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HUMAN CAPITAL MANAGEMENT IN THE PUBLIC UNIVERSITY: DIAGNOSIS AND MEASUREMENT

"From the regulation for Colombian universities"

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ABSTRACT

The present article shows the investigation related to the quantifying and the valuation of the University of Quindío human capital. Its purpose is to determine the impact that the application of the Decree 1279 of 2002 has had, its regulatory standards and the normativity of the Public University. The task was developed through an applied research, which allows identifying the characteristics of the research world to establish the degree of education. In addition, the study is quantitative because its root and nomothetic approach imply the measurement of something, in this case, the related object of investigation. When the proposal was done and applied to the full-time teachers, it was obtained as a result, that in the University of Quindío, according to the total number of the teacher staff, the productivity and the academic education, it has been consolidated in a low level, both for the productivity and the postgraduate education acquired. In the same way, it was reflected that a great number of teachers belong to an advanced age range, which in a determined moment, could lead the university to exhibit a negative balance in the number of the human capital. The proposal presented in the investigation can be used by other universities, adapting the formula to the internal conditions and normativity of each one, keeping the parameters that the national government established in general terms to this kind of institutions.

KEYWORDS: Human Capital, Human Talent, Knowledge Management, Intellectual Capital, Intangible Assets, Competences.

1. INTRODUCTION

It is possible that the country's universities do not make calculations of the future loss of human capital, to include them in the budget items. The lack of a mechanism to determine the "value" of the intangible (human capital) causes higher education institutions to be unaware of its true value and real position in relation to other institutions of the same nature.

As a result of expansive globalization, companies in general terms have been forced to generate structures of competitiveness, with which they can guarantee their permanence in the environment and face the aggressiveness of large multinational companies. This condition not only involves large companies in the real sector of the economy in Colombia, but also includes service companies, private educational entities and even those in the public sector. This situation is evident in the Colombian case, because the State has created a whole range of educational regulations from the budgetary level, which translate into incentives or retribution so that universities are more efficient and rational in the management of public spending. Thus, the central government conditions transfers to higher education institutions on the fulfillment of goals, indicators, and program accreditation, the latter being a measure of competitiveness.

However, the national government's recognition of the importance of human capital in institutions is not unknown, but it has such precise purposes as: qualification, remuneration and linkage to the teaching career, referred to in particular in Decree 1279 of 2002 issued by the Ministry of National Education.

As a background, in 1998, in Spain and particularly in the Basque Country, the pioneering project for measuring intellectual capital was the Intellect model, to classify intangible assets into: human capital, relational capital and structural capital, according to the study proposed by the Multidisciplinary Research Group on Knowledge Management and Intellectual Capital. the Intellect model was taken as a starting point, but the problem arises of how to adapt these assets to the case of small companies, in order to solve the dilemma, the knowledge cluster project was carried out to develop a panel of indicators, whose usefulness is the measurement of intellectual capital.(Universidad Uniknow , 2003)

At the same time, at the same university, research on knowledge management in the public university was carried out, work based on intellectual capital, recognizing that there were already some previous models, applied to companies. According to the

University Group, all these models consider Intellectual Capital as a combination of intangible assets or the "invisible part" of the company, although they propose different ways to measure it, and different classifications of indicators for this. It is for this reason that each of the variables related to human capital of the Intellect model was developed in the research, with the understanding that this capital is a fundamental component in the measurement of intellectual capital and that from this, each and every one of the aspects that make human talent contribute positively to the achievement of organizational objectives will be consulted.(2003)

Based on the research on Valuation and quantification of Human Capital at the University of Quindío, carried out in 2007, an excellent academic opportunity was presented to build this Reflection Article. This document became a key file for the execution of the results presented, since the information obtained from the source, allowed the application of the formula supported by the theory of the Intellectus Model, for the particular case data from the staff teachers were analyzed. In addition, the research establishes the criteria and processes for the valuation of human capital, which may be present in the moments of budget projection, participation in the nation's income, in the policy of retirements, retirements and other aspects that may generate loss of valued capital.

Thus, the objective of the referenced research focused on determining the impact of the application of Decree 1279 of 2002, its regulatory standards and the regulations of the University of Quindío, on the qualification of Human Capital. It is important to mention to the reader the hypothesis that is handled in the research, it refers to the fact that the application of the aforementioned decree has an impact on the valuation of human capital, in its intellectual production, as a contribution to the creation of new knowledge.

As stated in the research (2007), the result is a significant contribution to the process of valuing the human capital of universities (specific case of the University of Quindío); because if at this time there is any approximation to this valuation, it does not include the human capital represented in the training of its staff and intellectual production as a return on the investment made by the institution.

2. DEVELOPMENT OF THE THEORETICAL FRAMEWORK

The issue of company valuation was for a long time based on their tangible assets, on the valuation of their shares put on the market, or based on equity value. This was a traditionally accepted practice,

which can be deduced from the following text that states: "a modern methodology for valuing companies structured in a staggered manner and from different perspectives: accounting, statistical-accounting, microeconomic, econometric, and stock exchange; In addition, it also proposes some innovative approaches and procedures such as the stochastic balance sheet for the estimation of equity value and analogue-stock market models with accounting explanatory variables". (Sotomayor & Larrán, 2005)

In the current world economic order, a different concept of what intangible assets are; in this regard, it is indicated: "Intangible assets have their origin in the knowledge, skills, values and attitudes of people, these intangible assets are called Intellectual Capital..."; Previously, organizations were considered to be strong, from the point of view of competitive advantages, because they had strengths in work and natural resources, a conception that has changed with the emergence and implementation of a "new" economic model based on the preeminence of the market." In this regard, Acosta affirms, paraphrasing one of the most representative works of the world economy, written by Adam Smith: "In the past, wealth and power were associated with the possession and exploitation of physical resources. On the contrary, in the contemporary world, and in the future, wealth and power come mainly from intellectual, intangible resources, such as knowledge capital or intellectual capital. The advance of knowledge has been intimately linked to the nature of the capitalist market system." Companies no longer base their strengths and competitiveness solely on the traditional factors of production, as Ordóñez states: "In this new economy, the resource par excellence is no longer traditional economic factors, but knowledge, an asset that, despite not showing off in the accounts, contributes significantly to the company's results" (p. 5-16). (Di Domenico, 2002)(2017)(2006)

Human capital is therefore beginning to be considered as an important asset of the company, but as stated in the previous quote, "it does not shine in the accounts" and, therefore, it is not reflected in the value of the organization, despite the fact that in many cases it is the organization itself that contributes to the qualification of the human resource. to the adoption and transmission of knowledge; what in some circles is known as knowledge management.

However, there are works such as that of Professor Mantiola, "Intellectual Capital and Knowledge Accounting", in which, precisely, he speaks in terms

of the accounting measurement of that "intangible asset", which is knowledge and intellectual capital, in an environment such as the current one, as has been briefly expressed, the market economy and information technologies, are generators of a new conception of wealth, and whose chapters show why knowledge accounting arises as a response to the problems derived from the management of human capital, whose origin is given in the knowledge economy and in the measurement of intellectual performance as a conceptual framework, under standards that have begun to be expanded from the work of the FMAC (Financial and Managerial Accounting Committee, in 1998), of the International Federation of Accountants (IFAC) and the International Accounting Standards Council (IASB) in the same year.(2004)

Within what corresponds to knowledge and technological innovation, in the face of the search for competitiveness, the University has a great responsibility, in other words, it is not alien to any of the requirements of the current economic model, which is why the issue of Human Capital is also relevant here. This is how some governments generate scenarios in which higher education institutions assume great changes, which allow them not only to compete with each other, but to be able to offer what the economy requires, to train the workforce and leaders who can contribute to the development and growth of these organizations.

The following text supports the above: "At this time, the academic and business world focus their attention on new currents of ideas whose origin lies in the search for sustainable competitive advantages by organizations. It is about Knowledge Management and Intellectual Capital". By virtue of the above, the creation or adaptation of procedures that allow it to manage and quantify its human capital is also imminent for the University, undoubtedly as an indisputable parameter for competitiveness, in compliance with one of the foundations of the current model. (Mendialdua, 2003)

To reaffirm the above, we find this quote: "The management of the University of the twenty-first century needs a change, and that change involves the application of new techniques, among which the management of intellectual capital is beginning to occupy a prominent place." And to highlight the concern that exists in countries like ours on the subject, it is important to know Fournier's concept who comments in this regard that in the accounting of Colombian companies there is no item for intellectual capital, nor the appropriate procedures to know the intellectual resource they have. (Fernández

, 2001, pág. 259) (1997)

As established, changes in the economy have affected all business, economic, political and social dynamics, therefore, the scenario where the human resources that act in all these spheres are prepared does not escape these changes; in this sense we find the following text, which reaffirms what has been said: "Entrepreneurship has reached the University. It should gradually transform into the "Campus, Inc. That demands the economic and commercial development of nations in the context of globalization". (Ibarra, 2004)

Concerned about the issue, a group of experts from the University of the Basque Country, developed a study related to Intellectual Capital in public universities and its participation in the creation of research and development transferred to the business environment. According to the considerations of the document in question: "Since the university is basically a "factory of scientific-technical knowledge", intellectual capital is also - and above all - an important part of its endowment of intangibles. (Universidad Uniknow , 2003)

The Intellectual Capital of a public university can be defined as the stock of knowledge possessed by that university that creates value for society as a whole, especially the society of its immediate environment". In relation to the development of the subject of human capital, it can refer initially to the theory of Knowledge Management, which was not only involved in business development but also in the University, but when the subject takes on greater importance is in 2003, when it approaches the public University. through the Centre for Knowledge Management of the University of the Basque Country; Rodríguez Castellanos and others, carried out the research topic called "Knowledge management in a public university", in which three types of knowledge stand out: scientific knowledge and transfer; referred to: A) The drivers of Human Capital. B) The drivers of Structural Capital and C) The drivers of Relational Capital. (Universidad Uniknow , 2003)

It is important to highlight an adaptation of the same variables, to base the model on the human, the structural and the relational, applied to a university, as is done to a large company and an SME; which becomes the starting point, that is, in the consideration of the need posed by the world economic dynamics, to think in terms of competitiveness, to be part of a globalized economy, all types of companies, including universities, they are also in open competition anywhere in the world.

Another of the basic characteristics of the

Intellectus model referred to above is its dynamic nature, since it collects both the accumulated values of intellectual capital, at a moment in time, and the interrelations between its components, which dynamize it and make it evolve. (Grupo de investigación Intellectus, 2011)

Other studies, for example, "Human Capital Strategy" in which the basic differences between people and the other assets of companies are raised, and these differences are understood under different schemes of thought, denoting that business strategies are carried out only through people, and in an environment of permanent organizational dialogue, to create meanings in the understanding of reality. Models have also been built that have become means to convert intangible assets into tangible results, such as the "Strategy Maps", as an "extension" of the "Balanced Scored Card" and the "Strategy-Based Organization". The strategic map sets out how an organization tries to create value for shareholders and customers, supported by the management of intangible assets, which must be mobilized and strategically aligned. (Gratton, 2001) (Kaplan & Norton, 2004)

For the purposes of applied research, the Intellectus Model is taken into account, and is supported by the entire conceptual basis provided by the texts on theories of the aforementioned authors, in the measurement of human capital, which is accounted for to the extent of its use. The scope of the research is limited to the valuation and quantification of human capital, as one of the most important components of intellectual capital.

Human capital is defined as the labor force within a company and is the most important and basic resource, since they are those who carry out the work of producing goods or services, in order to satisfy needs and sell them in the market to obtain a profit. Human capital is important because the material means only become a finished product when they pass through the production process carried out by the workers' labor power. In this regard, Becker and his work on the concept of human capital can be mentioned. The American economist was awarded the Nobel Prize for working with the concept of Human Capital. However, for a long time his work on this subject was ignored and criticized by the world's leading economists, who did not consider him a true peer, for dedicating his study to this concept by extending the domain of microeconomic analysis to a wide range of human behavior and interaction, including that which has no relation to the market. Becker began to study knowledge societies and concluded with his study that their

greatest treasure was the human capital they possessed, that is, the knowledge and skills that are part of people, their health and the quality of their work habits, he also manages to define human capital as important for the productivity of modern economies. since productivity is based on the creation, dissemination and use of knowledge. While before it was considered that the priority was economic development and that everything else would follow: education, housing and health, today it is completely different since the link between education and economic progress is essential. Becker points it out as follows: "The growing importance of human capital can be seen from the experiences of workers in modern economies that lack sufficient education and on-the-job training." (2002) (Becker, 2002, pág. 26)

It is for this reason that each of the variables referred to Human Capital of the Intellect model was developed, under the understanding that this capital is a fundamental component in the measurement of Intellectual Capital and that from it each and every one of the aspects that make the human factor contribute positively to the achievement of organizational objectives were consulted.

3. RESEARCH QUESTION RAISED

In the case of staff professors of public universities, specifically, the research revolves around the following premise: Do the application of Decree 1279 of 2002, issued by the Ministry of National Education, the other regulatory decrees and the statutes of the University of Quindío, have an impact on the valuation of Human Capital, and on its intellectual production, as a contribution to the creation of new knowledge?

4. DEVELOPMENT

There is no known tool that allows quantifying the Human Capital (HC) in a university, in this sense and taking into account that the University of Quindío is a Colombian public institution, framed in a general and internal regulation of University autonomy, it is considered of great importance to propose an assessment mechanism, which allows collecting information for decision-making and the establishment of institutional development policy. The following normative parameters are the basis of some premises or considerations that allow determining the formula for quantifying the CH of the staff teachers of the aforementioned alma mater.

Therefore, the following regulatory parameters were taken into account:

- Decree 0371 of 1984. "By which the administrative institute of the University of

Quindío is adopted."

- Law 30 of 1992 "By which the public service of higher education is organized.
- Decree 1444 of 1992 "By which provisions are issued on salary and benefits for public teaching employees of public universities of the national order.
- Agreement 033 of July 28, 2000 "By which the institutional training plan of the teaching staff of the University of Quindío is regulated."
- Decree 1279 of June 19, 2002 "By which the salary and benefit regime of the professors of the State Universities is established.
- Law 909 of September 23, 2004. "By which rules are issued that regulate Public Employment, the Administrative Career, Public Management and other rules are issued."

From the above regulations, the following are taken into account for the proposal:

- Decree 1279 of 2002, issued by the Ministry of National Education, assigns points to university degrees, in the same way it grants points to academic productivity.
- Article 8 of Agreement No. 033 of 2000, in relation to the study commission, states: "The contestant must be a career teacher, with a tenure of not less than two (2) years at the University of Quindío", Article 15 "Teachers favored with internships or study commissions, shall sign a contract with the institution, by virtue of which they are obliged to provide their services to the University of Quindío for a time corresponding to twice as many as these" and Article 21 says "Once the study commission is completed, the professors will have the following time to accredit their respective degree:

-Specialization: one year

-Master's degree: a year and a half

-Doctorate: two years"

Considerations or premises for the proposal:

- Teachers must be linked to the University of Quindío with a minimum degree of schooling of Specialization in 2007, the year of the research. It is worth clarifying that currently this requirement has been raised to the degree of master's degree.
- The minimum points that a career teacher must produce, in a year, are three (3) points, which correspond to the minimum allowance granted by Agreement 1279 of 2002 for academic production.
- A career teacher with a seniority equal to two years may apply for a study commission, seeking his or her qualification.

- Taking point one of these considerations as a parameter, from the age of two onwards, the time for a career teacher to accredit the master's degree begins to be considered; on average the duration of a master's degree is two years, plus a year and a half granted by the university to accredit the degree, resulting in approximately 5 years the teacher holds the master's degree and must remain at least twice as long, that is, 4 more years providing his services to the University.
- From this moment (9 years of seniority) the professor can request a new study commission, which in this case corresponds to the doctoral level, which on average have a duration of 4 years, plus two years granted by the university to accredit their degree.
- In conclusion, the career professor of the University of Quindío at the age of 15 must have doctoral studies and have a recognition according to decree 1279 of 2002, of a maximum of 140 points for postgraduate studies.
- The points that Decree 1279 of 2002 grants for university degrees and the combination of them are:

P	Undergraduate	178 Points
E	Specialization	20 Points
M	Master's Degree	40 Points
Ph.D	Doctorate	80 Points

Possible combinations of university degrees award the following points:

Titles	Points
P+E	198
P+2E	208
P + M	218
P + E + M	238
P + 2E + M	248

P + PhD	298
P + M + PhD	298
P + 2PhD	318
P + E + M + PhD	318
P + 2E + M + PhD	318
P + 2E + 2M + PhD	318
P + E + 2M + PhD.	318

- Two fundamental parameters set out in the current decree (1279 of 2002) that allows the quantification of Human Capital are academic productivity and degrees corresponding to university studies.
- The numerical value of two (2) is determined as the figure or parameter for a professor of the University of Quindío to be in the minimum production of intellectual capital per year.

In this order of ideas, the following equation takes up the previous literals and adds academic productivity with level of schooling depending on the years of service.

$$CH = \frac{Pa}{A(3)} + \frac{Es}{198}$$

Where:

- CH: Human Capital (given in points/years of service).
- Pa: Academic Productivity
- A: Years of service (Excluding fractions)
- It is: Schooling equivalent to points on university degrees
- F: Factor (depends on A)
- 3: Minimum score awarded by Decree 1279 of 2002 for Academic Productivity.

According to the years of service, the formula was determined as follows:

If: $1 \leq A \leq 5$ the factor (F) will be:

Table

A	F
1	198
2	99
3	66
4	49.5
5	39.6

Source: Taken from the research Valuation and Quantification of the C.H.

In this case, the denominator A (F) of the formula corresponds to the figure 198, which are the points that at least a career teacher must have in the first 5 years of schooling, that is, undergraduate and specialization; The formula for this case can be

represented as follows.

$$CH = \frac{Pa}{A(3)} + \frac{Es}{198}$$

If: $6 \leq A \leq 15$ the factor (F) will be:

Table:

A	F
6	39,667
7	34
8	29,75
9	26,445
10	23,8

11	21,637
12	19,834
13	17
15	15,867

Source: Taken from the research Valuation and Quantification of the HC.

In this case, the denominator A (F) of the formula corresponds to the figure 238, which are the points that at least a career teacher must have with a time equal to 6 years and less than 15 years, by schooling, that is, undergraduate, specialization and Master's

degree, the formula for this case can be represented as follows.

$$CH = \frac{Pa}{A(3)} + \frac{Es}{238}$$

If: $A > 15$ the factor (F) will be:

Table:

A	F
16	19,875
17	18,706
18	17,667
19	16,737
20	15,9
21	15,143
22	14,455
23	13,827
24	13,25
25	12,72
26	12,231
27	11,778
28	11,358
29	10,966
30	10,6

Source: Taken from the research Valuation and Quantification of the HC.

In this case, the denominator A (F) of the formula corresponds to the figure 318, which are the points that at least a career teacher must have after 16 years of service, for schooling, that is, undergraduate, specialization, Master's and Doctorate, which is the highest score awarded for the accreditation of postgraduate studies; The factor shown in the previous table is only up to 30 years, but if the years of service are greater than 30, the formula can also be used, which in this case can be represented as follows.

$$CH = \frac{Pa}{A(3)} + \frac{Es}{318}$$

The equation allows quantifying what a career professor represents in terms of CH for the University of Quindío, in units of points for years of seniority, from the moment of entry until retirement, determining his contribution in the valuation or devaluation of the human talent of the institution object of the research. The analysis of these individualities determines the quantifiable total of the intangible CH that the University of Quindío possesses versus the length of seniority of its professors.

Analysis of the result that the equation can generate:

- a. If the result of the equation is equal to two (2), it means that the CH is at the minimum point, it does not increase or devalue the University's

Human Talent in terms of Human Capital.

- b. When the result of the equation is less than two (2), it can be concluded that this difference marks or constitutes a devaluation of the CH in a period of time constituted by the seniority of the career teacher. The greater the difference, below 2, the lower the contribution to the quantification of CH.
- c. If the result is greater than two (2), it can be concluded that this difference marks or constitutes a valuation of the CH in a period of time constituted by the seniority of the career teacher, providing added value to the quantification of Human Capital. The greater the difference, above 2, the greater the contribution to the quantification of CH.

5. MATERIALS AND METHODS

In applied research, the design is non-experimental, descriptive in scope. The instruments that were basically used for the collection of information were the questionnaire and direct observation; these were designed to be fed basically with primary and secondary information.

The realization of the work is a study applied at the University of Quindío, an official institution with domicile in the city of Armenia, Colombia, from which the corresponding status of staff teachers was taken. The population under study as a work unit

was made up of all staff teachers corresponding to 220 people, in order to achieve the lowest level of deviation and avoid bias in the information.

The research worked with independent and dependent variables, which were: Independent: national and local standards related to the qualification and classification of Human Capital in higher education, specifically at the University of Quindío. Dependents: number of teachers with postgraduate studies at different levels, classification of teachers according to the scale established in Decree 1279 of 2002 and the statutes, intellectual production derived from staff teachers (among others, essays, research, patents, publications).

From the information contained in the resumes of the staff teachers, the following data were obtained:

- a. Name of the teacher or official
- b. Position and category
- c. Seniority in the institution
- d. Undergraduate(s)
- e. Postgraduate duration
- f. Postgraduate training levels
- g. Time or years in which the training was received
- h. Institution where the training took place
- i. Geographical location of the institution
- j. Investment made in these processes
- k. Forms of financing of training
- l. Remuneration
- m. Position(s) currently held
- n. Intellectual production

To process the information and present the results, the use of descriptive statistical techniques was used; after which the analysis phase was carried out.

Among the most relevant findings, once the fieldwork was carried out, it was found that:

- In the case study, there are more teachers with less seniority who contribute significantly to the positive result, than those considered old; This

can be explained by the fact that the University uses Decree 1279 of 2002 as one of the parameters to enter the teaching career, which contributes to the fact that the majority of the personnel who enter win the competition because they accredit more points, which related to seniority, favor this value.

- Although academic production has only been recorded since 1994 and in some way stimulated, the institution under study presents a positive quantification of HC above the proposed average in relation to permanent teachers.
- As in Colombia there is no information on the quantification of Human Capital in University institutions, comparisons of this type cannot be made, which allow a more detailed analysis of the results obtained.

6. RESULTS

Human Capital is the most important intangible of any organization; Through this research, it was shown that it is measurable, a fundamental aspect in the human management process.

6.1. Service Time

- The length of service of teachers at the University of Quindío ranges from 0 to 36 years.
- The age of admission is between 20 and 56 years old.
- On average, 8 teachers have joined per year in the last five years; 40% of the University's staff professors have joined in the last 10 years,
- The average age of entry of teachers is 34.6 years.
- It should be clarified that the parameters of the previous points take as a reference the year of completion of the research.

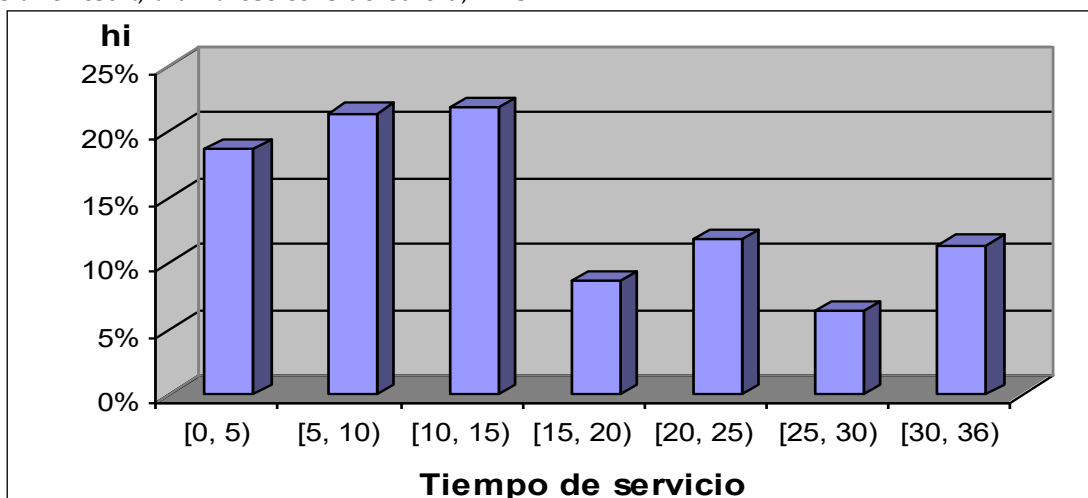


Chart 1: Time of service of the permanent teachers to the University of Quindío

Source: Taken from the research Valuation and Quantification of the C. H. In original Spanish language

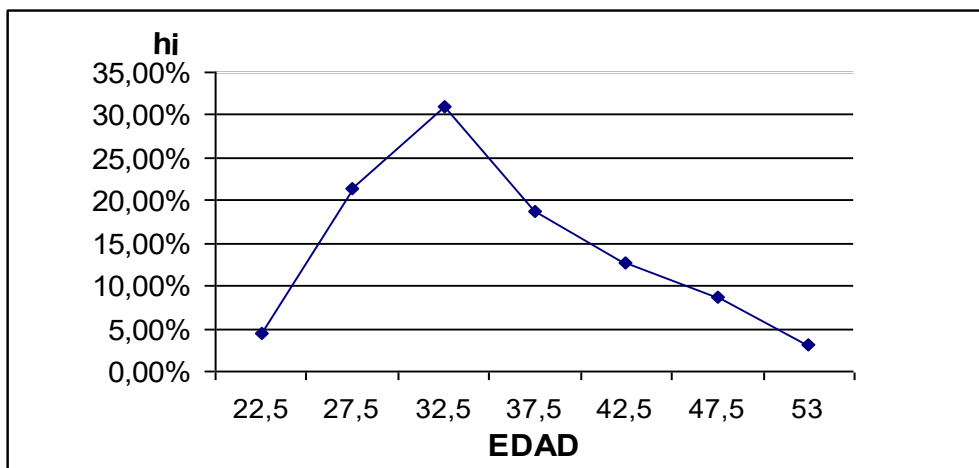


Chart 2: Age of admission of permanent professors to the University of Quindío
Source: Taken from the research Valuation and Quantification of the C. H. In original Spanish language

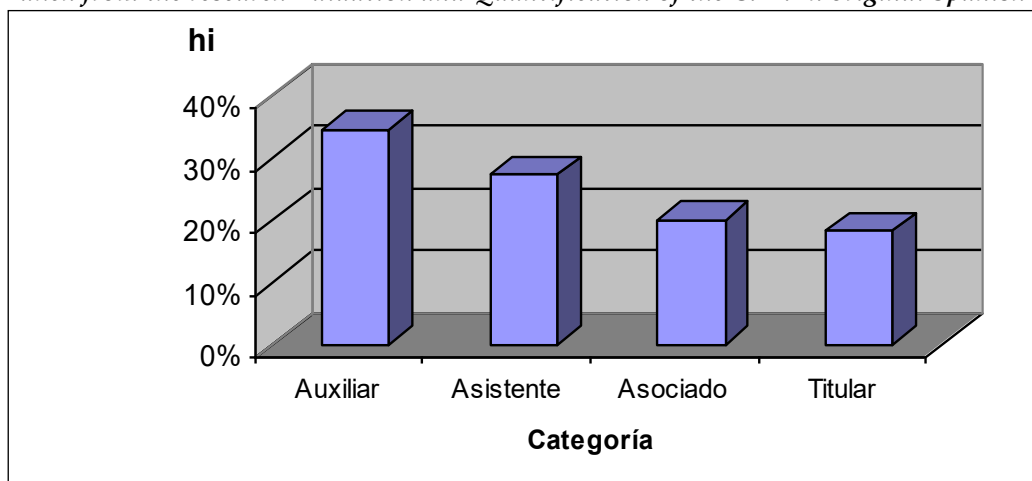


Chart 3: Number of teachers by category in the ranking
Source: Taken from the research Valuation and Quantification of the C. H. In original Spanish language

- 34.55% are linked in the category of assistant professor.
- 27.27% of the teachers are located in the assistant category,
- 20% of the professors belong to the associate category,
- 18.18% of teachers are in the tenured category

6.2. Intellectual production

The record of intellectual production of the professors of the University of Quindío, according to their type, can be observed globally in the following table:

Table 1: Total intellectual production by Faculty by number of teachers

Faculty	Total score	Total teachers by faculty	Average score by teacher
Agro-industrial sciences	0	1	0,00
Basic sciences and technologies	1.911,70	34	56,23
Economic and Administrative Sciences	573,5	20	28,68
Health Sciences	1.811,10	51	35,51
Human Sciences and Fine Arts	1.878,30	23	81,67
Education	3.422,04	51	67,10
Engineering	1.484,95	40	37,12
University Score	11.081,59	220	50,37

Source: Taken from the research Valuation and Quantification of the HC.

According to the average production per teacher, the faculty that reports the most intellectual production is the Human Sciences, with an average production of 81.67 points per teacher; followed by

the Faculty of Education with 67.10 points per teacher; the faculties with the lowest productivity are Agroindustrial Sciences, 0 points, and Economic Sciences 28.68 points.

Table 2: Resume score classified by category

Score Ranking	fi	hi
Intellectual production	11181,59	12,23%
Title Scoring	47240	51,67%
Points per Ladder	13388	14,64%
Score for recognitions	19622,214	21,46%
TOTAL SCORE RESUME	91431,804	100,00%

Source: Taken from the research Valuation and Quantification of the HC.

Comparing the total points of the curriculum vitae with intellectual productivity, see Table 2, it is concluded that 12.23% of the total points recognized to teachers are for academic productivity, while 51.67% of the points recognized correspond to university degrees, 14.64% are for promotions in the

ladder and the remaining 21.46% correspond to recognitions such as seniority. management positions, among others.

6.3. University degrees

Table 31: Teacher studies

Studies	fi	hi
An Undergraduate	220	100%
Of the Pregrates	2	0,91%
Undergraduate and Specialization	70	31,82%
Undergraduate and two specializations	19	8,64%
Undergraduate- Specialization- Master's	25	11,36%
Undergraduate- two specializations- Master's	5	2,27%
Undergraduate-Master's Degree	65	29,55%
Undergraduate- two Master's degrees	5	2,27%
Undergraduate- Master's- Doctor	6	2,73%
Undergraduate- Master's- Doctorate-Postdoctoral	1	0,45%
Undergraduate-Doctorate	5	2,27%

Source: Taken from the research Valuation and Quantification of the HC.

Table 42: Total number of teachers by studies completed

Studies	fi	Hi
	Undergraduate	220
Specialization	119	54,09%
Master's Degree	109	49,55%
Doctorate	12	5,45%
Postdoc	1	0,45%

Source: Taken from the research Valuation and Quantification of the HC.

All the professors of the university have an undergraduate degree, 54.09% of them have specialized studies, 49.55% with a master's degree; while 5.45% have doctoral studies and only 0.45% have a postdoctoral degree.

The University has 86 professors with a maximum level of specialization training, of which 5 were already hired already having this degree, of the others it can be said that despite the time of permanence in the institution they have not managed to advance towards master's or doctoral studies.

11 teachers were linked with a master's degree to the University, taking into account that their time of permanence does not exceed two years, of the remaining 84 some were financed by the university and others entered with the degree.

7. IMPLEMENTATION OF THE PROPOSAL:

As has been stated throughout this article, the research built the formula that allows quantifying the human capital of the teachers of the University of Quindío; thus, in order to apply this proposal, the

internal regulations of the University were taken into account within the framework of its autonomy and the parameters outlined in Agreement 1279 of 2002 issued by the Ministry of Education.

This formula relates academic productivity, previously defined according to the aforementioned agreement, with years of service, that is:

As it is known mathematically, in a fraction the

$$\frac{Pa}{A(3)}$$

quotient of the operation indicates how many times the divisor (Pa), in this case Academic Productivity, is contained in the dividend ($A(3)$), that is, in the years of service of the staff professors for this research.

In the considerations, it was determined what would be the minimum score that a teacher should have according to the number of years of service in the Institution, in this specific case The University of Quindío; This means that the quotient of this operation should be 1, if the teachers in their years of service have obtained the minimum points

corresponding to those years. On the other hand, if the teacher has not produced or better not obtained the minimum score of academic productivity corresponding to that time, the divisor will be less than the dividend, yielding a figure below 1, which is interpreted as a decrease in the contribution to the valuation in the Human Capital of the Institution; but if, on the other hand, the points obtained for academic productivity is higher than the minimum established in those years, the quotient of that operation will be greater than 1, which is interpreted as an increase in the contribution to the valuation in the Human Capital of the Institution.

Analyzing the relationship of the points for the university degrees contributed by the permanent professors, that is, their schooling with the years of service, which are represented in the following faction of the formula, as follows:

$$\frac{Es}{A(f)}$$

This relationship makes it possible to determine if the staff teacher has the points represented by the titles that he or she must hold as a minimum according to his or her years of service, as with academic productivity, if the teacher has points for a minimum level of schooling according to these years, the quotient of this operation would be 1, which indicates that he or she neither contributes nor decreases the human capital of the Institution; but if, on the other hand, the schooling is higher, that is, he has more university degrees than the average for the length of service, the quotient will be greater than 1, indicating that his schooling makes a positive contribution to the assessment of the Human Capital of the Institution. Otherwise, below 1, it will be a negative contribution.

For this reason, it was determined that if the sum of the relationship of academic productivity plus teacher schooling is above 2 is a positive contribution to the assessment of Human Capital, or if it is below, it represents a decrease of the teacher to this assessment, related to the time of service at the University of Quindío for this specific case.

Applying the proposed mathematical formula, with the use of the information obtained from the curriculum vitae of the staff teachers, they present the following results:

Personal teacher:

If the result of the formula is greater than 2

$$CH = \frac{Pa}{A(3)} + \frac{Es}{A(f)} > 2$$

The result was that 33.94% of the faculty of the University of Quindío, contribute positively, adding value in the quantification of the CH. The individual

contribution of each of them results in the total points per year that return to the institution in human talent qualification, the total value above the average is:

CHt= 148.51 point/years.

If the result of the formula is Less than 2

$$CH = \frac{Pa}{A(3)} + \frac{Es}{A(f)} < 2$$

66.06% of the staff professors of the University of Quindío detract from the quantification of the HC of the University, in the same way the individual negative contribution results in the total devaluation of the CH in the institution. The total value below the average is:

CHt= -90.76 points/years

The Total Human Capital CHT is: CHT= (148.51) + (-90.76)

CHT=57.75

The difference between positive and negative contributions to CH is 57.75 points/year, which is a positive contribution, giving a general added value by the faculty of the University of Quindío.

8. DISCUSSION

Although the percentage of the total number of teachers who contribute positively to the CH is lower than the percentage of the teachers who subtract from this assessment, the result is above average, giving a positive contribution to the CH and therefore generating added value.

It is clearly observed, in the research, that once the total of the different defined items that contribute to the valuation of human capital has been weighted, in the specific case, professors of the University of Quindío, these correspond to the university degrees that each of them has, contrasting with intellectual productivity, which is the lowest percentage in the contribution of this quantification. A significant difference, more than three times, is this contribution of schooling on intellectual productivity.

By way of discussion, it can be thought that Agreement 1279 of 2002, in some way, stimulates teachers to be more enthusiastic about having university degrees, which generate more points than for intellectual production, which represent fewer points in relation to university studies.

The Ministry of Education, in the case of Colombia, must encourage more intellectual productivity in University Institutions, in such a way that its faculty increases its intellectual productivity due to being able to obtain significant points, which in practice become a salary factor, bringing with it a positive impact on the positioning and recognition of Colombian Universities with respect to other Universities in the world.

Since Colombia does not have information on the quantification of Human Capital in university institutions, comparisons of this type cannot be made, which would allow a more detailed analysis of the results obtained.

9. CONCLUSIONS

In this reflection article, based on research carried out in 2007, it is highlighted that Human Capital is the most important intangible of any organization; through this research it is shown that it is measurable, a fundamental aspect in the Human Management process, since, for good administrative control, figures are essential. The statistical data and the behavior of what you want to control. This work will provide Universities with parameters that allow determining the conditions of CH in Higher Education institutions.

The proposal presented for the valuation of the human capital of the staff professors of the University of Quindío, can be used by other universities and different entities of the public and private sector; adapting the formula to the conditions or internal regulations of each of them, as the case may be.

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Based on the results obtained in the reference research, it was shown that the decrees issued by the national government, related to the salary regime for teachers of state universities, have stimulated in some way, the qualification of the human talent of these institutions, which by its very nature is fundamental, "motivating" the teaching staff to pursue higher education and to generate academic productivity. practices that could be taken by private higher education institutions, enhancing the human capital in them.

A fundamental premise that all administrators have is: "what cannot be measured, cannot be controlled"; and since the beginnings of scientific management with the engineer Frederick Winslow Taylor in the so-called industrial era, it has been necessary since then and until today to be able to quantify all the process that we know today as performance, which finally translates into indicators for decision-making. This approach amply justifies the need to value or quantify human talent in universities, which by their nature are responsible for generating knowledge and, if necessary, managing it.

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