# MASTER'S DEGREES IN THE SPANISH UNIVERSITY SYSTEM: ASSESSING THE VIRTUALIZATION OF ONLINE COURSES

## *LOS MÁSTERES EN EL SISTEMA UNIVERSITARIO ESPAÑOL: UN ESTUDIO DEL GRADO DE MODALIDAD ONLINE*

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## RESUMEN

Este trabajo presenta los resultados de una investigación orientada al estudio de la gestión académica de los másteres online impartidos en las universidades públicas presenciales españolas. La investigación se centra en el análisis de la modalidad online buscando establecer una tipología de títulos que dé cuenta del grado de virtualización de los mismos. Para recabar los datos se ha diseñado un test heurístico que comprende cuatro dimensiones fundamentales: tipo de plataforma de aprendizaje online, denominación de la modalidad de enseñanza, simultaneidad con otras modalidades y grado de virtualización. Los resultados muestran que la falta de precisión conceptual ha llevado a que más del 60% de los másteres ofrezcan una

modalidad online parcial al exigir la presencia física del alumnado en algún momento del proceso de aprendizaje.

**PALABRAS CLAVE:** Universidad, másteres, educación a distancia, aprendizaje virtual, campus virtual.

## *ABSTRACT*

This paper presents the results of a study on the academic management of online master's degrees taught at Spanish attendance-based state universities. The study focused on the analysis of the distance learning modality to establish a typology of courses and their degree of virtualization. To gather data, a heuristic test was designed consisting of four fundamental dimensions: type of online learning platform, course description regarding the learning modality, simultaneity with other modalities, and the degree of virtualization. The results show that due to the lack of conceptual clarification, more than 60% of the masters offer a blended modality because they require the physical presence of the student at some point in the learning process.

***Keywords*:** *University, masters, distance education, virtual learning, virtual campus.*

## 1.    INTRODUCTION

The Bologna Declaration of 1999 has brought with it profound reforms to the European university system in order to adapt it to the requirements of the European Higher Education Area (EHEA) that has paved the way for an innovative teaching and «learning ecosystem» (Álvarez-Arregui et al., 2017). One of the main innovations in Spain is the adoption of a three-tier university education structure: undergraduate, master's, and doctorate degrees, and this marks the first official

recognition of master's degrees in Spain. According to the Spanish Ministry of Science, Innovation and Universities (Ministerio de Ciencia, Innovación y Universidades, 2019), the number of students enrolled in Masters degrees in Spanish state universities has steadily increased in recent years, from 68.791 in the academic year 2009-10 to 131.305 in 2017-18.

Moreover, the establishment of the EHEA has served to confer official status to education based on «distance» learning. Spanish universities have been estimated to offer an average 9.02% of non-attendance degrees, which accounted for an average 8.06% of all degrees from these universities (Píriz, 2015). A similar tendency has also been observed worldwide in higher education.

With reference to master's degrees, the official data on the evolution of the Spanish university system is currently unavailable. Of the 47 state universities, 30 offered 78 online master's degrees in the academic year 2015-16 (Mahou, López, Álvarez & Varela, 2016).

In spite of the substantial number of distance master's degrees, the scientific and educational community lacks systematic studies on this mode of education, and has a poor understanding of the process involved in the specific management of these courses and their basic functioning. This underscores the need for an in-depth analysis of the institutional and organizational framework of universities in order to obtain a more comprehensive understanding of the global context and implications involved in implementing online graduate and postgraduate degrees (Ginsberg, 2011; Knights & Clarke, 2014), in order to overcome specific issues.

The first step is to broaden our systemic understanding of the functioning of online master's courses, in order to determine precisely how Spanish state universities, view online education in terms of the design and implementation of

online master's degrees, and to establish a typology of degrees outlining the characteristics that define the different levels of virtual developmen.

## 2. REVIEW OF THE LITERATURE

The option of «distance» education is not a new phenomenon. The XX century has witnessed the rapid expansion of distance education (DE) as an alternative designed to replace rigid time-place, attendance-based education. This option allows learners to choose the learning mode that best suits their needs according to their geographical limitations, family and/or work commitments, physical impairment and/or other personal circumstances (Holmberg, 1995; Elliott & Kukula, 2007).

DE can be envisaged in many ways, but essentially the teacher and student are separated in time and space, and both use specific means to communicate with each other in the teaching-learning process. DE materials initially consisted of correspondence courses with written texts and exercises being the most common tools, and through time they have rapidly evolved with Information Communication Technologies (ICT), web 2.0, and semantic web technologies (Domingo & Marquès, 2011; Anderson & Dron, 2011).

The result of implementing ICT to educational and vocational training has given rise to the generic term of e-learning. Nevertheless, there is no definition of e-learning broadly accepted by the scientific community due to competing perspectives regarding the concept itself (Sangrà, Vlachopoulos & Cabrera, 2012). The term (in English usage) is used loosely, alluding to a diverse set of teaching practices, and is commonly employed synonymously with other terminology such as online course/learning, web-based learning, web-based training, distance learning, virtual classrooms, online instruction, distributed learning, and so forth (Ally, 2004;

Moore, Dickson & Galyen, 2011). The immaturity of this field of study is reflected in the multitude of terms that attempt to describe the role of ICT in educational and training environments, in the disparity of the often contradictory research results, and in the inability to consolidate the array of findings into a conceptually coherent theoretical framework (García-Aretio, 2014). There are numerous examples where the meaning assigned by researchers to terminology lack any consensus; thus, for some a term is synonymous, yet for others it has a distinctive meaning (Bates, 2005; Anohina, 2005).

Thus, a study on professionals with previous practical experience or involvement in research related to different types of learning environments found an incoherent and inconsistent use of terminology (Moore, Dickson-Deane & Galyen, 2011). Recently, a national survey of online learning and distance education in Canadian public post-secondary education has underscored "there is no general agreement on definitions in this field. Furthermore, online learning is a dynamic, fast-changing area of education" (Bates, 2018, pp. 8).

Ever since the implementation of the first e-learning initiatives, which were until recently mainly based on platforms, significant changes have taken place in terms of both technology and methodology such as the influence of social media on the daily lives and habits of users (Gros & García-Peñalvo, 2016). This has subjected e-learning to an ongoing process of evolution. For García Aretio (2018) the borderline distinguishing face-to-face from distance learning has become progressively blurred throughout the years, and currently both tend to converge and overlap.

Technological developments advance at a rapid pace, and the use of social web tools such as blogs, wikis, podcasts, and social networking have become widespread in formal education (Álvarez, 2012; Gómez, Roses, & Farias, 2012;

Cabero & Marín, 2014; García-Aretio, 2014; González-Martínez, Lleixà-Fortuño & Espuny-Vidal, 2016; Demir, 2017). Nevertheless, university e-learning platforms continue to be extensively used together with a broad spectrum of pedagogical approaches (Arnaldos et al., 2015). For example, since Moodle began in 2002, it has become the most widely used platforms worldwide (Graf & List, 2005; Ruiz & Romero, 2008; Area-Moreira, Sanabria-Mesa & González-Afonso, 2008; Martín & Rodríguez, 2012), and according to the Moodle Statics tool (moodle.net/stats), Spain ranks as the second country in the world according to the number of Moodle registered websites. Moodle is an alternative to commercial solutions such as Blackboard and WebCT, and is freely available for download under an Open Source licence.

## 3. RESEARCH METHOD

A descriptive research method was applied using comparative analysis of cases. This method consists of varying a phenomena in order to eliminate variables and secondary factors to derive what is constant and fundamental (Caïs, 1997). Thus, in line with Grosser (1973, in Nohlen 2006), three steps were undertaken: to make a comprehensible map of online master's degrees through analogy and contrast; to highlight the peculiarities of the map to obtain an in-depth view; and to systematize the phenomena, emphasising the differences and similarities between master's degrees, in particular the varying levels of virtualization.

A crucial aspect of this method was defining the proprieties and attributes of the cases under comparison (Castiglioni, 1997). Thus, key concepts were defined and a series of variables capable of «travelling» were established (Sartori, 1970), that is, variables that could be applied to different levels were selected for comparison. For this purpose, a heuristic test was designed (see appendix)

consisting of three study dimensions: academic organization, basic characteristics of the degree, and the level of online virtualization.

The first two dimensions were examined during the first stage of the study and served to generate a profile of the online masters offered by state attendance universities in Spain during the academic years 2009-10 and 2015-16. The third dimension of the heuristic test, the level of virtualization of the online mode, was assessed in the second stage of the study, and the results are presented in this paper. Owing to the profile and variety of cases, the virtual character of the master's degrees was examined in order to establish a typology of degrees according to the level of virtualization of the courses according to identified variations of phenomena that generate differential categories of online education. This dimension consisted of the following four variables:

- Online learning platform.
- Descriptor of the online mode: distance, non-attendance, online, or virtual.
- Overlapping modes.
- Level of virtualization. The degree of virtualization i.e., if virtualization of the masters was «full» or «partial».

The heuristic test was applied in 30 of the 47 Spanish state universities offering masters courses with face-to-face learning during the 2015-2016 academic year.

A total of 78 masters were assessed, and 15 of the 30 universities only offered one single masters. Rey Juan Carlos University accounted for the highest number of masters (13), with the Autónoma de Barcelona and Jaume I University coming second with 6 masters each, followed by Pompeu Fabra University and Rovira and Virgili University offering 5 each.

For this dimension data was collected from three main sources: the official university websites posting the degrees, the prospectuses from ANECA, and the database of the Registry of Universities in Spain (Registro de Universidades, Centros y Títulos, RUCT), Centres and Degrees of the Spanish Ministry of Education. Finally, the coordinators of masters programs were contacted via email when the information obtained from the previous sources was inaccurate, incomplete, or even contradictory.

## 4. ANALYSIS AND RESULTS OF THE PROFILING OF ONLINE MASTER'S DEGREES: LEVEL OF VIRTUALIZATION OF THE ONLINE COURSE

The data highlight that only 39.74% of the masters were considered to be strict online degrees in terms of not requiring the physical attendance of the student during the teaching-learning process. As for the universities offering more than one degree under the online mode, the data revealed that only the Autónoma de Barcelona, and Jaén University offered all of their masters fully online. In all of the other universities, the online mode was combined with activities requiring mandatory attendance, in particular Rey Juan Carlos University (9 out of 13 masters), and the Jaume I University (4 out of 6 masters).

The field of knowledge with the most full online degrees were Social Sciences and Law, Humanities, and Health Sciences with 12, 9, and 5 degrees, respectively. However, this distribution differed considerably in the case of interuniversity degrees, where the number of Humanities masters remained constant at 9 degrees, but Social Sciences and Law dropped to 9 degrees, and Health Sciences to 2.

Similarly, differences in the distribution were also observed in the percentages of full and partial online master's degrees in each field of knowledge. As shown in

Figure 1, though Social Sciences and Law were the fields of knowledge accounting for most of the online master's degrees, they were also the fields of knowledge with the lowest percentage of full online degrees in relation the total number of master's degrees offered. Thus, 12 of 38 degrees, that is, only 31.6% of the masters were fully online degrees. As for the Humanities, more than half of the masters were full online degrees (9 out of 17), whilst for the Social Sciences only 2 masters were full online degrees.

Figure 1. Percentage of full online masters and discipline
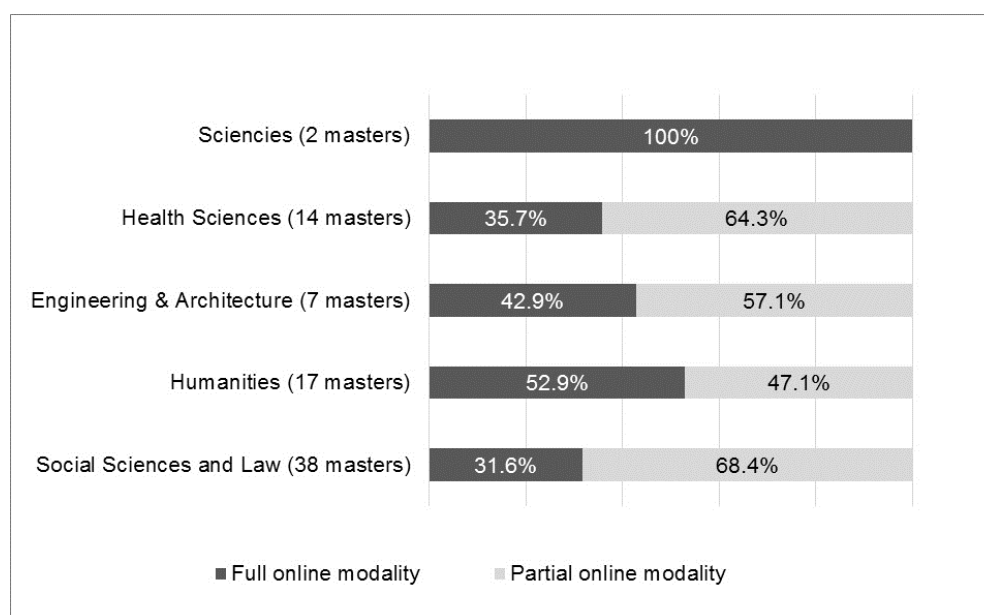


The significance of the data obtained in the present study becomes apparent when one examines how universities portray their virtual education in the prospectus of each master's degree. The most common descriptor was «virtual», accounting for 39.74% of cases, followed by «distance» (32.05%). In comparison, the most common descriptor for the online mode of education on the university websites was

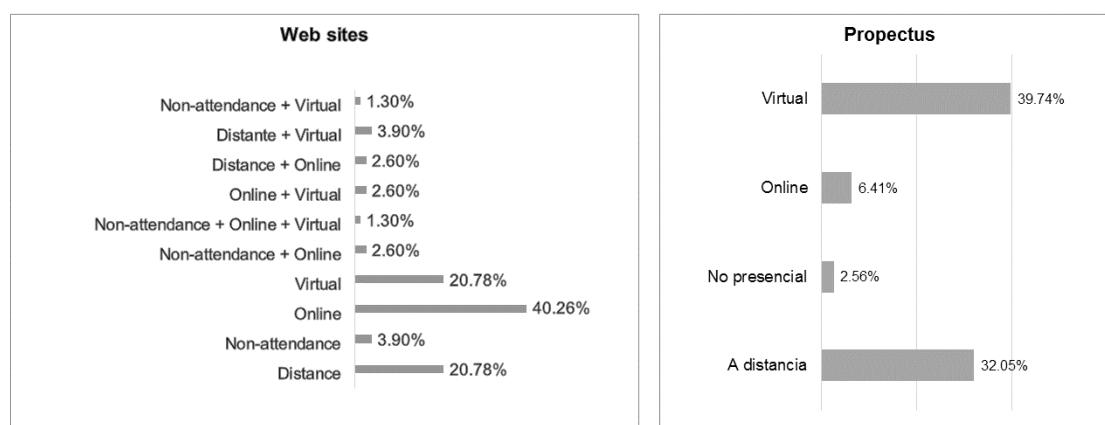«online» in 40.26% of the masters, followed by «virtual» (20.78%), and «distance» (20.78%). It is worth noting that 14.29% of the masters were described using a variety of terms such as «non-attendance», «online», «virtual» and/or «distance» (Figure 2).

Figure 2. Descriptor of the online mode of the master's degree in the websites and prospectuses of the universities.



Thus, if we examine the descriptors of the mode of online education of the master's degrees in relation to the field of knowledge, the term «online» was most frequent in masters in Social Sciences and Law, whereas the terms «online» and «virtual» were more common in the Humanities and Health Sciences.

As for learning platforms, 70.51% of the master's used the Moodle platform for managing the teaching-learning process, and this figure rose to 84% for masters under the full online mode. In comparison, the impact of other platforms such as Sakai or Blackboard Learning Sys was small, 10.26% and 6.41% of cases, respectively.

In terms of the level of student attendance, 39.74% were full online masters, whereas most online masters (60.36%) required the student's physical presence.

As a general rule, attendance was required in more than one activity, which was mainly the Defence of the Thesis (DT) (37.2%), followed by internships (30.8%), and specific evaluation activities (20.6%). Of a total of 23 master's degrees, only 8 required the attendance of the students in one activity, primarily the Defence of the Thesis DT (3 masters), internships (3 masters), and other activities (2 masters).

The master's degrees in Social Sciences or Law accounted for most of the cases requiring student attendance in all of the three types of activities under examination. However, internships were most frequent in Social Sciences and Law degrees (61.5%), primarily Law (5), and education (4); and the DT was most frequent in masters in Health Sciences (88.9%), and Humanities (87.5%).

Finally, the data revealed that 34.62% of masters had an overlapping online mode consisting of an attendance (23.08%), or semi-attendance mode (8.97%), or both simultaneously (2.56%). Thus, there was a small difference between full online masters (35.48%), and partial online masters (34.04%). As for the full online masters (31), 6 degrees had an overlapping online mode of attendance, 4 semi-attendance, and 1 both simultaneously. The partial online master's degrees followed the same pattern, 12 an overlapping online mode of attendance, 3 semi-attendance, and 1 both simultaneously.

## 5. DISCUSSION

The data analysed in this study assessed the overall level of virtualization of online master's degrees at state attendances universities in Spain from the academic years 2009-10 and 2015-16.

The results reveal that the main platform used by most master's degrees was Moodle, 70.51% of cases, with the figure rising to 84% in full online master's degrees. This result is in agreement with the findings of other studies (Graf & List, 2005; Ruiz & Romero, 2008; Area, Sanabria & González, 2008; Martín-Galán & Rodríguez-Mateos, 2012), confirming Moodle is overwhelmingly the leading digital environment in the Spanish university system. Moreover, the consolidation in recent years of what is commonly called the "Virtual Campus" in Spanish universities has enabled Moodle to become a rapidly expanding tool, where the online component complements and/or substitutes traditional methods of education (Mahou, López, Álvarez & Varela, 2016).

In spite of describing their degrees as «virtual» or «distance» in the university prospectus, and professing to be «online» on the university websites, this mode of education was partially implemented in more than 60 % of cases that require student attendance at some stage of the learning process, primarily for evaluation.

A plausible explanation for the low level of virtualization of online masters may reside in the terminological confusion resulting from e-learning being subjected to an ongoing process of evolution (Area-Moreira & Adell-Segura, 2009; Cabero, 2006; Moore, Dickson & Galyen, 2011; García-Peñalvo & Seoane, 2015); and the lack of official regulations and guidelines. For instance, though the legislative cornerstone of the Spanish university system i.e., Spanish Royal Decree 861/2010 (Real Decreto 861/2010) that modified Spanish Royal Decree 1393/2007 (Real Decreto 1393/2007), admits different types of education in Appendix I (attendance, semi-attendance, and distance), but neither Royal Decree gives precise definitions of the terms.

The Spanish National Agency for the Evaluation of Quality and Accreditation (ANECA) further exacerbates the ambiguity by allowing Universities to

indiscriminately use the terms «virtual» (39.74%), and «distance» (32.05%) as descriptors in the prospectuses of their Masters.

The only attempt by ANECA to clarify the concepts can be found in the definitions of both learning modes semi-attendance and «distance» cited in the ANECA Support Guide (ANECA, 2015). Notwithstanding, the definitions are generic and fail to clarify precisely the nature of either learning mode. Thus, the Support Guide defines «distance» learning in terms of where "the vast majority of learning activities outlined in the Syllabus do not require the student's physical presence at the learning institution awarding the certificate". Whereas semi-attendance is defined as when "the learning activities outlined in the Syllabus combine the requirement of the student's physical presence at the learning institution awarding the certificate with more student autonomy than in face-to-face learning" (ANECA, 2015, p.11).

Far from shedding light on the meaning of either learning mode, both definitions contribute to generate further confusion by placing the «distance» mode within the boundaries of semi-attendance by explicitly admitting that some «learning activities» may be carried out, without specifying the type or number that may effectively compromise the student's physical attendance.

The results of this study, in line with the findings of other authors (Bates, 2005; Anohina, 2005; Moore, Dickson & Galyen, 2011; García-Aretio, 2014), underscored the lack of conceptual clarification had generated an incoherent and inconsistent use of terminology to describe the teaching modality of the masters.

The data from the three public information sources examined in this study (university websites, the prospectuses of the masters obtained from ANECA, and the RUCT database) revealed several inconsistencies in the presentation and use of terminology. Whereas, in most cases the public information on each masters in the university prospectuses obtained from ANECA was presented clearly,

systematically, and ordered, in line with the RUCT database. However, the same was not true of the information provided on websites, which was presumably the main means for accessing future students, but was often found to be disorganized, fragmented, not intuitively accessible, and occasionally duplicated.

This may explain the discrepancy in the results obtained in the descriptors of the masters. Therefore, in the university prospectus obtained from ANECA and RUCT a homogeneous criterion was applied limiting to four the terms used to define the learning mode: "virtual" (39.74%), "distance" (32.05%), "online" (6.4%), and "non-attendance" (2.5%). In contrast, the websites of the master's degrees and the university websites showed substantial inconsistencies (up to 10 combinations) to define the learning mode of each masters. The highest percentage was for «Online» with 40.26% of cases (which did not correspond with the most frequently used term in the prospectuses «virtual» in 39.74% of cases), followed by "virtual" and "distance" (both 20.78%), and much lower percentages for the terms "non-attendance" (3.9%), and combinations or the indiscriminate use of both terms.

In order to address both the substantial increase in the number of new degrees taught under these learning modes, and the conceptual void, in 2018 The Spanish Network of Agencies for the Quality of Universities (Red Española de Agencias de Calidad Universitaria, REACU) published the Guidelines for the design and evaluation of undergraduate and master's degrees in non-attendance and semi-attendance education (REACU, 2018) which embraced the recommendations established by the *Working group on quality assurance and e-learning* of the *European Association for Quality Assurance in Higher Education* (ENQA) (Kerber, 2018). In contrast to the Spanish Royal Decree 1393/2007 and the *Support Guide*, this document aims to define the precise nature and features of the non-attendance mode by identifying two subtypes of non-attendance education: online and distance.

Undoubtedly, this clarification is essential given that the use of the term e-learning not only differs from one university system to another, but also differs within the same system itself, such as the Spanish university system, where the different universities have been inconsistent in their interpretation of this methodology. Nevertheless, the results of this study indicate this conceptual clarification has had little impact, judging by the variety of circumstances and situations prevalent in online masters in the Spanish university system.

Though Spanish masters use online learning platforms, mostly Moodle that enables distance access to contents and activities in line with Cabero (2006), and synchronous and asynchronous communication tools, the evaluation models implemented in most Master's degrees require the students' physical presence.

Evaluation models are a key element in the learning process, but they are also one of the didactic aspects of online education that have undergone little pedagogic change and innovation (Dorrego, 2006; Sánchez-Vera & Prendes-Espinosa, 2015). The growth in the number of online courses and programs in higher education institutions has not always been accompanied by a review of the criteria, processes, and strategies employed in the evaluation (Constantino & Llul (2010).

The present study has shown that the main variable influencing the level of virtualization of the masters was the level of student attendance in specific evaluation activities, either in the evaluation of competences in subjects, the defence of the thesis, or internships.

Thus, three levels of virtualization of master's degrees in the Spanish university system were identified according to the level of student attendance in the evaluation activities:

- High virtualisation. Masters degrees where the learning-teaching process did not require the physical attendance of the student to undertake the main evaluation

activities. The defence of the thesis was carried out using synchronic or asynchronic communication tools, and internships were undertaken on digital platforms, with attendance being restricted to exceptional circumstances.

- Intermediate virtualization. Masters degrees where the teaching-learning process was totally online for the evaluation tests and exams, but not for the defence of the thesis or for internships.

- Low virtualization. Masters degrees based on an online teaching-learning process for accessing learning content, resources, and activities, but the personal attendance of the student was required for exams and other evaluations, the defence of the thesis, and internships.

## 6. CONCLUSIONS

The new master's degrees resulting from the creation of the EHEA have witnessed an extraordinary rise both in the number of degrees and students registered (MEDC, 2019). Thus, online master's degrees represent one of the major innovations of the Spanish university system, and the tendency is for further growth in this learning modality.

In accordance with the aims of the present study, a map of online masters in the Spanish university system has been drawn, from which the following four conclusions may be derived:

- Moodle was the most extensively used platform for online masters.
- Of the total number master's degrees (78), the online modality was partially implemented in over 60% of cases, with student attendance required at certain stages of the teaching-learning process.

- Social Sciences, Law, Humanities, and Health Sciences were the areas of knowledge with the most online masters.

- The physical presence of student was primarily required for evaluation activities: exams, the defence of the thesis, and internships.

As for the analysis of the three main sources of information on the official masters (websites, university prospectuses from ANECA, and the RUCT database) have revealed certain inconsistencies in the presentation and use of terminology regarding e-learning. Though, the public information on the masters were presented clearly, systematically, and orderly in the prospectuses from ANECA in line with the RUCT database, the same was not true of the information presented in websites, which was often haphazard and hardly intuitively accessible.

The results of this study corroborated the incoherent and inconsistent use of terminology referring to online learning at Spanish state universities ("Virtual", "online", "distance", "non-attendance"), and this confusion was further exacerbated in the websites of each masters, which heightened the lack of any consensus or criterion in the definitions.

Moreover, the level of student attendance in certain evaluation activities was found to be the principal variable influencing the level of virtualization of the master's degrees. Thus, three levels of virtualization of masters in the public Spanish university system were identified: high virtualization not requiring the students' physical presence to undertake the main evaluation activities; intermediate virtualization, where the teaching-learning process and the evaluation were completely online, with the exception of the defence of the thesis and the internships; and low virtualization, where online learning involved access to contents, resources

and activities, but attendance was required for evaluation activities, the defence of the thesis, and internships.

Finally, this study has identified certain shortcomings in the state institutions supervising the quality of Spanish universities such as ANECA's failure to clearly distinguish the different learning modes, and the lack of guidelines for universities regarding attendance, and on how to approach the complex process of designing and implementing non-attendance courses, which have led to an array of scenarios that come into conflict with online education.

Finally, this study has identified certain shortcomings in the state institutions supervising the quality of Spanish universities such as ANECA's failure to clearly distinguish the different learning modes, and the lack of guidelines for universities regarding attendance, and on how to approach the complex process of designing and implementing non-attendance courses, which have led to an array of scenarios that come into conflict with online education.

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