Intellectual Capital Report for Universities

Yolanda Ramírez Córcoles, Ángel Tejad Ponce, and Agustín Baidez González

Abstract—Intellectual capital reporting becomes critical at universities, mainly due to the fact that knowledge is the main output as well as input in these institutions. In addition, universities have continuous external demands for greater information and transparency about the use of public funds, and are increasingly provided with greater autonomy regarding their organization, management, and budget allocation. This situation requires new management and reporting systems. The purpose of the present study is to provide a model for intellectual capital report in Spanish universities. To this end, a questionnaire was sent to every member of the Social Councils of Spanish public universities in order to identify which intangible elements university stakeholders demand most. Our proposal for an intellectual capital report aims to act as a guide to help the Spanish universities on the road to the presentation of information on intellectual capital which can assist stakeholders to make the right decisions.

Keywords—Intellectual capital, Spain, report, universities.

I. INTRODUCTION

EUROPEAN higher education institutions are currently immersed in a process of profound change, the intention of which is to improve the effectiveness, efficiency and transparency of these institutions with the aim of contributing to the development and improvement of the competitiveness of the European economy [1]-[4].

In this context, we agree with the Observatory of the European University [5], which states that in a not too distant future, publishing information on intellectual capital will be compulsory for universities, mainly due to the fact that they are considered to be critical institutional players in the national innovation systems within the current knowledge-based economy.

The need for universities to have a greater involvement with their wider community and the general concern to ensure the informational transparency of these institutions so as to satisfy the information needs of their users makes it advisable to present information on intellectual capital. Below are some of the reasons why it is a major necessity for these institutions to start including information on intellectual capital in their current accounting systems:

- Knowledge is the principal output and input of higher education institutions. Universities produce knowledge, either through scientific and technical 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 [6]. It is true to say then that universities' input and output are largely intangible [7].

- The existence of continual demands for greater information and transparency about the use of public money [8], mainly due to the fact that most of the funding for public universities is handed over by the government [9].

- The greater independence of universities regarding their organization, management and budget distribution requires greater social responsibility which will lead universities to prepare accounting information to report to society as well as to facilitate and satisfy the information needs of participants in the institution itself.

- The implementation of the European Space for Higher Education promotes the mobility of both students and teachers within the territory of Europe, while at the same time encouraging both collaboration and competition between universities. This environment of greater competition and necessary collaboration means that these institutions are now committed to accessing citizens and transmitting relevant information on their activities. All this could well play an important role in the decision-making processes of the users of the accounting information, for example in the case of potential students choosing where to study.

- Lastly it is important to point out that universities are now facing growing competition due to lower funding, which puts them under greater pressure to communicate their results.

So, new management and reporting systems allow universities to be in a better position to [8]:

- Create transparency about the use of public funds.
- Explain the achievements of research, training, innovation and their benefits to stakeholders,
- Illustrate the development of intangible assets,
- Reveal leverage effects and externalities,
- Communicate (new) organizational values,
- Demonstrate their competitiveness.

However, despite all this, in most countries there exists no obligation or recommendation for universities to present information on their intellectual capital. The only exception is in Austria, where universities have been obliged to present a report on intellectual capital since 2007. In view of this lack of obligation or simple recommendations from political authorities and university administrations related to presenting information on intellectual capital, our study will develop a

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proposal of intellectual capital report for Spanish universities. This involved identifying intangible elements university stakeholders demand most, which served as a basis for developing our proposal. To this end, a questionnaire was designed and sent to every member of the Social Councils of Spanish public universities in order to identify intangible items they consider it essential for universities to provide information.

The paper is structured as follows: in Section II, we briefly explore the concept of intellectual capital in higher education institutions. In Section III, we define the scope of the empirical study conducted. Then, we present the results obtained. According to this, our proposal of intellectual capital report for Spanish universities is presented in Section IV. Final conclusions are drawn in Section V.

II. INTELLECTUAL CAPITAL IN UNIVERSITIES

It is important for higher education institutions to identify measure, manage and present information on its intellectual capital, as it is a key factor to generate value to the organization.

The term "intellectual capital" is used to cover all of the non-tangible, or non-physical, assets and resources of an organization, including its processes, innovation capacity, patents and the tacit knowledge of its members and their network of collaborators and contacts. So, intellectual capital (IC) has been defined as the combination of intangible resources and activities that "allows an organization to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value" [10].

The intellectual capital is often represented as consisting of three basic and strongly interrelated components: Human Capital, Structural Capital and Relational Capital [1], [6], [7], [11]-[13].

In the case of Universities, we could define the components in the following way:

- Human Capital: The set of explicit and tacit knowledge of the universities personnel (professors, researchers and assistants) acquired through formal and informal educational and actualization processes embodied in their activities.

- Structural Capital: The explicit knowledge related to the internal process of dissemination, communication and management of scientific and technical knowledge in the organization. Structural capital may be divided into:
  o 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 the scope of the information system, etc.
  o 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: it gathers the wide set of economical, political and institutional relationships between the university and its non academic partners: enterprises, non-profit organizations, local government and society in general. It also includes the perception 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 [14]. 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 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.

The obligation to present this intellectual capital report in the higher education system would be a crucial step towards the new university management, achieving so a double objective: to identify and measure intangibles for management purposes and to provide useful information to stakeholders.

III. EMPIRICAL STUDY

The need for universities to have a greater involvement with their wider community and the general concern to ensure the informational transparency of these institutions prompted us to try to identify which is the positioning of Spanish public universities on the necessity of disclosing information on their intellectual capital. To this end, a questionnaire was designed and sent to every member of the Social Councils of Spanish public universities. It was thought that these participants would provide a good example of the attitude of university information users since they represent the different social groups connected with universities.

A. Research Objectives

The two fundamental objectives of this empirical study are:
- Objective I: To determine the extent to which university stakeholders are interested in having information relating to the intellectual capital of Spanish public universities, identifying which intangible resources are the most relevant for publication.
- Objective II: To elaborate a proposal for the disclosure of intellectual capital in universities: an Intellectual Capital Report for Spanish Universities.

B. Methodology and Data Collection

The methodology of the study is outlined in the data sheet attached in Table I.

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TABLE I
STUDY DATE SHEET

Analysis group	Users of accounting information from Spanish public universities
Universe	Members of the Social Councils of Spain's public universities (1.094)
Size of sample	247
Information collection technique	On line survey
Period of field work	May-July 2011
Average time per survey	7 minutes 45 seconds
Software	SPSS® v. 17

(Source: own information)

C. Defining the Population and Selecting the Sample

After reviewing the literature dedicated to the analysis of stakeholders in universities [15]-[19], a certain consensus was detected once the following users of the accounting information of the higher education institutions were identified: the public administration, bodies of university government, students, teaching and research staff, administration and service staff, unions, private and public organisations with plans to employ university graduates or to apply the research generated at the institution, the media, foundations or any other party interested in university activity. Thus, the choice of the members of the Social Councils of Spanish public universities as population to be studied is fully justified since it was found that they all include the following members: the vice-chancellor, general secretary, manager, council secretary, a president, a representative of the teaching and research staff, a representative of the administration and services staff, a students' representative, two to six (usually two) representatives of business organisations, two to six (usually two) representatives of union organisations and various representatives of the regional government, the regional parliament, the town council, the federation of municipalities and provinces, etc, all of which are included in the group denominated public administrations.

The population to be studied was therefore composed of the 1.904 members of the Social Councils of Spain's 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%.

D. Information Collection and Definition of Variables

The information was collected via an online survey. An email was sent to the members of the Spanish public universities' Social Councils, requesting their members to take part in our research. The questionnaire consists of 5-point Likert scale questions.

To achieve the objectives set in the study, those surveyed were asked to rate on a 5-point Likert scale the importance they gave to universities publishing information on the different intangible elements by Spanish public universities.

Specifically, based on the Intellectus Model [20], we proposed 32 intangible elements according to the higher education institutions' characteristics, in order to establish their relevance for disclosing: twelve relating to human capital

(concerning the abilities and skills of the people belonging to the institutions), fourteen relating to structural capital (these referring to how the institution is structured and how it works), and sixteen relating to relational capital (that reflect the institution's relations with students and the outside world).

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

TABLE II
INTANGIBLE VARIABLES USED IN THE STUDY (HUMAN CAPITAL)

	Intangible elements	Mean	Median	St. D.	Percentile	
					25	75
HC1	Typology university staff (historical data on increase and decrease of staffing numbers, staff age structures, type of contract, etc.)	3.63	4	0.433	3	4
HC2	Academic and professional qualifications of teaching and research staff (% of teachers, % of civil servants, etc.)	4.60	5	0.321	4	5
HC3	Mobility of teachers and researchers (% of teachers with fellowships, etc.)	4.21	4	0.552	4	5
HC4	Scientific productivity (books, articles published, etc.)	4.58	5	0.365	4	5
HC5	Professional qualifications of administration and service staff	3.66	4	0.672	3	4
HC6	Mobility of graduate students	4.37	4	0.327	4	5
HC7	Efficiency of human capital	4.54	5	0.413	4	5
HC8	Teaching capacities and competences (didactic capacity, teaching innovation, teaching quality, languages, etc.)	4.60	5	0.438	4	5
HC9	Research capacities and competences (research quality, participation in national and international projects, % of doctors, six year terms, etc.)	4.69	5	0.285	4	5
HC10	Capacity for teamwork	4.08	4	0.366	4	5
HC11	Leadership capacity	3.99	4	0.452	3	5
HC12	Training activities	4.51	5	0.369	4	5

(Source: own information)

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TABLE III
INTANGIBLE VARIABLES USED IN THE STUDY (STRUCTURAL CAPITAL)
(CONT.)

	Intangible elements	Mean	Median	St. D.	Percentile 25	Percentile 75
SC1	Facilities and material resources supporting pedagogical qualification and innovation	4.12	4	0.344	4	5
SC2	Facilities and material resources supporting research and development	4.47	4	0.343	4	5
SC3	The institution's assessment and qualification processes	4.31	4	0.383	4	5
SC4	Organizational structure	4.06	4	0.602	3	5
SC5	Teaching management and organization (academic networks, periodical exchange with foreign teachers, teaching incentives, etc.)	4.33	4	0.402	4	5
SC6	Research management and organization (internal communication of results, efficient management of research projects, research incentives, theses read, etc.)	4.50	5	0.329	4	5
SC7	Organization of scientific, cultural and social events	4.46	4	0.406	4	5
SC8	Productivity of the administration, academic and support services	4.05	4	0.449	3	5
SC9	Organization culture and values	4.12	4	0.437	3	5
SC10	Effort in innovation and improvement (expenditure on innovation, staffing level, etc.)	4.58	5	0.352	4	5
SC11	Management quality	4.54	5	0.394	4	5
SC12	Information system (document processes, databases, ITC use, etc.)	4.48	4	0.363	4	5
SC13	Technological capacity (total expenditure on technology, availability and use of computer programs, intranet/internet use, etc.)	4.49	5	0.394	4	5
SC14	Intellectual property (patents, licenses, etc.)	4.58	5	0.358	4	5

(Source: own information)

TABLE IV
INTANGIBLE VARIABLES USED IN THE STUDY (RELATIONAL CAPITAL)
(CONT.)

	Intangible elements	Mean	Median	St. d.	Percentile 25	Percentile 75
RC1	Effectiveness of graduate teaching (average duration of studies, drop-out rate, graduation rate, etc.)	4.57	5	0.374	4	5
RC2	Student satisfaction	4.66	5	0.377	4	5
RC3	Graduate employability	4.79	5	0.252	5	5
RC4	Relations with students (capacity of response to students needs, permanent relations with graduates, etc.)	4.29	4	0.359	4	5
RC5	Relations with the business world (spin-offs, R&D contacts and projects, etc.)	4.79	5	0.271	5	5
RC6	Relations with society in general (institutional representation in external organizations, collaboration in national and international projects, etc.)	4.47	5	0.354	4	5
RC7	Application and dissemination of research (dissemination of results, social appropriateness of research)	4.63	5	0.295	4	5
RC8	Results with the media	4.01	4	0.547	3	5
RC9	University image	4.65	5	0.313	4	5
RC10	Collaborations and contacts with public and private organizations	4.50	5	0.348	4	5
RC11	Collaboration with other universities	4.56	5	0.284	4	5
RC12	Strategic links	4.42	4	0.335	4	5
RC13	Relations with quality institutions	4.44	4	0.341	4	5
RC14	The regional, national and international reputation of the university	4.47	5	0.405	4	5
RC15	Social and cultural commitment	4.50	5	0.398	4	5
RC16	Environmental responsibility	4.49	5	0.434	4	5

(Source: own information)

IV. RESULTS OF THE EMPIRICAL STUDY

We now follow with some observations on the principal results obtained from the empirical study for each of the objectives defined.

A. Objective 1: Importance given to publishing information on different intangible elements

In order to identify which intangible items the members of the Social Councils believe relevant or very relevant to publish information about, it was decided that the items in question had to be given a mean value and a median of 4 or more points, in conjunction with a minimum percentile of 25 scoring 4 points and a minimum percentile of 75 of 5 points. The majority of the value distribution should be concentrated in high values – approaching 5 points. It was also considered that in order to classify any of the intangible items as essential

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to publish, apart from meeting the previous requirements, they must achieve a mean value of over above 4.5.

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. Specifically, the analysis of the data obtained from the various statistics (mean, median, mode, range typical deviation, 25 and 75 percentiles) led to classifying the following intangible elements as essential to publish (see Fig. 1).

Human Capital	Structural Capital	Relational Capital
• Academic and professional qualifications of teaching and research staff • Mobility of teachers and researchers • Scientific productivity • Teaching capacities and competences	• Effort in innovation and improvement • Intellectual property • Management quality	• Graduate employability • Relations with the business world • Application and dissemination of research • Student satisfaction • University's image • Collaboration with oher universities

Fig. 1 Essential intangible elements (Source: own information)

B. Objective 2: Proposal of an intellectual capital report for Spanish universities

We have developed a proposal for publishing institutional information specifically related to intellectual capital based on the results of our empirical study. To this end we also conducted a review of the principal intellectual capital reports drawn up at different institutions of higher education and research centres [1], [6], [7], [11], [21]-[23]. This proposal on publication recommends that universities draft and present an intellectual capital report. In our opinion this intellectual capital report is the best way for universities to inform society of their value.

These intellectual capital reports or intellectual capital statements are tools especially designed to identify, measure, manage and provide information on organisations' intangible resources. This tool has specifically been applied at institutions of higher education and research in order to identify and provide information on the organisations' strategy, objectives, visions, activities and key intangible resources, based on financial and non financial indicators.

The intention of this proposal for a university intellectual capital report is to contribute to the progressive recognition of intellectual capital as a key strategic factor to confront the competitive challenges currently facing universities. Our proposal for an intellectual capital report for universities aims to act as a guide to help these institutions on the road to the presentation of information on intellectual capital which can assist users (students and their families, teachers, researchers, companies, public administrations, society in general, etc.) to make the right decisions.

Our proposed intellectual capital report for universities is intended to be of an effectively practical application and easy

to use, contributing to a greater transparency and comparability in the higher education sector. Our aim is to present a structure for the intellectual capital report which can be easily understood by any non specialised user and which permits relatively simple comparisons with points in the institution's past or with other institutions.

Our proposal is for a format with two different parts:

- A first, essentially descriptive part, which covers all the strategic level and whose development depends on the extent of the organisation's interest in making public the contents of its strategic planning. In order for the indicators to be read and adequately understood it needs to include a complete description of the organisation's mission and vision and a synthetic presentation of the strategic objectives outlined in function of the mission and vision.

- A second part corresponding to the operational level, consisting of a set of indicators relating to the university's intellectual capital resources (human capital, structural capital and relational capital). Different elements are considered for each component which may correspond to a number of variables, which are represented by aggregate indicators. The values of the indicators can be calculated and presented for different successive periods, which permits a time-based comparative analysis.

In relation to the proposed indicators finally selected, taking into account the starting requirement that there be a limited number, 33 indicators have been included which are classified as fundamental or essential.

The following table shows the final structure of the intellectual capital report for Spanish public universities proposed in this research study.

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TABLE V
PROPOSED MODEL FOR UNIVERSITY INTELLECTUAL CAPITAL REPORT

STRATEGIC LEVEL				
Mission and vision	Descriptive information…..			
Strategic objectives	Descriptive information…..			
HUMAN CAPITAL - OPERATIONAL LEVEL				
Intangible elements	Indicators	n-1	n	n+1
Academic and professional qualifications of staff	− % of doctors among teaching and research staff − Number of qualified teachers − % of graduate administration, technical and auxiliary staff − Total teaching and research staff/students			
Teaching capacities and competences	− 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			
Scientific productivity	− Rate of participation in research projects − Proportion of six-year research periods − Production of doctoral theses − Number of scientific/teaching publications			
STRUCTURAL CAPITAL - OPERATIONAL LEVEL				
Intangible elements	Indicators	n-1	n	n+1
Teaching management and organization Management quality	− % of classes with less than 50 students − Rate first cycle credits in English − 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 - OPERATIONAL LEVEL				
Intangible elements	Indicators	n-1	n	n+1
Relations with students	− Employment rate − Time until first employment − Drop-out rate − Efficiency rate − Graduation rate − Performance rate − Graduate satisfaction with studies − % of pre-registered 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 programmes with official mention of quality − Rate of students from foreign universities on postgraduate programs			

(Source: own information)

V. CONCLUSION

Intellectual capital reporting becomes critical at universities mainly due to the fact that universities´ main goals are the production and the diffusion of knowledge and their more important investments are in research and human resources; so, both inputs and outputs are mainly intangibles. In addition, universities have continuous external demands for greater information and transparency about the use of public funds, and are increasingly provided with greater autonomy regarding their organisation, management, and budget allocation. This situation requires new management and reporting systems.

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

The results obtained in our empirical study show the great importance that the university stakeholders give to the disclosure of intellectual capital in universities. Specifically, this study allowed us to know the opinion of the university stakeholders about which intangible elements they consider it essential for Spanish universities to provide information.

Since there is presently no common international framework for the identification, measurement and disclosure of information on the intangible determinants of corporate value, but only scattered efforts around the world, it seems appropriate to devote efforts to the development of a proposal for publishing institutional information specifically related to intellectual capital in universities. Based on the results of our empirical study, we developed a proposal of intellectual capital report for Spanish universities.

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. Also, this empirical study has provided the basis for our proposal of intellectual capital report model for Spanish universities, which is intended as a guide to assist these institutions to present useful information to its stakeholders.

Our aim is to present a structure for the intellectual capital report which can be easily understood by any non specialised user and which permits relatively simple comparisons with points in the institution's past or with other institutions. The structure of this report consists of two parts. The first part (strategic level) shows the mission and strategic goals of the institution as a means of identifying the intangible elements needed in obtaining those goals. The second part (operational level) shows 12intangible elements, which are considered essential components in our empirical study. Finally, this part establishes a series of indicators that allowed us to measure these intangible elements.

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