
How to Respond to Information Needs of University Stakeholders: Proposal of Indicators for Reporting on Intellectual Capital

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The purpose of this paper is to know the opinion of the university stakeholders regarding the importance they give to completing the information from university financial statements with information relating to these institutions' intellectual capital. To this end, a questionnaire was designed and sent to every member of the Social Councils of Spanish public universities. The results of our empirical study allow us to recommend extending the limits of universities' annual accounts so as to include the information on different intangible elements demanded by the different stakeholders. Finally, the study's results served as basis to develop a battery of indicators which allows these intangible elements to be measured.

Keywords: university stakeholders; intellectual capital

Introduction

There is a growing interest in applying an intellectual capital approach in universities, since knowledge is the main output and input of these institutions (Leitner and Warden, 2004; Sánchez et al., 2009; Brătianu, 2009; Rafiee et al., 2010). Universities produce knowledge, either through technical

and scientific research (the results of investigation, publications, etc.) or through teaching (students trained and productive relationships with their stakeholders). Their most valuable resources also include their teachers, researchers, administration and service staff, university governors and students, with all their organizational relationships and routines (Warden, 2003; Leitner, 2004; Ramírez et al., 2007). The higher education institutions are, therefore, an ideal framework for the application of the ideas related to intellectual capital theory.

Furthermore, necessities like the increasing stakeholder demand for greater transparency, the increasing competition between universities and firms, and greater autonomy, push universities towards the adoption of new reporting systems which should necessarily incorporate intangibles (Sánchez et al., 2009).

This paper focuses on the importance of reporting on intellectual capital for Spanish universities and the information needs of university stakeholders.

Numerous papers and books have come to the conclusion that our traditional accounting systems do not suffice for today's organizations, whose value creation often depends more on intellectual capital type resources rather than monetary or physical resources (Burgman et al., 2007). However, the information provided by public universities focuses on ensuring financial control of the organization without paying attention to the needs of other groups of interest (Martín, 2006). In this sense, Gray (2006) considers that the information supplied in traditional financial reports is not enough. He highlights the need to establish more extensive communication and accounting mechanisms which take into account the needs of the different groups of interest. Coy et al. (2001) recommend extending the limits of US universities' annual accounts and defend a new paradigm for the annual accounts which provides more wide-ranging information on teaching and research. They favor the inclusion of effort indicators and achievements, with more attention being paid to the social responsibility of institutions of higher education.

Consequently, the current socio-economic climate creates the need for universities' financial statements provide all the relevant information on their activities and the key factors of their success "their intangible resources".

In this study we will show the opinion which exists among the university stakeholders regarding the need to complete the content of the current university financial statements by providing non-financial information on intellectual capital. Based on this empirical study, we define a battery of indicators for reporting on intellectual capital in universities.

The paper is structured as follows: in section 2, we explore the concept of intellectual capital in higher education institutions and we review the existing literature on the presentation of information on intellectual capital in these institutions. In section 3, we define the scope of the empirical study conducted and the methodology used. Then, we present the results obtained. According to this, our proposal of indicators for reporting on intellectual capital in universities is presented. Final conclusions are drawn in Section 4.

Intellectual Capital in Higher Education Institutions

Specifically, when referred to a university, the term intellectual capital is used to cover all the institution's non-tangible or non-physical assets, including processes, capacity for innovation, patents, the tacit knowledge of its members and their abilities, talents and skills, the recognition of society, its network of collaborators and contacts, etc. The intellectual capital is the collection of intangibles which "allows an organization to transfer a collection of material, financial and human resources into a system capable of creating value for the stakeholders" (European Commission, 2006, p. 4).

The components of a university's intellectual capital have been categorized in diverse ways, although undoubtedly, the tripartite classification is the most widely accepted in specialized literature (Leitner, 2004; Ramírez et al., 2007; Cañibano and Sánchez, 2008; Sánchez et al., 2009; Bezhani, 2010; Bodnár et al., 2010; Casanueva and Gallego, 2010; Secundo et al., 2010). Intellectual capital is represented as being formed by the following three basic and closely interrelated components:

- **Human Capital:** it is the sum of the explicit and tacit knowledge of the university staff (teachers, researchers, managers, administration and service staff), acquired through formal and non-formal education and refresher processes included in their activities.

- **Structural Capital:** it is the explicit knowledge relating to the internal processes of dissemination, communication and management of the scientific and technical knowledge at the university. Structural capital may be divided into:
 - **Organizational Capital:** this refers to the operational environment derived from the interaction between research, management and organization processes, organizational routines, corporate culture and values, internal procedures, quality and scope of the information system, etc.
 - **Technological Capital:** this refers to the technological resources available at the university, such as bibliographical and documentary resources, archives, technical developments, patents, licenses, software, databases, etc.
- **Relational Capital:** this refers to the extensive collection of economic, political and institutional relations developed and upheld between the university and its non-academic partners: enterprises, non-profit organizations, local government and society in general. It also includes the perception that others have of the university: its image, appeal, reliability, etc.

Current accounting regulations restrict the recognition of intangibles. Only acquired intangible assets may be reflected in an organization's balance sheet (Cañibano et al., 2008). For this reason, there are numerous international regulatory bodies, agencies and academic institutions that aware of the difficulty of incorporating intellectual capital into the balance, tend to recommend the development and presentation of the so-called Intellectual Capital Reports. Intellectual capital reports contain a set of indicators that contribute to improving the quality of accounting information in organizations. In this line, at Spanish level, the Commission of Accounting Experts of Ministry of Economy (ICAC, 2002) recommends the voluntary drafting and publication of a report on intellectual capital by following the guidelines of the Meritum Project (Cañibano et al., 2002), consisting of three parts: a vision of the company, a summary of intangible resources and activities and a system of indicators.

Taking these considerations into account, we believe that complementary non-financial information is the most appropriate form to

supply information on universities' non-tangible elements, so as to avoid the inclusion of accounting criteria which could endanger the quality and reliability of the financial information. In our opinion, an improvement in university accounting systems would be achieved by the drafting and presentation of a new report complementary to the current financial statements –the Intellectual Capital Report–. A set of indicators would show the information most demanded by different stakeholders regarding the institution's intangible resources.

One of the most interesting experiences in the presentation of information on intellectual capital is that of Austria's public universities, which are obliged to present Intellectual Capital Reports (known as Wissensbilanz). The Austrian University Law of 2002 (Federal Ministry of Education, Science and Culture of Austria, 2002), in article 13, established the obligation and the general framework for developing this intellectual capital report. According to UG2002 (section 13, subsection 6), the IC report will include, at least, the following elements: a) the university's activities, its social and voluntary objectives and its strategies; b) the intellectual capital, divided into human, structural and relational capital; c) the processes presented in the performance contract, including outputs and impacts. The first intellectual capital report should have been published in 2005. However, the ministerial order (Federal Ministry of Education, Science and Culture of Austria, 2006) relating to the detailed structure of the university intellectual capital report. The way to present the information and the indicators to be compulsorily included was not published until 15 February 2006. So, Austrian universities have only really been obliged to publish an intellectual capital report every 30 April since 2007.

Another interesting study is the case of the Poznan University of Economics, in Poland, where Fazlagic (2005) presents an intellectual capital report based on the methodology proposed by the Danish Ministry of Science, Technology and Innovation (2000), in which intellectual capital is presented in the form of resources, activities and results; and the proposal of the Korean non-profit research organization ETRI (Electronics and Telecommunications Research Institute), which in early 2001 developed an effective management tool and established a knowledge management system. And, since 2004 ETRI publishes intellectual capital reports annually (ETRI, 2005).

On the other hand, the Observatory of European Universities (OEU) proposed the presentation of an intellectual capital report called the ICU Report (Sánchez et al., 2006), specifically designed for universities and research centers, with the aim of improving transparency and aiding the homogenous dissemination of the indicators of intellectual capital. The proposed ICU report consists of three fundamental sections which describe the logical movement from internal strategy (design of the vision and objectives of an institution) and management towards a system of indicators (OEU, 2006, p. 211): (a) vision of the institution; (b) intangible resources and activities; (c) system of metrics.

Despite these experiences, at a national level neither accounting bodies nor government agencies have established regulations, standards or norms for preparing intellectual capital reports which involve the existence of a strict, agreed, and theoretical framework standardizing the data to be presented.

Empirical Study

The generalised concern regarding the need to guarantee the information transparency of universities led us to consider the need to include information on intellectual capital in universities' annual reports. To this end the decision was taken to seek out the opinion of the university stakeholders regarding the importance they give to completing the information from university financial statements with information relating to these institutions' intellectual capital. A questionnaire was designed and sent to every member of the Social Councils of Spanish public universities.

Research Objectives

The two fundamental objectives of the empirical study are:

- Objective I: To determine the extent to which different university stakeholders are demanding information relating to the intellectual capital of Spanish public universities in order to make the right decisions, identifying which intangible resources are the most relevant for publication.

- Objective II: To propose a battery of indicators for reporting on intellectual capital in Spanish universities.

Methodology and Data Collection

In order to achieve the previously mentioned objectives, in mid-May 2010 an online questionnaire requesting the opinion of the members of the Social Councils was sent to all Spanish public universities. The methodology of the study is outlined in the data sheet attached in table 1.

Table 1: Technical details

Analysis group	Stakeholders from Spanish public universities
Universe	Members of the social councils of Spanish public universities (1.094)
Size of sample	247
Information collection technique	On line survey
Period of field work	May-July 2010
Average time per survey	7 minutes 45 seconds
Software	SPSS [®] v. 17

Source: Compiled by the authors

Defining the population and selecting the sample

Two important factors were used to justify the population to be studied: (1) members of the Social Councils of Spanish public universities were considered to provide a good sample of the feelings of university stakeholders, as they represent the various social groups with links to the universities (2) these members are familiar with the accounting information published by the universities since they are responsible for approving the universities' annual accounts.

Following the analysis of the composition of the Social Councils, the members were divided into these seven groups: 1) university governors (vice-chancellor, general secretary, council secretary and manager), 2) teaching and research staff, 3) students, 4) administration and service staff, 5) representatives of business organizations, 6) representatives of union organizations, 7) representatives of the public administrations.

The population to be studied was therefore composed of the 1.904 members of the Social Councils of Spanish public universities. Replies were received from 247 members, 22.57% of the total. The size of the sample was considered sufficient, since in a binomial population the estimation error would be 5.37% for a reliability level of 95%.

Information collection and treatment

The information was collected via an online survey. An email was sent to the members of the Spanish university Social Councils requesting the members to take part in our research.

The questionnaire consists of closed dichotomous questions combined with Likert scales, designed to learn the opinion of university stakeholders on the importance of Spanish public universities publishing information on their intellectual capital. A list of intangible elements relating to human capital, structural capital, and relational capital is included so as to ascertain to what degree it is relevant to publish this information. Specifically, based on the Intellectus Model (Bueno-CIC, 2003), we proposed 32 intangible elements according to the characteristics of the higher education institutions, in order to establish their relevance for disclosing. Twelve were related to human capital (concerning the abilities and skills of the people belonging to the institutions), fourteen were related to structural capital (referring to how the institution is structured and how it works), and sixteen were related to relational capital (the institution's relations with students and the outside world).

A descriptive analysis of the replies was conducted according to the characteristics of each of the questions.

Analysis of the Results of the Empirical Study

There now follows a consideration of the principal results obtained through the empirical study for each of the objectives previously established.

Objective 1: The importance given by university stakeholders to the presentation of information on intellectual capital

A high percentage, 89.1%, of those surveyed in our study showed great interest in Spanish public universities presenting information on intellectual capital. They felt that publishing this information would make the content of the current university financial statements more relevant. Only 4.9% of those surveyed consider that publishing information on intellectual capital increases the ambiguity and the lack of relevance of the information included in the current accounting statements.

By user groups it was found that practically all the users – public administrations (89,4%), students (100%), business organisations (86,2%), teaching and research staff (95,5%), university governors (97,4%), administration and services staff (66,7%) and union organisations (76,5%)-consider that the presentation of information on universities' intellectual capital increases the relevance of the information contained in the current financial statements.

Then, in order to identify the intangible elements about which university stakeholders consider it relevant or very relevant to publish information, we set as a requirement that these elements had to reach a mean value or a median equal or higher than 4 points in combination with a minimum 25 of 4 points and a minimum 75 percentile of 5 points. In short, the intention is that most of the distribution of values is concentrated in high scores close to 5 points.

Table 2 shows the frequencies obtained in the empirical study (mean, median, standard deviation, and percentile 25 and 75) to the different intangible elements (grouped in three categories of intellectual capital).

Table 2: Frequency analysis in the human capital block (*)

Intangible Asset	Mean	Median	Mode	Standard deviation	Range	Percent-ile 25	Percent-ile 75
Typology of university staff (historical data of growth or decrease in staff, age structure of staff, contractual conditions, etc.)	3.66	4	4	0.76	3	3	4
Academic and professional qualifications of teaching and research staff (% of doctors, % civil servants, etc.)	4.52	5	5	0.60	3	4	5
Mobility of teachers and researchers (% of teachers on fellowships, etc.)	4.54	5	5	0.68	3	4	5
Scientific productivity (books, articles published, etc.)	4.08	4	4	0.87	3	4	5
Professional qualifications of administration and service staff	3.68	4	4	0.99	4	3	4
Mobility of graduates	4.30	4	5	0.73	3	4	5
Efficiency of human capital	4.49	5	5	0.74	3	4	5
Teaching capacities and competences (pedagogical capacity, teaching innovation, teaching quality, language proficiency, etc.)	4.57	5	5	0.66	3	4	5
Research capacities and competences (research quality, participation in national and international projects, % of doctor, six-year research periods, etc.)	4.63	5	5	0.62	2	4	5
Teamwork capacity	4.04	4	4	0.79	3	4	5
Leadership capacity	3.97	4	4	0.79	3	3	5
Training activities	4.44	5	5	0.71	3	4	5

(*) 5-point scale: (1: not at all important, 5: very important)

Table 2: Frequency analysis in the structural capital block (*) (cont.)

Intangible Asset	Mean	Median	Mode	Standard deviation	Range	Percent-ile 25	Percent-ile 75
Installations and material resources supporting pedagogical qualification and innovation	4.09	4	4	0.71	3	4	5

Installations and material resources for research and development	4.40	4	5	0.66	3	4	5
Evaluation and qualification processes and activities within the institution	4.28	4	5	0.73	3	4	5
Structural organisation	3.98	4	5	0.97	3	3	5
Teaching management and organisation (academic networks, teaching exchanges, teaching incentives, etc.)	4.56	4	4	0.69	3	4	5
Research management and organisation (internal communication of results, efficient management of research projects, research incentives, theses read, etc.)	4.47	5	5	0.60	3	4	5
Organisation of scientific, cultural and social events	4.40	4	5	0.68	3	4	5
Productivity of administrative, academic and support services	3.98	4	4	0.77	3	3	5
Organisational culture and values	4.04	4	4	0.80	3	3	5
Effort in innovation and improvement (expenditure on innovation, staff working on innovation)	4.55	5	5	0.58	3	4	5
Management quality	4.51	5	5	0.60	4	4	5
Information system (documented processes, databases, use of ITC)	4.38	4	5	0.63	2	4	5
Technological capacity (total expenditure on technology, availability and use of computer programs, use of intranet/Internet, etc.)	4.45	5	5	0.61	3	4	5
Intellectual property (patents, licenses, etc.)	4.52	5	5	0.64	3	4	5

(*) 5-point scale: (1: not at all important, 5: very important)

Table 2: Frequency analysis in the structural capital block (*) (cont.)

Intangible Asset	Mean	Median	Mode	Standard deviation	Range	Perce- tile 25	Perce- tile 75
Efficiency of graduate teaching (average duration of studies, dropout rate, graduation rate, etc.)	4.53	5	5	0.64	3	4	5
Student satisfaction	4.61	5	5	0.68	3	4	5
Graduate employability	4.75	5	5	0.50	3	5	5
Student relations (capacity for	4.21	4	4	0.60	3	4	5

responding to student needs, permanent relations with ex-students, etc.)								
Relations with the business world (spin-offs, contracts and R&D projects, etc.)	4.74	5	5	0.57	4	5	5	
Relations with society in general (institutional representation in external organisations, collaboration on national and international projects, etc.)	4.48	5	5	0.60	3	4	5	
Application and dissemination of results (dissemination of results, appropriateness of research)	4.42	5	5	0.55	2	4	5	
Relations with the media	3.94	4	4	0.85	3	3	5	
University's image	4.56	5	5	0.65	2	4	5	
Collaborations and contacts with public and private organisations	4.40	5	5	0.68	2	4	5	
Collaboration with other universities	4.55	5	5	0.54	2	4	5	
Strategic links	4.35	4	4	0.63	3	4	5	
Relations with quality institutions	4.38	4	5	0.70	3	4	5	
University's regional. National and international reputation	4.41	5	5	0.69	3	4	5	
Social and cultural commitment	4.47	5	5	0.65	3	4	5	
Environmental responsibility	4.44	5	5	0.70	3	4	5	

(*) 5-point scale: (1: not at all important, 5: very important)

Firstly it must be observed that, in general, a high mean value was awarded to publishing information on intangible items relating to human, structural and relational capital, which shows a strong emphasis on the need for universities to publish information on their intellectual capital.

It was also considered that in order to classify any of the intangible items as essential to publish, apart from meeting the previous requirements, they must achieve a mean value of over above 4.5. In the field of study relative to information on intangibles, this criterion has been used previously by Castilla and Gallardo (2003) and Pelau et al. (2011).

Specifically, the analysis of the data obtained from the various statistics (mean, median, standard deviation, 25 and 75 percentiles) led to classifying the following intangible elements as essential to publish (see Figure 1):

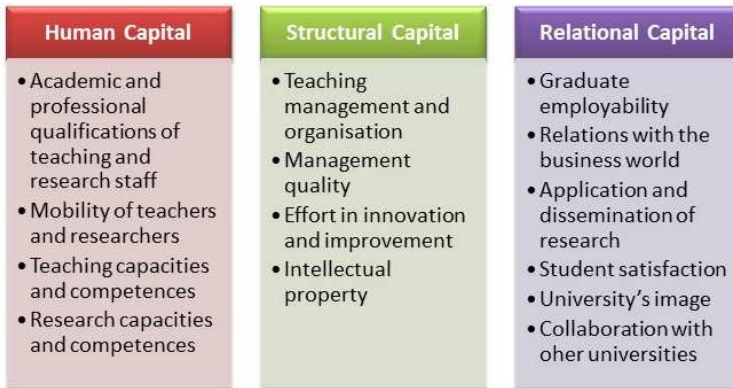


Figure 1: Essential intangible elements

Source: own information

Objective II: Proposal of a battery of indicators related to intellectual capital in Spanish universities.

We have developed a proposal of indicators for reporting on intellectual capital based on the results of our empirical study. We also reviewed the principal literature on intellectual capital reports drawn up at different institutions of higher education and research centre's (Bueno et al., 2002; Leitner, 2004; Fazlagic, 2005; Altenburger and Schaffhauser, 2005; Sánchez et al., 2006, 2009; Ramírez et al., 2007; Cañibano and Sánchez, 2008; Schaffhauser, 2009; Bezhani, 2010; Bodnár et al., 2010; Silvestri y Veltri, 2011; etc.), and also we took into account various studies which bring together tables of indicators designed by different universities (Malyshko, 2008; Sánchez and Rivera, 2009; Jones et al., 2009; González and Rodríguez, 2010; Nava and Mercado, 2011).

Using this information and the results obtained from our empirical study we are now able to identify the key aspects that need to be included in a presentation of intellectual capital information by Spanish universities in order to satisfy the needs of stakeholders.

Table 3 shows our proposal of battery of basic or general indicators which will align all the intangible elements which it is "essential" to make public.

Table 3: Proposed indicators for reporting intellectual capital in universities

Intangible elements	Indicators
Human Capital	
Academic and professional qualifications of staff	% of doctors among teaching and research staff % of qualified teachers
Teaching capacities and competences	Total teaching and research staff / students Number of participants in training programs Number of hours dedicated to teacher training
Mobility of teachers and researchers	% of teachers with fellowships at other universities
Research capacities and competences	Rate of participation in research projects Proportion of six-year research periods Production of doctoral thesis Number of scientific publications
Structural Capital	
Teaching management and organization	% of classes with less than 50 students Rate first cycle credits in English Library places
Management quality	Quality certificates awarded
Effort in innovation	R&D expenditure Number of R&D projects under development
Intellectual property	Generation of patents Scientific production
RELATIONAL CAPITAL	
Graduate employability	Employment rate Time until first employment
Efficiency of graduate teaching	Drop-out rate Efficiency rate Graduation rate Performance rate
Student satisfaction	Graduate satisfaction with studies (surveys) % of pre-enrolled students in first option in relation to total number of places on offer
Relations with the business world	Rate of in-company work experience Evaluation of university training by employers Number of collaboration agreements on projects and activities with enterprises
Collaboration with other universities	% of teachers received from other universities
University's Image	Society's opinion of the university Doctorate programs with official mention of quality Rate of students from foreign universities on postgraduate programs

Source: own information

The indicators are broken down into the respective elements of intellectual capital and comparisons will be made with previous periods and provisional information. The values of the indicators can be calculated and presented

for different successive periods, which permits a time-based comparative analysis.

Descriptions of Selected Indicators of Intellectual Capital

Below we show a few descriptive sheets of the proposed indicators for each category of intellectual capital.

Human Capital Indicators:

Proportion of doctors	
DEFINITION: Percentage relationship between the number of doctors and the total number of teaching and research staff at the university (TRS)	
CALCULATION:	$\frac{\text{Total no. of TRS and doctors at the university}}{\text{Total No. of TRS at the university}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is the academic level of the teaching and research staff? This indicates the ratio of doctors within the total TRS. It tells us the capacities the teaching and research staff have for university training, in other words, that is to say their level of academic qualification. This also provides information about the research potential of the teaching staff which is an indicator of the research quality at the university.	
Proportion of qualified teaching staff	
DEFINITION: Percentage relationship between the number of qualified teachers and the total number of teaching and research staff (TRS) at the university	
CALCULATION:	$\frac{\text{No. of qualified teachers}}{\text{Total no. of TRS at the university}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is the stability level of the university teaching and research staff? This is a clear sign of staff stability, and consequently of teaching and research functions. It reflects the university's stability policy for teaching staff and the level of TRS qualifications.	
Teaching and research staff-student ratio	
DEFINITION: Relationship between the total number of teaching and research staff (TRS) at the university and the total number of students.	
CALCULATION:	$\frac{\text{No. of TRS at the university (FTE)}}{\text{Total No. of students (FTE)}}$
USERS' QUESTION THAT THIS ANSWERS: What level of support or intensity of help do the students receive from the teachers?	

<p>This is without doubt an important ratio since it shows the amount of scientifically-oriented human resources available for teaching activities. This indicator tells us the proportion of students per teacher, which gives an idea of the level of massification at a university.</p>	
<p>Participants in training programmes</p>	
<p>DEFINITION: Number of participants in training programmes either in or outside the university</p>	
<p>CALCULATION:</p>	<p>Number of teaching and research staff participating in training programmes</p>
<p>USERS' QUESTION THAT THIS ANSWERS: What is the training level of university staff? This indicator tells us about the willingness of the university staff to take part in training activities (teaching, technology, etc.). It provides us with information about the importance teachers give to continuous training. This indicator also provides students with information about the level of specialisation of the teaching staff at the university.</p>	
<p>Hours dedicated to teacher training</p>	
<p>DEFINITION: Number of hours of teaching and research staff dedicate to teacher training activities</p>	
<p>CALCULATION:</p>	<p>No. of hours TRS dedicate to training ----- x 100 Total no. of TRS daily working hours</p>
<p>USERS' QUESTION THAT THIS ANSWERS: How much effort do teaching staff make to deliver quality teaching? This gives us information about the quality and the commitment of teaching staff in teacher training activities. It measures the effort made by teaching and research staff in lifelong learning of teaching skills.</p>	
<p>Percentage of teachers who hold/have held fellowships at other universities</p>	
<p>DEFINITION: Percentage relationship between the number of teachers who hold/have held fellowships at other universities (national or international) and the total number of teaching and research staff (TRS) at the university</p>	
<p>CALCULATION:</p>	<p>No. of TRS who hold/have held fellowships at other universities ----- x 100 Total no. of TRS at the university</p>
<p>USERS' QUESTION THAT THIS ANSWERS: What is the mobility level of the teaching and research staff at the university? This measures the degree to which the teaching and research staff at the university are willing to interact with their peers in other academic institutions. Teacher mobility helps to improve teaching and research competences. It helps university staff improves and mature and acquire knowledge of assistance to them in their academic work.</p>	
<p>Participation rate in research projects</p>	
<p>DEFINITION: Percentage relationship between the total number of teachers who participate in competitive scientific programmes (European Framework programmes, National or Regional Plan programmes with project assessment, etc.) and the total number of teachers.</p>	

CALCULATION:	$\frac{\text{Total no. of teachers who participate in research projects}}{\text{Total no. of TRS at the university}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: To what extent do teachers commit to competitive projects? This indicator aims to establish the level of commitment of the university to participation in competitive research projects. It also gives us information about how much the teaching and research staff (TRS) contribute to the non-financial income of public universities through contracts, agreements and research projects. This indicator is useful to see the level of self-financing achieved by universities for their research activities.</p>	
Proportion of six-year research periods	
<p>DEFINITION: Percentage relationship between the number of six-year research periods awarded to teaching and research staff (TRS) and the total possible number of six-year research periods</p>	
CALCULATION:	$\frac{\text{Total no. of six-year research periods awarded}}{\text{Total no. of possible six-year periods}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: To what extent is teaching staff committed to research? This productivity indicator tells us about the level of commitment of TRS to research. "Possible six-year periods" refers to the number of six-year periods which could be obtained between thesis reading and the current date.</p>	
Production of doctoral thesis	
<p>DEFINITION: Number of doctoral theses defended in the last year in relation to the total number of teaching and research staff (TRS) on doctorate programmes</p>	
CALCULATION:	$\frac{\text{No. of thesis defended in the last year}}{\text{Total no. of TRS on doctorate programmes}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: What is the level of thesis production at the university? Thesis production is an indicator of the research level of a university. It is measured extensively at most universities and is therefore open to comparison. The objective is to identify the level of commitment of teaching staff to graduate teaching and research.</p>	
Number of scientific publications	
<p>DEFINITION: Number of scientific publications in relation to number of teaching and research staff (TRS) at the university</p>	
CALCULATION:	$\frac{\text{Total no. of scientific publications}}{\text{Total no. of TRS at the university}}$
<p>USERS' QUESTION THAT THIS ANSWERS: What is the level of scientific productivity of the TRS at the university? This measures the number of publications (books, chapters of books, papers presented at national or international congresses, reports, etc.) stemming from research conducted by university staff. It</p>	

reflects the dedication to publishing work at a university. This indicator gives us an idea of the quality of research of a university.

Structural Capital Indicators:

Percentage of classes with fewer than 50 students	
DEFINITION: Percentage relationship between the total number of classes with 50 or fewer students and the total number of classes.	
CALCULATION:	$\frac{\text{Total no. of classes with 50 or fewer students}}{\text{Total no. of classes}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: How many students are there per class? This indicator tells us about the level of "massification of classes". It is assumed that when there are fewer students per class there is more student interaction and higher quality teaching since they receive more intensive and personalized attention.	
Number Rate first cycle credits in English	
DEFINITION: Percentage relationship between the number of credits available in English and the total number of credits of the study plan	
CALCULATION:	$\frac{\text{No. of credits available in English}}{\text{Total no. of credits of the study plan}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: Is it possible to study university courses in English? One of the objectives of the university is to promote the command of languages. This indicator aims to measure the evolution of this process by looking at how many programmes are on offer, that is to say, the proportions of credits available in English on undergraduate courses.	
Places in the library	
DEFINITION: Relationship between the number of students enrolled and the number of reading places in the library.	
CALCULATION:	$\frac{\text{Total no. of students enrolled}}{\text{Total no. of library places}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is the occupancy level of the libraries? This is an indicator of the material resources the university has to promote the best possible teaching and research practice and cultural outreach and services. The material resources available (in this case, libraries) are taken into account when evaluating the quality of services.	
Quality certificates awarded	
DEFINITION:	

Quality certificates awarded for good management systems.	
CALCULATION:	Quality seals awarded.
<p>USERS' QUESTION THAT THIS ANSWERS: What is the quality of management at the university? This shows the end result of appropriate management at the university. In the interests of prestige it is important for the university to recognise and publicise the quality seals awarded to the institution for its management systems.</p>	
R&D expenditure	
<p>DEFINITION: Expenditure on research and development.</p>	
CALCULATION:	Expenditure on R&D (in euros)
<p>USERS' QUESTION THAT THIS ANSWERS: What is the level of commitment to R&D at the university? This indicator reflects the how much the university spends on innovation activities which help give the university a cutting edge. It shows whether the university has an active policy on innovation.</p>	
R&D projects	
<p>DEFINITION: Number of on-going R&D projects</p>	
CALCULATION:	Number of on-going R&D projects at the university
<p>USERS' QUESTION THAT THIS ANSWERS: What is the level of commitment to innovation at the university? This indicator measures the number of innovation projects undertaken by the university in order to increase knowledge levels and how this knowledge is used to devise more applications. Research and development policies are a reflection of the creativity and experimentation process of a university.</p>	
Production of patents	
<p>DEFINITION: Number of patents registered by the university in the last year</p>	
CALCULATION:	Number of patents generated by the university to date
<p>USERS' QUESTION THAT THIS ANSWERS: How many patents has the university produced? In what fields of knowledge? Patent production identifies the degree of the relationship between the basic research undertaken at the university and its practical application in the business world. Instead of the number of patents registered yearly (which may vary greatly), it would be possible to measure the number of patents produced over a certain period (five years, for example) or the number of patents in use in the year in question.</p>	
Scientific production	
<p>DEFINITION: Relationship between the number of scientific documents registered in the Science Citation Index and the Social Science Citation Index in relation to the total number of teaching and research staff (TRS) at the university</p>	
CALCULATION:	$\frac{\text{No. of scientific publications registered in the SSCI}}{\text{Total no. of TRS at the university}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: What is the level of scientific production at the university?</p>	

This measurement of scientific production is based on the number of articles published in international science journals in relation to the number of TRS. This indicator is widely used to list different universities in international rankings. It is an indicator of the research quality of a university.

Relational Capital Indicators:

Employment rate	
DEFINITION: Percentage relationship between the number of graduates in year “x-3” who are in a job that matches their education in year “x” and the total number of students in work in year “x” who graduated in year “x-3”	
CALCULATION:	$\frac{\text{No. of graduates in year “x-3” who are working in year “x” in a job that matches their education}}{\text{Total no. of graduates in year “x-3”}} \times 100$
USERS’ QUESTION THAT THIS ANSWERS: What type of job do the graduates have? Do their Jobs match their education? One of the main objectives of the university is to train good professionals who quickly enter the job market in an appropriate position. The objective is consequently not only to find a job but to find a job that matches the degree in which they have graduated.	
Time until first employment	
DEFINITION: Amount of time passed (in months) between graduating and finding the first job	
CALCULATION:	$\frac{\sum \text{months passed between graduating and finding the first job for all graduates}}{\text{Total number of graduates}} \times 100$
USERS’ QUESTION THAT THIS ANSWERS: How long do graduates take to find their first job that matches their education? Society is interested in knowing how long graduates take to find their first job. It is also interesting to know the differences that might exist depending on the type of degree, gender, etc.	
Drop-out rate	
DEFINITION: Percentage relationship between the total number of a new entry of students who should have finished the previous year of studies and have not enrolled in the final two years	
CALCULATION:	$\frac{\text{No. of students not enrolled in the two final years “x” y “x-1”}}{\text{No. of new entry students in the year “x-n+1”}} \times 100$
USERS’ QUESTION THAT THIS ANSWERS: How many students drop out before finishing their studies? Monitoring the number of students who drop out is a measurement of the quality of the university education system. The objective is to reduce this dropout rate to a minimum and produce high-performing students so as to use resources efficiently.	

Efficiency rate	
DEFINITION: Percentage relationship between the theoretical number of credits of the study plan for which the group of graduates from a certain year should have enrolled and the total number of credits for which they have actually had to enrol.	
CALCULATION:	$\frac{\text{No. of theoretical credits of the study plan} \times \text{no. of graduates}}{\text{Total number of credits for which the graduates actually enrolled}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: How academically efficient are the students? The performance rate measures the degree of effectiveness of the teaching activity and the students' learning, which clearly makes it an indicator to maximize.	
Graduation rate	
DEFINITION: Percentage of students who graduate in the time foreseen in the study plan(d) or one academic year later (d+1) in relation to their entry group	
CALCULATION:	$\frac{\text{Graduates in "d" or in "d+1" of those enrolled in "c"}}{\text{Total number of students enrolled in one academic year "c"}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is the level of academic performance of the students at the university? How long do they need to finish their studies? The graduation rate measures the actual time students take to finish their degree course in relation to the time they should have taken according to their study plan. This indicator and the performance rate also show the level of academic efficiency of the students. It also indicates the productive effectiveness of the university regarding the level of satisfaction of the demand for academic accreditation shown each year by the users of the university teaching services.	
Performance rate	
DEFINITION: Percentage relationship between the total number of credits passed (excluding adapted, transferred, recognised credits, etc.) by students and the number of credits for which they have enrolled	
CALCULATION:	$\frac{\text{No. of credits passed by students}}{\text{Total no. of credits for which they have enrolled}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is the level of academic performance of the students? The performance rate measures the degree of effectiveness of the teaching activity and the students' learning, which clearly makes it an indicator to maximize.	
Graduate satisfaction with their studies	
DEFINITION: The mean score obtained from all the graduates surveyed when answering the following three questions: A. How do you evaluate the training received at the university? B. How appropriate is the training received to the actual requirements of your job? C. Would you study the same degree course again? At the same university?	

CALCULATION:	$\frac{\sum \text{scores obtained for each question}}{\text{Total number of answers obtained}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: What is the graduates' opinion of their training and the competences acquired? This shows us the level of appropriateness of graduate training to job needs. It is a valuable indicator for measuring the quality of university training, since it tells us the graduates' view of the training they received.</p>	
Percentage of pre-enrolled students in first option	
<p>DEFINITION: Relationship between the total numbers of students pre-enrolled in first option and the total number of places offered by the university.</p>	
CALCULATION:	$\frac{\text{Total no. of students pre-enrolled in first option in each branch}}{\text{Total no. of laces offered by the university}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: What do our students demand as first option? This indicator tells us the degree to which the university attracts students and the influence of the university in society. It also measures the impact of the image/reputation of the university in society. Furthermore, it reflects the extent to which the offer available satisfies students' demands.</p>	
Rate of in-company work experience	
<p>DEFINITION: Percentage relationship between the number of students on voluntary work experience in companies (with a duration of at least three months) and the total number of students enrolled</p>	
CALCULATION:	$\frac{\text{No. of students on work experience in companies}}{\text{Total number of students enrolled}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: Are students sufficiently prepared to enter the job market? Going on work experience makes students better trained and provides them with a more practical, real experience of the world of work. It complements the training received at the university and facilitates entry into the job market.</p>	
Evaluation of university training by employers	
<p>DEFINITION: Mean score obtained from all the employers surveyed when answering the following three questions: A. How do you evaluate the theoretical training acquired by graduates? B. How do you evaluate the practical training acquired by graduates? C. How do you evaluate the usefulness of the competences acquired at university for the work position?</p>	
CALCULATION:	$\frac{\sum \text{scores obtained for each question}}{\text{Total number of answers obtained}} \times 100$
<p>USERS' QUESTION THAT THIS ANSWERS: What is the opinion of companies regarding the training and competences acquired by graduates? This tells us the level of appropriateness of students' training to work needs. It is a highly valuable indicator for measuring the quality of university training since it lets us know the employees' opinion</p>	

of graduates. The company point of view is one of the most important criteria for identifying the strong and weak points of a university.	
Number of collaboration agreements on projects and activities with enterprises	
DEFINITION: Number of co-operation projects signed between the university and enterprises	
CALCULATION:	Number of co-operation agreements with enterprises
USERS' QUESTION THAT THIS ANSWERS: What is the level of co-operation between the university and the business world? This measures the degree of co-operation of the university with external agents, in this case, enterprises. It also measures the capacity for rising funding through collaboration with different organisations. The greater the number of co-operation agreements signed with private organisations, the greater will be the repercussion of the university in society.	
% of teachers received from other universities	
DEFINITION: Percentage of teachers received from other universities in relation to the total number of TRS at our university	
CALCULATION:	$\frac{\text{No. of teachers received from other universities}}{\text{Total no. of TRS at the university}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is the degree of co-operation with foreign universities? This measures the degree of internationalisation of the university.	
Society's opinion of the university	
DEFINITION: Proportion of positive assessments received, the number of answers which give a very good or quite good assessment of the public image of the university	
CALCULATION:	$\frac{\text{Total number of positive assessments (very good or quite good)}}{\text{Total number of answers obtained}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: What is society's assessment of the public image of the university? The image transmitted by the university is of prime importance and it is essential to know how positively people see the image it creates.	
Doctorate programmes with official mention of quality	
DEFINITION: Number of doctorate programmes which have received the Mention of Quality awarded by the Ministry of Education and Science	
CALCULATION: Number of doctorate programmes with a Mention of Quality	
USERS' QUESTION THAT THIS ANSWERS: What is the quality of the university's post-graduate qualifications?	

The university will largely stand out above others on the strength of its post-graduate qualifications. If the university offers a good selection of post-graduate qualifications, it will have a good image.	
Rate of students from foreign universities on postgraduate programmes	
DEFINITION: Relationship between the number of students from foreign universities enrolled on post-graduate courses and the total number of enrolments on these courses (official masters courses, doctorate programmes, university's own courses)	
CALCULATION:	$\frac{\text{No. of students from foreign universities on post-graduate courses}}{\text{Total no. of students on post-graduate courses}} \times 100$
USERS' QUESTION THAT THIS ANSWERS: Does the university attract foreign students to its post-graduate courses? Monitoring the number of foreign students on post-graduate courses offered by the university is a measurement of the university's capacity for attracting students from abroad and is consequently a measurement of international prestige. It also provides information on the degree of internationalisation of the university.	

Conclusions

This paper presents a proposal of indicators for reporting on intellectual capital in Spanish universities. This involved identifying intangible elements university stakeholders demand most, which served as a basis for developing our proposal.

In our opinion, universities will have to pay greater attention to their different stakeholders and their respective information interests when designing their communication strategy.

The empirical study conducted for this work is a first step towards highlighting the importance given by different Spanish public universities to the need to carry out a proactive publication of information on intellectual capital. Specifically, it is considered essential the disclosure of the following intangible elements: academic and professional qualifications of the teaching and research staff, mobility of teachers and researchers, teaching capacities and competences, and research capacities and competences (Human Capital); effort in innovation and improvement, teaching management and organization, intellectual property, and quality management (Capital Structure); as well as the graduate employability, relations with the business world, efficiency of graduate teaching, student satisfaction, the university's image and collaboration with other universities (Relational Capital).

Based on these results, we develop our proposal of indicators for reporting on intellectual capital in universities.

We believe that complementary non-financial information is the most appropriate form to supply information on universities' intangible elements, so as to avoid the inclusion of accounting criteria which could endanger the quality and reliability of the financial information. In our opinion, an improvement in university accounting systems would be achieved by the drafting and presentation of a new report complementary to the current financial statements –the Intellectual Capital Report-. A set of indicators would show the information most demanded by different stakeholders regarding the institution's intangible elements. It would be a healthy exercise in transparency for these institutions to facilitate access for their users to a variety of information which is relevant to their decision making.

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