

Twitter killed the media star: a historical evolution of marketing communication used by Spanish universities

Evolution of
marketing
communication

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Abstract

Purpose – In recent decades, higher education institutions (HEIs) have increasingly adopted marketing-oriented approaches. While the adoption of marketing was slower in Europe and Spain, it has become a vital tool for HEIs, both to stay competitive in a changing socio-economic context and to face the challenges posed by the transition to the University 2.0 model. This study aims to analyse the historical evolution of communication techniques used by universities, bringing into focus the relevance of social networks in the most recent decades.

Design/methodology/approach – This research methodology consists of two components. Firstly, a comprehensive analysis of the available data is conducted to investigate the earliest marketing and communication actions involving universities, as well as their evolution over time, contextualizing this within the significant shifts in the social, political and technological background. Secondly, a specific focus is placed on the contribution of social media, particularly Twitter, as a powerful tool in creating a university brand and effectively promoting educational institutions, especially during the last stage of this historical evolution. To identify and analyse these trends, Natural Language Processing is used, specifically by leveraging topic modelling techniques.

Findings – The results of this analysis offer insights into the evolution of marketing communication applied by Spanish universities and show the increasing importance of social networks and the use of specific topics and contents to enhance their impact on engagement.

Originality/value – This study contributes to the literature by using a novel methodological approach to the research on the historical development of communication in universities in Spain, providing guidance to manage their social media strategy to differentiate themselves, increase engagement and foster brand loyalty.

Keywords Higher education institutions, Natural language processing, Multilingualism, Social media, Educational marketing history

Paper type Research paper



1. Introduction

“Why can’t you sell brotherhood and rational thinking like you sell soap?” This rhetorical question raised by Wiebe in the 1950s led to the conclusion that the more marketing concepts were used to promote social objectives, the greater its prospects of success

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(Wiebe, 1951). Such an approach set the stage for the initial use of marketing principles and techniques to “sell” intangible social objectives. This innovative concept, which gradually gained acceptance in the higher education sector, was not absent from debate, given the initial reticence of some institutions to embrace a market-like approach (Gordon-Isasi *et al.*, 2021). However, during the early 1970s, several authors already stated that no matter what it was called, who did it or where in the institution it was done, universities were actively involved in marketing activities (Krachenberg, 1972). Over the years, marketing strategies have become integral to university operations, as institutions have increasingly realized their role in responding to changing societal needs. Understanding the historical development of marketing in the context of higher education is very important to comprehend the transformative journey undertaken by universities to adapt to each generation’s needs, taking profit of each opportunity to engage with real social problems and become agents of change.

In response to such new paradigms, a substantial number of authors have emphasized the need to adopt effective and differential communication strategies to boost higher education institutions (HEIs) identity, values and image (Chapleo *et al.*, 2011; Ivy, 2001; Kazoleas *et al.*, 2001; Kitchen and Schultz, 2009; Lee *et al.*, 2018; Manzoor *et al.*, 2020; Moore, 2004). Communication must be transparent and effective for university stakeholders (Boffo, 2004), taking into account students’ expectations to find academic institutions recognized and present in the media showing their commitment to society, ethical values and social and environmental responsibility (Alcaide-Pulido *et al.*, 2017). Therefore, the effectiveness of HEIs marketing communication rests on the ability to adapt to economic and social changes and to evolve over time, embracing new technologies and innovations. In just a couple of decades, traditional marketing based on print media, broadcast media, prospectuses or student guides has rendered obsolete to make room for social media as the most important means of communication. Bearing that in mind, a historical perspective should not be overlooked when it comes to analysing the evolution of the marketing communication techniques used by HEIs to portray their brand image.

The purpose of this paper is to shed light on the myriad challenges universities have faced over the past decades and how they have managed to adapt to the dynamic landscape by using specific communication techniques which have been significantly influenced by the rapid advancements in technology. Due to the immense significance and magnitude of the paradigm shift in universities’ marketing approach with the adoption of social media, this research places special emphasis on analysing the last period of this digital evolution. To achieve this, we use a methodological approach known as Natural Language Processing (NLP) to analyse the emerging function of social media and its consolidation as the primary means of communication adopted by Spanish universities. NLP allows us to examine a vast amount of social media content from the Twitter accounts of Spanish institutions and categorize and identify the prevalent topics over multiple years. Given that using minority languages in social media provides an excellent opportunity to promote pluralism, enhance engagement and facilitate effective communication (Ramallo, 2017), our research focuses on exploring multilingual environments. We consider language as an essential variable for strengthening bonds with the target audience and the community in general. While there is existing research on social media content published by HEIs, to the best of our knowledge, our study provides the first extensive examination of the categorized and identified topics spanning multiple years since the inception of the Twitter accounts of the Spanish institutions. Through NLP, we better understand how universities strategically use social media to differentiate themselves, increase engagement and brand loyalty, providing

guidance to effectively manage their social media strategies in an ever-changing higher education setting.

2. Marketing in Spanish universities: an in-depth look at its evolution

This section serves as a key component in understanding the historical context and development of higher education marketing. We analyse the evolution of the marketing communication approaches used by Spanish universities, exploring the transition from traditional to digital media and the profound impact of social media in shaping the new multidirectional marketing framework. In an effort to contextualize the distinct features of Spain in the latter half of the 20th century, an in-depth examination of the socio-political context is provided, emphasizing its profound influence on the higher education system.

2.1 From traditional to digital media

Organizations, including educational institutions, are required to acknowledge the importance of their environmental context, external pressures and resource constraints to implement effective strategies that encompass their previous and foresight experiences (Heiens, 2000; Schühly, 2022). Within the context of higher education, this alignment with the external environment becomes especially complex. A considerable amount of literature supports the idea that HEIs operate in market dynamics influenced by globalization, increased competition and the need to adapt to the institutional and legal changes of national and international government policies (Beine *et al.*, 2014; Frassetto *et al.*, 2012; Havas, 2008; Hemsley-Brown and Oplatka, 2006; Jongbloed *et al.*, 2008; Rivera-Camino and Ayala, 2010; Wæraas and Solbakk, 2009).

It is undeniable that communication was critical in the consolidation and strengthening of the image and identity of Spanish universities from the 1960s until the end of General Francisco Franco's dictatorial regime in 1975, which had lasted for nearly four decades. This was the case, even though the formal establishment of their initial communication offices did not materialize until the onset of the democratic era (Paniagua Rojano *et al.*, 2012). Looking back at those days, it becomes evident that Spain was deeply immersed in a dynamic era of critical changes and challenges. According to economic historians, the period going from 1960 to 1974 can be identified as the onset of a remarkable phase of economic growth, with a noteworthy gross domestic product growth rate of 7% (Montero, 2012). However, this significant economic development contrasted sharply with the absence of corresponding political and social improvements, which highlighted the regime's weakness and fragility (Linz *et al.*, 2009). Despite experiencing notable economic prosperity, the regime suffered from a lack of basic liberties, social and economic inequality, strict censorship and cultural repression (Townson, 2007). Universities' relevance during this period was highly remarkable, as they played a crucial role in the communication and dissemination of the ideas and demands of student protest movements, becoming a breeding ground for the opposition to the regime (Carrillo-Linares, 2015; Pecourt, 2006; Rivera Navarro, 2022).

Although events such as the Chinese Cultural Revolution, the Vietnam War or the 1968 French May Revolution had a strong impact on students, the Spanish movements had nothing to do with the revolts in other countries. This divergence can be attributed to the need to confront a strict censorship, tight control of education and media, as well as restrictions on freedom of expression, assembly and demonstration (Gómez Oliver, 2008). Moran (1993), a columnist for the Spanish newspaper, *La Vanguardia*, explained the contrasting realities experienced by France and Spain in an article commemorating the 25th anniversary of 1968 movements. He noted that, while the French aspired to change the world, the Spanish people simply hoped to be awakened by the milkman in the morning and

not by the police. This difference exemplifies the varying aspirations between changing a society and overthrowing a regime (Moran, 1993; Zamponi, 2018). In this repressive context, students strived for a way to spread their own messages and fight the official version of the news offered by the dictatorship. The regime controlled all communication channels, showing a regulated image of the institutions instead of fostering engagement with students, faculty and the whole society. Innovative ways to communicate emerged from this challenging environment, resorting to assemblies and meetings, leaflets, posters and graffiti and even music as a means of expression. Just as Woodstock in the USA became an iconic symbol of the spirit of the 1960s, advocating for peace and love, Spain witnessed its own pivotal milestone with a concert in Catalan held in May 1968 by the singer-songwriter Raimon at the Economics Department of University of Madrid (now Complutense University of Madrid). Thousands of students cried for freedom and democracy and confronted the police for hours in what was considered the most emblematic of the anti-Francoism movement in the classrooms (Zamponi, 2018). While Parisian walls cried out slogans such as “forbidden to forbid”, “power to imagination” or “beneath the pavements, the beach”, Spanish students demanded “amnesty and freedom”. Walls became the social media of that moment, the essential communication tool to freely express students’ ideas, wishes, protests, proposals and, even, poetry or philosophical quotes.

In contrast to the critical situation experienced in the Spanish streets, the regime tried to implant a particular political culture through the press, television, radio and even cinema, which was highly popular during those days. Garcia Farrero and Gómez-Mundó (2020) provide a comprehensive analysis of the NO-DO newsreels (colloquial name for “News and Documentaries”), one of the most important propaganda tools used by the Franco dictatorship. This study focused on the coverage of the University of Barcelona from 1943 to 1975. The research concluded that the NO-DO presented a university with limited presence of the teaching bodies and a misrepresentation of the students as individuals primarily concerned with enjoyment and entertainment. Not surprisingly, additional studies analysing the videos within the NO-DO News section revealed that only seven of them were dedicated to the May 1968 events, with no mention of the Spanish revolts (Molina Poveda, 2018).

The passing of Francisco Franco in 1975 marked the beginning of one of the most transformative periods in recent Spain’s history. This era was characterized by substantial changes in the country’s governance, legal frameworks and societal norms. In the midst of this profound transformation, Spanish universities faced the challenge of adapting to these new circumstances, embracing democratic principles and reshaping their institutional identities. This unique historical context made the Spanish case unparalleled in Europe and prompted HEIs to adapt to this transformation by adopting strategies based on global communication techniques. This argument pairs with Perotti’s (2007) analysis, which concludes that Spanish universities were significantly affected by particular historical circumstances, facing “a radical break with the past” due to the transition from a dictatorship to a democracy.

After the reinstatement of democracy and the promulgation of the new Constitution in 1978, the Spanish higher education system started to shift from an elite to a mass education system aimed at reaching a broader population (Barroso Osuna, 2000). According to the 1978 Ministry of Universities and Investigation, more than 714,000 students were enrolled at Spanish HEIs during that academic year, marking an impressive 381% increase compared to the figures recorded in 1960 (Sempere, 2018). This massive incorporation of students to the higher education system resulted in the establishment of a total of 34 new universities in 1979 (30 public institutions and 4 private ones). This increase in the demand for higher education, along with the emerging need for information transparency outlined in the 1978

Constitution, set the stage for the consolidation and development of the initial campus communication offices, whose main objective was to attain the public visibility and recognition that universities had never aimed to achieve before (Paniagua Rojano *et al.*, 2012; Simancas González and García López, 2016).

The implementation of the 1983 University Reform Act (Ley de Reforma de Universidades, LRU) brought about significant improvements and increased autonomy of universities. Prior to the implementation of the LRU, universities were under the direct control of the central government, but this legislation shifted the authority to the regional governing bodies. Additionally, this new regulation allowed the establishment of private universities, resulting in a significant increase in their number from 1991 onwards. With the presence of private institutions, higher education options expanded, offering students a wider array of choices for their academic pursuits. The number of universities doubled within a span of just two decades, reaching the amount of 68 in 1998, with 50 being public universities and 18 being private institutions (Simancas González and García López, 2016). This process was followed by a global stabilization of high education demand (Moreno Herrero and Sanchez-Campillo, 2010).

During the past two decades of the 20th century, numerous studies have demonstrated that the image of universities was mainly influenced by information derived from traditional news sources, predominantly newspapers and television. These media outlets primarily focused on events related to administration and university management, thus providing an almost non-existent coverage of teaching and research issues (Pérez Serrano, 1984; Nieto Martín, 1986). Barroso Osuna (2000), for example, presents findings from a content analysis of 5,000 printed media documents which sheds light on the predominant themes covered in the news between 1987 and 1997. This analysis revealed that a significant portion of the news in this period was focused on issues such as the excessive number of students, inadequate facilities and problems to get admission. Moreover, these publications were frequently concentrated within specific time periods, namely, March, April, June and October, dovetailing with the start of the academic year, exams and the associated challenges derived therefrom. Similarly, another study investigating 40,000 pages of printed media, 360h of television and nearly 700 hours of radio broadcasts, revealed that the representation of culture, research and university-related information in 1987 was incredibly scarce. Television coverage accounted for a mere 0.78%, radio coverage amounted to 0.4%, both at regional and national levels and the printed press ranged from 0.5% to 2.5%, without any specific reference to universities (Arceo Vacas, 1987). This leads to the conclusion that the university was not only perceived essentially as an administrative entity but also received minimal coverage in the Spanish media.

Meanwhile, during these decades, the global stage experienced significant societal and economic shifts attributed to the rise of information and communication technology (ICT). Scholars and experts emphasized the importance of digital technology in societal development during this era. Terms like the “information age”, “information society”, “post-industrial society” and “digital age” emphasized the growing importance of information and knowledge in driving power and competitiveness in the global economy (Bell, 1973; Castells, 1999; Forester, 1985; Masuda, 1980; Negroponte, 1996). The integration of ICT into education became imperative for serving the needs of contemporary students. However, the “University 2000 Report” by the Conference of Rectors of Spanish Universities (Bricall, 2000) indicated that while Spanish universities had initiated ICT integration, they still heavily relied on traditional teaching methods. This dual narrative illuminates the intersection of historical transformation and technological evolution within Spain’s higher education setting.

A turning point for university marketing came with the Spanish incorporation to the European Higher Education System and the implementation of the Bologna Plan, which led to necessary adjustments in the existing regulations. In 2001, the Organic Act on Universities (Ley Orgánica de Universidades, LOU), replaced the LRU, becoming the main regulatory framework for Spanish universities until April 2023, when the most recent legislation reform was implemented. The 2001 LOU established a new model of management based on a more efficient and productive university, seeking to foster greater mobility and transparency among European HEIs and making knowledge transfer a key objective on their agenda. As a consequence of these legal and demographic changes, together with the increasing presence of private institutions and the advent of ICTs, Spanish universities started recognizing the importance of applying proactive policies to recruit and attract students. The competition for students in the higher education context became more pronounced, and universities sought to differentiate themselves to stand out in an increasingly crowded market. Many authorities in the university management boards acknowledged that having a strong corporate brand had become a strategic priority for HEIs. As Professor van Dissel, Dean of the Rotterdam School of Management, affirmed in 2006, the Bologna Process was shifting the focus from product branding to institutional branding, making it more effective to brand the entire institution rather than individual programs such as the MBA (Balmer and Liao, 2007). In an effort to enhance their institutional external image and promote the required transparency in information, Spanish universities strived to give greater visibility to their activities and official publications through various means. They used welcome guides, scientific dissemination units, information point offices, fairs, seminars and emerging communication channels such as social media. Particularly, social media platforms were gaining significance not only in Spain but also across Europe (De Aguilera Moyano *et al.*, 2010), providing valuable avenues for universities to promote their activities and official publications.

In the early ages of its adoption by Spanish universities, digital media had limited impact, sharing importance with traditional marketing tools. In fact, studies conducted during the academic year 2007–2008 revealed that students showed a similar preference for posters, notice boards, Webpages, TV screens and emails (Herranz de la Casa *et al.*, 2009). Interestingly enough, the most effective communication tool, as perceived by students, was face-to-face contact with other students. In a different study conducted in 2010, Tapia Frade and Gómez Nieto (2011) analysed Spanish universities websites using content analysis. This research revealed an inadequate management of online communication, with an inefficient use of the flexibility offered by this medium. The researchers noted that most of the information presented on the university websites was mainly textual, neglecting other available options, such as greater visual content, which would have been more appealing to students. Carrillo Durán and Castillo Diaz (2014) obtained similar findings when studying the brand communication of Spanish universities through their websites in this same period. Their analysis concluded that the messages transmitting brand promises were rather weak and should have been expressed with greater clarity, including more audiovisual materials to reinforce the information and data presented. Furthermore, despite the underlying aim of internationalization within the new European Higher Education System, the Spanish university network appeared to be isolated from other European institutions, emphasizing local perspectives over international ones. Their limited English-language contents restricted their opportunities to have their websites linked and acknowledged by other international institutions (Ortega and Aguillo, 2007). Considering these study conclusions and the fact that Spain ranked as the most internet connected country in Europe in 2014 (Fundación Telefónica, 2015), it becomes evident that additional efforts should have been

applied to increase the effectiveness of digital marketing techniques used by Spanish universities. Instead of leveraging the vast potential offered by the rapid advancements of digitalization, universities used the internet merely as a passive source of information, failing to exploit its incredible capacity to foster meaningful connections with their stakeholders and enhance their national and international visibility.

2.2 Harnessing the power of social media to embrace the new multidirectional marketing approach

The emergence of social media revolutionized the way organizations interacted with their stakeholders, providing them with unprecedented opportunities to receive immediate feedback and achieve public engagement. This transformation from unidirectional to multidirectional communication gave rise to a new marketing environment where active social participation became essential. Marketing professionals encountered a distinctive array of challenges to promote the universities' image and mission within an ever-changing social media environment. For example, the study by [Casero-Ripollés \(2012\)](#) used a quantitative approach to examine the news consumption habits and perceptions of Spanish youth aged between 16 and 30 in 2011. The findings revealed a notable decline in the use of traditional media, particularly newspapers, while social networks emerged as the primary source of information. Young individuals adopted a more passive approach to information consumption, accessing the news which captured their interest as they were browsing the internet.

This change of paradigm has enormous implications when it comes to determining effective marketing strategies that successfully target university students. For instance, [Štefko et al. \(2015\)](#) highlight the complementarity perceived by university students in the various emerging e-marketing tools. They suggest that integrating social elements on faculty websites, along with e-marketing tools such as blogs, microsites, email newsletters and online publications, can significantly enhance the perception of HEIs among students. According to the 2012 report "University 2020" published by Fundación Telefónica, most of the new university students could be considered "digital natives", born in a world where new technologies were an integral part of their daily lives. This report concluded that a significant 97% of university students used the internet frequently, with 65% actively engaged with social media platforms (rising to 70% among those younger than 20). This data highlighted the critical importance of leveraging social media platforms effectively to engage with this tech-savvy demographic. New technologies have originated a shift in the profile of university students, who now exhibit a preference for immediacy, hypertextuality, flexibility, social networking and the constant pursuit of knowledge regarding the latest technologies and products ([Henderson et al., 2017](#)).

In this digital age, the power of word of mouth, a time-tested means of information dissemination and marketing, has transformed into "electronic word of mouth" with the advent of social networking ([Aramendia-Muneta, 2017](#)). This evolution stresses the need to use the digital tools to engage, communicate and interact effectively with these new-age students who seek information and connection through online platforms. It is within this context that social media's importance in enhancing student engagement becomes evident, as revealed by various studies ([Heiberger and Harper, 2008](#); [Junco, 2012](#); [Junco et al., 2011](#); [Evans, 2013](#)).

The 15M "indignados" movement, which emerged in 2011 in Spain driven by young people discontented with the government's handling of the economic crisis, demonstrated the growing influence of social media by effectively using "word of mouth" electronic communication to engage a vast and diverse audience. Considering that this movement

primarily comprised individuals aged 19 to 30 with ongoing or completed university studies (Arellano *et al.*, 2012; Calvo *et al.*, 2011; Tiina, 2012), it stands as a clear example of their use of social networking to adapt to the new technological framework. This social phenomenon offers an exceptional opportunity to grasp the mechanisms of network formation and online spreading dynamics, given that all real-world events, ranging from economic occurrences to political protests, act as driving forces for the development of intricate and dynamic communication patterns (Borge-Holthoefer *et al.*, 2011). Under the slogan “See you in social media”, Twitter and Facebook emerged as the main instrument for spreading information and convening meetings, overcoming physical barriers. Benito (2015) compares this kind of public online activity with viral marketing as its main objective is to promote and disseminate a specific message to create the highest level of brand awareness for a particular cause. Authors such as Sampedro and Sánchez Duarte (2011) highlighted the impact and transformative role of social media and observed that these platforms had evolved into virtual spaces to exchange ideas, coordinate actions and drive social change; in their own words “the digital network became the city square.” According to these authors, these social concentrations exhibited the distinctive features of digital communication: cooperation, instantaneousness, feedback, horizontality, decentralization, flexibility, dynamism and interconnection. In response to the global economic and financial crisis, ordinary citizens took communication into their own hands – literally, by using their smartphones and other mobile devices – leaving behind their traditional function as mere recipients of official and institutional communication and becoming active participants (Barbas and Postill, 2017). The 15M experience prompted Twitter to go beyond its primary role as a platform for entertainment and dissemination of current affairs information. It became a more complex instrument that enabled the establishment of personal relationships, increasing its potential to foster citizens participation and social connections.

University students soon recognized the potential of Twitter and began using it as a socializing tool, connecting to not only exchange information about universities, studies or accommodation options but also make friends and forge connections with their new university colleagues. According to Bolat and O’Sullivan (2017), 21st-century students are active, digitally savvy decision-makers whose expectations, motives and experiences are socially constructed. This raises the question whether universities are fully harnessing the Twitter’s potential, maximizing the possibilities offered by this social network to the same extent as students, one of its most essential stakeholder groups.

Spanish universities progressively adopted Twitter after its incorporation into Spanish social networks in 2006. The pioneering move came from Universitat Oberta de Catalunya, an online private university, which included Twitter among its social media tools in 2008. Subsequently, nine more universities joined in the same year, reaching an 86.9% adoption rate by July 2012 (Paniagua Rojano *et al.*, 2012). Although Twitter was soon regarded as a powerful catalyst for communication and educational interaction within the university community (Guzmán Duque *et al.*, 2013), research conducted on the contents and activity volume of Spanish universities on Twitter during these early years revealed a notable deficiency in terms of communication effectiveness and impact. Rodríguez Ruibal and Cristino (2012) conducted a quantitative analysis on the Twitter engagement of all the Spanish universities in 2012. Their study revealed no correlation between the most followed Twitter accounts and the number of students enrolled in these institutions or their contributions to this platform, suggesting that the ranking was influenced by temporal factors, or the quality of content published, rather than a specific marketing strategy implementation. A particularly noteworthy contribution is that of Paniagua Rojano *et al.* (2012), who conducted comparative research on the adoption of digital tools by Spanish

universities that same year. Although Twitter emerged as one of the most popular ones, its messages primarily focused on the dissemination of news and events, with minimal encouragement of followers' participation and interaction. [Paniagua Rojano et al. \(2012\)](#) emphasized that despite the presence of most Spanish HEIs on social media platforms, there was a remarkable absence of effective strategic planning, resulting in a far from optimal communication efficiency.

Unlike Spanish HEIs, US universities had already established a significant advantage in leveraging social media as integral components of their marketing strategies. A study conducted by [Barnes and Lescault \(2011\)](#) involving 456 USA institutions showed that all of them used some form of social media, with Facebook being the most prevalent platform (98%), closely followed by Twitter (84%). These platforms were not only used for educational purposes but also to promote their institutions aiming at recruiting potential students. This idea was corroborated by the study conducted by [Guzmán Duque et al. \(2013\)](#), which examined the hashtag contents of Twitter accounts belonging to the top 200 universities in Shanghai Ranking. This study identified two predominant trends: stimulating communication and interaction within the university community and disseminating corporate information. The research confirmed that the institutions with a higher level of presence on social media were typically the older public US universities, which particularly stood out due to their substantial number of followers and the volume of tweets they generated.

The level of engagement observed on social media platforms among Spanish HEIs during the 2010s was quite different. The research conducted by [Gómez-Aguilar et al. \(2012\)](#) revealed that, despite the widespread use of social media among university students, its frequency of usage for academic purposes was rather low and it was often the students themselves who initiated such interactions. Additionally, 53% of the analysed students in 2011 reported connecting to social media multiple times a day, with peak usage occurring mostly between 19:00 and 00:00. Interestingly, during this time frame, university social media platforms were less used, as HEIs primary activity period tends to align with the "morning and teaching" hours ([Reina Estevez et al., 2012](#)). [Gómez-Aguilar et al. \(2012\)](#) concluded that the limited use of social media was a consequence of the insufficient emphasis placed on these platforms by both teachers and institutions. They referred to authors such as [Martín et al. \(2010\)](#), who explain that educational innovations tend to progress at a slower pace than society itself, thus falling behind in adopting technological innovations.

Regarding dissemination of research-related contents, not many researchers were initially open to adopting social media ([Procter et al., 2010](#)). However, an increasing number of authors started to acknowledge the importance of sharing scientific information through these digital platforms, particularly Twitter ([Darling et al., 2013](#); [Letierce et al., 2010](#); [Shuai et al., 2012](#); [Younus et al., 2014](#)). In spite of that, a thorough analysis of social media usage by Spanish HEIs between 2012 and 2014 showed that they were not harnessing its potential to promote research and scientific dissemination ([López-Pérez and Olvera-Lobo, 2016](#)). Similarly, a study focusing on the Twitter messages of five top Spanish universities in 2013 showed that research-related content received minimal attention, leading to a defective institutional branding ([Gómez Calderón and Paniagua Rojano, 2014](#)). These authors proposed a possible explanation, suggesting that social media was mainly focused on the student community, which had limited direct involvement in research activities. This idea finds support in the study conducted by [García García \(2018\)](#), whose research confirmed students as the primary audience of interest for universities on social media, considering them as the main target, as their messages had the greatest influence on brand development.

In a parallel study conducted in 2015, [Simancas-González and García-López \(2017\)](#) interviewed communication directors from 33 Spanish universities, noting a lack of comprehensive strategic communication planning. The dominance of a diffusional model hindered marketing objectives by resisting bidirectional and dialogic approaches, likely influenced by the ongoing structural transformation of Spanish universities to adapt to the European Higher Education Area.

The position of Spanish HEIs in some of the most influential global rankings revealed significant challenges in internationalization, student-teacher ratios and reputation, which could only be addressed by boosting scientific dissemination and implementing additional measures in university management and communication ([Luque-Martínez *et al.*, 2018](#)). While confronting these challenges and the need to attract students amidst intensified competition, the education sector was dramatically affected by the Covid-19 pandemic, completely transforming it. The relevance of Twitter as a communication channel and the growing commitment of the university accounts formed the central focus of a study conducted by [Ferrer-Serrano *et al.* \(2020\)](#) in which the authors analysed the behaviour of Spanish HEIs on this platform during the pandemic. The research highlighted a shift in their communication strategy, from a focus on corporative image to a clear cooperative and pro-social profile. The health crisis was significant in reshaping the communication paradigms, capitalizing on the just-in-time nature of social media and the possibility to interact and provide support to one another when face-to-face conversations were not possible. A good example of the effective use of Twitter during the pandemic can be observed in university libraries, as analysed by [Martínez-Cardama and Pacios \(2020\)](#) during the initial weeks of the state of alarm. A content analysis on a corpus of 10,994 tweets from 56 Spanish university libraries revealed how they fostered closer connections with the university community. Through reading challenges and competitions, library professionals achieved unprecedented visibility, enhancing the sense of university community and showcasing Twitter's potential as an engaging tool for dialogue, going beyond its traditional function as a monologic instrument solely used for disseminating information.

Although the literature review demonstrates a high consensus regarding the widespread adoption of Twitter as a communication tool by HEIs over the years, there is also strong evidence indicating that its use for branding and marketing purposes falls short of its full potential, primarily due to a lack of strategic approach in social media. A recent study examining the social media practices of 70 universities across Europe, the USA and Latin America found Twitter to be the most widely used platform ([Capriotti *et al.*, 2023](#)). This study analysed the content shared on Twitter, Facebook and LinkedIn during a six-month period in 2021, identifying two main categories: functional topics related to teaching, research and social commitment and institutional topics focusing on organizational positioning rather than contextual and social engagement. In addition to its widespread use among universities, Twitter's open nature aligns with the transparency expected from educational institutions, making it exceptionally appropriate for studying public communication. Consequently, the choice of Twitter for our analysis was driven by its data accessibility and historical significance in university communication.

Evaluating and understanding the topics discussed on Twitter, as well as their evolution and interdependence with historical events, have proved to be essential to determine the effectiveness of marketing efforts used by Spanish HEIs to engage with an audience overwhelmed with a plethora of information sources. While previous research has been conducted on the use of social media by universities, most studies focused on limited time periods and not many have analysed large-scale data encompassing all the topics shared since the establishment of institutional Twitter accounts. Considering the significant

influence of the social and economic environment on all organizations, it becomes imperative to conduct studies that explore the evolution of topics and trends over the years. Such studies are essential in gaining insights into the marketing efforts undertaken by HEIs to effectively adapt to new technologies and innovations, thus enhancing their brand awareness and image over time. To bridge this research gap, we propose to analyse the Twitter accounts of a sample of Spanish universities, using machine learning techniques to conduct a comprehensive content analysis of all the tweets shared since 2009.

3. Unveiling the evolution of topic trends in Twitter: an NLP analysis

In this section, we examine the evolutionary journey of topic trends on Twitter and explore how its use has evolved over time. In this regard, first, we detail the methodology used for this research, providing information about the data collection process and the NLP techniques used for topic modelling. Subsequently, the key findings derived from the NLP analysis are presented to uncover the emerging patterns and shifts in communication trends observed within the past decade.

3.1 Methodology

To provide full information about the methodology used in this research, the data collection is explained to outline the process of gathering data from the Twitter accounts of the selected universities, spanning their activity since their inception in 2009. Later, a detailed explanation of the machine learning techniques used to conduct a comprehensive content analysis of the collected data is provided.

3.1.1 Data collection. In Spain, several regions have the coexistence of two official languages, such as Galicia, the Basque Country, Catalonia and the Valencian Community, among others. In the context of public Spanish universities in these regions, it is common for them to publish tweets in both languages (national and local) to engage a broader audience of stakeholders. Analysing the accounts of these specific universities provides a captivating case study, given the unique representation of minority languages in their digital communications compared to other European universities in multilingual environments, as highlighted in recent research by [Català-Oltra *et al.* \(2023\)](#). To ensure a comprehensive understanding of the words used in the analysis, this research focuses on languages in which the authors have proficiency. Therefore, the study delves into a corpus of tweets in two languages: Spanish and Valencian/Catalan. The main objective of the examination of these languages is the detection of distinct themes and communication patterns for each, illustrating the universities' adaptability and efforts to cater to their diverse audience. This study underlines the importance of considering minority languages in the Spanish education system, particularly in regions where they hold official status. By analysing the tweets in both Spanish and Valencian/Catalan, we gain valuable insights into the universities' communication strategies and how they connect with their local communities. The findings contribute to a deeper understanding of the purpose and impact of language choices in social media communication for Spanish universities, offering valuable implications for HEIs operating in multilingual settings.

To gather data for this research, the complete historical records of tweets published by the official university accounts were collected between May and June 2023. This data collection period followed Twitter's decision to eliminate the free access to tweets using the Twitter application programming interface for university-related tweets and their metadata. As a result, only the account managers of each university could download their tweet history. Therefore, data collection involved contacting each university in the target group of

this investigation to request collaboration in downloading their tweet histories. Ultimately, four universities willingly collaborated with the research. The language filtering process ensured that only Spanish and Valencian/Catalan tweets were retained, resulting in a data set comprising a total of 97,853 tweets (including 31,326 retweets). The average number of tweets per university increased from about 1,188 during 2009–2013 to around 2,293 in 2014–2019, 1,906 in 2020–2021 and approximately 1,645 in 2022–23, reflecting universities' progressive Twitter adoption, with around 30% of these tweets being retweets.

The selection of the sample of public universities for this study followed two specific criteria, crucial for ensuring the research's relevance and validity. Firstly, the university's willingness to collaborate was an essential prerequisite, ensuring active participation and cooperation from the institutions involved. Secondly, the study focused on universities located in regions where both Spanish and Valencian/Catalan were officially recognized languages, namely, the regions of Valencian Community and Catalonia. As a result, these public universities became the primary targets of interest for this research. The participation of the four selected public universities, meeting the specified criteria, represents a meaningful subset of the total universities eligible for inclusion in this study, accounting for 33.3% of the relevant institutions. Additionally, it is worth noting that these universities hold prominent positions in the U-Ranking, a prestigious ranking system that evaluates and ranks universities based on various performance indicators (www.u-ranking.es).

3.1.2 Method. Topic modelling is a powerful methodology within the realm of NLP that intersects with machine learning techniques. As a generative model, it possesses the capability to generate new data instances (Grun and Hornik, 2011). The input for topic modelling is a database, known as the corpus, consisting of tweets, which are the individual documents composed of words (terms) in a specific language. The primary objective of the analysis is to fit the parameters of selected probability distributions to describe the data, with a focus on modelling the frequency of the terms. In this approach, we make the assumption that terms are independent of each other, disregarding their order of appearance. This characteristic categorizes the models as bag-of-words.

In our study, we use the latent Dirichlet allocation (LDA) model. This technique is adequate to handle the assumption of no correlation among the terms. LDA operates as a Bayesian mixture model designed to uncover the latent topics that underlie the corpus. A topic is considered as a set of terms that collectively represent a subject or theme. In LDA, each document is assumed to be composed of a specific proportion of these latent topics. The main purpose of the LDA algorithm is to estimate the parameters of two probabilistic distributions: the distribution of words constituting each topic, and the distribution of the topics across each document. The number of topics, denoted as K , is itself a hyper-parameter that has to be determined during the modelling process.

Let $\omega_d = (\omega_{1d}, \dots, \omega_{Nd})$ be the set of N_d words in the document d belonging to a set of V different words from a vocabulary, that is $w_i = \{\omega_1, \dots, \omega_V\}$, $i = 1, \dots, N_d$. In the context of Topic Modelling using LDA, we aim to estimate specific parameters associated with the following distributions:

- The term distribution, that is, the distribution of the terms in each topic $\psi_k \sim \text{Dirichlet}(\beta)$, $k = 1, \dots, K$. The parameter β is a V -dimensional vector.
- And, the topic distribution, i.e., the proportion of topics in each document d , $\theta_d \sim \text{Dirichlet}(\alpha)$, $d = 1, \dots, M$, where M is the number of documents. The parameter α is a K – dimensional vector.

For our analysis, we used the R package *topicmodels*, which estimates the parameters through the use of Gibbs sampling methodology. We set the number of iterations to 100.000, with a burn-in of 10.000 to ensure convergence and stabilize the estimation process. To determine the optimal number of clusters (topics) for our model, we leveraged the function *FindTopicsNumber* included in the R package *ldatuning*. This function uses the metrics CaoJuan2009 and Deveaud2014 with the objective of minimizing the former and maximizing the latter. These metrics serve as indicators to guide the selection of the most appropriate number of topics for our analysis, allowing us to reveal the underlying thematic structure of the corpus effectively.

3.2 Findings

Through the comprehensive analysis of Twitter content conducted in our research, we have successfully identified four main periods that represent the overarching topics and themes prevalent in Spanish HEIs Twitter communication.

3.2.1 The early days: Twitter as a mere messaging tool (2009–2013). During the initial years of Twitter adoption by HEIs, the predominant topics and themes shared in Spanish primarily focused on disseminating institutional information, particularly related to teaching and administrative procedures. Our analysis identified two main topics, each revealing distinct communication strategies used by universities.

The first topic, labelled as “University News and Information”, reflects the focus on current affairs and activities related to the university community. The communication appears to be public-oriented, with universities sharing academic and institutional information with their students and celebrating achievements and milestones. HEIs try to keep their audience informed about the latest happenings, fostering a sense of community among students and staff.

The second topic, labelled as “Academic Research and Innovation”, provides an initial glimpse of Spanish HEIs’ positioning purpose, with universities sharing valuable information about research initiatives, conferences and symposiums. They use Twitter to disseminate news related to advancements in different fields, research projects and awards received by the university community. It is important to note that while universities strive to share their expertise, there seems to be a lack of emphasis on encouraging active engagement with their followers.

Regarding the content analysis of tweets published in Valencian/Catalan, two main topics emerge. The first topic can be labelled as “Cultural-related University News and Local Language”, as it focuses on disseminating relevant information and updates about various aspects of university life with a cultural background. This is in contrast to the academic and institutional activities that were primarily promoted in tweets published in Spanish for this period. Universities interact with their community through presentations, programs and conferences, emphasizing their commitment to enhancing intercultural awareness and promoting multilingualism. By using the local language, HEIs establish a more personalized connection with their audience, fostering a sense of belonging and inclusion.

The second topic is labelled as “Academic Excellence and Community Achievements”. Universities take pride in their campus and community achievements, showing awards received by their faculty and recognition for outstanding research efforts. Graduation ceremonies, which hold a significant importance in enhancing visibility and reinforcing the universities’ commitment to student success, are spotlighted for the first time. Additionally, communication gives an important share to the universities presidents and their function in determining the institution’s vision and direction. The topic also touches on international

projects, reflecting the universities' global presence and contribution to academic and political discussions in Europe and beyond.

3.2.2 Twitter's progressive evolution: unveiling its function as a dynamic online platform for communication and promotion (2014–2019). During this period, the data compiled from words published in Spanish reveals three main topics which, similarly to the previous period, are aimed at a broader or general audience.

In view of the first topic, "University Events and Student Engagement", we can infer a continued emphasis on informing about institutional information and teaching-related matters, with a growing stress on promoting active student participation in events, presentations and contests and thus suggesting a strong emphasis on student-centred activities and initiatives. This topic highlights the universities' commitment to organizing enriching events and creating a dynamic and vibrant academic environment.

The second topic can be labelled as "Academic Excellence and Recognition" and reflects an emerging relevance of enhancing visibility and positioning through the dissemination of research, innovation and internationalization efforts. Universities share information about various scientific news and research projects in diverse fields of science and knowledge. Awards and recognition received by the university community are emphasized, reflecting the universities' commitment to celebrating academic achievements. Communication extends to international collaborations, technology and innovation, demonstrating the universities' role in driving technological advancements and fostering a globally recognized academic environment.

The third topic, "University News and Information", focuses on sharing timely updates about university news, information and activities with their audience. The communication highlights program details, news of the local community around the university and activities. The universities are welcoming and encouraging visits to their campuses, showcasing their commitment to an open and inviting academic environment. This topic reflects the universities' efforts to keep their audience informed and engaged, fostering a sense of community and collaboration in university life.

The analysis of the most relevant words published in Valencian/Catalan extracted from this period reveals four main topics. The first one, "University Research and Local Impact", is consistent with the data analysed in the previous period (2009–2013), but only present in the Spanish corpus of messages. This topic emphasizes academic research and its impact on the local community, showing universities' dedication to advancing knowledge and technology. Collaboration with local communities to address region-specific challenges and cultural aspects is highlighted, along with the universities' involvement in European initiatives, fostering cultural exchange and integrating research and innovation into the local context.

Regarding the other three topics in Valencian/Catalan, there is a similar tendency to what was communicated in Spanish during the same years. Whereas the second topic in Spanish, "Academic Excellence and Recognition", highlights the significance of research and innovation, now the emphasis is shifted more on students' achievements, with graduation ceremonies, awards and contests gaining prevalence.

The third topic, "University Events and Student Engagement", highlights the importance of activities, conferences and institutional events aimed at students. Similar to the Spanish data, the analysis concludes that universities are committed to the dissemination of university events, cultural celebrations and campus presentations, fostering a vibrant and inclusive academic community. The communication also reflects the universities' engagement with international partners and participants, highlighting their global presence, open communication and information dissemination.

A fourth topic related to dissemination of information is now more focused on general news regarding university life: "University News and Information". While between 2009 and 2013 most of the information given in Valencian/Catalan was centred on cultural matters, now we can find a wider range of the issues addressed, matching those in Spanish during the same period. Universities emphasize their commitment to enriching the educational experience for all participants and highlight novelty initiatives and near-campus opportunities, reflecting their dedication to providing innovative and enriching experiences. The topic reflects the universities' efforts to build a strong sense of community and provide accessible information to all stakeholders.

3.2.3 Covid-19 as a trigger for interaction and social commitment in Twitter (2020–2021).

During the pandemic period, Twitter experienced significant growth worldwide due to its global spread and impact on health and economic activity. Highly affected by lockdowns and restrictions on social contact, the traditional higher education model faced serious challenges as HEIs were forced to shift all their teaching and activities to online platforms. Understandably, communication during this period was heavily influenced by the Covid-19 outbreak and its consequences. Based on the most relevant words and probabilities extracted from this period, two main topics are identified with similar contents both in the Spanish and Valencian/Catalan corpus of messages, mainly affected by the exceptional situation.

The first topic, "Academic Research and Social Commitment", represents a more cooperative approach influenced by the dramatic consequences of Covid-19. Universities actively engage with their audience, sharing information about research projects and scientific developments, at both national and international level. They showed a growing commitment to teamwork, supporting and contributing to the public health response. Not surprisingly, one of the most retweeted and favourite hashtags in Spanish in this period was *#SinCienciaNoHayFuturo* ("there's no future without science"). This topic reflects the universities' efforts to combine academic research with social responsibility, fostering a sense of unity and support during challenging times. The communication in Valencian/Catalan reflects a higher commitment with the local community, showing initiatives such as donations and support programmes to aid those affected by the pandemic.

The second topic, "University News and Community Outreach" shows how universities focused on providing support and up-to-date information to the university community, taking into account the exceptional measures adopted for the hasty transition to an online teaching system and the impact of lockdown on the whole community. The Spanish data shows an active involvement in disseminating activities that promote community engagement, fostering a sense of pride and community spirit. Regarding the Valencian/Catalan messages, the primarily purpose of the universities is merely to keep students informed, without necessarily aiming for community involvement.

3.2.4 Twitter takes its journey forward (2022 to April 2023). Based on the most relevant words and probabilities extracted from this period, two main topics are identified in the Spanish corpus of messages.

The first topic can be labelled as "Cutting-edge Research and Academic Achievements". The universities share information about scientific advancements, novel discoveries and research projects in diverse fields of science to reflect their commitment to advancing knowledge and scientific progress. Awards and recognition received by the university community for their exceptional research efforts are highlighted, showcasing the universities' dedication to academic excellence. This topic illustrates the universities' ongoing efforts to promote innovation, encourage teamwork and foster a research-driven

academic environment, striving to have a positive impact, particularly after a period characterized by restrictions and limitations.

The second topic can be labelled as “University News and Social Commitment”. The universities provide information about current affairs taking place within the academic community. They promote studies and academic courses, encouraging students to expand their knowledge and skills. The communication includes information about open events and activities, fostering community involvement and participation. The topic also highlights the universities’ engagement with their local community, welcoming visits and interactions to strengthen ties.

The emergent topics found in the Valencian/Catalan corpus of messages are similar to those in Spanish. In the first place, we can discern the topic “Cutting-edge Research and Community Impact”, which is limited to dissemination of findings and research by the academic body, with scarce reference to students’ recognitions. Universities communicate about research initiatives, faculty members contributions and projects that impact on societal well-being and development. Universities’ engagement with the community is also present through initiatives like donations and social projects, trying to make a positive impact on society. It further emphasizes the key figure of the university president in guiding the universities’ actions. This topic reflects the universities’ dedication to promoting cutting-edge research and innovation, benefiting the community and fostering social progress.

The second topic, “University Events and Student Engagement” places greater emphasis on the students’ activities and experiences, including alumni involvement post-graduation, courses, programs and conferences. It represents various components of campus life, including studies, campus events and academic achievements, such as awards, and graduation ceremonies. This topic reflects how universities build a lively campus community, providing students with enriching opportunities and support throughout their academic journey.

4. General discussion and conclusion

Daniel Bell (1967) astutely remarked that the university would become the central institution of the next century due to its responsibility in driving innovation and knowledge creation, surpassing the business firm as the key institution of the past. As time has passed, ample evidence has unequivocally validated the accuracy of Bell’s statement, as higher education has transitioned from being a service primarily addressed to a minority of people to becoming a highly competitive arena where institutions are faced with the necessity of competing for students across diverse recruitment markets. This transformation has been particularly pronounced in Spain, a country profoundly impacted by striking historical changes. By contrasting the findings of previous authors with a thorough analysis of the marketing communication strategies used by Spanish universities, this paper provides a number of valuable insights and contributions that significantly enhance the existing body of knowledge in this field.

This study provides compelling evidence of the remarkable adaptability of Spanish HEIs in response to the major technological, political, legal and economic changes that have significantly impacted them over the last five decades, acting as agents of social change in crucial historical moments, including student movements, the transition from dictatorship to democracy and other global and more recent events such as Covid-19 pandemic or the invasion of Ukraine. By adopting a historical perspective, this research has enabled us to examine the transition of universities from traditional to digital media, witnessing their increased online presence as a means to foster their interaction with stakeholders and gain visibility and competitiveness.

The analysis of the final stage of this historical evolution leads us to a more detailed examination of the communication undertaken by a sample of universities on social media, specifically on Twitter. Among the array of social media platforms available, Twitter has emerged as the preeminent choice due to its exceptional versatility and fast widespread impact. A study conducted by Kwak *et al.* (2010) reveals that any retweeted tweet eventually reaches an average 1,000 users, highlighting Twitter's influence as a powerful tool for disseminating information. Despite this potential for engaging in dialogue, debate and conversation, our research shows that educational institutions have been slow to grasp the full capability of Twitter.

In contrast to previous studies that focused on specific time periods and small datasets, our research offers a longitudinal analysis with a large number of tweets, allowing for a unique and detailed information about the research target and a higher level of accuracy in capturing and understanding the corresponding development trends. The findings derived from the NLP Twitter content analysis present a noticeable evolution in the topics addressed by HEIs since the inception of their social media accounts. Consistent with the literature, our research indicates that there has been a gradual transition from the traditional one-way approach of information dissemination towards a more interactive and conversational paradigm, aimed at reaching a wider audience. Another interesting finding is the distinct communication style used when two different languages are used for the same target audience in an area where two official languages coexist. This observation suggests that Spanish universities strategically adapt their messaging based on the language of communication to cater effectively to their diverse audience. The use of different languages allows universities to establish a more personalized connection with stakeholders who may have different linguistic preferences or cultural backgrounds. By tailoring their communication to the language preferences of their audience, universities can enhance engagement and strengthen their relationships with students, staff and the broader community, thus fostering a sense of inclusion and recognition for linguistic and cultural diversity. This adaptability illustrates the universities' commitment to effectively engaging with their audience and embracing the richness of linguistic diversity within their institutional contexts.

This study acknowledges several limitations that could be effectively addressed in future research to enrich the understanding of the topic. Although content analysis offers valuable historical and cultural insights that aid in identifying trends over time, it may oversimplify, especially when dealing with complex texts. Additionally, expanding the sample to include a more extensive array of institutions would yield more accurate results and bolster the conclusions drawn from this study. This research opens the door to exciting new avenues of study about social media communication in universities. By focusing on specific topic categories, exploring distinct time periods, analysing contents with significant impact among followers and examining the evolution of language used in social media, among other aspects, further insights can be gained. For instance, conducting longitudinal studies or exploring different time frames would enable a more comprehensive analysis of communication trends and their evolution over time. Investigating the language evolution in social media would provide valuable information about how universities tailor their messaging to resonate with their diverse audience. Such investigations hold great promise for enhancing our understanding of communication strategies used by Spanish universities in the digital age.

In the changing areas of communication and technology, future research efforts within the field of HEIs should explore the Deep Learning. This emerging field presents compelling prospects for HEIs seeking to enhance their competitive edge by gaining a more profound understanding of student needs, thus enabling the development of advanced artificial intelligence (AI)-driven solutions. By connecting the capabilities of Deep Learning and NLP,

HEIs can not only better decipher cultural nuances through the utilization of different languages, but they can also significantly contribute to the refinement of AI-driven educational resources, making them more effective. As HEIs increasingly adjust their responsiveness to the trends and preferences identified on social media platforms, they possess the capacity to tailor their educational offerings with greater precision, providing students with an education that is more adapted and pertinent to their individual needs and preferences.

At the managerial level, it becomes crucial to investigate whether the communication on Twitter, or other forms of social media platforms, aligns with the mission and strategy of each HEI. Understanding this alignment can facilitate effective communication strategies and ensure that the institution's objectives are effectively reflected in its online presence. The findings from this study illustrate a valuable theoretical and empirical pathway that can help university managers to improve their marketing communication. Embracing this pathway can enable them to leverage the potential of social media, harnessing it as powerful tool to enhance the institution's competitive advantages in the dynamic environment of higher education. Finally, social media platforms provide unique opportunities for universities to engage with their community, cultivate meaningful dialogues and solicit feedback from stakeholders. By actively participating in conversations, responding to inquiries and addressing concerns, HEIs can build a sense of community and strengthen their relationship with followers, fostering a positive and supportive environment. Therefore, this study serves as a call to action for university managers to optimize their marketing communication strategies.

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Further reading

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