Chapter 8
Outlining the Value of Cognitive Studies in Increasing the Strategic Management within Organizations

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ABSTRACT

The purpose of this chapter is to examine the value of cognitive studies in the optimization of strategic management through improved information systems. To reach this objective, cognitive concepts and their developments are initially contrasted with learning, mediation, and skills development, and the experiences in companies, for example, are presented by applying the Structural Cognitive Modifiability Theory (SCMT) and the Mediated Learning Experience theory (MLE), which were developed through the Instrumental Enrichment Programs (IEP) created by Reuven Feuerstein in order to describe the trajectory through which a subject arrives at a solution to a problem. In conclusion, professions undergo profound changes of a complex and diverse nature as a result of the political, economic, and social situation that leads to interdependence and competition, requiring an overhaul of theories and educational practices in order to align the professional profiles with the social and productive demands that require independent reflective, creative, proactive professionals.

INTRODUCTION

In order to be successful in the competitive landscape characteristic of the modern world, strong, dynamic and vigilant management models must guide organizations in competing for partners and customers, and developing internal capacity. Organizations must monitor the threats and op-

portunities from the external environment as well as the strengths and weaknesses of the internal environment. In other words, in order to improve the management process, organizations increasingly depend on relevant, reliable and quality information.

Managing information is therefore critical for organizations because it has become a strategic factor resulting from the monitoring of risky situations and opportunities, while also being a structural feature that is the basis of all organizational processes that broadens the knowledge of the market, competitors, partners and customers as well as the processes, products and services of the organization, thus ensuring more authoritative decision-making on the part of managers.

Information and its association with the constant development of information and communication technologies (ICT) gained a strategic and structural character that increased the production of information exponentially in all areas – from the world of business to scientific production and even in daily activities. Organizations therefore began to devote much of their time and investments in building contact networks that provide a permanent flow of reliable and quality information that enables informed decision-making in a timely manner.

This context has expanded the theoretical and conceptual reflection regarding information and knowledge management, while the approach of exploring strategies to minimize risks and maximize gains has intensified the need to prepare a critical mass able to use, evaluate and give meaning to the wealth of information that is produced at this juncture. This includes the development of skills geared towards the search and discovery of information and the intelligent, strategic and objective use of information found.

It is within this amalgam that there is evidence of the synchronicity between cognition, mediation and the development of information and professional literacy in order to increase the organizational management process, especially

with regard to information management that seeks to stimulate knowledge creation and technological innovation. From this perspective, cognition is a necessary form of knowledge as it increases the possibility of professionals to understand, devise and construct logical trajectories aimed at problem solving.

Consistent with this line of thought, the purpose of this chapter is to analyze the value of cognitive studies in optimizing strategic management through the strengthening information systems. To achieve this objective, cognitive concepts and their developments are initially contrasted with learning, mediation and skills development and the experiences in companies for example, are presented by applying the Structural Cognitive Modifiability Theory (SCMT), and the Mediated Learning Experience theory (MLE), which were developed through the Instrumental Enrichment Programs (IEP) created by Reuven Feuerstein (1980), a disciple of Piaget, in order to describe the trajectory through which a subject arrives at a solution to a problem, proposing the cognitive map as a tool to analyze the mental act.

STRATEGIC MANAGEMENT IN ORGANIZATIONS

It is known that strategic management consists of a series of activities designed to align the internal resources of an organization to the external environment, and that it emerged from the conceptual evolution of planning, expanding and integrating various concepts and practices in order to successfully address the growing complexity in the business world due to technological developments and the globalization of markets.

Strategic management incorporates strategic planning into the decision-making processes in all areas of the organization, as it brings together planning and administration in a single process that aims to ensure necessary actions are taken, so that the various parts of the organization are

participating, integrated, involved and committed to the decision-making process.

This perspective drives organizations to act with *a) flexibility,* integrating themselves within contexts of rapid change that are characteristic of the global competitive scene; *b) emphasis on information,* which happens to have a structural character in that it informs the decision-making process; *c) knowledge,* as a critical factor of organizational success in competitive environments; *d) integration of processes, people and resources,* through a systemic approach aiming to fulfill the objectives of the organization. Gluck et al. (as cited in Tavares, 2000, p. 102) note that the effective development of strategic management is accomplished through the use of three mechanisms: the preparation of a planning template; a process that will stimulate reflection and creativity among staff; and the establishment of a rating system that guides staff into action and managers in decision making.

Given the instability, complexity and diversification that characterize the current context, organizations had to adapt to the new environment by making their structures more flexible and dynamic and more importantly, by implementing systems to manage the wealth of information. According to Choo (2006) information is an intrinsic component of almost everything an organization does. Without a clear understanding of organizational and human processes that transform information into insight, knowledge and action, businesses are incapable of understanding the importance of information resources and the information technologies available to them.

Aligning themselves to this new reality, organizations have acquired a new profile wrapped in new ideas, strategies and characteristics such as:

1. The exponential growth of and decreased price for information that brought about a connected economy where any organization can access more advanced technology; competition is now international and

success comes to depend on the existence of an environment that is conducive to the development and use of knowledge;

2. ICT's permitting access to relevant information, and with just one click, can prefect the market and competition. Consumers benefit from better prices, more comfort and a greater variety of products;

3. The customer becoming the company's focus. The treatment of customers is the essence of competitiveness. In this environment, there is a reduction in periods of product and knowledge absence from the market, and continuous innovation is necessary.

4. The business structure being more flexible in order to adapt to the shifting environment;

5. The majority of actual work done is intellectual, and technology allowing people to connect with the company from anywhere. As a result, the number of people that work outside of the company increases;

6. Labor mobility increasing significantly in an environment where companies compete for talent;

7. The way in which companies attract, retain and motivate staff being a determinant of success;

8. The institutions and values, with changes in technology, created a world where cultures and tastes mix. Miscegenation is necessary;

9. The existent of markets for any kind of product or service that are increasingly sophisticated, results in more competition overall and a trend towards customizing products and services. (Zabala Romero, 2013).

These changes demonstrate the emergence of a new mode of production that is knowledge intensive and aggressive in the adoption of competitive economic policies, assumptions that underlie the capitalist trend towards economic globalization. These factors have imposed upon the mode of work organization, qualitative changes that have created a demand for professionals that have a

rich profile and multiple skill sets, are prepared for continuous changes in work and production processes, are conscious of their responsibility to and committed to the success of both themselves and the organization, are ready to drive innovation and respond promptly to the unpredictability of the market.

According to Mendelson and Ziegler (2004), organizations need to have relevant information about: a) the capabilities and skills of company staff to know where tacit knowledge lies; b) the customers whom are the main source of information both to meet company needs and to innovate and renovate products and services; c) the end users of products and services, who are the most important source of information for product improvement and innovation; d) prospective customers; e) lost customers; f) the competency needed to quickly launch innovations in products and services; g) providers, who can be an important source of information on good practices, market trends and technological evolution; h) the development and uses of ICT's, as well as the support for information management systems. It should be noted that knowledge about technology is obtained through market analysis and most especially through strategic alliances with technology companies and research institutions; i) the explicit knowledge available within the company as it is vital to transform the available information into a strategic asset that facilitates effective decision-making, gives the company the ability to react to contextual changes and enables the discovery of new business opportunities. (Gauchi, 2012).

For Choo (2006), organizational knowledge results from a social process linked to the creative process obtained from experts, and through documents and records of knowledge. The knowledge of an organization emerges from the processes of information use, the sharing of such information and the partnerships that generate and apply new knowledge. This places information at the center of management work and gives the organization a new form of decision-making that is guided by the identification, location, processing and use of information.

In 1995, Hamel and Prahalad had pointed to the fact that different tasks to be developed within the new organizational framework would require specialized and selective information. Today, information is an indispensable resource in decision-making that is of a critical character in supporting the implementation of a strategic management process. The timely identification of external signals enables the efficient and effective development of appropriate competitive strategies. This therefore makes it necessary to adopt mechanisms that promote collection, processing and dissemination.

Information management systems can be defined as a set of technical, human and economic resources that are dynamically inter-related and organized, with the objective of meeting the information needs of an organization aimed at effective management and decision-making. Consequently, the fundamental components or elements that constitute a current organizational information system are the following (De Pablos et al., 2012):

- **Information:** includes all the information captured, processed, stored and distributed by the system;
- **People:** which introduce and use the information system;
- **Staff:** for information processing and interaction with users;
- **Technologies:** hardware, software and communication networks;
- **Standards and/or Work Methods:** methods employed and the technologies used to develop their activities. It is important to emphasize that what is important is knowing how to use technology, not owning it (Gauchi, 2012).

According to Tarapanoff (2006), surveys addressing organizational theory suggest that organizations create and use information in three strategic

areas: first the organization interprets information about the environment in order to give meaning to what is happening in their context and what they are doing; afterwards, they create new knowledge by combining the expertise of its members as a way to learn and innovate; finally, they process and analyze the information to choose and take appropriate actions, thus defining knowledge management as:

[…] an independent activity, however when connected to the decision-making process, it is strongly linked to the process of information management, work and analysis. Intelligence (strategic) can be regarded as the synthesis of the work processes of information and knowledge that generate new knowledge capable of indicating new directions for the company, innovation itself and intelligence. In an organization, information, knowledge and intelligence are present in management processes, which feed the decision-making and strategic planning processes. Strategic planning aims to develop and maintain a reasonable fit between the objectives and resources of the company, as well as the changes in market opportunities. Through these strategies, companies use their strengths to better seize opportunities and implement actions that minimize the impact of threats on their weaknesses (information management) (Tarapanoff, 2006, pp.30).

On the other hand, understanding the information flow is a complex task that requires "informational tracking" work, which assumes that the information used in organizational contexts is transmitted sequentially over a series of informational channels (sources of information), and that these do not exist in isolation, but rather interact with and are used by each other to process, add value and / or introduce distortions to the original content of the information to be used by the end user. This thus influences informational behavior in both the search process and the use of information obtained.

From the cognitive approach perspective, information is understood as something constructed by the individual and that has meaning only when integrated into a context. This individual, in turn, is seen as a person endowed with a cultural repertoire of knowledge, beliefs and values with their own cognitive, affective and physiological needs inserted in an environment with sociocultural, political and economic constraints. Their needs dimensions, knowledge schemas and the environment in which they are inserted into are constructed on the basis of search behavior and information use.

Dervin (1983) illustrates this "new concept on information" through a metaphor where information is no longer characterized as predetermined "bricks" that are built by information systems and stacked on top of each other, but rather more like "clay," where the individual determines the form, consistency and direction they think best.

Considering information as an incomplete, given where the individual assigns meaning from their previous knowledge schemas, it can therefore be concluded that a product of the necessary observation of reality is the user being able to deal with perceived discontinuities in time and space.

With regard to information systems, they must be designed, according to the cognitive approach, under the aegis of flexibility, adapting the information search process to the needs of the user (which may change over time and is different from individual to individual). Martucci (1997) "highlights that information services should focus on the meaning of the search more than the location of information sources in the face of increasing access to large amounts of information that exists in the world today" (p. 3).

COGNITIVE STUDIES APPROACH

The application of cognitive studies in professional training, from the perspective of innovation and interdisciplinarity, aims to encourage profession-

als to broaden their expectations regarding the potential of information management in problem solving, in order to make them innovative and competitive within organizations and labor markets through a vision based on the diffusion, mediation and reduction of barriers to access to knowledge. Within this dimension, it is implied on the one hand, the development of technological solutions to access information based on cognitive strategies and on the other hand, the development of skills and ability, making the subject able to obtain the desired information in achieving desired goals.

All knowledge is at the same time, a translation and a reconstruction of signals, signs and symbols in the form of representations, ideas, theories and discourses. The organization of knowledge is made on the basis of principles and rules that involve both connection (conjunction, inclusion, involvement) and separation (differentiation, opposition, selection, exclusion) operations. The process is circular, going from separation to connection and vice versa and furthermore between analysis and synthesis. In other words, knowledge includes at the same time, separation and connection as well as analysis and synthesis.

The use of information consists of activities in which the individual grasps information and turns it into knowledge comprised of intellectual abilities like decoding, interpretation, control and organization of knowledge. Decoding and interpretation, in turn, includes: reading activities, establishing relationships, prior knowledge that supports the anchoring of new information beyond comparing various points of view and assessments.

The control and organization of information is self-produced through the use of cognitive tools like resources, diagrams, maps, and conceptual elaborations of texts. Thus, the user, in the search trajectory and information retrieval, performs cognitive operations like selection, analysis, synthesis, comparison, organization and writing, according to their cognitive structure, needs and interests, previous knowledge and internal and external conditions.

The constructivist paradigm, to explain these processes, uses the following principles: a) human subjectivity results from a reality that does not convey constant meaning; b) knowledge is unfinished, as it constitutes the individual's interactions with the environment through the use of language; c) users, as active beings, are focused on their own goals and capacity choices; d) information behavior varies according to the specific situation; e) users must be understood in a broader social context where systems are one of the elements they can resort to for more information. Thus cognitivism, which is based on the belief of approaches grounded in behavior and cognitive development, can contribute substantially in the process of organizational strategic management.

Theories and studies related to cognition and education may explain the phenomenon of knowledge acquisition as a learning process. Freire (1985) states that consciousness is the first moment of apprehension of reality and it is through dialogue that this initial perception –awareness - deepens and becomes consciousness-raising. Piaget (1964) believes that there is a tendency in human behavior for an experimental search for new assimilations thanks to the coordination of mental schemes that enables exploratory behavior in the real world and that when faced with the unknown, generates a cognitive imbalance in the subject.

Studies on cognitive psychology by Piaget, Vygotsky, Sternberg, Feuerstein and many others, have advanced greatly in their research on human cognitivism giving rise to various theories that when applied to education, have helped to develop new ideas about the process of teaching and the application of new methods.

According to Freire (1980), one learns by dialoguing and scrutinizing the organization of the world, and in this sense, dialogue-based education is understood as a process of structuring the world: "dialogue is the encounter between men that, mediated by the world, "pronounces" and transforms them, humanizing us all" (p. 45). Also from a dialogical view, Gadamer (1997) states

that a question is the path towards knowing, as it is through the art of asking one comes to the art of thinking. In this respect, Ardoino (1998) discusses the multi-referential nature of education, pondering it as a global function that pervades all fields of science, man and society and is therefore both a part of the human sciences and a complex and heterogeneous social practice. The author complements this idea by stating that learning and cognitive processes are steps that lead towards the formation of the subject, as it pushes them to perceive relationships and how they occur with others and the world through the discovery and inferences of information and meanings.

Piaget (1991) believes that stimuli in the world are assimilated by humans, according to the development of their cognitive structure, and that knowledge is derived from the sensation or perception of operating schemes or action at various levels, where "perception itself is not a simple reading of sensitive data, but rather involves active organization where decisions and pre-inferences intervene." (p. 105).

Assimilation and accommodation are the two pillars defined by Piaget (1987) in his theory. Assimilation refers to the capacity of the individual's cognitive structure to act within the environment, but it is also mobilized and changes depending on the environment, accommodating itself accordingly. Thus, learning is a lasting (balanced) behavioral change due to the acquisitions that result from experience. Knowledge is constructed in one continuous balancing movement, so it is important that the mediating action provokes subjects through unbalancing situations, as it gives space for them to create and/or find solutions from the very attempt of overcoming imbalance.

According to Piaget (1971), there is a tendency in human behavior for experimental searching for new assimilations that, thanks to scheme coordination, enables exploration of the real world. Thus, it can be said that for Piaget (1964) the learning process occurs at gradual levels, as the existence of previous structures built through individual (assimilation and accommodation) and organizational adaptation are necessary for the adaptation of a coherent system through a (balancing) self-regulating process. The learning process therefore always depends on cognitive development.

Vygotsky (1991) points out that mental development is a dynamic process that psychologically transforms both inter and intra shared meanings. The spaces for collective exchanges of feelings and affections, through dialogue, are sources of new psychological constructs, as they create processes of internalization--arising from reflection--through the communicatory exchange of experiences that then become a meeting point between individuals. The construction of shared meaning highlights the importance of the process of knowledge acquisition from the understanding of others and the feelings that are expressed. According to Vygotsky (1989), subjects are interactive once the process of knowledge acquisition occurs through inter and intrapersonal relationships and an exchange with the environment, thus highlighting that knowledge acquisition occurs from the interaction between subjects.

In this sense, interaction is a dialectical phenomenon that takes place through language, fostering a transformation of man himself and his environment, and that therefore makes essential the transfer of socially, culturally and historically constructed knowledge. However, for the interaction to occur, active participation of the subjects involved is essential in order to relate to the other beyond the intersubjective relationship. This then favors linguistic and cognitive development and the exchange of knowledge and experiences.

The emergence of verbal thought and language as a system of signs is crucial in the development of the human species, as it is the moment in which the biological became the historical and the centrality of semiotic mediation in the constitution of the human psyche emerged. The emergence of language, according to Vygotsky (1989), was due to the need for exchange between individuals at work, a specifically human activity.

It can therefore be concluded, based on Vygotsky, that symbolic systems - especially language - play a key role in the communication between subjects and the establishment of shared meanings, which enables the interpretation of objects, events and real world situations.

According to Rego (1999), Vygotsky identifies two levels of development: one is a reference to actual achievements, what he calls the actual or effective level of development, and the other is the level of potential or proximal development, which references the capacities that still need to be developed. In order for these capacities to become consolidated achievements, help from others (adults or older children) is critical. The author termed the "zone of proximal development" as the distance between what the individual is capable of doing autonomously (actual level of development) and what the individual accomplishes in collaboration with other members of their social group (potential level of development).

From Feuerstein's (1980) perspective, the mediator helps the learner to build, filter and scale stimuli. The author highlights various criteria for mediation conduct and classifies three of them as universal criteria, as they need to be considered in any learning experience: intentionality, reciprocity, meaning and transcendence. Thus, a mediator or mediators lacking intentionality - who comes between the subject and the world, selects and organizes information, contextualizes it culturally, and allows the individual to transcend the stimuli and experiences of life - cause the so-called cultural withdrawal syndrome, as the absence of cultural transmission prevents appropriate cognitive and affective development that then reduces the degree of cognitive modifiability and mental flexibility.

Conforming to Souza, Despresbiteris and Machado (2004), Feuerstein's studies on the functions of the human mind determined which aspects would lead to a more efficient mental processing and what factors might interfere with this process. For him, the 'being' has three basic functions: *psychological,* which corresponds to the internal, chemical, biological and psychological processes; *cognitive,* related to the learning and reasoning processes, perception, and intelligence; and *affective,* or connotative, which refers to emotional aspects and feelings. The author finds some structured and dynamic processes that combine and organize themselves so as to operate the cognitive structure, giving them the term cognitive functions.

The fundamental characteristics of cognitive function, according to Feuerstein (1980), are: ability, need and guidance. This set of characteristics gives rise to mental function. Ability, characterized by its dynamism, enables performance at various levels of complexity and is influenced by genetic, endogenous and external factors. Need stimulates or inhibits action according to the degree of intensity that mobilizes cognitive function. Need is closely related to the demands of the world. Guidance directs cognitive function, determines individual choices, methods and strategies for dealing with a problem, steers individual choices in content, environmental or structural domains, where effort is then directed to problem solve.

As Choo (2006) points out, information needs do not emerge fully developed, but rather become more clear and defined over a period of time. Information needs arise from uncertainty, which decreases as the need for information takes the form of questions or conscious themes that are later formalized.

The most constant questions deal with what one wants to know, why one needs to know, what the problem is, what one already knows, what one wants to find out, how that will help, what one needs to learn and in what way does one learn. Defined by informational needs, the next step is the search for information to get answers. In his studies on the search process, Kuhlthau (1993) concludes that this is a process that consists of a series of personal choices that will determine the efficiency in using sources and strategies. Beliefs and expectations about what sources should be used and on the relevance or irrelevance of the

sources selected are based on the experience, potential and cognitive style of the individual.

Kuhlthau (1993) divides the process of seeking information into six stages: initiation, selection, exploration, formulation, collection and presentation. Each stage of the search process is characterized by user behavior in three fields of experience: the emotional (feelings), cognitive (thinking) and physical (action). According to Choo (2006), the search for information makes the following path: start, link, search, compare, select, extract, verify and finalize. Starting, linking and searching are aimed at helping the individual develop a focus for research and a strategy for its implementation. As Choo (2006) noted, the existence of a cognitive vacuum drives the search process and is accompanied by different emotional states. The early stages of information search are characterized by anxiety, confusion, frustration and doubt. As the process becomes more successful, confidence grows and a sense of satisfaction emerges. Emotional states influence: a) how the individual processes and uses information; b) the user's ability to construct meaning; c) how the search is focused; d) the capacity to distinguish between relevant and irrelevant information; e) how to deal with emotions and expectations; f) the degree of interest in research (Choo, 2006).

Feuerstein (1980) argues that mental action is the product of mental and cognitive functions that can be understood as a set of internalized, organized and coordinated actions, with regard to the information received from internal and external sources. Mental functions according to Feuerstein (1980) are: identification, comparison, analysis, synthesis, classification, coding, decoding, projecting virtual relationships, differentiation, mental representation, mental processing, divergent reasoning, hypothetical reasoning, transitive reasoning, analogical reasoning, logical reasoning, syllogistic reasoning and inferential reasoning.

In an analogy relating to the processing of information in a computer, Feuerstein organized cognitive functions in the human mind into three stages: input, processing and output. However, this classification cannot be seen as fixed. Phases, as shown in Table 1, constitute an indivisible mental act, in which each phase is related to the others.

In the input phase, information processing and the search for solutions to problems occurs. In the output phase, the appropriate response to the problem in the input stage is indicated, implying precise communication skills. The search and use of information in all its dimensions - access, analysis, interpretation, evaluation, production, etc. - underlies competence mastery and capacity for information searching, but also the capacity for reading and comprehension, both related to cognition.

Organizational competence is more than the sum of individual skills, it is comprised of the complete harmonization of multiple human, technological and organizational resources, taking into consideration the "expertise" of the individuals that make up the development teams, the technologies these experts use, and their management and development structure. Organizational competence can be defined as "an articulation of organizational resources, organizational apprenticeship, a collective and complex know-how, especially with regard to the coordination of diverse production skills and integration of multiple streams of technology" (Prahalad & Hamel, 1997, pp.239).

In turn, professions in the contemporary world undergo reorganization, as new situations bring about interdependence and competition that demand changes in the educational practices that form new professionals. It is therefore observed, that the current formation of professionals goes beyond their specific training. Since 1998, Unesco registered the need to "strengthen cooperation between the work world, analysis and the forecasting of societal needs." Since then, educational projects now focus on the design of teaching and learning environments that foster learning experiences where future professionals acquire skills that allow them to successfully integrate into the labor market.

Table 1. Phases of Mental Action

Input Phase	Processing Phase	Output Phase
-Clear and precise perception; -Systematic exploratory behavior; -Use of appropriate vocabulary and concepts; -Efficient Spatial orientation; -Efficient temporal orientation; -Verification of object permanence and constancy; -Accurate data collection and object permanence; -Precise and accurate data collection; -Consider two or more sources of information.	-Understand and clearly define the problem; -Facility in distinguishing relevant and irrelevant data; -Exercising comparative conduct; -Magnitude of the mental field; -Global Perception (not episodic) of reality; -Use of logical reasoning; -Internalization of own behavior; -Hypothetical-inferential thinking; -Draw strategies to test hypotheses; -Planned conduct; -Elaboration of cognitive categories; -Application of summative conduct; -Facility to establish virtual relations.	-Decentralized communication (non-egocentric); -Projection of virtual relationships; -Expressing responses with non-blocking communication; -Right answers without trial and error; -Use appropriate verbal instruments; -Precision and accuracy in unanswered communication; -Effectiveness in visual transportation; -Controlled, planned conduct

Source: Adapted from Feuerstein, Klein and Tannenbaum (1991).

Regarding general skills, Unesco (1998) argues that professional expertise is more obsolete today than in the past. The fields of expertise of a large number of professions within companies and public bodies are not clearly specified, but are rather defined in relation to the knowledge emanating from different academic disciplines. Therefore, people who have learned to be flexible and have had a more general education are considered more likely to develop new and unexpected assignments and face employment crises.

Competence, according to Teixeira (2008), is the ability to mobilize knowledge, values and decisions in order to take relevant action in a given situation. Competence can only be developed through practice. It is not only about knowledge, but also about the know-how. In a situation that requires expertise, one learns by doing, and ingenuity is the result of skill acquisition. Despite the advances made in the conceptualization of competency, there are a number of gaps in this approach that hinder, in a significant way, its application in education. It can be confused with similar concepts, such as intelligence, function, capacity, qualifiers, skills, attitudes, dexterities, indicators of achievement and standards (Tobón-Tobón, 2004). For the author, *attitudes* are affective dispositions to action that drives human behavior. *Aptitude* refers to the innate potential that humans possess that needs to be developed through education. *Skills* involve the learning of certain tasks or activities to be carried out with perfection; a skilled person performs procedures they were trained for with efficiency, efficacy and effectiveness.

According to Tejada Artigas and Tobón-Tobón (2006), the dimensions of competence are well systematized:

- **Cognitive-Declarative:** Meaning the assimilation of concepts, rules and principles governing a work function;
- **Cognitive Skills:** Refers to information processing and the generation of knowledge required to learn observation strategies and analysis of the surrounding reality;
- **Actual-Procedural:** Refers to how to perform and work in reality;
- **Social:** Is the establishment of relationships with people in order to follow the fast pace of changes, updates and advances;
- **Communicative:** Relates to cognition and information processing activities subdivided into three basic skills: interpretation, argumentation and proposition;

- **Ethical:** Is guided by the benefits of those who practice a profession and assume activities that benefit others.

Le Boterf (2003) asserts that competency consists of mobilizing and combining resources. The professional has a double instrumentalization; personal and surrounding resources. The first incorporates and is made up of knowledge, know-how, skills or qualities and accumulated experiences. The second consists of competencies and skills needed to manage machines, physical facilities, information and relational networks. According to Le Boterf, the notion of competence is implicit in the concept of professionalism, in other words a professional subject is necessarily a competent person.

Zarifian (2001) believes it is too complex to articulate a concept related to the notion of competence. Therefore, in an attempt to encompass the various facets of the issue, he constructs what he calls a proposed definition that seeks to address the various dimensions of competency. The first statement highlights the changes that have affected organization, labor function and the nature of the category itself, giving rise to centrality in work organization: "Competence is 'taking the initiative' and 'taking responsibility' for the individual in the face of professional situations." (p. 68). For the author, taking initiative means discerning and creating solutions that combine accumulated knowledge and experience in order to face new situations, assuming responsibility in responding to a situation that the professional takes, making all of their capacity available to enable the execution of a task.

Emphasizing the dimension of learning, Zarifian (2001) states "competence is a practical intelligence of situations that is supported by acquired knowledge and that transforms it as the diversity of a situation increases." (p. 72) This means that practical understanding refers to the cognition and understanding of facts, because in order to intervene in an event one must understand it to

then mobilize prior knowledge - associating the cognitive dimension to understanding - so that when interacting with others, the subject seeks to understand it: "the understanding of the others reasons allows one to intelligently understand their own behavior and adjust it." (p. 72).

Another concept Zarifian (2001) shares is that "competence is the ability to mobilize a network of actors around the same situations: to make these actors share the implications of their actions and assume areas of co-responsibility," (p. 74) meaning that when situations acquire a complex character, it mobilizes the expertise of various subjects or the network of actors.

Perrenoud (1999) also states that there is no precise definition of competence mainly because the word is polysemic and involves many fields of knowledge. For him, competency is "the ability to act effectively in a particular type of situation based on knowledge, but not limited to it." (p. 7). That is, in order to solve unexpected situations efficiently, the subject must put into action and synergy cognitive resources, among them knowledge. According to the author, competence goes beyond knowledge because it consists of assimilating additional general or local knowledge, along with a set of rules and schemes that allows knowledge to be mobilized with discernment at the right time.

The notion of competency has not been registered, in its recent application phase, within the field of education, and has only resurfaced as Lodi (2004) mentions, the last ten years in the work world, and, soon after, was appropriated by economists and also became part of the discourse of labor sociologists, mainly in France; only later was it incorporated into the educational system to meet economic needs, often without proper adaptation and for that reason, the model applied to education is heavily related to the nature of work. In Brazil, for example, curriculum reform in secondary education was unsuccessful due to the lack of mindfulness in the design relative to the educational environment, perhaps because of

disagreement on the design and implementation of a competency-based model.

However, according to studies carried out in recent years regarding cognitive theory, the school has deepened this thread and one can find an endogenous model grounded in the learning process that includes the subject-learner in their sociopolitical and cultural environment, which then allows them to meet the aspirations and mission of the school. From this perspective of education and cognitive processes, it is important to reflect on the development of mental operations to face challenges and problem situations.

Throughout the ages, man has always faced problem situations that required constant efforts to resolve. However, the increasingly technological and globalized society imposes challenges that demand very sophisticated solutions and asks us to solve large problems because of the continual changes in all knowledge areas that requires constant updating in work, school or the tasks we face in our everyday lives (Torres, 2007).

The questions pervade: How does one find or acquire new knowledge? How does one learn to interpret reality in a context of ongoing scientific, cultural, political, social and economic changes? How does one learn to be, saving our humanity and constructing personhood? How does one perform actions in a practice that is simultaneously driven by the traditions of the past and the future that is yet to come? How does one act in a context of so much diversity, singularities and changes in the competitive environments of businesses and organizations?

To face, overcome and solve these problem situations, Torres (2007) explains that it is necessary to mobilize certain resources, be it in the context of our social, personal or affective relations, performing professional or any other duties, taking positions to make decisions, knowing how to act on them, and selecting best possible actions or procedures in that moment. "This implies activating our mental schemes, mobilizing prior knowledge and transforming or updating them according to what is new in every situation. Mental work materializes in the form of the 'know-how', a set of procedures and strategies for action" (p. 36).

To activate the schemas/mental operations, Torres points out five skills that can be applied in educational and organizational contexts to resolve problem situations:

1. **Mastering Languages:** Which implies working with content within the dimension of conjecture, propositions and symbols. In this sense, language constitutes the most powerful instrument of our thinking, as it serves to support it;

2. **Understanding Phenomena**: Whether natural or unnatural, it became essential for the human being in order to actively participate in such a complex world where different peoples and nations coexist, and that is defined by great cultural, scientific, political and economic diversity. Understanding phenomena means being competent in formulating hypotheses or ideas about the causal relationships that determine them.

3. **Selecting, Organizing, Relating, Interpreting Data and Information in Different Ways to Make Decisions and Cope with Problem Situations:** Coping with problem situations relates to the ability of a subject to accept challenges they are confronted with, and going through a process of overcoming obstacles in order to reach a goal. If successful, it can be stated that the subject came to the resolution of a problem situation. To produce successful outcomes in the context of a problem situation requires confrontation;

4. **Relating Different Forms of Information and Available Knowledge in Concrete Situations in Order to Construct a Consistent Argument:** This is another highly valued competency in today's world, given that we live in a time where most

human societies are more open to pursuing ideals of democracy and equality;

5. **Using the Expertise Developed in Educational Institutions to Design Proposals for Real Joint Interventions that Respect Human Values and Take Socio-Cultural Diversity into Consideration:** It is no longer possible to solve problems by only using the knowledge and wisdom that humanity has accumulated over time, as it is often obsolete. Today, reality imposes the need to create new solutions to every situation we face, not just those based in traditional knowledge. (Torres, 2007).

Fleury and Fleury (2001) define competence as related to the notion of adding value to business as well as the social development of the individual, as it represents a knowledge act that mobilizes, integrates and transfers knowledge that adds economic value to the organization and social value to the individual. These authors suggest a number of verbs considered a part of the concept of competence:

1. Know how to act (knowing how and why something is done, knowing how to judge, choose and make decisions);
2. Know how to mobilize resources (create synergy and mobilize resources and expertise);
3. Able to communicate (understand, cultivate, communicate information and knowledge);
4. Know how to learn (working on knowledge and experience, revising mental models, knowing how to develop);
5. Know how to engage and commit (learn to undertake, take risks and commit);
6. Know how to take responsibility (be responsible, assuming the risks and consequences of ones actions and being recognized for such a position);
7. Possess strategic vision (know and understand the business of organization, its

environment, identifying opportunities and alternatives). (Fleury & Fleury, 2001).

Moreover, it is worth noting that information literacy is not restricted to knowing how to use software or a source of information, but involves aspects related to training, where people are able to use techniques and apply them to information needs in any environment with a critical perspective that promotes lifelong learning.

Spitzer, Eisenberg and Lowe (1998), in the work *Information Literacy: essential skills for the information age*, demonstrate the evolution of the concept of information literacy, stating that the term information literacy was first used by Zurkowski, president of the Information Industries Association (IIA), an entity formed by computer companies. These authors, in producing the report *The Information Service Environment Relationships and Priorities,* submitted to the *National Commission on Libraries and Information Science* (NCLIS), recommended the adoption of a program to ensure the implementation of actions to develop information literacy so that the population would be able to use information products available on the market. In his report, Zurkowski argued that individuals competent in the use of information sources to develop their work could be classified as competent subjects in information because they have acquired a mastery of skills and techniques to be used along with the vast universe of information tools and primary sources to solve problems. (Spitzer, Eisenberg & Lowe, 1998).

The thesis defended by Zurkowski in the context of the industrial segment, pointed to the need for information literacy for work development and success, referring to the urgent need for better performance in decision-making by using information to problem solve. At its root, the concept of information literacy emerges from the industrial and business sector, and later becomes a subject of interest in the education field, especially higher education. According to Bundy (2004),

the term "lifelong learning" was now being used for education.

Burchinal (as cited in Spitzer, Eisenberg & Lowe, 1998, p. 88) adds to the concept of information literacy the ability to find solutions to problems, arguing that it is a prerequisite to information literacy to have a set of skills that involve knowing how to find and use the information necessary for efficient and effective problem solving and decision making. Moreover, although problem solving is an intrinsic goal in all fields that apply information literacy, this aspect is especially important in the workplace.

Still, in retrieving the literature on the topic, there appears to be a range of designations for this type of competency, although there is an understanding that information literacy is a set of steps related to the processes of identifying information needs, then locating, selecting, evaluating and proficiently using information, incorporating aspects related to the development of critical thinking and lifelong learning. For scholars on the subject like Bruce, Doyle and Kuhlthau, information literacy consists of attitudes and behaviors that enable the proficient use of information, which makes information literacy perceived as a set of skills related to the exercise of critical thinking.

According to Doyle (1994), to be information literate corresponds to having the ability to access, evaluate and use information from different sources. For her, information literacy relates to the positive attributes of the subjects regarding:

1. The recognition that complete and accurate information supports the process of intelligent decision making;
2. The ability to realize the need for information;
3. The ability to formulate questions related to information needs;
4. The identification of qualified information sources;
5. The development of successful research strategies;
6. Access to and use of diverse sources of information;
7. The information review process;
8. The organization of information for practical application;
9. The incorporation of new information to previously acquired knowledge;
10. The use of information for problem solving, based on critical reflection about its content.

It is understood that the various proposals of competence are from different conjunctural moments that include differentiated paradigms outlined from the perspective of meeting the demands of society, the world of work, and the changes due to economic, political, social and technological issues. In the current context where information is essential in keeping the organization alert to possible threats and opportunities from the external environment, it is essential that professional staff demonstrate expertise in reading contexts, meaning knowing how to interpret outside signals or political, economic and social information regarding business, competitors, customers, etc. Therefore, the organization needs to have professional profiles dedicated to the processing of information in terms of the organization, representation and provision of agile and interactive systems that enable the speedy recovery of information related to decision-making. In every sense, professional training and competence development, from the broadest to the most restricted, where cognition is an underlying aspect that brings in cognitive tools into training programs, are shown to empower individual development.

COGNITIVE DEVELOPMENT TOOL APPLIED TO STRATEGIC MANAGEMENT

One of the existing tools to implement cognitive development applied to strategic planning is the Instrumental Enrichment Program (IEP), created

by Romanian psychologist Reuven Feuerstein. The aim is to increase the capacity of the human body to be modified through direct exposure to stimuli and lived experiences, both in formal learning and life itself, or in other words, to extend the cognitive potential of the individual through the mediated learning experience and in a specific way, develop cognitive functions that are essential for learning. This is a program designed with a basis in the theory of Structural Cognitive Modifiability (SCM) developed by Feuerstein, who understands human intelligence as a flexible and modifiable construct constituting the basis for the adaptability of the human species, throughout its socio-historical trajectory.

According to Varela (2007), through the methodological mediation strategy, IEP triggers a cognitive act, supported by the trajectory of the cognitive map, in order to develop the subject's operational capacity. Intervention with the Program's toolkit enables the generalization and transfer of knowledge gained through activities that exercise cognitive functions; the development of mental operations; vocabulary expansion that stimulates accurate usage of terms that support concept development; and encourages critical reflection, stimulating self-awareness, cognitive autonomy and intrinsic motivation in the individual.

The IEP instruments facilitate a performance repertoire of mental operations ranging from the basic to the more abstract, by using verbal and non-verbal language. The problem situations of all the instruments are arranged in terms of increasing difficulty, focusing on the cognitive progress inherent in them, and not on the final resolution, shown in Table 2.

To trigger these instruments, the mediator outlines a cognitive map, draws up an implementation plan, selecting: cognitive function and mental operations; mediation strategies for developing cognitive functions; and the possible trajectories of generalization (insight, divergent thinking, contextualization, generalization).

An example of the use of the IEP instrument application presented was in the French industry in the second half of the 80s, when companies began to face significant changes in which previous skills of its employees, in response to new and emerging requirements, were not sufficient in quantity and especially quality. The training systems that had been used so far did not meet most demands. It was therefore necessary to find new ways of training, focused more on the capabilities of individuals than on knowledge and know-how. The new economic situations characterized by an increase in variability made it essential to prepare employees to know how to change. (Camusso, 1996). The common point of all actions in which the IEP proved to be a suitable tool is that they were changing actions. The differences are related to the nature of change. A typology of three points is fairly representative: changes in technology, organization and qualification.

The actions of *changing technology* are essentially actions related to automation and computerization. The difficulties may be, beyond being replaced in a learning situation, the feeling of incompetence in relation to the new and, above all, the ability to learn systems where physical contact disappeared to make way, in the case of computer systems, for the transmission of information mediated through a screen, or in the case of a director of operations, numerical control machines. In this field, the awareness of the introduction of robots is mentioned at the Foundry and Forge workshops, where an IEP action preceded a more technical stage, and an action intended to explain the use of a computer system. In the latter case, the IEP was instructed for transpositions in the architecture and operation of an information system. The actions of *qualification and requalification* mainly raise the problem of placement in a learning situation and of developing the capacity to learn. The actions of *organizational change* group all installment or alignment operations where professionals, previously having a well-defined function, must exercise a variety of tasks within autonomous cells. The

Table 2. IEP application instruments: objectives/skills

Instrument	Objectives/Skills
Level I	
1. Organization Points	Planning, designing virtual relationships and work accuracy
2. Spatial Orientation I	Developing mental representation exercising flexibility and plasticity in spatial, objective and subjective orientation in topological, projective and Euclidean space.
3. Comparisons	Identify and justify judgments, classify and establish relationships, exercise systematic exploration, precision and differentiation.
4. Analytical Perception	Decompose, integrate, understand and interpret whole relationships and its parts.
5. Ratings	Establish categories, prerequisites for logical- verbal reasoning.
6. Instructions	Use codes, exercising hypothetical / inferential thinking, planned behavior, analysis and synthesis.
7. Illustrations	Perceive and define problems, decoding, exercise temporal orientation, encouraging oral expression, establishing relations of cause and effect.
Level II	
8. Spatial Orientation II	Use of external, stable and absolute references, use multiple sources of information simultaneously, using logical inference.
9. Numerical Progressions	Compare, exercise hypothetical / inferential, precise and differentiating thinking, identify and implement rules and laws.
10. Family Relations	Exercise systematic exploration, simultaneously use two or more sources of information, employ virtual and hierarchical relationships.
11. Temporary Relations	Use of a reference system that is objective and subjective, plan and exercise sequential reasoning.
12. Transitive Relations	Identify conditions that enable the transfer of relationships from inferences and logical implications.
13. Syllogisms	Analyze propositions and arguments to check veracity, distinguish inference between valid and invalid propositions and between possible and inevitable alternatives.
14. Draft Standards	Mentally represent a sequence, visually convey shapes, encode and decode information, reflective thinking, mental flexibility and reversibility of reasoning.

Source: Varela (2007) adapted from Feuerstein (1980).

main problem in these cases refers primarily to the versatility and autonomy aspects. It is necessary to identify changes, including the cognitive development tool in a skills development project, provide a teaching staff, prepare the environment, call skilled trainers, and make an assessment of the long-term effects. (Camusso, 1996).

In Brazil, in the northeast region in the state of Bahia, IEP was used by Copene Petrochemical Northeast, a company responsible for supplying steam, electricity and water to the Camaçari Petrochemical Complex plants, aside from producing basic petrochemicals. Brito and Abenhaim (2000) reported the experience, clarifying Copene's goal:

to improve the autonomous process and provide employees with innovative learning experiences - cognitive and structural - that enable and encourage information / knowledge searching and the belief in personal and professional potential. According to the authors, 120 employees, divided into six groups, experienced the application of IEP instruments. Five groups were made up of operations employees, and one group comprised officials from the administrative sector. The groups consisted of people of different ages and education (ranging from incomplete high school to completed college level), different sectors of

the company, different functions and work shifts. The IEP in Copene had as goals to:

1. Optimize cognitive development and maximize the learning potential of individuals, providing them a method of learning to learn ;
2. Sensitize the individual for professional renewal and the availability to always learn;
3. Enhance the individual with a basic vocabulary, a repertoire of learning strategies and study skills needed to accomplish professional and personal tasks ;
4. Promote the individuals intrinsic motivation development, making them feel attracted to task accomplishment, to then use and apply the concepts, relations, operations and strategies autonomously;
5. Raise the level of reflective thinking, abstraction and concentration, i.e: meaningfully learning to learn, applying knowledge and integrating them in a consistent context of relationships ;
6. Allow individuals to develop a self-image, self-esteem and autonomy at work, enabling them to reflect independently from new bases of learning;
7. Optimize the company's autonomous process in the continued application of the IEP methodology in functional segments, and if necessary, under the coordination of the Authorized Training Center – ATC Bahia (Abenhaim & Brito, 2000).

According to the authors, a pre-test was performed to assess, in an input situation, the cognitive function, mental operations, the necessary mediation level, and to have data to assess the effects of IEP instrument use and Experience Mediated Learning.

The pre-test consisted of exercises designed with a basis in IEP instruments (organization points, spatial orientation, illustrations, comparisons, ratings and analytic perception), for the sake of the Organizing test and the Complex Figure Test. The last two questions aimed to assess the participants' ability to organize and structure a complex field: identifying, describing, conceptualizing, analyzing and summarizing.

At Copene, IEP was utilized for 80 hours, distributed in 26 meetings over four months, with the indispensable presence of the mediator, who helps interpret and give meaning to stimuli, adapting them to specific needs. The program was developed outside of the work shift; the group of members from the administrative sector had meetings in the evening after the workday, while the groups of people who had varying work shifts, met on days off. Despite this schedule, they remained committed. During the program, the people involved always sought alternative solutions to obstacles that could interfere with the completion of the program. Be it holidays or other courses that could lead to a promotion, nothing dissuaded them to complete the program. Among other types of results, presented here are some testimonials of employees participating in the program:

When faced with a problem, what was your behavior before IEP: I would go out in search of a solution; looking for a culprit; trying to solve it alone; saw the problem as if it was enormous; tried to resolve it the best way possible; often going straight to the solution, as opposed to the organization; passed it on to another person; was anxious, wanting to resolve as quickly as possible; and did not control impulsiveness.

When faced with a problem, what was your behavior after IEP: Solve problems as they arise; assesse the problem and try to solve it; control impulsiveness; analyze the problem and then proceed with caution; looking at the problem as a whole, identifying the parties and seeking the solution; seeking more information; reason first, then execute; seek help; identify the problem; examine, ponder, compare, resolve; make a classification.

How did you solve problems before IEP: Tried to resolve immediately; sought direct strategies to

the solution; solved what was emerging as it arose; tried the first hypothesis; was less of an observer; decided on the first solution that presented itself; solved without involving all stakeholders; trying to resolve in anyway; knew what it would solve, but did not question why; had difficulty finding / seeing solutions; did not control my impulsiveness; was anxious.

How did you solve problems after IEP: Establish solution criteria; more observant; try to see the best solution and use it; try various options; analyze the best strategies for final solution; disclose solutions seeking feedback; seek more information; seek to analyze how I got to that solution; use correct reasoning; define the problem, establish assumptions, plan / implement appropriate solutions.

Conforming to the report of the IEP experience at Copene, professional members of the program had good cognitive function, had the opportunity to participate in the best courses offered in the country and abroad, and demonstrated good performance in work duties, being highly selective and demanding.

Both quantitative and qualitative aspects can be gauged from the results. In the quantitative aspects, there was a significant increase in the number of correct responses from pretest to post-test, and the answers to the questions considered "novelty" in the post-test showed a significant transfer of cognitive skills. In the qualitative aspect, Copene professionals that went through the process made excellent evaluations of the results of this study, and considered it important for their professional and personal growth, mainly because the work had as its starting point the analysis of internal, subjective and personal issues driving the experience with cognitive functions and mental operations. In the organization, some results in relation to autonomy, leadership and inter and intragroup relationships have been perceived.

This experience demonstrates that within the modern organization, the individual must be more flexible, switching from one task to another, learn new skills to meet present and future demands in their field of work. This requires being on constant alert to adapt to change.

CONCLUDING CONSIDERATIONS

The situation in the contemporary world is marked by the contingencies of economic, social, scientific, technological, business and political events at a global and local level. It is therefore an unpredictable world that requires a constant monitoring of events. In this climate, it is clear that information is one of the critical resources for an organization, in that it is the basis for success. Thus, maintaining information systems focused on the interest of the organization that are well structured and efficient is a competitive advantage for organizations.

From this perspective, it appears that the strategic management of an organization requires the perception and objective interpretation of the value and meaning of information in business, actions and organizational decision-making so that the information is used effectively in problem solving. And this is an intellectual process designed from complex cognitive strategies, which presuppose the existence of intellectual capital that is qualified and prepared to monitor, understand, interpret and transform information into knowledge that is useful for the organization's objectives. This evidence reinforces the idea that in the new information based economy, individuals unskilled in this kind of management will be unprepared to face the competitive environment of a society based on information, knowledge, lifelong learning and creativity.

It is therefore important to note education as a strategic priority in promoting development and lifelong learning as one of the basic principles of the new economy, with information literacy as a key element in addressing the daily challenges faced in all types of organizations and societies. The individual, in acquiring and enhancing

their competence in information for professional performance, will therefore develop skills that are key to the organization's success to which they are bound because they become capable of creating articulating and mobilizing knowledge, skills and values that foster problem solving and decision making.

Knowledge management integrates this context because its proposal to identify, organize and share strategically relevant information ends up creating a favorable environment for knowledge creation, constant learning, and valuing of intellectual capital in organizations. In the end, the search for results requires the team to incorporate new learning, new knowledge and a constant willingness for continued learning.

Knowledge management in the organization also dispenses a new way of managing people, as it is not enough to merely invest in qualifications in the search for pragmatic and useful outcomes, but necessary to also invest in promoting changes in attitudes that develop a higher degree of accountability geared towards increasing autonomy and freedom of action. This inevitably includes the need for a deeper understanding of the knowing subject, but on the other hand, requires more opportunities for the enhancement of creativity as well.

Furthermore, the organization that invests in information management ultimately ensures that channels for innovation and communication are created on a daily basis, promoting in a flexible manner, its own adaptation to the frequent political, economic and social changes, thus paving way towards an organizational structure with a competitive edge.

REFERENCES

Ardoino, J. (1998). Abordagem multirreferencial (plural) das situações educativas e formativas. In Multirreferencialidade nas ciências e na educação (pp. 24-41). São Carlos: Editora da UFSCar.

Brito, C., & Abenhaim, E. (2000). *Conferência: Desafios do PEI na empresa.* Retrieved February 20, 2014, from http:///www.flem.org.br

Bundy, A. (2004). *Australian and New Zealand information literacy framework: Principles, standards and practice* (2nd ed.). Underdale, Australia: Adelaide, Australian and New Zealand Institute for Information Literacy.

Camusso, D. (1996). *Développement cognitif et entreprise.* França: L'Harmattan-Défis-formation.

Choo, C. W. (2006). *A organização do conhecimento: Como as organizações usam a informação para criar significado, construir conhecimento e tomar decisões* (2nd ed.). São Paulo: Editora Senac.

De Pablos, C., López-Hermoso, J. J., Martín-Romo, S., & Medina, S. (2012). Organización y transformación de los sistemas de información en la empresa. Madrid: ESIC Editorial.

de Souza, A. M. M., Despresbiteris, L., & Machado, O. T. M. (2004). *A mediação como princípio educacional – Bases teóricas de Reuven Feuerstein.* São Paulo: Editora Senac.

Dervin, B. (1983). Information as a user construct: the relevance of perceived information needs to synthesis and interpretation. In S. A. Ward & L. J. Red (Eds.), *Knowledge structure and use: Implication for synthesis and interpretation* (pp. 153–183). Philadelphia: Temple University Press.

Doyle, C. S. (1994). *Information literacy in an information society: A concept for the information age.* New York: Syracuse University, ERIC Clearinghouse on Information & Technology.

Feuerstein, R. (1980). Instrumental enrichment: An intervention program for cognitive modifiability. Baltimore, MD: University Park Press.

Feuerstein, R., Klein, P., & Tannenbaum, A. (1991). *A mediated learning experience (MLE): theorical, psychosocial and learning implications*. London: Freund Publishing House.

Fleury, M. T. L., & Fleury, A. (2001). *Construindo o conceito de competência*. Revista de Administração Contemporânea - RAC.

Freire, P. (1980). *Conscientização*. São Paulo: Moraes.

Freire, P. (1985). *A importância do ato de ler* (11th ed.). São Paulo: Cortez.

Gadamer, H. (1997). *Verdade e método*. Petrópolis, RJ: Vozes.

Gauchi, V. (2012). Aproximación teórica a la relación entrelos términos gestión documental, gestión de información y gestión del conocimiento. *Revista Espanola la de Documentacion Cientifica*, *35*, 531–554.

Hamel, G., & Prahalad, C. K. (1995). *Competindo pelo futuro*. Rio de Janeiro: Campus.

Hamel, G., & Prahalad, C. K. (1997). *Competindo pelo futuro: Estratégias inovadoras para obter o controle do seu setor e criar mercados de amanhã*. Rio de Janeiro: Campus.

Kuhlthau, C. C. (1993). Seeking Meaning: Process approach to Library and information services. Norwood, MA: Ablex Publishing.

Le Boterf, G. (2003). *Desenvolvendo a competência dos profissionais*. Porto Alegre: Artmed.

Lodi, L. H. (2004). Subsídios para uma reflexão sobre o Ensino Médio. In *Brasil ministério de educação (MEC): Orientações curriculares do ensino médio*. Brasília, DF: MEC.

Martucci, E. M. (1997). *Abordagem sense-making para estudo de usuário*. Porto Alegre: ABEBD - Associação Brasileira de Ensino de Biblioteconomia e Documentação da UFRGS.

Mendelson, H., & Ziegler, J. (2004). *Los 4 principios de la empresa inteligente: Reinventar la empresa en la era de la información*. Barcelona: Ediciones Deusto.

Perrenoud, P. (1999). *Construir as competências desde a escola*. Porto Alegre: Artmed.

Piaget, J. (1964). Development and learning. *Journal of Research in Science Teaching*, *2*(3), 176–186. doi:10.1002/tea.3660020306

Piaget, J. (1971). *A epistemologia genética*. Petrópolis: Vozes.

Piaget, J. (1976). *Psicologia e pedagogia*. Rio de Janeiro: Forense Universitária.

Piaget, J. (1987). O nascimento da inteligência na criança. Rio de Janeiro: Guanabara.

Piaget, J. (1991). *Psicologia e epistemologia* (5th ed.). Lisboa: Editora Dom Quixote.

Rego, T. C. (1999). *Vygotsky: Uma perspectiva histórico-cultural da educação*. Petrópolis, RJ: Vozes.

Spitzer, K. L., Eisenberg, M. B., & Lowe, C. A. (1998). *Information literacy: Essential skills for the information age*. Syracuse, NY: Syracuse University, Clearinghouse on Information & Technology.

Tarapanoff, K. (2006). Informação, conhecimento e inteligência em corporações: Relações e complementaridade. In K. Tarapanoff (Ed.), *Inteligência, informação e conhecimento em corporações* (pp. 19–36). Brasília: Ibict, Unesco.

Tavares, M. C. (2000). *Gestão estratégica*. São Paulo: Atlas.

Teixeira, G. (2009). *Significado de competência: Ensino e aprendizagem: Ser professor universitário.* Retrieved May 10, 2013, from http://www.serprofessoruniversitario.pro.br/ler.php?modulo=12&texto=728

Tejada Artigas, C. M., & Tobón-Tobón, S. (2006). *El diseño del plan docente en información y documentación acorde con el espacio europeo de educación superior: Un enfoque por competencias*. Madrid: Facultad de Ciencias de la Documentación, Universidad Complutense de Madrid.

Tobón-Tobón, S. (2004). *Formación basada en competencias: Pensamiento complejo: Diseño curricular Y Didática*. Bogotá: Ecoe.

Torres, M. Z. (2007). Situações-problema como recurso de avaliação de competências no enem. In M. da Educação (Ed.), *Eixos cognitivos do Enem* (pp. 31–53). Brasília: Ministério da Educação.

Unesco. (1998). Declaración mundial sobre la educación superior en el siglo XXI: Visión y acción. *Annals of Conferencia Mundial Sobre La Educación Superior*. Retrieved May 10, 2013, from http://WWW.unesco.org/education/educprog/wche/declaration_spa.htm

Varela, A. V. (2007). *Informação e autonomia: A mediação segundo feuerstein*. São Paulo: Editora Senac.

Vygostsky, L. S. (1991). *A formação social da mente*. São Paulo: Martins Fontes.

Vygotsky, L. S. (1989). *A formação social da mente: O desenvolvimento dos processos psicológicos superiores*. São Paulo: Martins Fontes.

Zabala Romero, A. (2013). Influencia de las buenas prácticas de gestión de información en los resultados empresariales. *Cuadernos de Gestión de Información*, *3*, 105–120.

Zarifian, P. (2001). *Objetivo competência: por uma nova lógica*. São Paulo: Atlas.

KEY TERMS AND DEFINITIONS

Cognitive tools: Help us to make possible the action upon, or operating on, direct experience to organize and transform internal and external sources of information, to internalize them in representational levels. They are used to organized, coordinated and internalized sets of actions required by the mental act or specific learning task, and making possible representation of experience into higher order, cognitively more distant experiences.

Competence: Is the ability of an individual to do a job properly. A competency is a set of defined behaviors that provide a structured guide enabling the identification, evaluation and development of the behaviors in individual employees. Some scholars see "competence" as a combination of practical and theoretical knowledge, cognitive skills, behavior and values used to improve performance; or as the state or quality of being adequately or well qualified, having the ability to perform a specific role.

Instrumental Enrichment Programs (IEP): The Feuerstein Instrumental Enrichment program consists of more than 500 pages of paper-and-pencil exercises, divided into 15 instruments. Each instrument focuses on a specific cognitive deficiency but addresses itself to the acquisition of many other prerequisites of learning as well. The major goal of Instrumental Enrichment is to increase the capacity of the human organism to become modified through direct exposure to stimuli and experiences provided by the encounters with life events and with formal and informal learning opportunities.

Knowledge: Helps persons to make sense out of their sensations. Knowledge resides in the brain, inside of the skills. It may be considered at several levels of abstraction. Useful knowledge consists of relationships among concepts having predictive power. Sometimes knowledge is formalized (academic knowledge); other times it is experiential and empirically formulated.

Mediated Learning Experience theory (MLE): The interactional process between the developing human organism (the learner) and an experienced, intentional person (the mediator),

who - by interposing him or herself between the learner and external sources of stimulation – mediates the experience by selecting, framing, focusing, intensifying, and feeding back environmental experiences in such a way as to produce appropriate learning sets and habits.

Mediation: A major aim is to integrate knowledge about humans by drawing on various approaches and methods. The mediation processes can have very different forms, depending not only on the nature of the conflict, but also on the role of the mediator and the mediation style. Mediation tends to facilitate interactions by solving and preventing problems and conflicts either by offering formal structures that develop negotiation and conflicts resolution processes or by preparing several protagonists that in their daily life will apply and use these concepts and competences of apprenticeship in the cognitive and social domain.

Mental Act: A strategy or set of rules which serve to organize internal and external sources of information. All cognitive behaviors are ultimately mental acts, which differ in various dimensions. Effective mental acts require adequate and adaptive cognitive functions and are subject to modifiability through cognitive tools.

Structural Cognitive Modifiability Theory (SCMT): Theory elaborated by Reuven Feuerstein. He argues that intelligence should be viewed as a dynamic construct; that the human cognitive faculty is flexible, not fixed. Feuerstein's view of cognitive development is rooted in the theory of Mediated Learning Experience (MLE). Structural changes refer not to isolated events but to the organism's manner of interacting with, that is, acting on and responding to, sources of information. A structural change once set in motion, will determine the future course of an individual's development. Then, cognitive modifiability refers to structure changes, or to changes in the state of the organism, brought about by a deliberated program of intervention.