

Knowledge Management in postgraduate and research educational institutions

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ABSTRACT

The fundamental task of education is to make it possible for the human being to be able to conduct himself in life and be able to interact with his fellows in the friendliest way possible. Therefore, the educational institution has to modify some of the practices that, if in the Humboldt era were necessary, today are frankly inoperative for the same development. The educational institutions and society can not live apart, therefore they have to open up, if the knowledge society has pretensions to be such. This permanent contact between knowledge and social practices is what must be the fundamental objective of a permanent education. This article shows the importance of adding knowledge management to postgraduate and research educational institutions, through qualitative research which highlights its use, its prospective and its observable consequences on a sample of 3000 people.

Keywords: knowledge management, index of educational organizational intelligence memory, degree of relevance of knowledge management, degree of knowledge management and competitive advantage.

1 Introduction

Knowledge management is known as "knowledge management"; it seeks to transfer explicit knowledge using knowledge as a resource available to others in the same organization. This process involves developing techniques to capture organizing the storage of knowledge using collaborators to transform it as an intellectual asset that lends benefits and can be shared.

At present, information technologies allow to have tools that support knowledge management in companies, basically supporting the collection, transfer, security and systematic administration of information together with a system designed to help make the best use of that information. knowledge.

Its use goes beyond information technology where all the members of an organization from the highest executive to the lowest position and in any area, provide knowledge and experiences. The process of knowledge management has mainly the following objectives:

Build collect and organize existing knowledge to facilitate the creation of new knowledge;

1. Aim for innovation;
2. Reuse of knowledge.

Through the use of knowledge management develops the ability of people who rely on the organization to achieve better performance. Knowledge management is developed informally through discussions and sessions that formally represent training programs as an emerging practice.

Based on knowledge management, the institution represents the main and official spokesperson for knowledge and depends on the establishment of corporate plans and other practices.

The term institution is used to be able to allude to certain norms to which they express values protected before a social reality. Four concepts are used to define an institution which are:

1. The institution is a synonym of social regularity, refers to the application of standards and presents social values, the individual always has character within the group and is controlled by different internal regulations and external;
2. The institution as a synonym of establishment to the organization, expresses a specialized function that has its own space;
3. The institution as an entity before the existence of the symbolic world;
4. The social institution: Entity that marks the permitted, the prohibited, the recognition, the obedience.

Today it is recognized that the institutions are the fundamental mechanisms for the development of our society, which are governed by general rules that govern our society, which they allow the coordination of the subjects and they manage the conflicts.

The educational institutions focus on the social part on the integral formation of the individual, the strengthening of traditional values and the improvement of the individual to be a better person. They

are inadequately characterized by diagnosing and managing the environment of an organizational culture where staff, learning, teamwork and knowledge are scarcely valued.

Lacks a shared vision to achieve the mission, vision and institutional commitment of all instances from the direction and usually fails in the coordination and development strategies that stimulate and motivate staff to develop their productive capacity.

Knowledge management as a competitive strategy in educational institutions

Knowledge as a resource has become the competitive strategy for nations, educational institutions and people, in today's society there has been a tangible change in the nature and importance of knowledge and its relationships with prosperity (Benavides and Quintana, 2003).

The essential differences that give sustainable competitive advantages to nations, organizations and people over prolonged periods of time, turn out to be those based on skills and knowledge, which are called intangible assets, or intellectual capital (Drucker, 1993), (Toffler, 2000).

Information and communication technologies have made it possible to modify the way of life, relationships and the way people work; the way of learning; the way to teach and to direct and to structure. The transformation of the industrial society to the information society and the knowledge society, is characterized by considering knowledge as the center of the different activities of people and organizations to increase productivity. The knowledge society, the generation, processing and transformation of information into useful knowledge, become the fundamental sources of productivity and power.

Due to the great advances in information and communication technologies, the new relationships between people and organizations are structured in the form of "networks" that arise freely and are constantly configured or reconfigured (Society in Network).

The Networked Society allows the development of numerous personal communities based on individual interests or personal affinities. The network makes it possible for people with similar projects to reinforce their convictions and establish powerful social networks of affinities that are difficult to create outside the network.

In the current knowledge society, knowledge is specifically the factor and the advantage that enables the generation and sustainability of the competitive advantage of organizations in today's economy to respond to the challenges that the new society demands today (Nonaka and Takeuchi, 1995).

In the current educational institutions, due to the changes that have taken place in the world in the last decade, the development of the new communication and information technologies have facilitated the organizations a greater competence and efficiency to manage their intellectual capital as well as to generate new services, products, patents, technologies, projects and in particular, the emergence of a new management modality: knowledge management. Knowledge management and

intellectual capital are undoubtedly changing the way in which the economy of organizations works in this increasingly globalized world. Logically, not all countries have identified the same opportunities to introduce this philosophy, based on the management of intangible assets, in order to socialize knowledge and increase competition and market value in organizations in Mexico.

Study of this topic by the State, the interest of several researchers in the subject by expressly incorporating thematic content on the subject in their academic programs and promoting the development of research projects. In relation to educational institutions the picture is different because there is little work on the subject, which is why our research question focuses on this: Is it possible to use a successful knowledge management model in educational institutions?

Type of study and methodological design

This exploratory descriptive study was conducted with a sample of 3000 people in educational institutions (men and women, managers, middle managers and teachers, with different seniority) of 12 educational institutions of different sizes (large, medium and small). The application of the selected instrument was a survey during the period from February to October 2017. The instrument used to obtain the information presented here was a survey made up of two parts:

1. Degree of relevance of knowledge: it consists of a survey made up of 12 statements related to the appropriation, application and generation of knowledge in education in relation to training, environmental analysis and the use of information technologies and communications. This survey was designed specifically for this study and is structured according to the Likert scale criteria, where the person surveyed qualifies each statement, according to their perception, in scores of 1 to 4, where: 1 = Strongly disagree, 2 = Partially disagree, 3 = Partially agree and 4 = Strongly agree.
2. Matrix of Index of Measurement of Organizational Intelligence: it is conformed by three dimensions or factors: the organizational memory, the simple matrix of capacities and the culture, the attitudes and the behaviors. Likewise, each dimension is constituted by different statements that appear in the internal boxes of the respective matrix and are scored according to a scale 1 to 4, where: 1 = Bad, 2 = Fair, 3 = Good and 4 = Excellent.

Methodology for calculating the Organizational Intelligence Measurement

The Matrix is an instrument designed by Ángel Arbonés Ortiz and Jon Aldazabal Basauri. Its objective is to know what the organizations with respect to the need to capture, create and exploit knowledge to determine the facts that make an organization have the capacity to generate added value through knowledge. In order to calculate this index, the following steps were followed:

1. Calculation of the generation of value was carried out based on the organization's capabilities (GVACO). The different capacities that condition the generation of value in a different proportion were considered:

- a) Capacity to monitor (CV);
- b) Ability to respond (CR);
- c) Ability to solve (CRP);
- d) Ability to learn (CA);
- e) Capacity to innovate (CI);
- f) Capacity to exploit knowledge (CEC).

2. Calculation of the generation of value from the perspectives of K-facts: Identification and evaluation of knowledge flows in educational institutions (GVAPE). This is calculated for both internal and external perspectives, which are interrelated for the fulfillment of the strategic objectives of the organization.

Where: GVAPE: generation of value from the perspectives of the organization in terms of: Po: Projects, Pu: Publications, Pa: Patents, Ag: Graduates, Vi: linkages, CL: Book chapters, Co: congresses and symposia.

3. Calculation of the generation of value from the organizational memory / structural capital GVAMO. The aspects related to the organizational memory show the generation according to the internal and external perspectives, like this:

GVAMO: generation of value from the organizational memory / structural capital, is in function of: Po: Projects, Pu: Publications, Pa: Patents, Ag: Graduate students, Vi: links, CL: Book chapters, Co: congresses and symposiums.

4. Calculation of the generation of value from the culture, skills and organizational behavior GVACUL. The aspects related to the culture, aptitudes and organizational behavior show the generation according to the internal and external perspectives.

Where: GVACUL: value generation based on culture, skills and organizational behavior, is based on: Po: Projects, Pu: Publications, Pa: Patents, Ag: Graduates, Vi: links, CL: Book chapters, Co: congresses and symposiums.

From these 4 components of value generation, we have that the organizational memory index (IMIO) is in function of:

1. GVACO: generation of value from the capabilities of the organization.
2. GVAPE: generation of value from the perspectives of the organization.
3. GVAMO: generation of value from the organizational memory.
4. GVACUL: generation of value based on culture, aptitudes and organizational behavior.

In this way, the IMIO will be determined based on these four values according to equation 1.

$$IMIO = f(GVACO + GVAPE + GVAMO + GVACUL) \quad (1)$$

The calculation of the matrix consists of completing each cell, with the scale mentioned above: bad, fair, good or excellent.

ANALYSIS AND INTERPRETATION OF THE RESULTS

When the matrix is fully qualified, one of the value generators is reached and the state of the response is symbolized, as follows:

1. Green: there are no distortions or ruptures between capacities and perspectives, since they are found in a state with a capacity between 76% and 100%.
2. Yellow: the educational organizations are in significant difficulties, it is in a capacity between 51% and 75%, where there is a risk of not having skills in front of the perspectives or vice versa, and it is an alert about the possibilities of improvements be of perspectives or capabilities.
3. Red: Educational institutions present distortions or ruptures between perspectives and critical capacities and need immediate attention, that is, they are well below 50% of the capacities compared to the perspectives.

This color convention allows us to analyze the aspects in which the capacities are not giving an accurate answer for each of the perspectives analyzed. They can also be represented in a Dashboard graphically.

In terms of organizational memory and culture, they are shown separately and analyzed by relating the knowledge accumulated by the organization (memory) and the response to society (culture and skills).

Table 1 shows the values obtained for the GVAMO organizational memory.

Table 1. Organizational Memory.

Projects	Publications	Patents	Graduate students	linkages	Book chapters	congresses	GVAMO
70.5%	69.78%	69.53%	70.5%	70.14%	70.14%	71.12%	71.12%

Table 2. The list of capacities related to projects carried out.

Table 2. Shows the relationship of organizational memory dimensions with capabilities.

	CV	CR	CRP	CA	CI	CEC	TOTAL
	HOWDEVELOPED	TECHNOLOGIES ARE ARE USED	RESOLUTION OF PROJECTS	CAPACITY TO LEARN	NEW KNOWLEDGE	NEW PROJECTS	
Projects	72.12%	70.5%	71.5%	68.5%	70.5%	60.0%	80.6%

Table 3. The relationship of the capacities related to articles made.

Table 3. Shows the relationship of organizational memory dimensions with capabilities.

	CV-Cap. monitor	CR-Cap. response	CRP Cap. Solveproblems	CA -Cap. learn	CI-Cap. innovate	CEC-Cap. Exploitation of knowledge	TOTAL
	What other centers publish	New fields	Other articles	Published	articles New articles	Disclosure	
Articles	68.75%	68.75%	67.19%	70.5%	69.47%	65.27%	68.32%

Table 4. The list of capabilities related to patents.

Table 4. Shows the capabilities related to patents.

	CV-Cap. monitor	CR-Cap. Response	CRP Cap. Solveproblems	CA -Cap. Learn	CI-Cap. innovate	CEC-Cap. Exploitation of knowledge	Total
	What other centers publish	New c	Other patents	Published	patents New patents	Disclosure	
Patents	8.75%	2.25%	67.19%	1.5%	0.95%	65.27%	24.31%

Table 5. The list of skills related to graduate students.

Table 5. Shows the capacity related to graduate students.

	CV-Cap. monitor	CR-Cap. response	CRP Cap. Solveproblems	CA -Cap. learn	CI-Cap. innovate	CEC-Cap. exploitation of knowledge	TOTAL
	that graduates othercenters	graduate	Graduatestuck	Works	New fields	Disclosure	
Studentsg raduates	74.66%	73.48%	71.09%	74.12%	71.77%	71.77%	72.81%

Table 6. The ratio of capacities related links made.

Table 6. Shows the capabilities related to links made.

	CV-Cap. monitor	CR-Cap. response	CRP Cap. Solveproblems	CA -Cap. learn	CI-Cap. Innovate	CEC-Cap. Exploitation of knowledge	TOTAL
	other centers	linkagelinkagesli nks	Future	Previous	New knowledge	Disclosure	
Connections	24.66%	33.48%	21.09%	14.12%	11.77%	11.77%	19.48%

Table 7. The list of capabilities related to book chapters.

Table 6. Shows the capabilities related to book chapters.

	CV-Cap. monitor	CR-Cap. response	CRP Cap. Solveproblems	CA -Cap. learn	CI-Cap. Innovate	CEC-Cap. Exploitation of knowledge	TOTAL
	What other centers publish	New fields	Other	chapters published	chapters New chapters	Disclosure	
Cap. Books	70.14%	70.50%	70.00%	14.12%	71.25%	69.53%	60.9%

Table 8. The relationship of the capacities related to congresses.

Table 6. Shows the capabilities related to congresses.

	CV-Cap. monitor	CR-Cap. response	CRP Cap. Solveproblems	CA -Cap. learn	CI-Cap. innovate	CEC-Cap. Knowledge exploitation	TOTAL
	Assistance from other centers	New conference	congresses	Presentations	New topics	Disclosure	
Congresses	72.5%	71.50%	70.62%	74.12%	61.25%	69.53%	70.42%

The result of all relationships is shown in Table 9 where the final GVAPE index is expressed.

Table 9. Shows the GVAPE.

GVAPE	
Projects	80.6%
Articles	68.32%
Patents	24.31%
Graduates	72.81%
Connections	19.48%
Book	60.9%
Congresses	70.42%
chaptersGVAP	56.69%
E	

Table 10. Shows the calculation of value generation based on culture, skills and organizational behavior GVACUL

Table 10. GVACUL sample.

Participation Projects	Writing articles	Graduate students	Connections made concrete	Cap. Books	Participation Congresses	GVACUL
72.51%	68.55%	74.32%	70.42%	70.10%	72.17%	71.34%

Table 11. Shows the calculation of the generation of value from the capacities of the organization (GVACO).

Table 10. GVACO sample.

CV-Cap. monitor	CR-Cap. response	CRP Cap. Solveproblems	CA -Cap. learn	CI-Cap. innovate	CEC-Cap. Exploitation of knowledge	GVACO
72.50%	71.50%	70.62%	74.12%	61.25%	69.53%	70.42%

In this way, the IMIO will be determined based on these four values according to equation 1.

$$IMIO = f \frac{(70.42\% + 56.69\% + 71.12\% + 71.34\%)}{4} = \frac{269.57}{4} = 67.39\%$$

CONCLUSIONS AND RECOMMENDATIONS

In general, in Mexico, since the 2000s and as a strategy to respond to research challenges, the accelerated development of information and communication technologies and the complexity acquired by the Internet and the relationships they have made that society is complex and educational organizations are becoming increasingly complex, has generated a repeated concern on the part of the academic community to promote activities related to training and research in the field of knowledge management and their relationships.

Managers of postgraduate or research educational institutions have begun to include in their development plans strategies related to knowledge management as a factor that generates value for their competitive capacity. For the last two years, the government of Mexico has been formulating national, regional and local agendas in which knowledge management is considered a priority for the development and competitiveness of each community.

For the case that is analyzed in this research, it is observed that, in general, according to the results expressed by the respondents, there is interest and a significant degree of knowledge management on the part of the surveyed institutions where the training of the people, the analysis of the environment, the use of information and communication technologies, culture, attitudes and behavior as well as organizational memory play an important role in their dynamics in order to

provide better results to this important task that is the investigation.

The results of this study, highlight that the Institutions should work and help their researchers to make links and patents, as well as reinforce the publication of articles and book chapters. It is shown that in the field of diffusion the values obtained are interesting since the disclosure is made in a systematic way.

Finally, one aspect to be considered relevant in the results of the Organizational Intelligence Memory Index (IMIO) for the total sample of the institutions participating in the study is that in the "capacities" element it shows the lowest degree of generation value for the dynamics of the same, this means that although there is a positive perception of the importance of knowledge in the context of institutions, this is more of criterion than of specific actions aimed at developing competencies and in accordance with the theory on management of knowledge, it is not enough to identify, acquire or create knowledge but it is more important to have the skills or competencies for the respective appropriation, creation and use of knowledge for the generation of added value and generate competitive advantage.

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