goals can lead to changes in competences. As competences take time to develop, firms typically allocate resources to build competences (create new assets, capabilities and modes of coordinating assets and capabilities), while others will be used to leverage competences (apply competences already existing in the market). Thus, in seeking to balance long- and short-term goals, the firm can use its resources in a distinctive mix of activities to build and leverage competences.

Teece, Pisano and Shuen (*1997*) formulated the concept of dynamic capabilities to investigate how organizations develop and renew their competences in response to environmental changes. As there are extremely difficult factors to be marketed as values, culture, experience, and organizational competences generally cannot be acquired, but must be constructed, which can take years and even decades. One of the few studies that support this relationship is by *Patriotta* (*2003*), which is highlighted by its theoretical, methodological and empirical contribution. His research helps to understand the process of OL and establish a roadmap for further empirical investigations. For these reasons, this model was adopted as a reference in this work.

The Model Adopted – Patriotta's Model

An important consideration of *Patriotta* (*2003*) is that tacit knowledge is more intricate than the literature in administration seeks to present. That is, tacit knowledge is not a property, it is related to the problems of pre-interpretation. The author uses phenomenology as the intellectual perspective and the ethnography as a research strategy to get immersed in the creation, use and institutionalization of knowledge.

In this study, the author considers that the configuration of knowledge is affected by three important factors: the history, since knowledge stays at the background as a result of sedimentation of learning experiences through time, the habit, for when knowledge is deeply internalized and institutionalized one tends to use it almost automatically, and experience, since tacit knowledge is related to it by definition. Lenses, in general, focus discontinuity on providing a way of looking at the tacit characteristics of the system of organizational knowledge. The dynamics of knowledge creation in reverse can be seen below.

The resulting model for the study of *Patriotta* (*2003*) shows how competences have been built and maintained and how they relate to learning processes. His longitudinal study was conducted at the Fiat factory and involved three case studies in two industrial plants. The first two were conducted in a new plant (greenfield) opened in 1994, the first being related to the planning and design of the factory and the second to the operation of this plant. The third was held in an old industrial plant (brownfield) opened around 1950 and active ever since. Each of the three cases studied showed different results.

In the first case, the progressive appropriation of the factory resulted in the acquisition of competences based on the identity of the factory assembly experience in the field of construction and the assembly task of the car on the shop floor. Learning seemed to occur in the form of processes of appropriation of knowledge connected with different aspects of work: the role, task, product and production process, and more importantly, the work itself. An intense socialization process occurred, where learners had a proactive role in acquiring knowledge. In this case, the author found the source and the result of knowledge in the dimensions of: project design, recruitment and training, and construction of work.

In the second case, when the Melfi plant was put into full swing, a new institutional order was created. The knowledge then transferred to impersonal mechanisms as routines, processes, artifacts, and technology. The competences acquired during the construction phase were applied in the practical context of the production process. The exercises with cars allowed the competence to be built around the task. It was through the construction of the plant that workers learned the practice of assembling that fed a core competence on the factory floor: the competence to assemble a car.

In the third case, held at the Mirafiori plant, knowledge is socialized by the narratives, or 'detective stories' as *Patriotta*

(2003) calls them. These narratives provide employees guidelines for the conduct based on the recurrence of stories of interruptions, functioning as storage devices and receptacles for the organizational memory. The resulting learning process promotes the internalization of such stories as part of the knowledge acquired in the workplace.

These three cases show different ways of anchoring, replicating and institutionalizing knowledge. Based on this empirical research, the author generalized and justified the construction of a theoretical model of knowledge in organizations. The cycle of knowledge systematically links the content of knowledge, the process and the context. In this model, the main contents of knowledge in the three cases were identified: projects, practices and common sense. Figure 1 shows the characterization of the major standards of knowledge that emerged:

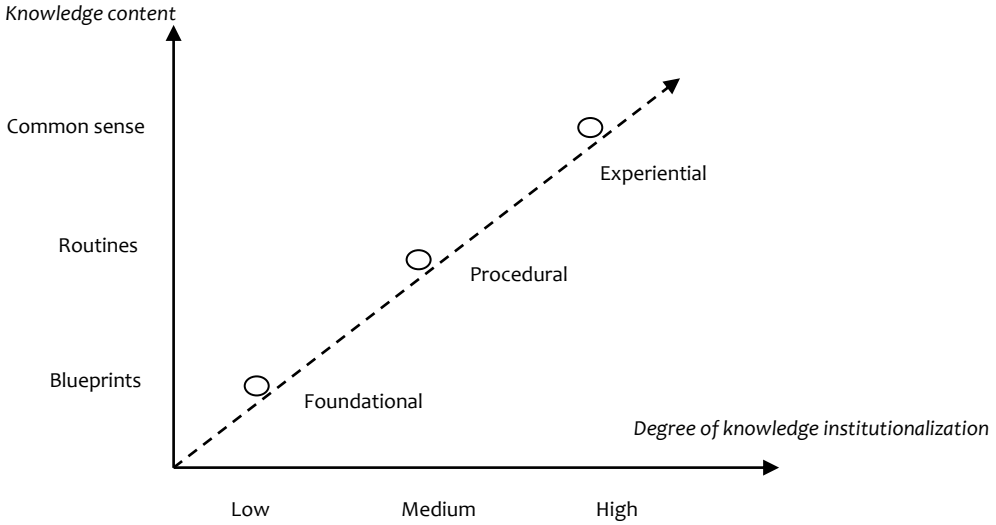

Fig. 1. Classificatory system of knowledge in organizations*

*Source: (*Patriotta, 2003, p. 193*).

The intersection between content knowledge and degree of institutionalization resulted in a classification system with specific types of knowledge: a) foundation, linked to the design of the organization, the nature of knowledge related to the origin of that knowledge reflected in the organization, to the design, b) procedure, for the routinized nature of organizational action in consolidated workplaces, and c) experience on the more mature stages in the evolutionary trajectory of knowledge and organization.

Subsequently, this study was resumed by *Patriotta and Lanzarra* (2007) because of a strike in the Melfi plant, causing a breakdown of the current model of production. The authors found the recursiveness of the process of institutionalization of knowledge that involves the reproduction of a code (template) within a stable environment. The authors consider the strike a critical incident, or event that produces new information to the institutionalization of knowledge. An old industrial order is effective in place of the climate of joint construction of the plant, i.e., a discontinuity in the process of institutionalization, as questions arise in the belief that the process that existed could actually be controlled by self-reproducing routines.

Thus, it is proposed that the OL refers to the process of transformational change, involving the various levels (individual, group, and organization), by which the creation, use and institutionalization of knowledge occurs. It operates within the collective, encompassing cognitive, behavioral and cultural aspects. Its content is knowledge itself, the source and result of its *background* (history, habits, and experiences), expressed in the development of organizational competences (acquisition, leverage or maintenance).

Methodology

The analysis of the concepts depends on the assumptions that the researcher uses, and the angle of view of the organizational reality, because science is basically a process of engagement between scientist and object of study. The same object can produce many different kinds of knowledge, since there are different ways to study the same social phenomenon (*Morgan, 1983*). Below, we present the assumptions adopted to address the phenomenon outlined.

Assumptions for the Approach to the Organizational Phenomenon

Ontologically, this study takes neither extremes of subjectivism or objectivism, because the social world outside the knowledge is not only made up of tangible concepts or structures, but of an objective reality with different interpretations of individuals who have a subjectively established meaning (*Berger, & Luckmann, 1996*). According to the authors, the reality is socially constructed by man, and is a product of social interaction. Individuals are also social structures that, when interacting, build the social world (*Scott, 1995*).

Epistemologically, according to the classification of the paradigms of *Burrell and Morgan* (1979), this work stands as predominantly interpretive. That is because it focuses on cultural and interpretive aspects and is consistent with the concept of a reality socially constructed as a result of social interaction (*Berger, & Luckmann, 1996*). In interpretative sociologies the priority is of action and its significance in the explanation of human conduct (*Giddens, 1989*). This view seems to be relevant to the study of competences and OL by considering the interaction context historically and socially situated, from the integrated perspective.

Research Design

Theoretical and empirical research on OL related to the development of organizational competences are scarce in the literature. For this reason, the nature of research is exploratory and essential for the development of the proposed research, since it can generate new ideas and discoveries (*Selltiz, Wrightsman, & Cook, 1987; Yin, 2010*). The methodological approach adopted is qualitative, since it is consistent with the

proposed topic and the nature of the research (*Richardson, 1989; Creswell, 2002; Merriam, 2009; Yin, 2011*).

For the exploitation of these research questions, we adopted three assumptions. *Eisenhardt* (*1989*) highlights some important aspects to avoid superficiality in the case studies and theoretical constructs, one being the adoption of assumptions rather than research hypotheses. The assumptions are:

A1 – organizational competences are dynamic, not static, and are developed through the articulation in the various categories of resources;

A2 – OL involves significant changes in the coordination of resources, it is collective and occurs in the social interaction at work, and implies the institutionalization of knowledge (records in the organizational memory, legitimacy and incorporation into the routines and practices);

A3 – there is a relationship between processes of OL, knowledge and development of organizational competences.

Case Study

The case study was chosen because it is a research method that focuses on understanding the dynamics present within an environment (*Eisenhardt, 1989*), and answers questions like 'how' and 'why' (*Yin, 2010*), allowing an in-depth look into the phenomenon (*Richardson, 1989*). For purposes of this study, we carried out a multiple, non-comparative study with two cases, in order to obtain more solid results (*Yin, 2010*). Specifically, in the field of OL, the use of case studies has been recommended for several years (*Easterby-Smith, & Araujo, 2001*), since they point to a scarcity of studies with empirical research. *Antal, Dierkes, Child and Nonaka* (*2001*) point out that more researchers in various cultures and with different *backgrounds* and approaches must address these issues, leaving the comfort zone, and that there is little or no research on the experiences of organizations in South America, which is the case of this research conducted in Brazil.

According to *Yin* (*2010*), a case study project must maximize some conditions to determine the quality of the exploratory research: construct validity, external validity and reliability. To ensure construct validity, we used multiple sources of evidence. Internal validity was ensured using theoretical analysis patterns. External validity was established using theory in each case study and the use of replication logic in multiple cases. Reliability was assured using a case study protocol and a database for case studies.

Temporal Research Perspective and Historical Approach

The perspective of the study is longitudinal and historical approach. This approach seems more appropriate to the studies of OL, as noted by some authors. The studies, both in Brazil and other countries, have been conducted predominantly with a cross-temporal perspective, which have limited understanding of the phenomenon as a process of OL.

The historical approach has been used for assisting the studies of OL involving change, transformation, processes, routines, practices, perception, intersubjectivity, memory, among other factors (*Fear, 2001*). Thus, the approach provided a historical perspective, a basis of experiences lived and basis for the contrast, providing an advantage to reflect their own OL.

Data Collection

In this study the primary and secondary data were collected from: documentary research, non-participant observation and interviews. In qualitative research, researchers use theory as a broad explanation, a theoretical lens or perspective to guide their study. In these research, there is also an end point, an established standard, or a generalization that emerges inductively from the data collected and analyzed (*Creswell, 2002, p. 140; Eisenhardt, 1989*). This involves asking what is similar, which contradicts, and why. For this purpose, we used a literature search.

We can say that general rules for drawing up and implementing data collection instruments were observed not only to minimize possible limitations but also to ensure the quality of the instrument adopted. Data collection covered the two organizations and 39 interviews. The contact was almost daily, allowing an intense familiarity with the actors.

Analytical Techniques

For the analysis of documents collected within organizations, we used the technique of documentary analysis, described by *Bardin* (*1979*). For the assessment of competences, based on the application of the scale of *Mills and colleagues* (*2002*) that ranges from very low to very high, we used the frequency analysis. The data of observations were recorded in a diary, made for each of the two HEI surveyed. The interviews were analyzed using the techniques of thematic content analysis (*Bardin, 1979*). The technique of triangulation was used to obtain further conclusions (*Triviños, 1987*).

Empirically, in selected cases, we applied the logic underlying the methodological model by *Patriotta* (*2003*). The author used six cases in two industrial plants of the same factory (Fiat); each case corresponds to one of the three phases of the process studied in each of the plants. Here we analyzed two cases, which represent six specific situations in two different HEIs: pre-deployment, deployment, and post deployment of technological courses. One of the phases, called 'future', emerged from the analysis of data, which refers to the continuity of HETCs at the HEI and in the country.

Population and Sample

The identification of the population and sample occurred by means of HEI survey of suppliers in the city of Curitiba, located in the state of Paraná-Brazil. The population in this work is composed by the HEI that offer HETC in Brazil. We considered the logic of the organizations studied, which is the provision of educational services, that are knowledge-intensive, which is set against the industrial logic.

The HETCs are undergraduate courses in Vocational Education (equivalent to Associate Degrees), which has specific characteristics such as being short compared to other undergraduate programs (which confer the Bachelor Degree), having specialized focus on a specific area, for example, Human Resource Management or Public Administration, meeting the market demands, having different methodology focused on theory-practice relationship and being flexible and interdisciplinary in its curriculum. The network of private institutes was responsible for 70% of HETC in Brazil. Laws from 1996 and their subsequent regulations consolidated the vocational training courses as a form of higher education for professionals. In this scenario, new competences are demanded of the HEI to offer HETCs, which, for many, represented an opportunity for growth and renewal.

The selection of organizations for the case study was due to the accessibility and convenience (*Yin, 2010*). In the collection period, 38 HEI were identified, regardless of offering HETCs or not. Among these, at a later stage, we selected those that offered HETCs in the city of Curitiba, adding up to 18 institutions. In a third step, we analyzed the possible cases for study based on the criteria established. Finally, two HEI proved to be accessible and available to participate meeting all criteria: a unit of CEFET Curitiba-PR (Federal Center of Technological Education of Parana, now called the Federal Technological University of Paraná) and CET OPET (Center for Technological Education Opet Group).

Some authors (*Stake, 1994; Eisenhardt 1989; Yin, 2010*) stressed the importance of selecting cases that could bring significant contributions to the study. This was true for the two selected

cases. The first was a pioneer in offering HETC in 1999, even before the construction of the curriculum guidelines of 2001, the second was the first educational institution in the private sector in southern Brazil to offer HETC. Thus, the two accumulated industry experience, which made the cases richer in history and facts.

Respondents were selected from each institution according to the position held by them (managers/headmasters), and according to their involvement with the technological courses (senior teachers). We had the participation of members of the presidency, unit directors, officers and / or administrative and teaching managers, course coordinators, deputy coordinators, secretaries, aides and teachers. In CEFET-PR, we performed a total of 22 interviews, recorded and transcribed, totaling 383 pages. Among the leaders of the Opet Group and the TEC OPET, 17 interviews were conducted, recorded and transcribed, totaled 333 pages.

Limitations

As for the criticism to existing case study, some care has been taken (*Yin, 2010*). In relation to the critical lack of methodological rigor, due care has been taken in both the planning and data collection and analysis, as well as methodological procedures were precisely defined.

Regarding the criticism that these studies take a long time and often their results become inconsistent, the time was planned by means of a schedule, and although the survey time was long, between 2005 and 2007, with further analysis until present, it was enough to reach saturation in the data analysis.

Regarding the criticism of having difficulty in generalizing, since the cases provide little basis, we used two cases where each was analyzed, then an analysis of the two cases was performed, seeking new insights and standards. It is emphasized that the purpose of the case study is not statistical generalization, but to provide an overview of this issue in depth. As it is well expressed by *Eisenhardt (1989, p. 448)*, "The purpose of a case report is not to represent the world, but to represent the case."

Results and discussion

In this section, we present data analysis of the context and organizational values identified in the two HEI, the events, the competences evaluated, the process of implementing HETCs and, finally, the analysis of the inter-relationship between OL and competences development.

Context and Organizational Values

The first step of the analysis was to identify the data from HEI and its values. CEFET-PR opened in 1909 and, since 1999, has offered HETCs, the same year they made the necessary adjustments to plead for the transformation of the institution into the Federal Technological University of Paraná (UTFPR).

The organizational values identified in the data analysis are: quality - understood as a discipline, rigor in teaching practice, planning and excellence; interaction with the market - in the sense of employability of the student, school-business integration, identity with technological education - as part of professional education and technology that turns to research and innovation. The history of HEI shows a century of tradition and affinity with the professional and technological education, which enabled them to build their identity.

The Opet Group organizational constitution and historical features are quite different. This is a private company and a family business. Founded in 1973 from the entrepreneurial vision of its founder, who came from the interior of Parana to Curitiba in order to complete his studies and open his own business, it started its activities with courses in typing and, later, with free courses in management. In 1985, with the advent of computer technology, Opet joined that branch and in 1986 began to offer regular and technical courses. The Opet business grew and now has schools, colleges, and their own publishing company. In 1999, already as Opet Group, created the Center for Educational Technology (CET-Opet/TEC-Opet), starting to offer the HETCs from 2001. The TEC-Opet is a business unit of the Opet Group and was the first private educational organization in southern Brazil to offer such courses under the new legislation. Currently, they offer HETCs in several areas, including management.

The organizational values identified are: quality - understood as teaching for practices and contextualized in the work, integrity and commitment, market orientation - as a link with the needs of the labor market, combined with the productive sector and school-business interaction; with vocational identity - such as vocational and technological application of such knowledge. Born out of an entrepreneurial vocation, the Opet remained concerned with the theoretical context in daily practice and work to meet the needs of businesses.

The values are related to the history of each institution, their experiences, their aspirations for the future and its inclusion in the sector (public and private) schools. These values have guided the decisions before the events, legal and regulatory requirements, and guided their actions in the implementation of technological courses.

Events: Interpretation and Decisions

It is considered that the events triggered a crisis that drove to the decision to offer the HETCs. To this end, it was necessary to develop competences, which were then analyzed. In this sense, the picture of organizational competence was relevant as a step to see the processes of OL.

In both cases, we identified the legal and regulatory changes occurring in vocational education and technology as main events in promoting the decision to offer HETCs. They were the National Education Bases and Guidelines Law (LDB) of 1996 (BRAZIL, 1996), especially n.2.208 Decree of 1997 (BRAZIL, 1997a) and the Decree n.646 of the same year (BRAZIL, 1997b), which prohibits the provision of technical courses integrated to high school, an activity that was central in both HEIs. Other factors, however, influenced this decision: in the case of CEFET-PR, their leaders' desire to transform it into a university (organizational factor); in the case of Opet, the opportunity to be a pioneer in offering this type of education in the Private sector in the southern region of the country (entrepreneurial factor).

These changes have caused significant impact on CEFET-PR. Given this conundrum, there were two possibilities: offering courses in high school and vocational-technical courses concomitantly, at a different period/schedule and/or offer post-secondary technical courses, or change the teaching focus entirely to undergraduate courses (higher education).

CEFET opted for offering HETCs, positioning itself in undergraduate courses, which occurred not only because of the new legal restrictions, but also to the latent aspirations of their leaders in transforming the institution into a university. Respondents agreed that this was a difficult period for the institution, since the implementation of the HETCs was permeated by uncertainties, conflicts and anxieties before the challenge they were facing.

In the case of CET-Opet, the impossibility of offering integrated technical courses was directly superseded by the initiative of offering HETCs. With information obtained through business networking, the president of the group identified a new market opportunity that could fill the gap caused by the new legislation. Hence, deciding to offer the HETCs and being a pioneer in this type of education in southern Brazil, a factor that gave them a competitive advantage for several years. The projects were developed in 2000 and the first group started in 2001. This process was also permeated by uncertainties and fears about the

acceptance of HETCs in the market, but the initiative of the president of the institution did not generate significant conflict. Because the new courses would be offered in a new unit of the institution, it took several actions such as program design courses, permitting the operations, recruitment and training of employees, in addition to actual construction and implementation of the education program.

Evaluation of the Organizational Competences

It can be seen that both HEI, due to their background, already showed significant harmony between professional education and their organizational values, which was undoubtedly a facilitator of the process; however, the features demanded by the teaching of HETCs, as well as its management, were quite different.

The data analysis, according to the typology adopted (*Mills et al., 2002*), allows us to infer that in the learning context, CEFET-PR has the essential competence of **offering technology-based courses.** This competence seems to be related to the identity of the institution, which was built valuing an education focused on teaching and on applied research. Thus, it extends to several levels in which the institution operates, as well as to all units. However, by focusing on the unity of Curitiba, a cross-section of the research, the ability to **offer the Higher Technological Education Courses** is highlighted as an organizational competence.

To develop the organizational capability of offering HTECs, three activities were found to be relevant and, therefore, were classified as support competences. They are: keeping a qualified faculty, who are constantly keeping up-to-date, provide a physical structure, i.e., a building or facilities, that allows the practical activities prioritized by the course to be developed, keep connected to the market and its demands regarding the offer of technological courses. These are considered support competences since they are valuable in keeping the organizational competence (*Mills et al., 2002*). These three competences were leveraged and combined support of a new form in light of new demands. An organizational competence was developed and the core competence was maintained *(Sanchez et al., 1996; Sanchez, 2001*). However, according to respondents, it is still necessary to improve the organizational competence of offering HETCs,

At CET-Opet, the essential competence identified was of **offering courses that meet the needs of the market.** This competence is aligned with the background of the institution and with the organizational values of school-business interaction in professional education. According to respondents, to develop the organizational capability of **offering Higher Technological Education Courses** it was necessary to incorporate critical knowledge as well as to perform profound changes in the institution. Three activities were considered relevant for the construction of the organizational competence, thus representing the competences of support (*Mills et al., 2002*). They are: offer Higher Education Technological Courses that are aligned with the needs of the market, teach and evaluate according to the principles of post-secondary education and keep a faculty who have practice and remain active in their fields of work.

In short, to develop their organizational competences, the TEC-Opet had two competences to leverage existing support - offering HETCs in synergy with the needs of the labor market and maintain a faculty of teachers with practical experience - and build a third: to teach and assess according to the principles of technical education. This process took years and is still changing, which can be verified by the testimonial of one of the teachers interviewed: "*Just as our students build their competences throughout the process, OPET has been building its competences throughout the process as well*" This finding was already noted by *Teece and colleagues* (*1997*), for whom the competences and abilities can take years and even decades to be built.

Advancing on the use of the competences assessment scale of *Mills and colleagues* (*2002*), we analyzed the strength or weakness of the competences of the organizations studied in relation to its competitors. As a result, we found that the organizational capability of offering HETCs was assessed as **very high** by all 22 respondents from CEFET-PR and 13 of the 17 respondents from the CET-Opet. Over 90% of respondents viewed this competence as highly developed in their institutions.

The data presented below about organizational resource changes (VBR) and flow of knowledge (IT), obtained from the analysis of the competences assessed were organized according to temporal logic, from the events.

Phase I: Pre-implementation of Higher Education Technological Courses

During pre-implementation, we used as a reference the structure of sources and results of the process of knowledge creation in stages outlined by *Patriotta* (*2003*): project design, recruitment and training, and construction of work.

In the case of Curitiba unit of the CEFET-PR, the decision of offering HETCs was initially not received warmly by all teachers. The first step was to adapt the change of structure adopted by the technical courses at HEI. In the case of CET-Opet, employees of the unit where the TEC would be implemented were informed of the decision, which created some concern, but low level of conflict. This difference found can be explained by the legal constitution of each HEI, for the first is public and the second is private and thus operate under different logic.

The first step was to design projects and prepare for deployment. For this end, it was necessary to create the designs of the courses, recruit and train people, build the work, to finally operationalize the HETCs. The first steps generated knowledge that was sought internally and externally, until the courses were in full operation.

The design of the HETCs projects unit in Curitiba-PR CEFET occurred at a time when the legal standards were not yet fully formulated. The knowledge base was the experience with courses in other countries with which the institution has exchange programs, a pilot HETC project implemented in another unit of CEFET-PR even before the change of the LDB, organizational values and competences that had been developed in the provision of courses.

In CET-Opet, the participation of leaders in the emerging discussion forums HETCs that were occurring in Brazil allowed the acquisition of knowledge about the principles of the courses. Internally, the experience with professional education and organizational values of education, together with the knowledge brought by the consultants hired, allowed the sharing of specific knowledge relating to the design of the courses. The construction of the work in CET-Opet demanded certain creativity, because it was mainly based on interpretation of laws and guidelines (theoretical knowledge) and not based on observation or experience (practical knowledge).

Phases II and III: Implementation and Post-implementation of Higher Education Technological Courses

In the implementation and post-implementation phases, based on the classification of resources of *Mills and colleagues* (*2002*), several changes occurred in all categories of resource investigated. We analyzed each of them and found the degree of depth of change and the knowledge obtained. The following table summarizes the analysis of the two organizations by resource category and level of depth of change.

Table 2

Change and knowledge in the implementation of the Unit HETCs: CEFET Curitiba-PR and CET-Opet

Resource category	Knowledge (about)	Depth of Changes	
		CEFET/PR	*CET -OPET*
Tangible resources	Legal requirements-physical structure	Incremental	Transformational
Knowledge resources, competences and experience	- HETCs (design, structure) -Methodology of teaching and practice - teaching / assessment	Transformational Incremental	Transformational
System and procedural resources	-Management of HETCs -Domain of the education system	Transformational Incremental	Transformational
Cultural resources and values	-Incorporation of new assumptions and preservation of core values	Transformational	Transformational
Network resources	Market-work of technologists	Incremental	Transformational
Resources important for change	-Monitoring of environmental pressures and the ET HETCs	Transformational	Transformational

Source: Elaborated by the authors.

In the case of the Curitiba unit of the CEFET-PR, it was observed that some changes were incremental and located in a particular activity, and other changes were significant because they were focused on understanding the character of the institution itself, its mental models, values, and involved the development of competences. For this reason, they were transformational. The first led to the single-loop learning, of lower level, or even low degree. The second led to double-loop learning, higher level, or even a high degree by altering the assumptions of organizational actions (*Argyris, & Schon, 1978; Fiol, & Lyles, 1985; Barr, Stimpert, & Huff, 1992*). Core values were kept and new values were internalized. During this period, the project of transformation of a Federal Center into a Federal University of Technology was approved. The successful experience of change for the higher level of technology education led to the breakdown of the current paradigm and the creation of a culture oriented to a technology-based higher education.

In the case of CET-Opet, it was found that all changes in the various categories of resources were of significant impact, reaching the organizational culture. Therefore, according to *Barr and colleagues* (*1992*), they were transformational. This depth of change highlights the occurrence of double-loop learning, higher level, or even high-degree (*Argyris, & Schon, 1978; Fiol, & Lyles, 1985; Barr et al., 1992*). The TEC-Opet, being a new unit, developed their own assumptions about professional education, and on HETCs about the way it operates. Since this is a different type of education, she applied to the internalization of specific knowledge and expertise. As for the organizational culture, and the incorporation of the core values of the group, there was also the solidification of their own values of acceptance, recognition of the validity of professional education, the methodology adopted and the way they work. His impact was significant enough to guide the development of a particular method of teaching and assessing, as this coordinator said: "*Every working system of the associate, assessment by competence, modular system, i.e., all this assessment and curricular organization is something that the Opet had to learn.*" Thus, the practices were incorporated into becoming a stable standard set of routines. Finally, the HEI was able to position itself as a unit of and in the Opet Group.

The experience of deployment of HEI, of overcoming initial fears, the recognition and legitimization of the courses are some of the main outcomes at the end of the three phases.

Phase IV: The Future of Higher Education Technological Courses

This was a phase which emphasizes the need for Institutions to Evaluate the incorporation of acquired knowledge into the organizational memory and culture through inclusion in its strategic intent.

In the case of CEFET-PR, the offer of HETC and transformation into a university (UTFPR) were steps that are already consolidated in the history of the organization, according to a coordinator: "*Today, since we already offer technological courses, there would also be the possibility of offering the technical course integrated to the high school again. But it is just now that we understand that this space is not interesting for the Department anymore, because we have made headway*". New courses will be created, while current ones are modified or discontinued. In the case of CET-Opet, after a significant growth in its years of existence, its future plans involve the consolidation and expansion of HETCs diversity courses. Aiming to meet the demand for new courses and a consequent increase of students, new changes are planned in the physical resources of the HEI.

OL and Competences Development – Cross-Case Analysis

In both cases studied, there are some patterns. The organizational competence of offering HETCs is aligned with organizational values, which facilitated the allocation of resources for its development. These findings attest to the claim of *Barney and Hersterly* (*1996*) that the company's history is unique and that some of its features can be hard to replace, or imitate, such as the organizational culture and reputation. Thus, while some organizational competences were maintained and leveraged, others were built (*Sanchez et al., 1996; Sanchez, 2001*).

Throughout the process of implementing HETCs, knowledge was incorporated and profound changes occurred in the articulation of resources, marking a learning process at the organizational level that enabled the development of the organizational competence (*Prahalad, & Hamel, 1990; Weick, 1991, Mills et al., 2002; Patriotta, 2003*), thus, becoming part of the organizational memory (*Hedberg, 1981*).

The analysis of the process of social acceptance and legitimacy of HETCs within each HEI allowed us to understand the impact of changes in organizations and the level of learning generated. These changes occurred in the values (culture), the understanding and interpretation of the organizational reality (cognition) and in the practice and routines of institutions (behavior). There are three elements of the learning process to show their breadth and justify the consistency of the adoption of an integrative approach to the organizational analysis. Thus, the OL enabled the development of new cognitive maps, which proves that learning is built collectively.

The pre-implantation played a central role in the acquisition of knowledge about the functioning of the HEIs and professional technological education. Even though the first routines were based on experience with technical courses, learning refers to the mechanism of **how to create HETCs**, encompassing from the widest procedures – such as the legal ones, to the most operational, such as the development of the structure and its deployment. The learning occurred in the creation of course projects and the main result was embodied in these projects. The interactions that occurred among the staff to socialize information and the history experienced in the design process,

contributed to the appropriation of knowledge, as pointed out by a teacher: "*When the courses were new, nobody know what would lie ahead, so , we had to learn a lot about the HETCs, i.e., we had to familiarize with a course that is… let´s put it this way, that has a much more specific character than the generalist technical course we had been working with, so we had the (natural) obstacles in the beginning of the implementation*".

The organizational changes that have occurred and the institutionalization of knowledge resulted in the HETCs projects (foundation knowledge), routines (procedural knowledge) and wisdom (knowledge of experience). As noted by *Patriotta* (*2003*), practices start to make sense over time, and so common sense is built.

The projects represent the HETCs product that originated from the learning process, the result of collective effort and the breaking of internal barriers. In the second and third phases of implementation and post-implementation, the learning process was related to the operation and maintenance of HETCs. In these two phases, the main result was the mastery of their own routines for the teaching, assessment, relationship and management, and the construction of a common sense around the validity of the courses. At the interface of the processes (creation, deployment, and maintenance) and learning outcomes (projects, routines, and common sense), there was a cycle of development of knowledge relating to technology education, which was created, used and institutionalized. These results allowed us to validate the theoretical model of *Patriotta* (*2003*). The pattern of activities was normatively and cognitively taken, deemed as correct and legitimate (*Meyer, & Scott, 1994*).

Learning observed in the two cases studied was, therefore, of organizational level because it involved not only profound, significant changes, but also the institutionalization of knowledge in the practices, routines, and strategies. It occurred due to changes in strategy, rules and assumptions which are embedded in organizational memory. As a social process, it emerged in the natural environment of the relations of work, becoming collective because it happened during social interaction (*Cook, & Yanow, 1993*). Therefore, it accounted for more than a simple sum (*Hedberg, 1981*) of individual learning and it went beyond the individual cognition (*Weick, & Westley, 1996*). Thus, in this work, we could confirm the OL concept adopted. This concept also confirms the points of consensus reached in the literature by *Shrivastava* (*1983*), *Fiol and Lyles* (*1985*), *Prange* (*2001*), among others.

Notwithstanding the study of multiple cases allowed us to progress in the results. First, it was observed that the two organizations studied are still in the third phase of appropriation of knowledge of experience (*Patriotta, 2003*) in the provision of HETCs. Secondly, and most importantly, we see that in the cases studied, unlike the empirical research of *Patriotta* (*2003*), events interrupted practices and routines previously institutionalized. Therefore, while new knowledge was incorporated into a recursive process of creation, use and institutionalization of knowledge, leading to changes in the articulation of resources, others fell into disuse causing disruption to existing practices. This does not mean, however, that it abandoned all previous knowledge. They were even relevant to the first year of operation of the technological courses and were articulated to compose another competence.

This finding draws attention to the background of change, or the determinants of deinstitutionalization. At this time, we referred to the work of *Oliver* (*1992*) so that we could analyze the two movements – the institutionalization and de-institutionalization of knowledge. The author warns that the understanding of the institutionalization of research also depends on the process by which organizations reconstruct reality, when values and practices are rejected or invalidated. This seems to be the case in this research. Thus, it was possible to advance in the integrated analysis of cases to achieve the final contributions of the study.

Discussion and conclusions

We could observe the presence of empirical indicators of institutionalization in two cases: social pressures, and functional policies (*Oliver, 1992*). These pressures led to the institutionalization of a teaching practice and certain types of knowledge. At that time, we referred to the assumed model (*Patriotta, 2003*) and added the change observed, which expresses the process of OL in the (de) construction of organizational competence during the (de) institutionalization of knowledge. Therefore, we sought to advance from the contributions **of** theory to contributions **to** the theory (*Eisenhardt, 1989*).

Fig. 2 summarizes the process investigated, observed through the lens of time, and represents an advance in the author's model, by broadening the analysis (the discontinuity) of time (deconstruction) and of action in the cases studied:

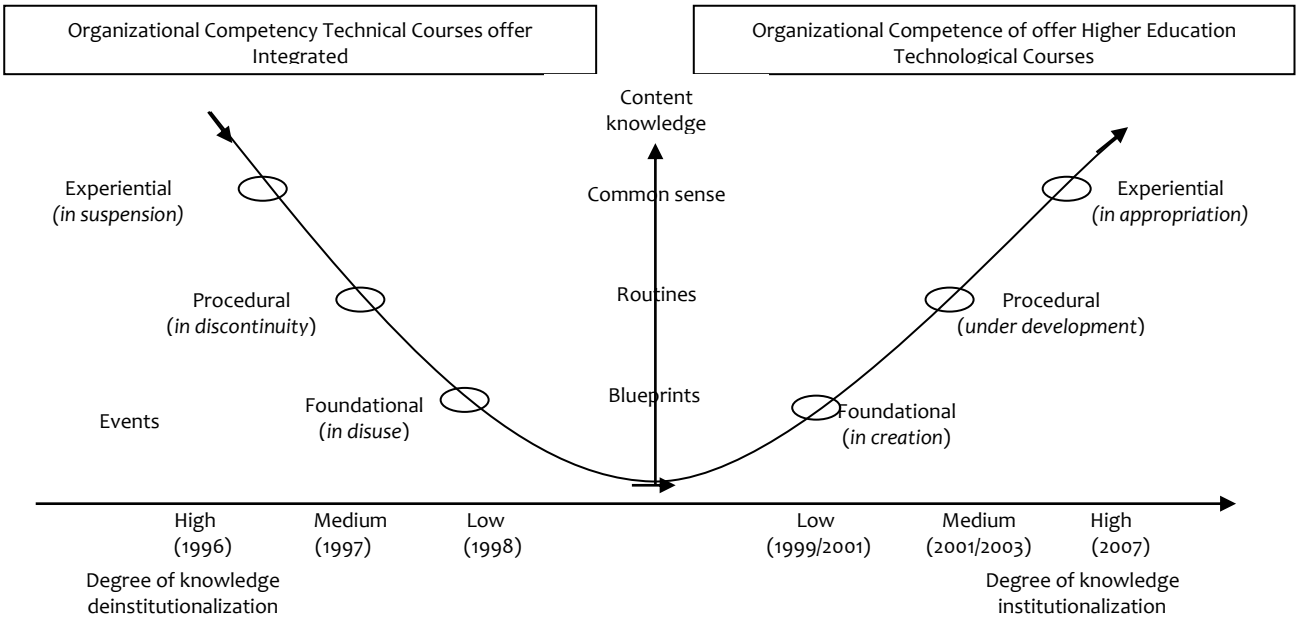

Fig. 2. System of classification and de-institutionalization of knowledge in organizations*

*Source: elaborated by the authors.

From the events, the knowledge of experience in integrated technical courses was suspended temporarily with the discontinuity of the procedures and disuse of offer for these courses. On the other hand, other practices were developed with the creation of HETCs, which, over time, brought experiences that were incorporated. That is, the routines for integrated technical courses, built before, were discontinued while others were developed, creating a new procedural knowledge.

With the construction of common sense around the new routines, knowledge of experience was being appropriated in the organization. The regression of the use of knowledge (suspension, discontinuity and disuse) regarding offering integrated technical courses characterizes a process of deinstitutionalization, in which the knowledge previously institutionalized pales in time. The progression in the acquisition and application of knowledge (creation, development, and ownership) involved in building the organizational capability of offering HETC characterizes a process of institutionalization in which knowledge becomes more intense over time, and gains from the experience. Attesting to *Oliver* (1992), the result was characterized by the process of institutionalizing a practice of teaching in favor of the gradual deinstitutionalization of another.

Prior to the deinstitutionalization process, the HEI also experienced a process of OL in the development of competence of offering integrated technical courses. Despite the development of a new organizational competence, the earlier competence of offering integrated technical courses, institutionalized over decades of experience, was not lost, but suppressed. Later, with the return of the authorization to offer integrated technical courses, those courses were resumed, but with little emphasis, because they did not have the same importance for organizations anymore.

For the two organizations studied, the development of new competences were important in that it led to growth and changes in their profile. Thus, if competences can be built, maintained and leveraged (*Sanchez, 2001*), the reverse movement can also occur: they can be discarded or atrophied. Therefore, the ability to the renewal of competences was observed in two cases, presenting, albeit in varying degrees, what *Teece and colleagues* (1997) call dynamic capabilities. Despite the inertia that is typical to the education sector, it was found that organizations are aware of the need for change, which is, according to *Mills and colleagues* (2002) the characteristic of dynamic capability, competence that determines the adaptation to competences or activities over time.

At this point, based on the analysis and considerations presented here, we confirm the three assumptions made in this paper: that the dynamics and organizational competences are developed through the joint resources (P1), that the OL involves significant changes in resources, it is collective and takes place in the social interaction of work, and involves the institutionalization of knowledge created and used (P2), and that there is a consistent relationship between processes of OL and development of organizational competences (P3).

Corroborating the statements of authors, OL is the result of the acquisition of a competence that represents this process. Using a metaphor, it was found that the competences of an organization represent the 'DNA' of the OL. This means seeing competences in motion, changing in time and in the context of the organization, according to the events and changes in their objectives, intentions, and strategies. Finally, we believe that with the study it was possible to move towards the understanding of OL processes in the organizational competences development, thus contributing to the advancement of knowledge in OL.

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