

# Voluntary Information of Intellectual Capital Disclosed Online by Public Spanish Universities

Yolanda Ramírez, Ángel Tejada, Agustín Baidez

**Abstract**—The purpose of this paper is to examine the quality of voluntary intellectual capital disclosure by public Spanish universities on their websites. To this end, a content analysis was used to analyze the websites of 50 public Spanish universities in 2016. The results of this study show that human capital was the most disclosed category with relational capital being the least frequently disclosed in Spain. However, the quality of structural capital disclosures was higher than relational and human capital. Finally, most IC disclosures were narrative in nature.

**Keywords**—Intellectual capital, quality disclosure, websites, universities, Spain.

## I. INTRODUCTION

THE presentation of information about intellectual capital has now become of prime importance in universities, mainly because the growing social concern about establishing processes of accountability and ensuring information transparency [1].

Universities can improve their relationships with users –e.g. students, teachers, general staff and society- through the disclosure of their services on the internet, revealing information about their intellectual capital [2].

The Spanish University Law [3] establishes that “there exists a need to improve the quality of university systems, through a culture of evaluation of universities services”, within the context of a full integration of the Spanish higher education system into the European Education Area. Two main reasons for this are [4]: (i) the increase in competition among universities in order to recruit students; and (ii) the new dynamism in the financing of these institutions. In this sense, Spanish universities need to provide more transparent information to each agent according to their needs, thus facilitating the right decision-making [5].—These information requirements, both those imposed by law and those derived from an increase in demand by stakeholders, justify the need to examine the disclosure of information by Spanish universities, including digital information [6]. However disclosure on the internet has not been as well researched as other ways universities have for revealing information, so that few studies have used an institutional website as the means for assessing information disclosure [2].

The goal of disclosure is to provide relevant, reliable, and timely information to people who need to know the information so that they can make decisions concerning their relationship with the organization [7]. Ideally, external

Yolanda Ramirez is with the University of Castilla-La Mancha, Spain (e-mail: Yolanda.Ramirez@uclm.es).

reporting of an organization should capture all IC information and this can then be monitored and reviewed by the public [8]. Most prior studies on intellectual disclosure have focused on knowledge-intensive or services-based industries. However, in spite of its nature as producer and supplier of knowledge, the university sector appears to have been largely overlooked [9]. Also, recently most studies on the disclosure of information in universities have focused on surveys and interviews such as [10] for Norwegian universities, [11] for universities in the UK, and [12] for Canadian universities.

The purpose of this paper is to analyse the transparency practices of Spanish universities. In adapting an IC framework developed previously to measure IC reporting in the university sector [13], [14], the authors of this paper have research objective to explore the quality of the IC reporting practices of Spanish universities. To this end, a content analysis of the Spanish universities’ websites is carried out.

The paper is structured as follows: Section II justifies the importance of intellectual capital reporting in universities. Section III presents the methodology followed by this research and analyzes the empirical results obtained. Finally, conclusions are presented in Section V.

## II. IMPORTANCE OF INTELLECTUAL CAPITAL REPORTING IN HIGHER EDUCATION INSTITUTIONS

Intellectual capital literature review comprises a lot of intellectual capital definitions [15]. The definition accepted in this paper considers intellectual capital as 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” [16]. In general terms, all of the major authors in the intellectual capital community share the idea that intellectual capital can be divided into three basic and strongly interrelated components: Human Capital, Structural Capital and Relational Capital [17]-[20]:

- Human Capital: It includes the knowledge, skills, experiences and abilities of the academic staff, researchers, and students. Human capital represents essentially the capacity to use and create explicit and tacit forms of knowledge [21].
- Structural Capital: The institutionalized knowledge and codified experience residing within and utilized through databases, patents, manuals, structures, systems, and processes. It also embraces corporate culture and management philosophy.
- Relational Capital: It gathers the wide set of economic, political and institutional relationships developed and

maintained by universities.

Universities are knowledge producers per se [1]. Among their most valuable resources are researchers, managers and students with their organisational processes and networks of relationships [22], [25]. These resources are part of its intellectual capital, and despite its importance, universities seldom deal with them in a specific manner [26]. Moreover, the existence of continual stakeholders' demand for greater information and transparency about the use of public funds [27], the increasing competition between universities and firms, and a wider autonomy regarding their organisation, management, and budget allocation, push universities towards the adoption of new reporting systems which should necessarily incorporate intangibles.

Some prior empirical studies regarding the voluntary IC disclosures by universities are the followings. For example, [9] analyses the quality of voluntary IC disclosures by universities in New Zealand, Australia, and the UK in the 2011 annual reports. They found that quality of IC disclosures by New Zealand universities was generally higher than their Australian and UK counterparts. Reference [2] focuses on the information provided by Spanish universities on their websites, taking into consideration different types of information such as financial information, corporate governance, social responsibility, research, teaching activities, strategic information, timeliness, contact information,

technology, interactivity with users, navigability and web structure [2].

### III. EMPIRICAL STUDY

The fundamental objective of this research is to explore the quality of voluntary IC disclosure practices of public Spanish universities on their websites.

The sample analysed for this study comprised 50 public Spanish universities. The primary data source for this study was the website of universities in 2016. After selecting the sample we carried out a content analysis of universities' websites. As a data analyzing technique, content analysis involves codifying qualitative and quantifying information into various categories based on selected criteria [28]. Content analysis aims to analyse collected information systematically, objectively, and reliably [29], [30]. During the data analysis process of the present study, an IC measurement framework was developed to quantify the websites data. In order to reduce the level of abstraction, IC was first operationalized into three categories, namely: relational capital, structural capital and human capital. The three categories were further broken down to facilitate coding and measurement.

The final framework of IC components and descriptions is detailed in Table I.

TABLE I  
 INTELLECTUAL CAPITAL CATEGORY, COMPONENTS AND DESCRIPTION

Category	IC components	Descriptions	Maximum quality measure
Structural capital	Intellectual property	All copyright (in relation to phonograms and broadcasts), patents rights, plant varieties, registered and unregistered trademarks, and publications (journal, books, e-journals, chapters, etc.) held by sample university	4
	University culture	Comprising the vision, attitudes, experiences, beliefs, and values of a university	2
	Management philosophy	Information referred to in mission statement	2
	Management processes	Information relating to the process in the university	2
	Information system/networking system	Information on the development, use application, and influence of systems	2
	Research projects	Research projects conducted by a university	4
	Financial relations	Information referring to the relationships between the university and its financial supporters	4
Relational capital	Brands	Information on brands associated with the university	2
	Students/student satisfaction	Information relating to the students and their satisfaction about learning	4
	Business/university partnership	All the activities and collaboration between universities and other organisations (firms, non-profit organisations, public authorities, local government, and society as a whole)	4
	Student database	Database of all students	4
	Quality standards	Information referring to teaching quality or learning quality	2
Human capital	Work-related knowledge/know-how	Individual competencies of researchers, knowledge or skill obtained from the job or training	2
	Employees	Information regarding staff, researchers, lectures, PhD students, and administrative personnel	4
	Employee's experience in profession	Information referring to employees' international or national experiences in their profession	4
	Employee qualification	Information referring to employees' qualifications	4
	Employee compensation/benefit	Information referring to welfare or other benefits for employees and PhD students provided by a university	4
	Cultural diversity	Demographic information of employees	2
	Training programme	Education or training programmes for employees provided by a university	4

Adapted from [9], [13], [31] and [32]

The content analysis typically leads to a disclosure index, a numerical indicator that reflects the quantity of information disclosed, with the purpose of showing the level of disclosure

on the communication channel analysed [2]. Thus, the disclosure index is made up of categorical variables – items – that take the value 1 if the institution discloses specific data,

and 0 otherwise [33]. In this research it can be regarded as an appropriate methodology for analyzing the information disclosed, as it has been applied in previous research in the corporate field [34], [37]. Then, the coding process used in this study to allocate quality measures to specific IC information was based on [19]. A five-point scale was employed to assist the coding process. In order to maintain the reliability of the research approach taken for this study, following rules were applied during the coding process:

- Code for meaning rather than search for key words since some concepts are broad or because key words might not be adequate;
- Classify one row as one sentence when coding tables;
- Do not code if the concept is only implied; and
- Record the highest measure [32], [13] if an IC component is disclosed more than once in the same website.

In order to measure the quality of IC disclosure on websites, a quality measure which was drawn from prior IC disclosure studies (see Table II) was employed. A five-point measure [32] was used as it is comprehensive and allows more distinctions when assessing the quality of IC disclosure (see also [38], [39], [13]). For the purpose of this study, the authors have used quality measures for scoring the text units for each of the components in the three IC categories. The maximum quality measure was 4. [13], however, noted that some components in the IC framework were of a descriptive nature and it was, therefore, difficult to assign quantitative or monetary value for those components. These components include: management philosophy; management processes; information system/networking system; university culture; university brand or image; quality standards; work-related knowledge/know-how; and cultural diversity. These components have a maximum quality measure of 2 (see Table I).

TABLE II  
 QUALITY MEASURING SYSTEM

Quality measure	Explanation
Quantitative/monetary and descriptive – 4 points	IC component is clearly defined and quantified with a detailed descriptive statement
Quantitative/monetary – 3 points	IC component is clearly quantified
Descriptive – 2 points	IC component disclosure appeared and showed a significant impact on the organization
Obscure – 1 points	IC component disclosure appeared with limited reference
Non-disclosure – 0 point	IC does not appear in the website

After defining the items of information to be included in the quality disclosure index and studying their quantification and weighing, we performed a thorough analysis of the contents of public Spanish university websites. The data were gathered by the authors directly from the websites after a thorough navigation in search of the specific items included in the disclosure index. When there were conflicting interpretations on a specific finding, deliberations took place among the authors in order to research a consensus.

#### IV. RESULTS AND DISCUSSION

This section presents the results generated from analyzing of public Spanish universities' websites. These results are displayed below and commented on according to the different groups of items analysed.

Table III summarises the findings for the voluntary IC information disclosed by public Spanish universities.

TABLE III  
 INTELLECTUAL CAPITAL INFORMATION ONLINE DISCLOSED BY PUBLIC SPANISH UNIVERSITIES

Category	IC components	Frequency	Percentage
Structural capital	Intellectual property	40	80
	University culture	23	46
	Management philosophy	27	54
	Management processes	21	42
	Information system/ networking system	36	72
	Research projects	42	84
	Financial relations	8	16
Relational capital	Brands	17	34
	Students/student satisfaction	8	16
	Business/university partnership	7	14
	Student database	41	82
Human capital	Quality standards	11	22
	Work-related knowledge/ know-how	3	6
	Employees	45	90
	Employee's experience in profession	40	80
	Employee qualification	42	84
	Employee compensation/benefit	30	78
	Cultural diversity	30	60
	Training programme	36	72

First, the general performance of IC disclosure by Spanish universities in 2016 is viewed as being favourable. In general, the IC disclosure means of Spanish universities is reasonable. This finding is reflected in their high means of disclosure across all three IC categories, although there were some low means in the human capital category for some universities.

**Structural capital:** First, it is worth emphasizing that Spanish universities disclose a high volume of information related to research project (84%). Since universities are institutions with a specific focus on research, most of them are expected to use the internet in order to reveal their aims and achievement. In addition, many universities describe public subventions for research (62%). Also, the disclosure of university culture and management philosophy is made by just half of public Spanish universities. Some 54% disclose the mission statement, while 46% reveal specific aspects concerning the vision, values and general strategic objectives. Nevertheless, only eight universities disclose information referring to the relationships between the university and its financial supporters.

**Relational capital:** The revelation of information about quality standards –information referring to teaching quality or learning quality- is expected to attain high scores as teaching activities are the main purpose of universities. However, the universities seem to be reluctant to reveal aspects of teaching quality. Only 22% disclose some aspects of quality standards.

The items related to students are widely disclosed by Spanish universities, specifically those concerning the database of all students. However, most universities disclose very little information about the students' satisfaction about learning (16%). Finally, other relevant item which can facilitate information about activities and collaboration between universities and other organisations (firms, non-profit organisations, public authorities, local government, and society as a whole) is disclosed in a minor way. Only, seven universities disclose this information.

**Human capital:** The least disclosed component is work-related knowledge/know-how (individual competencies of researchers, knowledge or skill obtained from the job or training). The items related to employees are more widely disclosed by public Spanish universities. So, 90% reveal some information regarding staff, researchers, lectures, PhD students, and administrative personnel. In addition, many universities describe employee's experience in profession (80%), employee qualification (84%), demographic information of employees (82%) and training programmes for employees provided by the university (72%).

Regarding to the quality of IC disclosure it is important to highlight the following. Among, the three IC categories, structural capital is disclosed with higher quality, even if it is not one of the most disclosed categories. Of interest is that the IC component research project is the most favourable component disclosed by all public universities with the highest disclosure quality. The least disclosed component is work-

related knowledge/know-how which was disclosed by only three universities and has the lowest disclosure quality together the item business/university partnership. In addition, it is of importance to note that the quality of IC disclosure in Spanish universities appears to be of concern. This is reflected by the finding that the majority of the disclosures was discursive in nature and, therefore, was allocated a measure of 3 or less. Overall, 82% of total disclosure across all fifty universities was discursive in nature. The top five IC components disclosed by Spanish universities were: employees; research project; employee qualification; cultural diversity; and student database (see Table III). Among these components, research was the highest value on average and was disclosed by forty two universities. 40 of them disclosed their research project using monetary terms and therefore were allocated three points or more. Further, cultural diversity is also disclosed by most public Spanish universities (41 universities). However, this component is of a descriptive nature and, therefore, it is difficult to assign quantitative or monetary value to this component. The least disclosed IC components were work-related knowledge, business/university partnership, and financial relations. The low value of mean values allocated to these components was not only because of their low frequency of disclosure (e.g. work-related knowledge was disclosed by three out of fifty universities), but also due to the IC information being disclosed in discursive terms.

TABLE IV  
OVERALL SPANISH UNIVERSITIES' QUALITY DISCLOSURE BY IC COMPONENT (MEAN – DESCENDING ORDER)

IC components	IC quality measure					Sum	Mean max 1	Discursive disclosure (%)	Monetary disclosure (%)
	0	1	2	3	4				
1.6. Research project	0	0	2	10	30	42	0.92	12.5	87.5
1.2. University culture	0	4	19	na	na	23	0.91	na	na
3.6. Cultural diversity	0	8	33	na	na	41	0.90	na	na
1.4. Management processes	1	5	15	na	na	20	0.83	na	na
3.2. Employees	0	0	3	20	22	45	0.86	20.45	79.55
2.1. Brands	0	6	11	na	na	17	0.82	na	na
1.3. Management philosophy	2	7	18	na	na	25	0.80	na	na
2.2. Students satisfaction	1	0	0	5	2	7	0.72	13.64	86.36
2.5. Quality standard	1	6	4	na	na	10	0.70	na	na
3.5. Employee compensation/benefit	8	0	17	11	5	33	0.53	90.48	9.52
1.5. Information system/networking system	15	6	15	na	na	21	0.50	na	na
3.4. Employee qualification	3	7	24	5	3	39	0.49	98.00	2.00
1.1 Intellectual property	8	12	12	8	0	32	0.38	90.0	10.0
3.3. Employee's experience in profession	12	10	12	4	2	28	0.38	82.67	17.33
3.7. Training programme	14	4	12	6	0	22	0.32	81.82	18.18
2.4. Student database	13	10	15	3	0	28	0.30	75.00	25.00
1.7. Financial relations	1	5	1	0	0	6	0.21	71.88	na
3.1. Work-related knowledge/know-how	2	1	0	na	na	1	0.17	na	na
2.3. Business/university partnership	1	5	1	0	0	6	0.17	90.2	9.8

## V. CONCLUSIONS

The main objective of this study was to examine the quality of the voluntary disclosure of IC made by public Spanish universities.

We first aimed to describe the main website contents of

public Spanish universities, focusing on intellectual capital aspects (human, structural and relational capital). Our findings emphasize that their website content usually relates to human capital, while structural and relational capital are less widely disclosed. In particular, this work has evidenced a low volume

of disclosure about relational capital on universities' websites.

Second, the results of our empirical show a high level of quality with the disclosure of the structural capital category. Further, research project was the most favourable IC component. Not only was it disclosed by 42 two Spanish universities (84%), it also had the highest disclosure measure compared with other IC components.

In addition universities placed more focus on reporting human and structural capital with a higher level of reporting on employee, research projects, cultural diversity, and intellectual property in particular. Furthermore, a reason for universities placing more importance on structural and human capital could be the major changes happening in universities, resulting in frequent engagement in conducting research projects, training employees, and improving management process.

Finally, this study found that most IC disclosures were narrative in nature.

This study contributes to be understanding of the current voluntary reporting of IC by addressing the gap in empirical research regarding IC reporting in universities. Second, an IC framework was used to specifically measure the quality of IC disclosure in universities. This framework could be utilized and further modified by future researchers who examine universities in order jurisdictions or study other educational institutions. A key feature of this framework is that it examined both the level of disclosures and compared the quality of IC disclosure practice. In this aspect, it differs from many prior studies that assessed mainly the extent of the IC disclosure. Third, the results generated from this study provide insights into the nature of voluntary reporting in universities. These findings could be used by management of the universities, regulators, and standard-setting bodies as they seek to improve the reporting of IC in universities. Finally, the results generated from this study could be utilized by future researchers as a basis to facilitate comparative research in identifying possible trends, similarities, and distinctions of IC disclosure practice in universities and/or other knowledge-based industries across different jurisdictions.

Despite the contributions outlined, this study is subject to a number of limitations. First, this study examined data of one year only (2016). It is, therefore, difficult to draw conclusive trends that could show IC disclosure change over time. Second, the framework used was viewed as being able to reflect the IC disclosure trends in universities. However, this study recognizes that some of the components incorporated here may be irrelevant, depending on different researchers' perspectives of IC. Third, similar to other IC disclosure studies of this nature, content analysis utilization may involve the application of judgment in determining whether an IC component should be assigned to a given IC category. Although every effort was made to ensure reliability of the coding process and to minimize error, possible subjectivity may still have occurred during the coding process.

Several avenues are suggested for future research in this field. First, future research could examine IC disclosure on universities' websites differentiating universities in terms of

whether they were public or private; small or large; and even by their organizational structure (centralized or decentralised). It might provide further insights into the extent and quality of IC disclosures by these universities. Second, the authors suggest that order research methodologies could be adopted. For example, interviews or questionnaires could probably generate additional data to enrich understanding of the IC disclosure practice. Third, considering the lack of a generally acceptable framework, developing such a framework to assist organisations' voluntary reporting of IC could be a focus of future research.

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