
ESTUDIOS / RESEARCH STUDIES

Main factors influencing the digital transparency in higher education institutions

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Abstract: This paper aims to analyze the online transparency of Spanish higher education institutions and examine the factors that explain the degree of online transparency achieved by these institutions. To this end, this paper analyses the institutional websites of all Spanish universities and develops a global transparency index comprising of four dimensions ("E-information", "E-Services", "E-Participation" and "Navigability, Design and Accessibility"). This paper evidences that Spanish universities are aware of the importance of having a web page with adequate navigability, design and accessibility. In contrast, the "E-information" is the least valued dimension, particularly concerning the disclosure about Community services and Outcomes of teaching services. Moreover, the results show that internationality, leverage and size positively affect the online transparency in Spanish universities. From a practical point of view, our findings could be used by university managers, regulators and standard-setting bodies to improve the online transparency in universities.

Keywords: Online transparency; websites; factors; higher education institutions, Spain.

Principales factores de la transparencia digital en las instituciones de educación superior

Resumen: Este trabajo tiene como objetivo analizar la transparencia online de las instituciones de educación superior españolas y examinar los factores que explican el grado de dicha transparencia alcanzado por estas instituciones. Para ello, se analizan las páginas web institucionales de todas las universidades españolas y se elabora un índice de transparencia global compuesto por cuatro dimensiones ("E-información", "E-Servicios", "E-Participación" y "Navegabilidad, Diseño y Accesibilidad"). Este trabajo evidencia que las universidades españolas son conscientes de la importancia de tener una página web con una adecuada navegabilidad, diseño y accesibilidad. Por el contrario, la "E-información" es la dimensión menos valorada, especialmente en lo que se refiere a la divulgación de los servicios comunitarios y los resultados de los servicios docentes. Además, los resultados muestran que la internacionalidad, el apalancamiento y el tamaño de la institución afectan positivamente a la transparencia online de las universidades españolas. Desde un punto de vista práctico, nuestros resultados podrían ser utilizados por los gestores de las universidades, los reguladores y los organismos de normalización para mejorar la transparencia en línea de las instituciones de educación superior.

Palabras clave: Transparencia online, páginas web, factores, instituciones de educación superior, España.

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1. INTRODUCTION

The economic, social, and political changes that have occurred in universities in recent years have increased the importance of financial imperatives, operational efficiency, effective internal governance, and accountability and transparency discourses (Bezhani, 2010). Transparency and trust in public institutions are crucial mechanisms for ensuring credibility, fostering trust in public administration (Bertot et al., 2010), and achieving good governance and institutional quality (Relly, 2012). Similarly, a high level of autonomy within universities has necessitated accountability in order for its administration and partners to evaluate the performance of institutions. Due to the autonomy of universities and the fact that they are deemed to be of public interest, various stakeholder groups are demanding greater transparency and accountability from these institutions (De la Torre and Torres, 2010). To fulfil their accountability and transparency responsibilities, universities must enhance their reporting mechanisms. In addition, the increasing demand for global information from universities may be a result of the international globalisation process, which requires universities to become management units in search of new sources of funding and to interact with public and private agents (Gallego et al., 2011). Consequently, in an increasingly competitive environment, higher education institutions (HEIs) should be concerned with their institution's positioning and image (Ivy, 2001) and must maintain or cultivate a distinct image to gain a competitive advantage (Paramewaran and Glowacka, 1995).

In this scenario, universities are increasingly required to provide a broad range of information to stakeholders to support fundraising activities, ensure accountability in the use of public funds and the results of research and teaching, and foster close relationships with industries and territories (Ramírez et al., 2016; Manes et al., 2018).

On the other hand, communication and the transmission of information have changed dramatically in recent years, with the Internet now being the primary medium (Gandía et al., 2016). In this vein, some researchers have begun to investigate online disclosure (Pisano et al., 2017), highlighting several advantages of this disclosure: improved accessibility, increased transparency and accountability towards stakeholders, reduced costs, and a more timely dissemination of information (Meijer, 2007; Gallego et al., 2011). Therefore, Coy et al. (2011) argue that fairness, accessibility, and distribution are crucial concepts that should govern the development of a public accountability and disclosure model in HEIs.

Nonetheless, there is still a lack of research with regard to transparency in universities, and what does exist has mostly consisted of analyses of traditional reports as the primary data source, namely the annual reports (Gordon et al., 2002; Bezhani, 2010; Ntim et al., 2017; Nicoló et al., 2020), or surveys and interviews (Angluin and Scapens, 2000; Nelson et al., 2003; Pettersen and Solstad, 2007; Flórez et al., 2017). Few studies have assessed universities' voluntary information disclosure via their institutional websites (Gallego et al., 2011; Garde et al., 2013; Saraite et al., 2018; Andrades et al., 2021). Similarly, there is a severe dearth of evidence regarding the impact of factors on online transparency in the higher education institution sector (Ntim et al., 2017; Flórez et al., 2017; Manes et al., 2018; Brusca et al., 2019; Nicoló et al., 2020; Segura-Mario et al., 2020a; Garde et al., 2021). This study fills in these voids by providing new insights into online transparency at Spanish universities.

This research focuses on the websites of Spanish universities in an effort to fill these gaps and has the following two objectives:

1. Analyse the extent of online disclosure in Spanish universities by analysing the content of institutional websites using a global transparency index.
2. Identify possible factors that explain this online voluntary information in Spanish universities, focusing primarily on age, size of the university, funding, social media presence, gender of the Chancellor, leverage, and internationalisation.

Lastly, it should be noted that in 2013, the Spanish government approved Law 19/2013 on transparency, access to public information and good governance, which aims to increase and strengthen the transparency of public activity, regulate and ensure the right to access information about such activity, and establish the responsibilities of good governance that public officials are expected to uphold. This law established a set of mandatory reporting requirements that must be implemented by various public sector entities. For the university system, Article 2 recognises that all public universities, but not private universities, are subject to this law (Andrades et al., 2021). Therefore, we find it fascinating to compare empirically whether Spanish public universities have improved their online transparency since the aforementioned law went into effect.

This paper makes innovative contributions to the existing literature on the setting and disclosure of higher education institutions. This paper begins

by providing current evidence on the degree of online transparency among Spanish universities. This study will therefore provide a relatively robust benchmark for comparison with future studies based on web transparency or international findings. Second, this paper contributes to the body of knowledge by obtaining empirical evidence of the explanatory factors that influence the level of web-based information disclosure in Spanish universities. The study's findings may be useful as a foundation for formulating strategies to resolve web-based voluntary disclosure.

The remaining of the paper is structured as follows. The next section provides a review of the literature on web transparency in universities and the factors that influence online disclosure. Section 3 describes the methods used to verify the hypotheses, including the disclosure index and the estimated model. The results are discussed in Section 4, and the last section outlines the conclusions, highlighting both the limitations and the value of this research.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Digital transparency in universities

The necessity of online disclosure in higher education institutions has been investigated considering different theories. The public accountability perspective suggests that managers are more likely to engage in online disclosure because they have a greater commitment to public accountability and transparency (Coy et al., 2011). Second, according to legitimacy theory-based predictions (Suchman, 1995), increased online disclosure can be a strategic way for HEIs to demonstrate congruence with the goals and norms of the larger society (Chen and Roberts, 2010), with positive effects on institutional reputation, image, and public goodwill. In the Spanish context, the approval of the law on transparency, access to public information, and good governance in Spain has mandated certain reporting requirements for all public universities. Kansal et al. (2018) noted that compliance with minimum reporting requirements is a prerequisite for legitimacy when disclosures are mandatory. Thirdly, according to the stakeholder theory, all stakeholders, both internal and external, have the right to access information about an organisation's activities and results (Deegan and Samkin, 2009). Specifically, universities must meet the public's demand for increased oversight and accountability. Providing online information enables stakeholders to satisfy their information requirements and be aware of the process of value

creation. This can facilitate support and consent from various stakeholder groups, including students, parents, funding bodies, research councils, the government, employers, and employees (Manes et al., 2018). Therefore, a greater degree of transparency will strengthen the legitimacy of universities in the eyes of key stakeholders, including students, parents, academic and administrative staff, ranking organisations, web agencies, and the general public (Ceulemans et al., 2015). Fourth, the resource dependence theory predicts that increased voluntary disclosure (Vidovich and Currie, 2011) can assist HEIs in gaining access to vital resources, such as donations and funds, and reduce political costs through improved institutional image and reputation (Chen and Roberts, 2010).

Alternatively, with the consolidation of the Internet and the sustained increase in its penetration rates, websites were established as channels that provided citizens with access to information, technological applications, and a variety of resources (Luna, 2017). The websites can be evaluated using a variety of models. Fath-Allah et al. (2017) evaluate 25 contemporary models proposed in specialised literature and identify four stages of digital maturity. The phases are as follows: (a) presence, where government agencies merely present information on the Internet; (b) interaction, where citizens can interact with the public administration; (c) transaction, where citizens can complete transactions and exchanges through the portals; and (d) integration, where different government agencies share information, including social networking applications and e-participation mechanisms. Following this approach, this paper uses a modified version of the global online transparency index developed by Saraite et al. (2018), which consists of four dimensions: E-information, E-Services, E-Participation, and Navigability, Design, and Accessibility (see Table I), to evaluate the online transparency of Spanish universities.

A few prior empirical studies on web disclosure have focused on HEIs (e.g., Crawford, 2012; Díaz et al., 2015; Kirchner et al., 2016; Saraite et al., 2018; Ramírez and Tejada, 2019). Among the existing studies, there are those that examine stakeholders' perceptions of the importance of web transparency (Evgenievich et al., 2015; Ramírez et al., 2016; Flórez et al., 2017); those that examine the actual web transparency carried out by the university, albeit focusing on one specific dimension such as the information contained on the web page (Crawford, 2012; Flórez et al., 2014; Brusca et al., 2019; Son-Turan and Lambrechts, 2020), E-services (Kim et al., 2014) or E-participation (Díaz et al., 2015; Li and Zhao,

2020) and those that take a more synthesized approach to various dimensions (Pinto et al., 2009; Gallego et al., 2011; Manes et al., 2018; Ramírez and Tejada, 2019). Similarly, a number of studies have examined accessibility and usability issues on university websites (Buenadicha et al., 2001; Hilera et al., 2013; Casasola et al., 2017; İşeri et al., 2017; Acosta-Vargas et al., 2018).

Therefore, there is a need for research that examines the information provided by universities on their websites and the factors that explain this transparency practice.

2.2. Explanatory factors of online disclosure by universities

This study concentrates on some factors that have been considered in previous research in the context of the corporate and public sectors, as well as some factors that are unique to the higher education sector (Saraite et al., 2018; Larrán et al., 2019; Segura-Mariño et al., 2020b; Garde et al., 2021). Seven variables have been chosen in particular: private funding, internationality, gender, academic performance, social media presence, university age, and university size.

2.2.1. Size

From the perspective of the legitimacy theory, the larger organizations utilize social reporting and web-based communication to satisfy the greater disclosure pressure and accomplish greater consensus. From the perspective of stakeholder theory, a website can be a dependable and effective means of communication to fulfil university stakeholders' accountability (Ismail and Bakar, 2011). In addition, from the perspective of agency theory, the disclosure of corporate information reduces agency costs resulting from conflicts of interest between managers and shareholders and between managers and debtholders (Gallego et al., 2011). Taking these considerations into account, organizational size has been shown to have a positive effect on online disclosure (Cuadrado et al., 2014), as larger entities have more resources and are subject to a greater demand for transparency from a larger number of stakeholder groups. Large universities are more willing to disclose information on their websites in order to maintain their image among a large audience, according to previous research (Gordon et al., 2002; Gallego et al., 2011; Católico, 2012; Garde et al., 2013; Saraite et al., 2018; Andrades et al., 2021). Nevertheless, Flórez et al. (2017), Manes et al. (2018), and Segura-Marino et al. (2020a) found no correlation between universities size and the extent of online disclosure.

Therefore, based on the arguments and prior research, this study establishes the following hypothesis:

H1: There is a positive relationship between university size and the web transparency of Spanish universities.

2.2.2. Age

Younger organisations are more innovative and more likely to adopt new technologies to improve accountability practices than older organisations, which may experience problems of inertia due to internally consolidated routines and change resistance (Saxton and Guo, 2011; Manes et al., 2018). Concerning higher education, Banks et al. (1997, p. 211) reported that "established universities tended to have higher quality disclosure than new universities in the service performance and financial performance categories" for universities in England, Wales, and Northern Ireland. Several empirical studies (Murias et al., 2008; Ismail and Bakar, 2011; Católico, 2012; Garde et al., 2013; Segura-Mariño et al., 2020a) indicate that age (older universities) has a positive effect on the web transparency of universities. However, Saraite et al. (2018) found that newer universities are the most enthusiastic about using websites. While Gallego et al. (2011), Bisogno et al. (2014), Manes et al. (2018), and Garde et al. (2021) have discovered no significant correlation between university age and online disclosure.

It is logical in this situation to examine empirically whether age at university has a positive correlation with online disclosure. Consequently, this investigation proposed the next hypothesis:

H2. There is an association between Spanish university age and their transparency.

2.2.3. Funding

According to Gordon et al. (2002), the primary distinction between public and private entities is that private universities rely primarily on student fees and private donations, whereas public universities are primarily funded by the government. This could imply, according to the stakeholder theory, that public universities in Spain would disclose more online information than private universities because they are required to do so by the government (Andrades et al., 2021). Gallego et al. (2011) contend that public universities should be more interested in disclosing information because they must address political concerns to a greater extent than private universities. However, their study of Spanish universities yielded inconclusive results.

Likewise, in the Spanish university system, only public universities are subject to the mandatory reporting requirements outlined in the law on transparency, access to public information, and good governance. Thus, according to institutional theory, coercive forces derived from the regulation may cause public universities in Spain to have higher levels of disclosure than private universities (Kansal et al., 2018). Segura-Mariño et al. (2020a) and Andrades et al. (2021) determined empirically that public universities possess a higher web communication index than private universities.

However, Saraite et al. (2018) argue that private universities may be more motivated than public universities to be transparent, as the trust of donors and students can be highly volatile, and as a result, they may be under increasing pressure to meet the accountability expectations of their current and potential stakeholders. These authors provided empirical evidence that privately funded universities are the most interested in utilising websites. Furthermore, Garde et al. (2013, 2021) note that private institutions are most interested in disseminating information on their websites to obtain a competitive advantage due to the fierce competition for limited financial resources.

Considering these factors, the third hypothesis is as follows:

H3. Funding affects the web transparency of the Spanish universities.

2.2.4. Internationality

In recent decades, a number of programmes (Tempus and Erasmus) and policy reforms (the Bologna Process) have pushed for the harmonization of all European university systems in order to promote comparability and competition among them (Manes et al., 2018; Ramírez et al., 2019), with a particular emphasis on the international mobility of students (Altbach and Knight, 2007; Gallego et al., 2011). To attract more international students and researchers, universities should provide more information about their activities and services (Ramírez et al., 2016). According to Gallego et al. (2011), the website is a useful instrument for promoting and disclosing activities and opportunities to a global audience due to its immediate accessibility and usability (many websites are available in multiple European languages). In fact, their investigation of the online disclosure of Spanish universities revealed a correlation between internationality and online disclosure. In addition, Manes et al. (2018) demonstrated that internationality positively influences the intellectual capital disclosure of Italian universities.

Accordingly, based on the aforementioned arguments and previous research, a positive correlation between university internationalisation and the level of online disclosure is anticipated. This investigation specifically proposes the following hypothesis:

H4. There is a positive correlation between the internationalisation of Spanish universities and their web transparency.

2.2.5. Presence in social media

Social media provide numerous opportunities to enhance information transparency and communication between organizations and their stakeholders (Criado et al., 2013; Gandía et al., 2016). Pisano et al. (2017) found through a review of the literature that social networking sites appear to offer the most intriguing opportunity to captivate the attention of stakeholders and develop long-term relationships with them. Examining the relationship between the use of Web 2.0 technologies and the web transparency of Spanish universities is thus particularly intriguing.

Regarding higher education institutions, Ramírez and Tejada (2019) believe that social media contributes to a university's communication effectiveness because it makes information more visible and accessible to stakeholders and increases corporate dialogue in the context of voluntary disclosure. However, literature analysing the use of social media by universities is scarce (Knight and Kaye, 2016; Clark et al., 2017; García, 2018; Ramírez and Tejada, 2019).

This study investigates whether the participation of universities in social media has an effect on their web transparency. This motivates the development of the following hypothesis:

H5. Universities with a social media presence report greater levels of web transparency.

2.2.6. Leverage

According to the agency theory, leverage is another factor associated with a greater quantity of disclosed information, particularly as a result of leverage-related conflicts. In this sense, companies with higher levels of debt incur greater agency costs, as there is a possibility of wealth transfer from debtholders to stockholders. Due to the high presence of external financiers, firms with a high level of debt incur greater monitoring expenses (Gordon et al., 2002). Corporations can reduce their agency costs and potential conflicts of interest between proprietors and creditors by disclosing more information (Gallego et al., 2011).

In the university context, Gordon et al. (2002), Ntim et al. (2017), and Nicoló et al. (2020) found no empirically significant relationship between university leverage and disclosure. However, Gallego et al. (2011) discovered evidence that universities with lower levels of leverage disclose more information online, while those with higher levels of debt are more reluctant to disclose their internal situation on the web.

Therefore, based on the theory and previous research, the following hypothesis has been established:

H6. There is a correlation between university leverage and Spanish university web transparency.

2.2.7. Gender of Chancellor

The profile and personality of the Chancellor may influence the administrative style of the university and may be notably relevant to the university's overall stance on transparency, thereby influencing the decision and/or process of providing online information.

At the same time, women tend to be more collaborative and democratic (Eagly and Johannesen-Schmidt, 2001) than men (Merchant, 2012). Empirical research (Hatcher, 2003; Merchant, 2012) identify fundamental gender differences in organizational values, management styles, policy preferences, and leadership strategies. Theoretically, and in accordance with the moral reasoning theory, female managers have certain psychological attitudes and a greater social orientation, which makes them more inclined to value stakeholder demands (Cabeza-García et al., 2018). Burke and Collins (2001) note that women are more likely to report using an interactive management approach that results in more effective communication. According to Fine (2009), ethical considerations are central to women's conceptions of leadership, and they have a lower propensity to commit fraud (Vermeir and Van Kenhove, 2008), which has a positive impact on the degree of transparency.

Very few studies (Ntim et al., 2017; Garde et al., 2020; Andrades et al., 2021) have examined the relationship between the Chancellor's gender and online transparency in the context of higher education. All of these studies, however, find no correlation between the gender of the university's chancellor and the disclosure policy.

Therefore, it is reasonable to examine empirically whether the gender of the Chancellor may be a factor in online disclosure. Consequently, this investigation proposed the next hypothesis:

H7: *Universities with female Chancellors demonstrate greater online transparency.*

3. METHODOLOGY

3.1. Sample and data collection

Our sample is based on the total population of Spanish universities as of December 31, 2019 (50 public universities and 26 private universities).

We collected two primary categories of secondary data: university characteristics such as size, age, funding, internationality, presence on social media, leverage, and the Chancellor's gender, and the global online transparency index (GOTI). In 2019, these data were collected from each university's website.

3.2. Research design

This paper's research is structured in two phases. First, a content analysis of all 76 Spanish universities' websites was performed between September and December of 2019. The purpose of content analysis is to analyse collected data in a systematic, objective, and reliable manner (Guthrie, 2014; Krippendorff, 1980; Guthrie et al., 2004). According to Krippendorff (1980, p. 21), content analysis is "a research technique for drawing replicable and valid conclusions from data based on their context". Moreover, according to McMillan (2000), the benefits of content analysis can also be applied to web content analysis. In addition, the content analysis typically yields a disclosure index, which is a numerical indicator that reflects the quantity of information disclosed in order to demonstrate the level of disclosure on the analysed communication channel (Gallego et al., 2011; Lacy et al., 2015). This study employs a modified version of the global online transparency index (GOTI) developed by Saraite et al. (2018) to quantify and evaluate the level of online transparency in Spanish universities. This index consists of 76 items divided into four dimensions: E-Information (it refers to the inclusion of information on the Internet about the main aspects of the university), E-Services (online services that optimise the process of learning and administrative services), E-Participation (online participatory democratic process in order to obtain the involvement of their heterogeneous stakeholders), and Navigability, Design, and Accessibility (characteristics of the webpage that facilitate the involvement of their diverse stakeholders). The E-Information dimension is comprised of seven subcategories: university overview, university organization and governance, financial items, general services: input (of students and resources), teaching services: process, teaching

Table I: Global transparency index

Theme	Item: Information on or reference to	Frequency	Percentage
E-INFORMATION		51.39%	
(i) Overview of University			41.32%
	Approved strategic plan	57	75.00
	Execution of strategic plan	7	9.21
	Statement of objectives	49	64.47
	Descriptive report/general operating review	30	39.47
	Key performance indicators	14	18.42
(ii) University organization and governance			73.19%
	Organization chart (structure)	71	93.42
	Administrative offices and functions	68	89.47
	Directory	70	92.11
	Chancellor schedule	5	6.58
	Details about bibliography of Chancellor and Vice Chancellors	61	80.26
	Details about remuneration	43	56.58
	University policies and regulations	70	92.11
	Minutes of agreements made by Governing Council of the University	57	75.00
(iii) Financial items			31.39%
	Financial performance statement	13	17.11
	Statement of cash flows	17	22.37
	Statement of cost of services	18	23.68
	Budget information	52	68.42
	Financial ratios	14	18.42
	Investments	28	36.84
	Total value of estates	25	32.89
(iv) General services: Input (of students and resources)			73.50%
	Student numbers	54	71.05
	Cost per equivalent full-time student	37	48.68
	Revenues	39	51.32
	Staff	63	82.89
	Qualification of student intake	52	68.42
	Space	72	94.74
	Financial aid	74	97.37
(v) Teaching services: Process			64.74%
	Student: staff ratios	22	28.95
	Processes to ensure quality of teaching	32	42.11
	Library service information	65	85.53
	Computer service information	55	72.37
	Fields of study	72	94.74
(vi) Teaching services: output/outcomes			44.08%
	Graduates	54	71.05
	Destination of student	48	63.16
	Pass and completion rates	23	30.26
	Student satisfaction	48	63.16
	Employer satisfaction	19	25.00
	Average time to complete programme	9	11.84
(vii) Research services			48.68%
	Postgraduate students	16	21.05
	Research income	37	48.68
	Publications	56	73.68
	Destination of research graduates	39	51.32
(viii) Community services			34.21%
	Local community service	20	26.32
	Information on alumni activities, involvement and participation	29	38.16
	National community service	17	22.37
	Environmental-related information	19	25.00
	Employee health and safety-related information	29	38.16
	Equal employment opportunity information	24	31.58
	Staff training and development information	44	57.89

Theme	Item: Information on or reference to	Frequency	Percentage
E-SERVICES		47.37%	
	Availability of downloadable forms and applications for administrative procedures for official studies	50	65.79
	Availability of downloadable forms and applications for administrative procedures for unofficial studies	40	52.63
	Option to conduct online administrative transactions for official studies	50	65.79
	Option to conduct online administrative transactions for unofficial studies	40	52.63
	Possibility to fully complete administrative transactions, including payment, for official studies	35	46.05
	Possibility to fully complete administrative transactions, including payment, for unofficial studies	26	34.21
	e-learning for official studies	20	26.32
	e-learning for unofficial studies	27	35.53
E-PARTICIPATION		55.26%	
	Student complaints and/or suggestion box	18	23.68
	Discussion forums on the university web page	28	36.84
	Chat	41	53.95
	Opinion surveys	8	10.53
	Blog	47	61.84
	Web page contains professor and teacher contact information	54	71.05
	Web page contains contact information of the people in charge of the services offered by the university	62	81.58
	Web page offers option to be included on a mailing list to receive information and news	59	77.63
	Web page provides an email address different from webmaster for users to request general information	61	80.26
NAVIGABILITY, DESIGN AND ACCESSIBILITY		60.53%	
	Specific section available on web pages for accessing each type of information	70	92.11
	Electronic formats utilized for the dissemination of information	5	6.58
	Information supplied available in different languages	40	52.63
	Search system on web page	69	90.79
	Web page clearly differentiates the presence of the public institution's internal links from external ones	65	85.52
	Site Map available that clearly identifies information content on web page	61	80.26
	Web page utilizes hyperlinks as tool with supplied information	8	10.53
	Responsibility for content contained on web page	45	59.21
	Web page offers information in audio and/or visual format	51	67.11
Total	Global Online Transparency Index	53.64%	

services: output, research services, and community services.

After delineating the information to be included in the disclosure index, a comprehensive analysis of the content of Spanish university websites was conducted. Specifically, the accumulation of data was conducted manually by two researchers who analyzed the websites of the 76 universities in Spain. The authors collected the data between September 2019 and December 2019. These researchers conducted the content analysis, which, according to previous scholars (Guthrie et al., 2004; Striukova et al., 2008), contributes to the precision and dependability of the coding procedure. Initially, a meeting was held to establish the strategy for each indicator. In particular, the researchers coded a sample of

websites from ten universities. After discussing the differences and determining the final set of coding principles, the two researchers conducted the analysis independently. In conclusion, the results were reviewed to resolve any discrepancies and eliminate any potential bias. No significant discrepancies were reported, indicating that the coding was reliable. In instances where there was disagreement regarding the score ascribed to a particular item, a third researcher was consulted to determine the appropriate value. Krippendorff's Alpha was calculated for the purpose of calculating the intercoder reliability test. The average value should be $\alpha \geq 0.70$ (Krippendorff, 2011). The $\alpha = 0.9$ was obtained. This is likely due to the fact that there was no significant confusion during the contributor's training or during the final data collection.

As GOTI is a numerical indicator with the purpose of quantifying the amount of information that is disclosed (Gallego et al., 2011), a dichotomous scoring method was selected in accordance with previous research that suggests an item's presence is not correlated with its importance (Wood, 2000) and those with comparable research objectives (Buenadicha et al., 2001). Thus, a specific item (d_i) was assigned a "1" if the information was available on the webpage and a "0" otherwise. The quotient between the aggregates of all item scores (d_i) and the total number of items observed (76 items) determines the GOTI. In order to convey this as a percentage, this was multiplied by 100.

Taking these factors into account, the GOTI is calculated as follows:

$$GOTI = \frac{\sum_{i=1}^{76} d_i}{76} * 100$$

where $\sum_{i=1}^{76} d_i$ is the score obtained in the sub-group of 76 items. The maximum value of the GOTI is 1 and the minimum is 0.

Using Cronbach's alpha as recommended by Feldt (1969), the internal consistency of the GOTI index was calculated to be $\alpha = 0.68$, which is an acceptable value for exploratory research (Hair et al., 2014).

In the second phase, we employed the ordinary least squares (OLS) regression technique to determine the extent to which the selected explanatory variables could affect the level of online transparency.

To analyse the determinants of online transparency, the following model is proposed for both of them:

$$GOTI = \beta_0 + \beta_1 (\text{Size}) + \beta_2 (\text{Age}) + \beta_3 (\text{Funding}) + \beta_4 (\text{Internationality}) + \beta_5 (\text{Presence on social media}) + \beta_6 (\text{Leverage}) + \beta_7 (\text{Gender of Chancellor}) + \varepsilon_i$$

where GOTI is the global online transparency index of university; β_0 is the constant; β_1 – β_7 is the coefficient of the explanatory variables (size, age, funding, internationality, presence in social media, leverage, and gender of Chancellor); ε_i is the error or disturbance terms of university.

Table II summarizes the hypothesis, definitions of variables, proxies and expected signs.

4. RESULTS AND DISCUSSION

4.1. Content analysis results: Web transparency of universities

Globally, the analysis of university websites revealed an online transparency level of 53.64 percent (see Table I). This result is consistent with the assertion that, despite the fact that the web can be an effective and useful tool for disclosing information to the broad range of stakeholders involved in university activities, its use by Spanish universities is below the desired level (Brusca et al., 2019; Ramírez and Tejada, 2019).

Regarding subindexes, this study demonstrates that universities do not place equal emphasis on all aspects. In particular, it was observed that "Navigability, Design, and Accessibility" and "E-participation" had higher values than "E-Information" and "E-Services". This result is consistent with the findings of Saraite et al. (2018), who found that the top 100 universities in the world are aware of the importance of having a website with adequate "Navigability, Design, and Accessibility", while "E-Information" was the least valued dimension.

Table II: Summary of hypothesis and independent variables

Hypothesis	Variable	Variable proxy	Expected sign
H1	Size	Number of students	+
H2	Age	Number of years since the foundation year	+/-
H3	Internationality	Number of foreign students/number of students	+
H4	Funding	Dummy variable, noting 1 in the case of private universities and 0 for public ones	+/-
H5	Leverage	Debt ratio, measured by total debt/total assets ratio	+/-
H6	Chancellor's gender	Dummy variable: 1 if the Chancellor is female and 0 otherwise	+
H7	Use intensity in social media	Presence Index to examine the use that universities make of the two most popular social media: Twitter and Facebook. For Twitter: we measure the activity through the number of tweets, the number of followers, the number of "followings" and the number of retweets. For Facebook: we use the number of likes	+

Focusing on categories, the mean value of "E-Information" is 51.39 percent, indicating that, on average, Spanish universities do not disclose many of the items that should be disclosed in accordance with stakeholder theory. Specifically, Spanish universities are more likely to disclose items related to "General services: Input of students and resources": (73.50%) and "Teaching services: Process" (64.74%), which is not surprising given that teaching appears to be the primary mission of most universities. In addition, the subtopic University organisation and governance (73.19%) are extensively accessible online. The lowest scores pertain to financial items (31.39%), highlighting the dearth of transparency regarding the financial performance statement and financial ratios. Additionally, the subsection "Community services" registered a low result, achieving an average value of 34.21%, indicating that despite the emerging third mission, characterised by synergy with the external community of industries and research centres, Spanish universities disclose a low quality and quantity of this information on their websites. Previous studies (Gallego et al., 2011; Católico, 2012; Flórez et al., 2017; Saraite et al., 2018; Ramírez and Tejada, 2019) have highlighted the need for higher education institutions to exert more effort on E-information.

The results, however, indicate that there is a high level of interest in "Navigability, Design, and Accessibility" (the mean value is 60.53%). Specifically, the obtained values indicate that the websites of Spanish universities have a high level of navigability and accessibility but not interactivity. The item with the highest usage rate was the presence of a section used specifically to access each category of information (92.11%). Similarly, the majority of cases included a search function on their pages, and the internal links of the university were distinguished from external links in 85.52 percent of instances. However, only a few cases (10.53%) included hyperlinks as a tool alongside the supplied information. These findings are consistent with those of other studies (Hilera et al., 2013; Casasola et al., 2017; İşeri et al., 2017; Acosta-Vargas et al., 2018), indicating that there is still work to be done before the entire university community is fully accesible.

The "E-Participation" subindex represented 55.26 percent of the total items. It was striking to discover that only 10.53 percent of universities offered online opinion polls when analysing this category. Also receiving a low score was the student complaints and suggestions box (23.68%). In contrast, it was observed that contact information for those in command of the services was abundant, with

a value of 81.58%. These results indicate that the mechanisms implemented by Spanish universities to improve e-participation are still in their infancy, which is consistent with the findings of Díaz et al. (2015) and Li and Zhao (2020), who assert that higher education institutions need to pay more attention to facilitating the e-participation process and providing the necessary channels to receive feedback from the public.

Finally, "E-Services" dimension received the lowest score (47.37%). In terms of this category of information, it is important to note that 65.79 percent of the studied universities offered downloadable forms and applications for managing official study procedures. In only 26.32 percent of all cases, it was possible to complete the entire process online, including payment, for unofficial studies.

Therefore, despite the fact that the Internet can be an effective and useful tool for disseminating information to the vast array of stakeholders engaged in university activities, its use by Spanish universities falls short of expectations. In this regard, these results demonstrate the need for universities in Spain to make greater efforts to disseminate pertinent information and establish interaction mechanisms that facilitate effective communication. Moreover, our findings are consistent with those of Ramírez and Tejada (2019), Brusca et al. (2019), and Andrades et al. (2021), who discovered that Spanish universities are attempting to create websites with the properties recommended by the literature. Moreover, if we compare our results with those of Gallego et al. (2011), we can see that, despite the 2013 implementation of the law on transparency, access to public information, and good governance, the situation regarding the characteristics of the websites of Spanish universities has not changed after ten years.

4.2. Linear regression model: empirical finding of OLS model

Table III contains the principal descriptive statistics of the independent variables used in the regressions.

To test the seven hypotheses, an OLS regression model was performed with web transparency as the dependent variable (i.e., the global online transparency index, GOTI).

The results of the OLS regression model used to test the seven hypotheses are presented in Table IV. Multicollinearity (variance influence factor test) and heteroscedasticity were evaluated as hypotheses underlying the regression model (Hidalgo et al., 2011). To evaluate multicollinearity issues, the variance

Table III: Descriptive statistics for independent variables

Independent variables	Min	Max	Mean	Std. Dev
University size	4,367	143,830	22,786	27,933
University age	4	801	102	179
Internationality	0.04	0.087	0.048	0.032
Funding	0	1	0.32	0.75
Leverage	0.14	0.89	0.69	0.27
Chancellor's gender	0	1	0.21	0.43
Use intensity in social media:				
No of tweets	660	21,099	5,439	5,273
No of "followers"	280	84,914	5,065	7,985
No of "followings"	0	18,758	1,322	1,840
No of retweets	0	9,769	1,062	785
No of "likes"	0	58,872	4,815	6,131

Table IV: OLS regression model results and test

	Coefficient	Standard Error	t-Statistic	p-Value	Sign.
const	0.176052	0.134315	1.0348	0.4891	
Size	0.273746	0.0988838	2.5876	0.0318	**
Age	-0.0616706	0.0428916	-1.4378	0.1863	
Funding	-0.0092279	0.0104711	-0.8813	0.3823	
Internationality	0.0438911	0.0151369	2.8996	0.0055	***
Presence in social media	0.0945028	0.0504292	1.2995	0.1996	
Leverage	-0.0330361	0.0254213	1.7239	0.0996	*
Gender of Chancellor	0.0745031	0.404172	0.1843	0.8544	
Model specification: Mean dependent variable 0.597077 SD dependent variable 0.128314 Sum of squared residuals 0.385993 Regression SE 0.067968 R2 0.511486 Adjusted R2 0.453107 F(7,71) 7.278235 p-value (F) 0.000015 Notes: Test: t-statistic: LM = 30.2527; p-value = P(Chi-quatro(27) > 23.2427) = 0.624792 (Not heteroscedasticity); Breusch-Pagan Test: t-statistic: LM = 4.36958; p-value = P(Chi-quatro(6) > 4.36958) = 0.567683 (Not heteroscedasticity); Variance influence factors test= Maximum value Complexity 3.176 (Not collinearity) *, **, ***Statistically significant at the 10, 5 and 1 per cent levels, respectively					

inflation factor (VIF) score was calculated for each independent variable. In this instance, the maximum VIF for variable leverage is 3.176, eliminating multicollinearity issues. In addition, White's and Breusch-Pagan's heteroscedasticity analyses were conducted with negative outcomes (Table IV). With an adjusted R-Squared of 0.45, the regression model is statistically significant (P-value 0.01).

Three out of seven variables are statistically significant in general: internationality, size, and leverage.

Internationality specifically has a positive coefficient and is statistically significant at the 1% level (p-value 0.01). This conclusion can be derived from the fact that a higher level of information disclosed by universities can attract

more international students, for whom university websites are the primary source of information regarding the activities, services, and financial condition of the universities. Previous research on the level of online information disclosure in universities (Manes et al., 2018; Gallego et al., 2011) has found a positive relationship between internationality and online information disclosure. Some features, such as an English-language website and audio and video files, offer international students friendlier and more accessible disclosure.

Similarly, we discovered a correlation between size and voluntary disclosure. The coefficient for size is positive and statistically significant at the 5% level (p-value 0.05). This result confirms, in accordance with stakeholder theory and political

costs theory, that large universities disclose more information to satisfy the information needs of a growing number of stakeholders (taxpayers, governments, students, research centres, and external funders) who demand high levels of transparency and to reduce external pressure and political costs (White et al., 2007). According to the legitimacy theory, larger universities are more visible and subject to public scrutiny, which may prompt them to disclose more information in order to enhance their legitimacy (Andrades et al., 2021). In addition, the findings are consistent with those of previous research on universities (Maingoth and Zeghal, 2008; Gallego et al., 2011; Saraite et al., 2018; Católico, 2012; Garde et al., 2013; Andrades et al., 2021).

Leverage is negative and statistically significant at the 10% confidence level (p-value 0.10). This demonstrates that leverage has a negative effect on the extent of web-based disclosure by universities as the quantity of information to disseminate decreases in proportion to leverage. This finding is consistent with Gallego et al. (2011), who noted that Spanish universities with greater leverage disclose less information on their websites than universities with minimal leverage. In contrast to the findings of other studies (Gordon et al., 2002; Ntim et al., 2017; Nicoló et al., 2020), we find that leverage has no significant effect on the extent of disclosure in the context of higher education.

On the other hand, there were no significant associations between web transparency and the variables "age, funding, social media presence, and gender of the Chancellor." Specifically, age and funding have negative coefficients that are not statistically significant, whereas social media presence and the gender of the Chancellor have positive coefficients that are not statistically significant. These results are consistent with previous studies that found no relationship between public or private funding and online transparency (Gallego et al., 2011; Flórez et al., 2017; Brusca et al., 2019); studies that found no significant relationship between university' age and online transparency (Gallego et al., 2011; Bisogno et al., 2014; Manes et al., 2018; Garde et al., 2021); and studies that found that gender of the Chancellor is not a factor affecting the online transparency in higher education institutions (Garde et al., 2020; Andrades et al., 2021).

In conclusion, internationality, size, and leverage appear to be three appropriate factors on which universities can act to develop strategies that positively influence the level of online information transparency. While it appears that the trend regarding the greater or lesser implementation

of transparency best practices via the Internet is not influenced by the "age, funding, social media presence, and gender of the Chancellor," these factors do appear to play a role.

5. CONCLUSIONS AND IMPLICATIONS

Universities in Europe and elsewhere are confronted with increased demands for accountability from a growing number of stakeholders. The dependence of the new knowledge economy on information technology increases the need for measurable outcomes (Maingot and Zeghal, 2008). Moreover, due to the nature of international competition and rankings, universities feel compelled to make their results public based on an appropriate information model. This has prompted us to consider how Spanish universities disseminate information voluntarily on their websites as an external accountability and transparency mechanism. In addition, using the Spanish Law on Transparency, Access to Public Information, and Good Governance as a reference, the purpose of this paper is to demonstrate the importance that Spanish universities attach not only to e-information but also to issues such as e-participation, e-services, and navigability and accessibility in order to achieve online transparency effectively.

This paper demonstrates that the online transparency of Spanish universities is moderate. In particular, it was observed that "Navigability, Design, and Accessibility" and "E-participation" had higher values than "E-Information" and "E-Services". Thus, it appears that universities are aware of the importance of having a website with adequate navigability and accessibility; however, these institutions do not appear to consider it necessary to disclose pertinent information and to establish interaction mechanisms that ensure effective communication and better facilitate the e-participation process.

Regarding the "E-Information" dimension, it received a very low score. This finding indicates that the quantity of online information disclosed by Spanish universities is insufficient and does not satisfy the demands of stakeholders or the requirements of the Law on Transparency, Access to Public Information, and Good Governance. Additionally, there are notable distinctions between the subsections. Specifically, it appears that Spanish universities recognize the importance of disclosing online information about "Input of students and resources", "University organization and governance", and "Process of teaching services", but they do not yet recognize the significance of responding to the growing demand for specific

information regarding "Financial information", "Community services", and "Outcomes of teaching services". These findings are partially consistent with previous studies (Gallego et al., 2011; Flórez et al., 2017; Saraite et al., 2018; Ramírez and Tejada, 2019; Andrades et al., 2021) that have highlighted the need for higher education institutions to invest more in E-information.

Similarly, our findings indicate that the most disclosed information pertains to institutional and economic information ("organizational chart (structure), administrative offices and functions, and budget information"), which is required by the Spanish Law on transparency, access to public information, and good governance. The remaining elements, which are optional, have low levels of disclosure. This could be an argument to explain the absence of a culture of accountability in the Spanish context, as the concern for the disclosure of information is lessened if there are no requirements. García-Tabuyo et al. (2016) found that the commitment to transparency is associated more with the attitude of organizations and their managers than with the implementation of regulations. (Ortiz et al., 2018; Andrades et al., 2021). The Spanish public management style prioritizes compliance with administrative law over the improvement of public sector organizations' efficacy and accountability. Moreover, our findings indicate that the mechanisms implemented by Spanish universities to enhance e-participation and e-services are in their infancy.

This paper concludes by presenting empirical evidence regarding the potential explanatory factors that could influence the level of online transparency among Spanish universities. Larger, less leveraged, and more internationally focused universities are the ones most interested in utilizing websites to increase transparency, according to the findings. In this regard, according to the legitimacy theory, our findings indicate that larger universities, which are more visible and subject to greater public scrutiny, are the most inclined to use their websites as a channel for providing accounts and enhancing services. Similarly, according to the stakeholder theory, larger universities are more proactive towards online transparency because they have more and more diverse groups of stakeholders interested in how these institutions operate (Saraite et al., 2018; Andrades et al., 2021). Our findings also indicate that internationality positively affects online transparency. Given its immediate accessibility and usability, the website is a useful instrument for promoting and disclosing activities and opportunities to an international audience (Gallego et al., 2011; Manes et al., 2018). Thirdly,

we have discovered that universities with reduced leverage have greater online transparency, as it allows university administrators to demonstrate the quality of their management and competencies and legitimize their actions.

In contrast, the age, funding, social media presence, and gender of the Chancellor have no significant effect on the implementation of best practises for online transparency in Spanish universities.

Our findings have significant implications for policy, practise, regulation, and theory.

According to Ntim et al. (2017), from a multi-theoretical perspective, universities that will be able to commit to greater public accountability (public accountability theory) through increased voluntary disclosures may not online enhance their legitimate right to exist (legitimacy theory), but they may gain the support of influential stakeholders, such as alumni, communities, parents, and students, who may offer them access to critical resources, such as capital. This research contributes to the extant theories in the field of voluntary disclosure because it is one of the few attempts to provide a comprehensive view of online disclosure in the context of higher education institutions.

From a practical standpoint, we would recommend that relevant sector-based institutions, such as the Ministry of Education, consider developing voluntary disclosure guidance and seek regulatory support for such guidance. The academic community and legislators recognise the need for guidelines to enhance universities' accountability. Establishing a sector-wide enforcement and compliance body that will specifically monitor the levels of compliance and disclosure of relevant online reporting requirements can be a step in the right direction from a policy and regulatory standpoint. Our evidence suggests that governors, executives, and managers of HEIs require a significant transformation in their reporting and transparency practices. Our findings may be of interest to government bodies in universities in order to identify the items that tend to be disclosed more and those that are still undervalued in order to enhance the content disclosed in this vital communication channel. Specifically, university websites should include important non-financial disclosures pertaining to a broad range of pertinent issues, including prospective information, financial ratios, teaching and research quality, career and employability prospects, and social, environmental, and community contributions, among others. Such an increase in online disclosure would also benefit the internationalization process fostered by the Bologna process, which seeks to encourage comparisons and competition among universities in

order to promote excellence in teaching, research, and the third mission. Lastly, in accordance with the recommendation of Andrades et al. (2021), it was necessary to implement monitoring elements to ensure compliance with the Spanish law on transparency, access to public information, and good governance, or to penalize organizations that do not comply with such disclosure requirements.

Despite its contributions, this study has limitations that must be addressed in the future. First, it focuses on a single year (2019), thereby failing to capture reporting trends via longitudinal analysis. Future research may employ a longitudinal data set within a national or cross-national context, which may enhance the generalizability of its findings. In addition, future research may investigate the perspectives of both university management and staff regarding the primary advantages and disadvantages of using online media (websites and social media) as a transparency mechanism.

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7. CREDIT ROLES

Yolanda Ramírez: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing-Original draft preparation, Writing-Reviewing and Editing, Visualization, Funding acquisition. Francisco Montero: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing-Original draft preparation, Writing-Reviewing and Editing, Visualization.

CONTRIBUCIÓN A LA AUTORÍA

Yolanda Ramírez: Conceptualización, Metodología, Análisis formal, Investigación, Recopilación de datos, Redacción-Preparación del borrador original,

Redacción-Revisión y edición, Visualización, Obtención de financiación. Francisco Montero: Conceptualización, Metodología, Análisis formal, Investigación, Recopilación de datos, Redacción-Preparación del borrador original, Redacción-Revisión y edición, Visualización.

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