

<https://doi.org/10.23913/ride.v12i23.1107>

Artículos científicos

Modelo de gestión de capital humano por competencias para universidades públicas en México

***Human Capital Management Model by Competencies for Public Universities
in México***

***Modelo de gestão de capital humano por competências para universidades
públicas no México***

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Resumen

El capital humano es pieza indispensable en cada organización, por lo que la gestión de este debe ser punto de partida en cualquier entidad. El objetivo de esta investigación fue generar un modelo de gestión de capital humano para universidades públicas en México cuyo modelo educativo se sustente en la promoción de competencias. El estudio se realizó bajo un enfoque cualitativo *in situ* y tuvo un corte transversal. Se utilizó como base el paradigma de investigación de la teoría fundamentada (*grounded theory*). La recolección de datos se llevó a cabo mediante entrevistas y la técnica de observación. El modelo que se diseñó se encuentra constituido por tres etapas: 1) reclutamiento y selección docente por competencias, 2) contratación y 3) desarrollo. Se trata de una propuesta de modelo cíclico, pero no cerrado, perfectible en sus conceptos y abierto a mejoras tanto administrativas como de fundamentos legales.

Palabras clave: competencias del docente, enseñanza pública, gestión de personal, modelo educacional, universidad.

Abstract

Human capital is an indispensable piece in every organization, so its management must be the starting point in any entity. The objective of this research was to generate a human capital management model for public universities in Mexico whose educational model is based on the promotion of skills. The study was carried out under a qualitative approach *in situ* and had a cross section. The grounded theory research paradigm was used as a basis. Data collection was carried out through interviews and the observation technique. The model that was designed is made up of three stages: 1) teacher recruitment and selection by competencies, 2) hiring and 3) development. It is a proposal for a cyclical but not closed model, perfectible in its concepts and open to improvements, both administrative and legal.

Keywords: teacher competencies, public education, personnel management, educational model, university.

Resumo

O capital humano é uma peça indispensável em qualquer organização, portanto sua gestão deve ser o ponto de partida em qualquer entidade. O objetivo desta pesquisa foi gerar um modelo de gestão do capital humano para universidades públicas no México, cujo modelo educacional é baseado na promoção de competências. O estudo foi realizado sob uma abordagem qualitativa in loco e teve um corte transversal. O paradigma de pesquisa da teoria fundamentada foi usado como base. A coleta de dados foi realizada por meio de entrevista e da técnica de observação. O modelo desenhado é composto por três etapas: 1) recrutamento e seleção de professores por competências, 2) contratação e 3) desenvolvimento. É uma proposta de modelo cíclico, mas não fechado, aperfeiçoável em seus conceitos e aberto a melhorias, tanto administrativas quanto jurídicas.

Palavras-chave: competências docentes, educação pública, gestão de pessoas, modelo educacional, universidade.

Fecha Recepción: Julio 2021

Fecha Aceptación: Diciembre 2021

Introduction

An organization is made up of two or more people who form a structured system designed to achieve common goals and objectives. One of the purposes of any business is to be competitive in a global market. To achieve the above, it is necessary to ensure the quality of your products or services. Hence, the human factor is essential for a good organizational functioning. Indeed, most companies have their own personnel training, recruitment and selection processes, the purpose of which is to acquire the ideal human talent for each position, qualify it for the tasks, projects and objectives assigned according to the activity to which it is dedicated.

Currently, in the knowledge society, the processes related to human capital have acquired a new aspect of importance because the achievement of the objectives of the organization depends to a great extent on their efficiency. That is why generating a human capital management model as a proposal for public universities is closely related to the ability of companies to achieve their objectives. It is about establishing a coordinated effort among those responsible directed towards the continuous improvement of personnel management: the formation of a teaching human capital management model will depend on the

organizational needs, as well as the contribution of the management by competencies of the Corresponding government agencies.

Once the study, analysis and systematization of data has been carried out, and following a qualitative methodology, this work proposes a model for the management of teaching human capital that includes the basic and specific competencies that a candidate must fulfill, as well as the competences to be developed by teachers and people who make up the human resources department as part of a behavioral model of competencies.

Literature review

According to Giere (2004), a relevant aspect of scientific models is their ability to represent aspects of the world: “Scientists use models to represent aspects of the world for various purposes. From this point of view, models are primary instruments of representation in science”(p. 747). This ability of models resides in the fact that “they are designed so that their elements can be identified with characteristics of the real world” (Giere, 2004, p. 747).

Bailer-Jones (2013), on the other hand, characterizes scientific models as interpretive descriptions of phenomena that facilitate the understanding of these, of the phenomena. Thus, he identifies that the models must not only fit with the available empirical data, but must also give rise to predictions and, in this way, be testable.

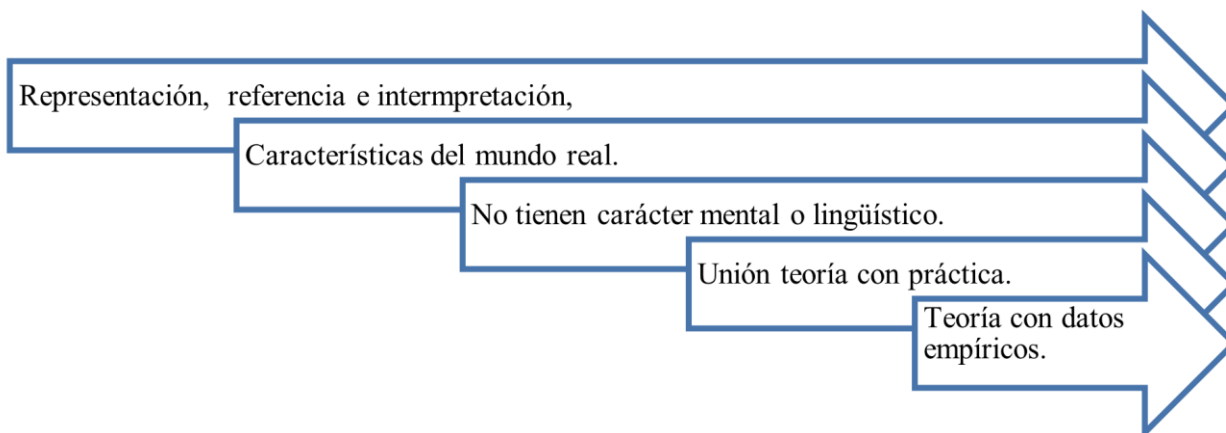
While Suárez (2010) indicates that scientific models are not mental or linguistic entities; They can be concrete entities, such as a model or a prototype, or abstract entities, such as a set structure or a system of equations, but in any case, they do not have a mental or linguistic character.

Along the same lines, Adúriz and Izquierdo (2009) indicate that the model is the relationship between the theory and the world or the specific relationship between the models of the theory and the world. The relationship of similarity of the models is based on the connection between them and reality. They also point out that the model acts as a mediator between theory and empirical data, or between theory and the real world.

Finally, Acevedo, García, Aragón and Oliva (2017) point out that a scientific model is like a representation of an objective (the referent) and that the referents represented by the models can be diverse entities, such as objects, phenomena, processes, ideas or systems. A scientific model is also a tool to connect a scientific theory with a phenomenon, because it helps the development of the theory from the data and links it to the natural world.

Next, in figure 1, some of these central elements are taken up in order to understand what a scientific model is. It should be noted that this has specific characteristics according to the study area.

Figura 1. Elementos conceptuales de un modelo científico



Fuente: Elaboración propia

Once the concept of model has been addressed, it is necessary to address human capital management. Cuesta and Valencia (2018) indicate that human capital management includes all decisions and managerial actions that affect the relationship between employees, the organization and the work that is being developed. Likewise, Rodríguez (2015) considers that human resource management consists of planning, organization, development and coordination, as well as the control of techniques capable of promoting efficient staff performance. In this conception, the organization represents the means that allows the people who collaborate in it to achieve the individual objectives directly or indirectly related to work.

Hellriegel (2009) proposes a competency-based approach and combines the principles of administration with what he considers to be core competencies, namely: self-administration, strategic action, multicultural, teamwork, planning, administration, and communication. In addition, in parallel, he presents the stages of administration. Thus, Hellriegel (2009) makes an analysis that is important for the present research since it combines the phases of administration from a competency perspective.

Competency interviews are, for the same author, a relevant factor. Interviews can be useful to obtain better results, especially if it is carried out with a format where competencies are the center of it. In addition, he states that offering training to people who provide

employment helps employees to overcome work restrictions and increase their productive capacity, since it fosters the necessary skills to develop work and their living environment.

Alles (2017) For its part, it identifies the elements of a comprehensive follow-up to fill a vacancy: it begins with the determination to recruit and ends with the process of promoting the person. The following phases are part of this process: 1) competency management, 2) competency selection, 3) planning, 4) profile definition, 5) attraction and recruitment, 6) first selection, 7) competency interview, 8) comparison of candidates, 9) specific evaluations, 10) negotiation and offer, 11) incorporation, 12) management control, 13) audit and 14) internal promotions.

From the above, it is worth highlighting the incursion of competencies in the interviews and in the promotion process, in addition to observing the profile of the person, since they are elements that allow a more comprehensive vision and that provide a greater number of tools to the person. human capital management process in organizations.

Another model for the recruitment and selection of human talent based on competencies is that of Restrepo, Landino and Orozco (2008), who present a way of choosing new collaborators with sufficient standards to contribute to business development. This is a human management system that emphasizes the person, their abilities and motivations as factors of success.

The authors identify the following elements in the model developed:

- Identify the competencies.
- Recruitment.
- Human talent selection process.
- Evaluation phase of the selection process.

Now, as part of the works that put theory into practice, Gómez and Mendoza (2013) present a model of management by competencies for the Acmed company, where a manual of functions and profiles by personnel competencies stands out. And Saracho (2005) traces a route that goes from the identification of the distinctive competences to the necessary resources for the implementation of a model.

The work of Alles (2018) draws attention, which proposes a model of competencies where cardinal competencies, executive levels, intermediate levels and initial levels are identified. It is also worth noting the proposal of Tejada (2003), who emphasizes the role of learning in competencies and their sub-processes. Furthermore, he classifies competencies from the

perspective of fundamental managerial development processes. This is very interesting, since it is an area of opportunity for the development of skills and training of managers in organizations.

For his part, Chiavenato (2020) raises four subsystems: feeding, application, maintenance and development, the latter, as will be seen later, very important for the model proposed in this research.

Finally, Cuesta (2005) raises four subsystems: the flow of human resources, education and development, work systems and workers compensation. Subsequently, he presents the fundamental aspects included in each of the elements that make up his model: situation factors, interest groups, policies, human resources and results.

The objective of this research was to propose a teaching human capital management model aimed at public universities in Mexico that handle an educational model based on competencies. The foregoing in order to propose improvements in the teaching staff management processes.

Investigation case

A human capital management model for public universities based on competencies as an educational basis can achieve improvements in personnel management processes in public university teachers.

Materials and methods

The use of qualitative methodology was elementary to achieve the objective. Given its inductive orientation, this methodology does not seek to test a priori hypotheses. In addition, it allows contextualizing the experiences of teachers and administrative personnel, who, in their daily actions in public universities, have experienced the transition from a traditional model to the implementation of the model by competence. This is valuable, since it is they who, as informants, will narrate the experiences lived in their daily teaching or administrative work.

Using Grounded Theory

This research is based on the grounded theory paradigm of Glaser and Strauss (2017). The lack of human capital management by competencies is a reality in the public institutions under study that can be analyzed through the narrative of the informants. In the first place, some teachers shared their experiences regarding the difficulties they experienced from their recruitment to the moment they faced the learning group in a classroom environment (virtual or face-to-face). Second, there were administrative staff, who, as secondary informants, expressed orally and through documents how to carry out the management of teaching human capital.

It should be considered that the hypotheses were achieved as a product of the selected methodology and at the end of the research, always with the purpose of gathering sufficient information through interviews, which allowed to know in depth the state of the teaching human capital management in the moment of development of the investigation. Finally, it is worth noting that the informants reviewed and consented to the data released in the interviews.

Analytical Rules of Grounded Theory

In the present investigation, it was not intended to test hypotheses, but concepts were generated in the presented model. Likewise, it was intended to understand and explain the phenomenon of human capital management by competencies in public universities in Mexico. The use of the grounded theory was due, in addition, because it was intended to have an abstraction generated by the daily action and its significance of the research subjects. In this sense, there was an abstraction of time, space and research subjects.

However, the analytical rules of grounded theory were also followed, following here Raymond (2005), namely:

- *Definition of the research object:* when studying the social acts of the teachers of public universities in Mexico, the research object is the social phenomenon of human capital management by competencies in public universities, this considered as a social action susceptible of be constantly compared with other similar and contrasting situations, considering that there may be variations from the beginning to the end of the study.

- *Theoretical sensitivity*: it is important to note that it was sought to avoid preconceived perceptions about the management of human capital by competencies and alluded to creative capacity given the professional and personal experience of the researchers in this work.

During the investigation, the researchers were required to think in theoretical terms, and the researchers were constantly involved in the collection and analysis operations, rather than making hypotheses until the data is analyzed.

- *The selection of the situation or group under study*: observations and interviews were carried out to collect the information. It was also sought to get involved in the daily actions of the research subjects in the study contexts.
- *Theoretical sampling*: it was closely linked with the analysis of the research in such a way that the situations under study, the groups and research subjects were selected based on the previously defined categories, determined in turn by the research question. For this reason, it was very difficult to fix it in advance, since it was elaborated in subsequent stages and developed throughout the investigation.
- *The elaboration of conceptual categories*: taking into consideration the principle of saturation, it was not intended to characterize data, but rather to find what the management of human capital by competencies means. In this way, the concepts that were emerging from the same universe were grouped into a conceptual category; Even so, a detailed description of the incidents was not sought so much, which vary throughout the investigation, but rather the concepts were refined from the constant comparisons of the phenomenon.
- *The coding process*: the comparison was the main analysis tool of the theory based on the present investigation; showed similarities and differences of the data in order to identify their characteristics and the relationship between them. The coding was open, since all the incidents were coded, however, throughout the investigation it became more selective; it was also accompanied by a theoretical reflection. Theoretical coherence did not mean an immobility of the categories, on the contrary, they were adapted based on the generality of the data.

It is important to emphasize that the codes and their interrelation were given importance; those left out were omitted.

- *The qualities of substantive theory*: the application of the theory based on the human capital management model by competencies allows integrating a series of concepts to generate a flexible theory and the opportunity to study the phenomenon of human capital management in depth.

Variables

Discrete variables were not considered given the selected methodology, since their importance lies in the in situ observation of the phenomena for their better understanding.

For this purpose, and using direct observation of the incidents, the phenomena were labeled to subsequently be constantly compared with the previously defined categories, which allowed a new selection or creation of new categories.

For the realization of this model, the following was taken into account:

- 1) Literature review.
- 2) Definition of the problem.
- 3) Delineation of data collection instruments.
- 4) Determination of the sampling. The total population was 38 public universities with the competency education model in Mexico.
- 5) Data collection through direct observation and 50 semi-structured interviews applied in the study institutions.
- 6) Finally, as the model was developed, reasons were found as to why the teaching human capital management tools under the competencies approach have an effect on the implementation of said model in public universities. In this way, it is possible to propose a model that is the object of this research.

It should be noted that the variables were not manipulated. The information was obtained from 50 interviews in 38 institutions under the principle of theoretical saturation. Observation in situ allowed them to be studied as they have arisen. In addition, the collection of interviews through recording on electronic devices in a single moment allowed the research to be systematic, empirical and cross-sectional. All the information obtained was transferred for interpretation into the Atlas ti computer program, since it is a program that facilitates the creation of variables, categories, concept maps and the constant compaction of variables.

Results

The teaching human capital management model by competencies is divided into three fundamental stages:

- 1) Recruitment and selection of teachers by competencies, which includes: a) the identification of the key preliminary elements for the implementation of the model, b) the previous changes for the implementation of the model and c) the way to approach the candidates to teaching positions, as well as to designate the people who will be the recruiters.
- 2) Hiring. That by giving legal tender to the hiring, legal certainty is given to the management of teaching human capital.
- 3) Development. At this stage, a series of concepts is proposed that are outlined to a training rather than a training.

It is important to mention that the proposed model is made up of four phases that, in a classical way, have been taken up in human resources administration (recruitment, selection, hiring and development), however, these stages are taken up from the perspective of the competencies for teachers, that is, from before starting the process, it is recommended to make organizational changes for the implementation of the model, as well as a proposal in competencies.

Stage I: teacher recruitment and selection by competencies

The following are the key prerequisites for getting the model up and running.

Management commitment

As an important part in the management of teaching human capital, it is required that the management staff and especially the department in charge of human resources is convinced of the implementation of the model. That they be the first to apply the principles, formats and guidelines of the competences in their administrative work.

Sensitization

The knowledge of the advantages that the application of competences in the management of teaching human capital can bring to achieve learning competencies in the

classroom is very important, especially if one is aware that the personality and competencies of the teacher Recruited teachers can help or hinder the achievement of the objectives of the educational institution that has the competencies model. Seeking training rather than training is a factor that should be encouraged in those involved, both managers and teaching support staff and teachers themselves. In this sense, it can be recommended, in addition to the training offered by the federal educational authorities, an experiential workshop where the skills achieved by people throughout life can be expressed, as well as the potential skills that the individual can develop and that they probably don't have much to do with your education background. The foregoing in order for the subject to clarify the concept of both teaching and non-teaching skills. This can be complemented (in training) with a demonstration where the teacher can show their knowledge, abilities, skills and values, which will be evaluated by the workshop members themselves with the instruments that are usually used for this purpose (checklist, guide to observation, evidence portfolio).

Identification of the governing institutional competencies

The mission, vision, objectives and philosophy of each university, the decree of creation of each institution, the state government philosophy and each university, as well as the institutional development plan will be basic documents to determine the governing competencies. This work can be carried out by senior management in conjunction with managers and full-time and part-time teachers when carrying out the institutional development plan. The foregoing in order to have a guideline to follow in terms of competencies and to be able to transfer said work to all levels of the institution.

Conformation and continuous training of the panel of experts for a selection by competencies

Once the concept of competences has been clarified and the governing institutional competencies determined, the group of people who will carry out the selection of teachers in the institution must be formed. Here it is suggested that it be made up of the following profiles: 1) an academic director, 2) a basic area teacher, 3) a teacher (full or part time) of the specialty to be evaluated in the selection, 4) a curriculum designer of the same specialty and 5) a human resources representative.

It is very likely that there is only one or two panels of experts in each institution and that only specialists will move; It is not a question of forming as many panels of experts as there are subjects.

The work of selecting the teachers of the specialty and the curriculum designer will be of utmost importance. Based on the key competences of the manual of the subject to be evaluated, they will carry out the process of elaboration of the assessment instruments of the aspiring teacher, which can be checklists, observation guides or a portfolio of evidence in the specialty of the subject. . The basic area teacher's job will be to evaluate those same competencies in the applicant. For his part, the human resources specialist will be in charge of evaluating the legal and personality aspects of the subject. The manager will evaluate the executive competencies of the individual. And finally, the panel of experts should focus on a constant update on the advances that the knowledge society generates in terms of skills and educational technology in order to modify the selection instruments according to said advances. At the same time, the previous changes for the start-up of the model are presented.

Proposal to improve the organization's manual of the institution under the educational model by competencies

The administrative document that provides all the information about the hierarchies, functions and obligations of all the personnel of the organization is the organization manual. It is worth mentioning that it would be ideal to modify the entire document in accordance with the requirements of the educational model by competencies. However, this model only suggests the change concerning the management of teaching human capital and that this change be reviewed by the panel of experts in order to comply with the expectations of the educational model.

Determination of generic competencies and specific competences in the organization manual for the selection of human capital

The panel of experts will review the functions of each member of the human resources department. Subsequently, it will focus on determining the competencies of each of the positions in the human resources department, both generic and specific.

Determination of generic and specific teaching competencies

The panel of experts must propose to the planning department the generic competencies that teachers must possess in order to be hired and these must be reflected in the organization manual with the aim of identifying the competencies for future hiring in the teaching positions.

On the part of the specific competences, they are determined by the expert teacher in the matter and the curriculum designer of the career. They will be taken into account in the evaluation of the candidate by the panel of experts at the time of the sample class and will be reflected in a checklist or observation guide that the panel will design for this purpose or portfolio of evidence.

Proposal to improve quality procedures related to the management of teaching human capital aligned to competencies

Quality management procedures have the virtue of being capable of being modified through what is known as continuous improvement. In this sense, it is key that the procedures concerning the management of teaching human capital are reviewed by the panel of experts so that they comply not only with the requirements of the same standard, but also the requirements of competencies and the academic needs of the institution.

Proposal to improve the regulation of entry, promotion and permanence

The proposed improvement to this regulation focuses on the following points:

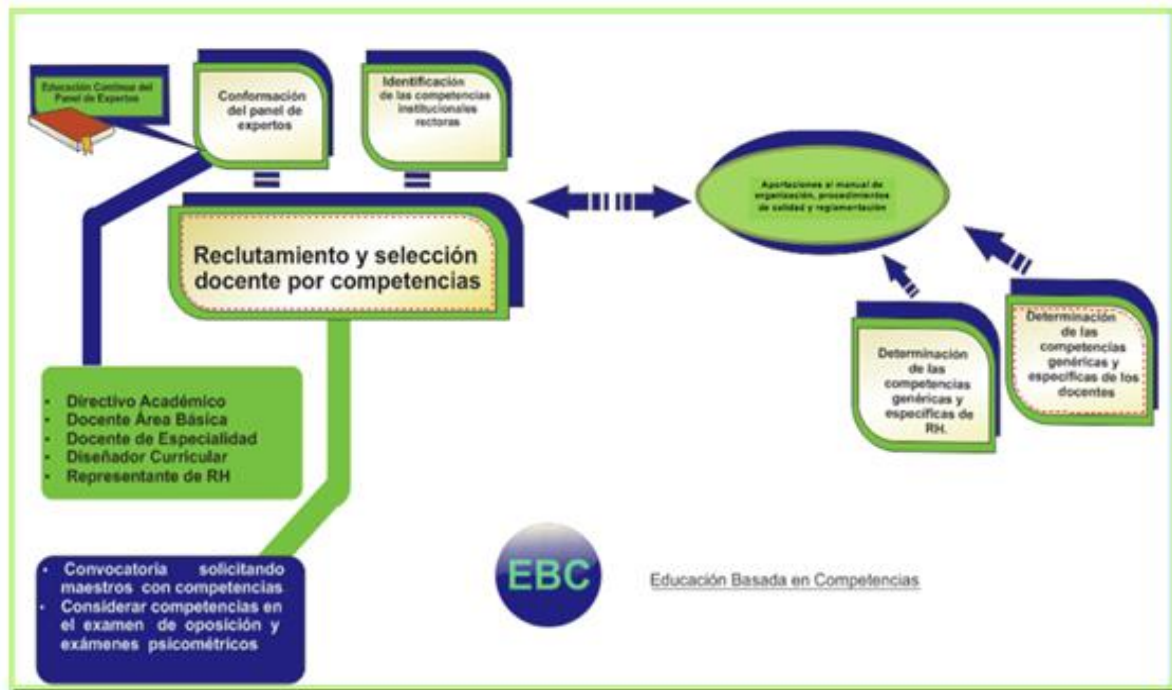
- 1) Manage teacher competencies at the established levels to determine the tabulators.
- 2) Verify that the competences are considered as a complement to the evaluation in the opposition exam.
- 3) That the personnel needs of the academic areas that are sent to the human resources department include both generic and specific competencies required by the position for better identification.
- 4) That in the public announcement to request teaching personnel, the competences required by the subject manual and by the organization manual be noted (in addition to the requirements established by the regulations).
- 5) That the entrance evaluations are carried out by the panel of experts based on competencies.

- 6) That in the evaluation for promotion, in addition to the points set by the regulation of admission, promotion and permanence, the development of both teaching and non-teaching skills is considered.

Regarding recruitment and selection by competencies, the following considerations are shown:

- The human resources department will issue a call for teaching vacancies trying to gather, more than the profiles, the competencies that are required. The foregoing based on the generic and specific competencies required and which are already determined in the organization manual. It is that the candidate is asked for a portfolio of evidence, in addition to his curriculum, and is presented in his sample class. The non-teaching skills developed in the company or previous jobs should also be required in the call.
- Once the applications have been received, discard those that do not meet the required competencies and call the suitable candidates for an interview (face-to-face or virtual). This interview will be in three parts: one with the person in charge of human resources, later with the specialist in the subject to be taught and, finally, with the director or coordinator of the academic area. Those who do not meet the competencies in the interview will be discarded. And the most competent candidates will be asked to take a sample class (face-to-face or virtual), where generic, specific, teaching and non-teaching skills will be evaluated. Once the suitable candidate has been completed and selected based on their competencies, the evaluation instruments with their opinion will be turned over to human resources, which may be: a) competent, b) basic, c) threshold, d) not competent. From this, their hiring will be carried out or not, without losing sight of the application of psychometric tests that allow the candidate to identify the personality, abilities, skills, values and competences that the candidate possesses or that the candidate can potentially develop. Everything previously described can be seen graphically in figure 2.

Figura 2. Etapa I: reclutamiento y selección de capital humano docente por competencias



Fuente: Elaboración propia con datos de la investigación

Stage II: recruitment of human capital by competence

In chapter III of the Federal Labor Law in Mexico (“On productivity, training and training of workers”), in articles 153 A, C, D, H, U and V, the term labor competence, which is a legal endorsement of the object of existence of this model. Terms such as knowledge, skills and abilities are also recurrent in the same law. Indeed, the Federal Labor Law in Mexico intrinsically considers the concept of competencies. In turn, the General Law of Education in Mexico, in article 4.5 establishes: "Training for work will seek the acquisition of knowledge, abilities or skills that allow the recipient to develop a productive activity demanded in the market , by means of any qualified occupation or trade ”.

The hiring of teaching personnel by competencies (proposed in this model) does not differ from the legal figure embodied in the Federal Labor Law, since it considers the concept of competencies as an element of job performance or termination of the employment relationship, according to the Article 47 section I, which establishes that it is cause for termination of the employment relationship, without responsibility for the employer:

Deceive it by the worker or, where appropriate, the union that had hired him with false certificates or references in which they attribute to the worker the capacity, aptitudes or faculties that he lacks. This cause for termination shall cease to have effect after thirty days of the worker rendering his services.

In this sense, it can be interpreted that the certificates or references referred to in the previous article may be labor certifications or evidence presented by the worker at the time of hiring. The stage of hiring human capital by competencies can be seen in figure 3.

Figura 3. Etapa II: contratación de personal docente por competencias



Fuente: Elaboración propia

Stage III: development of teaching human capital by competencies

The proposal of this model seeks to go beyond a teacher development through training, that is, it seeks constant training, considering the following elements.

Adequate teacher induction

Once the hiring has been carried out based on competencies rather than on the profile, it is about locating the hired teacher, as well as making known the key places in the development of their teaching work, it is important that the teacher knows the model EBC, give new hires a training course-workshop that starts activities that can identify their generic and specific competences in addition to the competences that the subject possesses by training but as well as the competencies that they can potentially develop and that they may not have discovered , It is also proposed, just as the EBC model determines tutors for

students, there is a tutoring for new teachers in the management of the evaluation formats and instruments that are required by the model, such tutoring can serve to resolve doubts of the new teachers. hired in the application and development of skills in the classroom, assessments, counseling, tutoring students.

Ongoing training at the EBC

It should be considered that most of the teacher training has been “traditional” and that the competence model establishes a distribution of 70% practical and 30% theoretical (in most public universities in Mexico). In this sense, and thinking that teachers should allow the collection of skills to students, continuous teacher training has to be conceived, and not temporary training, taking into account the following points:

- 1) Establish training courses based on the teaching needs and the development of competencies of the members of a group of teachers with related careers.
- 2) Permanent monitoring of the application of the competency model in the physical or virtual classroom.
- 3) Follow-up of the full application of the subject manuals and the evaluation instruments suggested therein.
- 4) Training and on-site training, that is, to obtain the linkage of the productive sector to achieve stays of the teaching staff in their area of knowledge in order to involve the same staff in the business reality of their environment. Thus, at the end of said stay, the teacher will have developed non-teaching skills that will allow them to comply with the competence model (30% theoretical and 70% practical).
- 5) Monitoring of the training provided to the teacher.

Everything previously described can be seen graphically in figure 4.

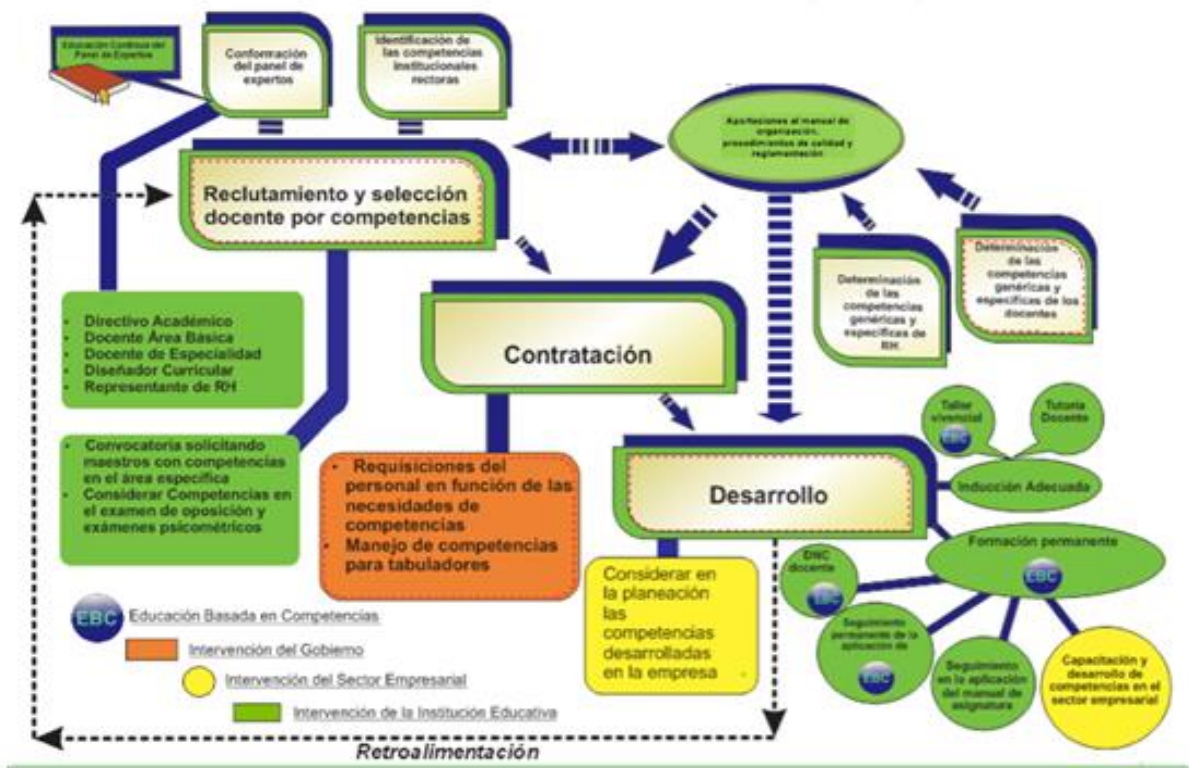
Figura 4. Etapa III: desarrollo de personal docente por competencias



Fuente: Elaboración propia

In figure 5, for its part, the human capital management model by competencies is presented in a holistic way, integrating each and every one of its parts.

Figura 5. Modelo de gestión de personal docente por competencias



Fuente: Elaboración propia

Relationship of the results obtained with the grounded theory

The benefits derived from the use of the theory based on the construction of the human capital management model described above are related to an incursion into organizational management studies that seek to highlight the importance of establishing a structure that allows to reveal administrative and management elements based on primary sources and their social actors in their lives and daily activities in their organizations. The theory based on human capital management was considered as a methodological tool and for the analysis of empirical information, which allowed obtaining useful data for the construction of a model that serves for the construction of new knowledge.

In this sense, it is important to emphasize that grounded theory as a methodological tool allows the generation of management tools in educational institutions. From Glaser and Strauss (2017) and their grounded theory to the conception of Raymond (2005), the construction of knowledge provides elements to enter the area of administration and management in order to recognize the applicability in this branch of knowledge and leave evidence of the usefulness of qualitative research, and specifically the theory based on human capital management.

Discussion

It is important to mention that the model has recruitment and selection as an input and development as an output. The model for managing teaching staff by competencies is cyclical, but not closed, since it is open to the feedback that development itself can give to new forms of recruitment; It is upgradeable based on the advances that human capital management has, as well as based on the participation of the government, the business sector and the educational institution itself, and it is holistic because it considers both internal and external elements of the environment. It is also equally important to note that some elements intervene in more than one phase, such is the case of contributions to the organization manual and quality procedures, and the elements that derive from there, the foregoing based on the fact that the organization manual it is a guiding document in any organization.

However, in a comparative exercise with some of the studies already cited above, Alles (2017) identifies 20 elements in its management model by competencies, from management by competencies to the incorporation and internal promotions of personnel, which contributes to a effective selection of personnel by competencies. It is important to

assess the incursion of competencies in the interviews, a point of convergence between both proposals, however, it is also important to note that it is not aimed at teaching staff and much less at public university staff, which is the contribution to management of the knowledge of the present work.

Along the same lines, Hellriegel (2009) combines core competencies with administrative principles and bases its knowledge on self-administration, strategic, multicultural action, teamwork, planning, administration and communication, and as a point of convergence points to the application of the competences in an integral management of knowledge in the organization; however, there is no point of agreement for the teaching sector.

On the other hand, Rivero, Dabos, Marino and Rodríguez (2014) resort to grounded theory to explain the impact of formal postgraduate education and work trajectories and to understand the interpretation that research subjects contribute to postgraduate training. This is precisely the link with the proposed model, since the fact of seeking the generation of management theory from grounded theory is valuable, especially in the fact of how the generation of new theories is achieved from empirical data.

In addition to this, Hubert (2019) analyzes the influence of game theory and its application in administrative processes to promote business entrepreneurship in order to predict the problems of strategy selection. Analogously to the present work, he investigates, through the assignment of capacities, the study of decision-making. This study, carried out based on grounded theory, had the objective of obtaining optimal entrepreneurship solutions.

Gómez (2010) presents two perspectives of grounded theory. One refers to the modifications of those who participate in it. The second linked to the procedures that give validity to the emerging theory. In this sense, the second argument suggests that in the teaching field not only the historical facts of the research subjects are linked, but also a modification to the management procedures and forms is proposed, a reconversion to the competency model.

Thus, in the convergence and divergence of the constant comparison of the variables, it is possible to find what is called a posteriori theory, thanks to which in this case it was possible to build the model presented with the elements described above.

The limitations that the model can face is resistance to change, since, according to the research subjects themselves, some government actors would not allow the incursion of new

management elements, since they consider that remaining status quo is more convenient . Also the lack of governing documents, the government's difficulty in adapting to new forms of personnel management. In this sense, the model allows a gradual incursion of the same public sector that wishes to intervene. The foregoing to give certainty to the application of the law in the management of teaching staff.

Conclusions

The human capital management model by competencies for public universities in Mexico presented has as its backbone the concepts of recruitment, selection, hiring and development, and a described proposal of the application in the management of teaching staff in public universities. By integrating as much as possible all the elements in a holistic way in the management processes, the objective set out in this research is achieved: to generate a tool of immediate applicability for universities whose educational model is based on the promotion of competencies and that, without However, their management of teaching staff does not consider the same in their daily actions.

The foregoing allows us to identify that, like any model, it can be perfectible, and although elements of the current form of work are being considered in a hybrid way in the country's public universities, it can be updated as the way in which they are modified changes. evolving activities.

The proposals that derive from the model presented are that all the actors involved in the management of teaching personnel manage to participate actively, as described, to achieve a change in the paradigm of the hiring of teachers, which is sometimes carried out only by the knowledge of their professional profile, which does not always match the skills developed in their professional and personal actions.

On the other hand, it is pertinent that from the recruitment process in the issued calls, the competencies required for the teaching position to be filled are included; thus directing the candidate to a subject that may not be of his professional profile but that, nevertheless, has the skills and certifications to teach them: expanding his range of employment possibilities.

It is important to note that the teacher must meet the requirement of competency education: 30 percent theoretical, 70 percent practical. The most frequent criticism of the practical integration of the teacher in companies is obvious: "How do you know that the

teacher you send to the company is going to return to teaching?" The answer has been given by history: those people who have the teaching vocation will always be teachers, and that is the competence that, for those who are in front of a group in a face-to-face or virtual classroom, must be discovered, promoted and develop.

Future lines of research

The following lines of research can be extracted from the model designed here:

- Comparative analysis with different subsystems for their adaptation to them.
- Integration of students to the teaching human capital management process, being they the active participants in the learning process.
- Recruitment: it is of interest to study new forms of electronic recruitment, which include competencies in the use of information technologies in the candidate.
- Selection: it is perhaps one of the most important points in human capital management, especially in the study of interviews, where the competencies of individuals are discovered; and without a doubt there is interest in the study of psychometric tests designed by competencies based on the written theory to shape psychometric instruments that not only describe the candidate's competencies, but also present new competencies that the individual possesses and that, perhaps, there is no discovered. The above to improve the work range of the teacher.
- Development: two concepts that have been coined and which are described as a contribution to knowledge management in this model are of special attention for subsequent studies: 1) teacher tutoring, accompaniment of the new teacher during the first months by another teacher that they know the model by competencies in order to guide the correct application of it until they know that they have mastered not only the handling of formats, evaluation instruments and manuals, but also the model itself; 2) non-teaching competencies, those competences that the teacher must develop during stays in the company (being a teacher) under a well-defined contractual modality in the educational institution.

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