

Urban morphological curricula in Spanish schools of architecture

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Abstract. *Urban morphological curricula in recently redesigned programmes in all 33 schools of architecture in Spain are examined. In an international context a comparative study is made of different courses using data available on university websites. Urban morphology is present in most compulsory urban studies modules, but these modules are rarely seen as relevant to architectural programmes and only a very few are fully dedicated to the study of urban form. The weak state of urban morphological curricula in Spanish architectural programmes is revealed. Change is urgently needed to provide future professionals with better knowledge and tools for research and practice.*

Keywords: urban morphological education, architectural education, Spain, European Higher Education Area, study of urban form

The ISUF Task Force on Research and Practice in Urban Morphology recommended that curricula in different countries should be compiled and published (Samuels, 2013, pp. 40-1). This paper is the first systematic attempt to explore on a national scale the place of urban morphology in higher education.

The first objective of creating and developing The European Higher Education Area (EHEA) was to adopt by 2010 a 'system of easily readable and comparable degrees' among the countries involved (European Ministers of Education, 1999). The significance of the present analysis relates not only to the exploration of the Spanish case but, perhaps more importantly, to the methodology that is developed, and its potential transferability to other countries.

In Spain, there is no specific academic degree in urban studies. Instead, several disciplines deal with urban phenomena in general and, on occasion, with urban morphology in particular. Nevertheless, only graduates in architecture or civil engineering

do any kind of planning or *urban work*, no matter the scale. This exclusive right is granted automatically when students graduate in either of these two disciplines.

We believe that those who thereby have the right to develop the urban fabric should have a good background in urban morphology, in the same way that doctors, especially surgeons, should have a good background in human anatomy. The present study of urban morphological curricula in Spain is limited to architectural programmes. It could have included civil engineering but, although historically a number of urban planners have been civil engineers – some of them as well known as Ildefonso Cerdá and Arturo Soria – at present it is architects who have the main role in the planning and building of the urban environment. Furthermore, a pilot study has shown that, in Spain, architectural programmes include a higher credit load of urban studies than civil engineering programmes.

Before analysing the place that urban morphology has within architectural curricula,

it is important to understand the place of urban studies. In a speech to the Congress of Spanish Architects, Moya (1996) stated that the 1970s modules in urban studies served as a supplement to architectural design studios, which were considered to be the core of the curricula. At that time, architectural students had the option of enrolling in a set of urban intensification modules during the sixth and final year of their studies, obtaining a type of 'urban specialist' degree in architecture. Moya suggested that, considering the quality of the modules and the percentage of architects that worked exclusively in this field, new curricula should avoid specialization and simply offer several elective modules that could be chosen freely by the students.

This 'old school' type of urban specialization had a strong legal, regulatory, economic and statistical orientation. The *urban block* of architectural programmes was progressively deprived of the study of urban form, urban history and urban sociology. Urban planning became an abstract and legalistic discipline both in academe and in the professional world (Terán, 1997).

Architectural programmes were redesigned during the 1980s and 1990s but urban modules remained uninviting and insufficient (Sánchez de Madariaga, 2001). The Bologna Declaration of 1999 led to a further round of restructuring. Sánchez de Madariaga made several claims about the previous curricula: first, the light load of urban modules could not guarantee an adequate training in this field; secondly, this was serious since graduates in architecture were deemed to have *full* professional planning competence; and finally, because of this, urban studies should not be left with merely a secondary role in the curricula.

Today, the transformation in curricula needed to conform to the EHEA has been carried out in all 33 Spanish schools of architecture. As part of this, all modules are assigned a number of credits, according to the European Credit Transfer and Accumulation System (ECTS), which is the standard for comparing the performance and achievement of higher education students across the

European Union and other countries. One academic year corresponds to 60 ECTS credits, equivalent to between 1500 and 1800 hours of study. This general redesigning of the programmes makes it timely to evaluate them and to explore the current urban morphological curriculum.

To clarify the framework in which the new programmes have been designed it is important to note that, in the case of architecture, at least 75 per cent of the total credit load (226 credits from a total of 300) is compulsory, and that these 226 credits are to be distributed as follows: 60 for basic sciences and drawing; 60 for construction techniques, structural design and building systems; 100 for architectural design, urban studies and history; and 6 for the final project (Boletín Oficial del Estado, 2010). In many cases, half of the required 100 credits are dedicated to architectural design, one quarter to urban studies and the other quarter to history.

At the end of the twentieth century, urban morphology was considered by Moudon (1997) to be an 'emerging' interdisciplinary research field and, in the context of constant change and evolution of urban and territorial patterns, it was argued that it should have considerable significance and potential for appropriate professional and research development (Larkham, 2005). Nevertheless, our own experience as researchers and academics in both architecture and civil engineering, and our different academic backgrounds, leads us to think that architectural schools in Spain offer quite a modest urban morphology curriculum.

Our objective here is to undertake a quantitative and qualitative review of urban morphology curricula within Spanish architectural programmes and, in doing so, to develop a method that others can apply to analyse the situation in other regions and programmes. The remainder of the paper is arranged in four parts. The first provides an overview of urban morphology in Spain; the second describes our research methodology, data and sources; the third analyses morphological curricula within architectural programmes in Spain; and the final part synthesizes and offers conclusions.

An overview of Spanish urban morphology

Vilagrassa (1998) points out two main characteristics of the study of urban form in Spain: first, the links to development in other countries; and secondly, the influence of a number of academic fields, particularly at the end of the twentieth century, in giving rise to a consolidated discipline of urban morphology.

In the case of the first of these he notes in particular the grounding of Spanish urban morphology in 'French urban sociology, Anglo-Saxon urban geography, and Italian architecture and urban history' (Vilagrassa, 1998, p. 35). Indeed many authors (including Gauthiez, 2004; Moudon, 1997; and Vilagrassa, 1991) recognize that a small number of 'schools' have established the main theoretical foundations of the discipline, having links to many parts of the world. Such 'schools' include the Anglo-Saxon school (which includes M. R. G. Conzen, B. Hillier, A. B. Jacobs, K. Kropf, P. J. Larkham, K. Lilley, T. R. Slater and J. W. R. Whitehand), the Italian school (including C. Aymonino, G. Caniggia, G. Cataldi, M. G. Corsini, G. L. Maffei, P. Maretto, S. Muratori, A. Rossi and G. Strappa), the French school (including J. Castex, J. C. DePaule and P. Panerai) and, although not currently so active, the German-Viennese school (including H. Bobek, M. R. G. Conzen, H. Hassinger, E. Lichtenberger and O. Schlüter).

The second characteristic, Vilagrassa (1998, p. 40) refers to as 'the consolidation of tradition' in the study of urban form in Spain. It was supported by a significant number of works developed from different academic fields, and constituted a movement away from the early dependency on foreign ideas. Table 1 lists the main Spanish contributions to three stages in the development of urban morphology identified by Vilagrassa: formation of an academic field (from the 1940s to the 1960s), political crisis and intellectual opening (the 1970s), and consolidation of an academic tradition (in the 1980s and 1990s).

The main contributions so far in the twenty-first century are listed in Table 2. We suggest that this body of work forms a fourth

stage, extending Vilagrassa's analysis. The fact that there has not been any increase in the amount of academic production in the field during this fourth stage makes us wonder if the Spanish 'tradition' is not as solid as we previously thought, and that perhaps research on urban morphology curricula might help to clarify this.

Vilagrassa (1991) expressed the view that, in the Spanish case, urban morphology is nowhere but also everywhere. By this he meant that the study of urban form is implicit in many publications, but not central to their main purpose. It is hard to share knowledge and research on similar or even identical concepts between disciplines, owing to the different approaches and paucity of interdisciplinary communication. We suggest that the different academic backgrounds of the present authors, namely architecture, civil engineering and geography may help to reduce this problem.

Methodology, data and sources

In order to characterize current urban morphological curricula in Spanish schools of architecture, we have collected information from all 33 universities in the country offering a degree in architecture. Responses have been sought to the following questions. First, what are the absolute and relative weights within architectural programmes of urban studies modules and modules related to urban morphology? Secondly, how are these two types of modules distributed within the 5 years of higher education? Thirdly, what is the emphasis in these modules? Finally, how specific and up-to-date are the reference lists of modules related to urban morphology?

To answer these questions a range of information was gathered from the web page of each university (Table 3) and a number of analyses undertaken.

1. Compilation of the compulsory, elective and total number of credits for (a) each architectural programme, (b) the different urban studies modules included in each

Table 1. Three stages in twentieth-century Spanish urban morphology, based on Vilagrasa (1998)

1939-1970: formation of the academic tradition

- Terán, M. (1942) 'Calatayud, Daroca y Albarracín. Notas de geografía urbana', *Estudios Geográficos* 6, 163-202.
Casas, J. M. (1946) *Esquema de Geografía urbana de Jaca*.
Terán, M. (1946) 'Sigüenza. Estudio de geografía urbana', *Estudios Geográficos* 25, 633-66
Terán, M. (1961) 'Dos calles madrileñas: las de Alcalá y Toledo', *Estudios Geográficos* 84-5, 375-476.
Bosque, J. (1962) *Geografía urbana de Granada*.
Bohigas, O. (1963) *Entre el Plan de Cerda i el barraquisme*.
Ribas, P. (1964) 'Història recent de la urbanística als Països Catalans', in Bardet, G. (ed) *L'urbanisme* 137-61.
García, J. et al. (1968) *Resumen histórico del urbanismo en España*.
Martorell, V. et al. (1970) *Historia del urbanismo en Barcelona. Del Plan Cerdá al área metropolitana*.
Torres, L. (1970) *Ciudades hispanomusulmanas*.
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1970s: political crisis and intellectual opening

- Solá-Morales, M. (1972) *Las formas de crecimiento urbano*.
García, J. (1974) *Crecimiento y estructura urbana de Valladolid*.
Capel, H. (1975) *Capitalismo y morfología urbana en España*.
Busquets, J. (1976) *La urbanización marginal en Barcelona*.
Ruiz, E. (1976) *Ordenación y transformaciones urbanas del casco antiguo madrileño durante los siglos XIX y XX*.
Chueca, F. (1977) *La destrucción de legado urbanístico español*.
Bonet, J. (1978) *Morfología y ciudad: urbanismo y arquitectura durante el Antiguo Régimen en España*.
Linazasoro, I. (1978) *Permanencias y arquitecturas urbanas: las ciudades vascas de la época romana a la Ilustración*.
Más, R. (1978) 'El plano parcelario del sector noroeste del ensanche de Madrid', *Ciudad y Territorio* 2, 25-48.
Noguera, J. (1978) *Los ensanches menores en la región de Barcelona*.
Terán, F. (1978) *Planeamiento urbano en la España contemporánea. Historia de un proceso imposible*.
Más, R. (1979) 'Tipos de viviendas en el ensanche nordeste de Madrid', *Estudios Geográficos* 152, 307-46.
-

1980s & 1990s: consolidation of a tradition

- Más, R. (1982) *El barrio de Salamanca. Planeamiento y propiedad inmobiliaria en el ensanche de Madrid*.
Teixedor, M. J. (1982) *Valencia. La construcción d'una ciutat*.
Brandis, D. (1983) *El paisaje residencial de Madrid*.
Río, I. del (1984) *Industria y residencia en Villaverde. Génesis de un paisaje urbano en la periferia de Madrid*.
Gómez, A. (1986) 'La industria de la construcción residencial: Madrid, 1820-1935', *Moneda y Crédito* 177, 53-81.
Claverol, L. and Vilagrasa, J. (1987) *Historia urbana i intervenció al centre històric*.
Estébanez, J. (1989) *Las ciudades, morfología y estructura*.
Tafunell, X. (1989) 'La construcción residencial barcelonesa y la economía internacional. Una interpretación sobre las fluctuaciones de la industria de la vivienda en Barcelona durante la segunda mitad de siglo XIX', *Revista de Historia Económica* 2, 389-437.
Martín, C. (1990) *Córdoba en el siglo XIX. Modernización de una trama histórica*.
Fernández, J. A. (1991) *Promoción oficial de vivienda y crecimiento urbano de Valladolid*.
Rivas, J. L. de las (1992) *El espacio como lugar. Sobre la naturaleza de la forma urbana*.
Galiana, L. (1995) *Suelo público y desarrollo urbano en Madrid*.
López de Lucio, R. and Hernández, A. (1995) *Los nuevos ensanches de Madrid. Morfología residencial de la periferia reciente, 1985-1993*.
Ferrer, A. (1996) *Els polígons de Barcelona. L'habitatge massiu i la formació de l'àrea metropolitana*.
Mas, R. (1996) 'La promoción inmueble en España (1846-1995)', *Ciudad y Territorio, Estudios Territoriales* 107-8, 241-69.
Vilagrasa, J. (1997) *Vivienda y promoción inmobiliaria en España*.
Esteban, J. (1998) *Elementos de ordenación urbana*.
Monclús, J. and Oyón, J. L. (1998) *Elementos de composición urbana*.
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Table 2. A fourth stage in Spanish urban morphology**Since 2000: consolidation of a tradition?**

- Capel, H. (2002) *La morfología de las ciudades. Vol. I Sociedad, cultura y paisaje urbano.*
- Capel, H. (2002) *La morfología de las ciudades. Vol. II Aedes facere: técnica, cultura y clase social en la construcción de edificios.*
- Busquets, J. (2004) *La construcción urbanística de una ciudad compacta.*
- López, J. (2004) *La ciudad construida: historia, estructura y percepción en el conjunto histórico de Sevilla.*
- López de Lucio, R. et al. (2004) *Guía del urbanismo de Madrid: s. XX.*
- Trachana, A. (2008) *Arquitectura y construcción de la forma urbana.*
- Bielza de Ory, B. (2011) *El tema de la morfología urbana en la historia del pensamiento geográfico.*
- Falcon, M. I. (2011) *Zaragoza en el siglo XV: morfología urbana, huertas y término municipal.*
- Tarduchy M. J. (2011) *Forma y ciudad. En los límites de la arquitectura y el urbanismo.*
- Lois, R. (2012) *Los espacios urbanos: el estudio geográfico de la ciudad y la urbanización.*
- Ureña, J. M. et al. (2012) *El hábitat unifamiliar en ciudades históricas de regiones metropolitanas policéntricas: el caso de Toledo.*
- Capel, H. (2013) *La morfología de las ciudades. Vol. III Agentes urbanos y mercado inmobiliario.*
- Zárate, M. (2014) *En torno a la ciudad y la forma urbana.*

- programme, and (c) those modules dealing with urban morphology.
2. Compilation and analysis of the average credit distribution of urban studies modules and modules related to urban morphology in the 5 years of study of Spanish architectural programmes, distinguishing between compulsory and elective modules.
 3. Acquisition and analysis of the content of programmes dealing with urban morphology, distinguishing between explicit urban morphological content and content related to urban morphology. The amount of urban morphological content was categorized as (a) very high (more than 75 per cent); (b) high (50 – 75 per cent); (c) medium (25 – 49 per cent); and (d) low (less than 25 per cent).
 4. Acquisition of reference lists of modules related to urban morphology and analysis of them in terms of the cultural origin and recurrence of the texts cited.

Analysis of urban morphological curricula in Spanish architectural programmes*Weights of urban studies modules and modules related to urban morphology*

Although architectural programmes could have 25 per cent of elective credits (Boletín Oficial del Estado, 2010), the maximum percentage offered is 17 per cent, given at just one university, Ramón Llull. The next highest value is only 10 per cent (Table 4). In fact, the mean value for the programmes as a whole is only 6 per cent – an extremely low level of electability.

The relative weight of compulsory urban studies modules is as low as 10 per cent. Considering the low level of electability of the programmes in general, this is very modest. But the current situation is even worse: the mean percentage of maximum urban studies credits for which students can register is only 13 per cent. So not only is the presence of urban studies extremely low, but it is not

Table 3. Spanish universities offering programmes in architecture: level of module information available online, webpages, and the years of establishment of first and current programmes

University	Module Info.	Webpage	Programme	
			First	Current
Alcalá de Henares	++	https://portal.uah.es/portal/page/portal/arquitectura/	1999	2013
Alfonso X el Sabio *	++	http://www.uax.es/grado-en-arquitectura.html	1999	2007
Alicante	++	http://www.eps.ua.es/es/fundamentos-arquitectura/	1984	2010
Antonio de Nebrija *	++	http://www.nebrija.com/carreras-universitarias/arquitectura/grado-arquitectura.php	2009	2011
Camilo José Cela *	++	http://www.ucjc.edu/estudios/areas/arquitectura-diseno-y-tecnologia/	2000	2010
Cardenal Herrera CEU *	++	http://www.uchceu.es/estudios/grado/arquitectura.aspx	2002	2010
Castilla-La Mancha	++	http://www.uclm.es/to/arquitectura/	2010	2010
Católica San Antonio de Murcia *	++	http://www.ucam.edu/estudios/grados/arquitectura-presencial	2008	2008
Europea de Madrid *	++	http://madrid.universidadeuropea.es/estudios-universitarios/estudiar-arquitectura-y-edificacion	2001	2013
Francisco de Vitoria *	++	http://www.ufr.es/grado-en-arquitectura/	2006	2011
Gerona	++	http://www.udg.edu/politecnica/EstudiaunGRAUaPolitecnica/EstudisdeGrau/Arquitectura/tabid/21152/language/es-ES/Default.aspx	2005	2010
Granada	++	http://www.ugr.es/pages/centros/escuelas/ets_arquitectura	1995	2011
Instituto de Empresa *	--	http://www.ie.edu/es/universidad/estudios/oferta-academica/grado-arquitectura	1999	2009
Internacional de Cataluña *	++	http://www.uic.es/es/escuela-arquitectura	1996	2009
La Coruña	++	http://www.udc.gal/centros_departamentos_servizos/centros/detalleCentro/?codigo=630	1973	2011
Las Palmas de Gran Canaria	++	http://www.etsa.ulpgc.es/	1973	2010
Málaga	++	http://www.uma.es/grado-en-arquitectura/	2005	2011
Navarra *	++	http://www.unav.edu/web/escuela-tecnica-superior-de-arquitectura	1964	2007
País Vasco	++	http://www.ehu.es/es/web/arkitektura	1977	2014
Politécnica de Cartagena	++	http://www.upct.es/estudios/grado/5011/index.php	2008	2007
Politécnica de Cataluña (Barcelona)	++	http://www.upc.edu/aprender/estudios/grados/estudios-de-arquitectura-barcelona-etsab	1875	2010
Politécnica de Cataluña (Vallés)	++	http://www.upc.edu/aprender/estudios/grados/estudios-de-arquitectura-sant-cugat-del-valles-etsav	1973	2014
Politécnica de Madrid	+	http://etsamadrid.aq.upm.es/	1844	2010
Politécnica de Valencia	++	http://www.upv.es/entidades/ETSA/	1966	2010
Pontificia de Salamanca *	--	http://www.upsam.es/index.php?Mod=Estudios&Section=Mostrar&IdEstudio=1646&Lang=es	2005	2010
Ramón Llull *	++	http://www.salleurl.edu/?mvchandler=portals&action=start&showingIndex=true	1997	2011
Rey Juan Carlos	++	http://www.urjc.es/estudios/grado/arquitectura/fundamentos_arquitectura.html	2011	2013
Rovira i Virgili	++	http://www.urv.cat/universitat/centres_departaments/es_etsa.html	1991	2010
San Jorge *	++	http://www.usj.es/estudios/oficiales/grados/arquitectura	2009	2010
San Pablo CEU *	++	http://www.uspceu.com/es/facultades-escuelas/escuela-politecnica-superior/index.php	2001	2011
Sevilla	++	http://www.etsa.us.es/	1958	2012
Valladolid	++	http://www3.uva.es/arquitectura/	1968	2007
Zaragoza	+	http://www2.ulpgc.es/index.php?pagina=ea&ver=inicio	2008	2012

* Private Institution

-- Name and number of credits; + Name, number of credits and description / content; ++ Name, number of credits, description / content and reference list

Table 4. ECTS credit weight of architectural programmes (AP), urban studies modules (US) and modules related to urban morphology (UM)

University	Architectural Programme (AP)				Urban Studies Modules (US)				Urban Morphology Modules (UM)					
	AP Total (1)	AP Comp.	AP Elective	% of AP Total	US Comp.	AP Total Elective	US Elective	% of AP Total	US Comp.	AP Total	US Elective	US Max.	% of AP Total	US Comp.
Alcalá de Henares	291	261	30	10	24	8	0	24	8	2+0	12	4	50	50
Alfonso X el Sabio *	300	283.5	16.5	6	18	6	36	24	8	1+0	9	3	38	50
Alicante	300	288	12	4	36	12	0	36	12	1+0	6	2	17	17
Antonio de Nebrija *	282	276	6	2	12	4	0	12	4	1+0	6	2	50	50
Camilo José Cela *	300	288	12	4	24	8	18	36	12	2+0	12	4	33	50
Cardenal Herrera CEU *	294	288	6	2	30	10	6	36	12	3+0	18	6	50	60
Castilla-La Mancha	300	277.5	22.5	8	33	11	9	42	14	3+0	15	5	36	45
Católica San Antonio de Murcia *	294	285	9	3	22.5	8	4.5	27	9	3+0	13.5	5	50	60
Europea de Madrid *	270	258	12	4	18	7	22.5	30	11	3+1	18	7	60	100
Francisco de Vitoria *	300	288	12	4	18	6	0	18	6	2+0	12	4	67	67
Gerona	300	270	30	10	30	10	9	39	13	2+1	12	4	31	40
Granada	294	276	18	6	30	10	12	42	14	2+0	12	4	29	40
Instituto de Empresa *	300	270	30	10	18	6	NA	NA	NA	NA	NA	NA	NA	NA
Internacional de Cataluña *	300	287.5	12.5	4	17.5	6	NA	30	10	2+0	11.5	4	38	66
La Coruña	300	282	18	6	30	10	9	39	13	3+0	18	6	46	60
Las Palmas de Gran Canaria	300	292.5	7.5	3	36	12	4.5	41	14	3+0	13.5	5	33	38
Málaga	300	294	6	2	30	10	0	30	10	2+0	12	4	40	40
Navarra *	300	282	18	6	24	8	48	42	14	4+0	24	8	57	100
País Vasco	291	261	30	10	31	11	15	50	16	2+0	7	2	15	23
Politécnica de Cartagena	300	276	24	8	24	8	12	36	12	2+0	15	5	42	63
Politécnica de Cataluña (Barcelona)	300	270	30	10	30	10	22.5	53	18	4+2	28.5	10	54	95
Politécnica de Cataluña (Vallés)	294	264	30	10	26	9	20	67	16	2+0	10	3	22	38
Politécnica de Madrid	294	282	12	4	24	8	12	36	12	2+2	24	8	67	100
Politécnica de Valencia	300	276	24	8	33	11	24	57	19	3+0	27	9	47	82
Pontificia de Salamanca *	300	288	12	4	27	9	0	27	9	NA	2	1	7	7
Ramón Llull *	300	249	51	17	48	16	6	54	18	1+0	6	2	11	13
Rey Juan Carlos	294	288	6	2	37.5	13	0	38	13	2+0	9	3	24	24
Rovira i Virgili	300	270	30	10	96	32	0	96	32	2+0	24	8	25	25
San Jorge *	294	270	24	8	18	6	24	42	14	5+1	30	10	71	167
San Pablo CEU *	300	294	6	2	24	8	3	27	9	2+0	6	2	22	25
Sevilla	294	276	18	6	24	8	18	42	14	2+0	12	4	29	50
Valladolid	300	282	18	6	30	10	6	36	12	3+0	15	5	42	50
Zaragoza	294	270	24	8	24	8	6	30	10	3+0	18	6	60	75
Mean :	296	278	19	6	29	10	10	38	13	3+0	14	5	39	55

* Private institution (1) Not including Final-Year Design Project ECTS (2) Compulsory modules + Elective modules Column highest values are bold

possible for students of architecture to significantly increase their personal curricula in urban studies. In general the percentage of urban studies elective modules offered is just 58 per cent of the total number of required elective credits.

There is one exceptional programme with 32 per cent of compulsory credits in urban studies (Rovira i Virgili University) but it offers no elective credits in this field. With this exception, the maximum offer is below 20 per cent, and only five are above 15 per cent: País Vasco, Politècnica de Valencia, Ramón Lull and Politècnica de Catalunya (at both locations, Barcelona and Vallés). All are located in some of the most densely-populated Spanish regions.

The average architectural programme in Spain includes only 14 credits – about three modules – dealing with urban morphology, namely 5 per cent of the total credits but 55 per cent of the compulsory credits in urban studies. It seems that those deciding the specific content of the modules in urban studies consider urban morphology to be an important part of this field of knowledge. In fact, almost all modules containing urban morphology are compulsory. Among the different universities, there is a group of six offering 24 to 30 credits related to urban morphology: Politècnica de Madrid, Politècnica de Catalunya (Barcelona), Navarra, Rovira i Virgili and San Jorge universities. The first four are among the five longest-established architectural programmes.

Distribution of urban studies modules and modules related to urban morphology in the 5 years of higher education

It is usually in the second year that architectural students are introduced to urban phenomena, mainly through modules dealing with urban morphology. On average, these modules comprise 80 per cent of urban studies credits (4.3 out of 5.4). In the third year, the urban content reaches 8.1 credits, 5.5 of which are related to urban morphology. However,

during the final 2 years, though the available urban credits reach 12.1 and 12.8, the presence of urban morphology decreases to 3.4 and 1.3 (that is, 28 and 10 per cent respectively).

Degree of emphasis on urban morphology

Less than 5 per cent of the credits in Spanish architectural programmes are related to urban morphology: 458 credits spread over 83 modules. Though these are modules in which the study of urban form plays a role, this does not necessarily mean that they are purely urban morphology modules.

The available information allows a content analysis of 78 of the modules. The units into which modules were grouped were divided into three categories according to their content: (a) explicit urban morphology, (b) related to urban morphology, and (c) unrelated to urban morphology. The content was considered to be *explicitly* morphological if it included any of the following terms or forms derived from them or synonyms with an analytical purpose: built environment, city form, city shape, constructed space, land use, plot, morphogenetic, morphology, open space, street, urban configuration, urban fabric, urban form, urban settlement, urban shape, urban structure and urban tissue. Content was considered *related to* urban morphology when, despite none of the above terms being present, urban morphology was implicit.

In an initial analysis explicitly urban morphological content was classified as very high (more than 75 per cent), high (50 – 75 per cent), medium (25 – 49 per cent) or low (less than 25 per cent). Only 16 per cent of modules have high or very high explicit content, and 54 per cent have low explicit content.

In a further analysis content is considered that is both explicitly urban morphological and just related to urban morphology, using the same definitions of very high, high, medium and low. With this wider perspective, half of the modules have a high or very high content, and only 10 per cent have low content.

Specificity and cultural influences of reference lists of modules related to urban morphology

Of the 83 modules dealing with urban morphology, 57 (69 per cent) provide online access to their lists of recommended references. These lists include 900 references of which 160 (18 per cent) explicitly deal with urban morphology or are very closely related to it.

Allowing for repetitions between modules, there are 48 different references. These have been analysed in terms of the number of reference lists in which they are included and the language in which they were first published or their cultural origin (Table 5). The analysis reveals two striking findings.

First, it seems there is no well-established subject-level bibliography, since there is a very low recurrence of references. Eighty-four per cent of the references are included in less than 10 per cent of the lists and only two references are included in more than 15 per cent of the lists. The two references are *Las formas de crecimiento urbano* by Solà Morales (1997) (in 33 per cent of the lists) and the Spanish version of *History of urban form: prehistory to Industrial Revolution* (Morris, 1979) (in 28 per cent of the lists). In our view, these are the only two that can be considered to have a significant presence.

Secondly, there is a lack of up-to-date references that are not specifically Spanish. Although 41 per cent of the 160 listed references are not Spanish in origin, 86 per cent of these are translations into Spanish. Unfortunately this means that almost everything that is not translated is ignored, leading to an outdated bibliography with important gaps in the foreign literature. There are a few works by French and Italian authors, but it is striking that the Anglo-American and German schools of urban morphology are widely ignored.

Conclusion

A number of conclusions can be drawn about urban morphological curricula in Spanish

schools of architecture. First, it is evident that the recently redesigned architectural programmes contain relatively few urban studies modules and provide little student choice. This means that future professionals with key responsibilities for managing the built environment are likely to have inadequate knowledge of urban phenomena. There is a mismatch between higher education and what is required in practice.

The very low weight of urban morphology modules in the architectural curricula – on average lower than 5 per cent – is a major concern. However, more than half the credits in urban studies are *related to* urban morphology, and these modules are largely compulsory. They are mainly taught during the second and third years of study, which suggests that they are considered fundamental. But the weight attached to them declines in the final two years, which means that students are not offered the chance to explore urban morphology in depth.

Only 16 per cent of modules dealing with urban morphology had half or more of their content explicitly dealing with it. In most of the modules, urban morphology is studied before students undertake other more design-oriented parts of the modules. There are very few examples in which the module is dedicated to the study of urban form itself. This might lead students (and future architects) to perceive urban morphology as merely a tool in understanding a particular case, without appreciating its wider significance.

Analysis of lists of references suggests that there is not a well-established bibliography of urban morphology in Spanish academia. Moreover, there is little awareness of foreign contributions that have not been translated into Spanish. This is a reflection of the state of research in urban morphology in Spain, which is frequently focused on particular cases and is largely carried out by researchers or research groups with low levels of interaction between different disciplines and institutions. The creation of a common discussion forum would help to rectify this.

Finally, it is clear that urban morphology in particular (and urban studies in general) is

Table 5. Recurrence and cultural origin of urban morphology references

Author(s), (Year of publication), Original Title or English Title if there is an English version	Times listed	Cultural origin
Alexander, C. (1977) <i>A pattern language: towns, buildings, construction.</i>	1	English*
Aymonino, C. (1975) <i>Il significato delle città.</i>	5	Italian*
Boaga, G. (1977) <i>Progettazione del traffico e forma urbana.</i>	3	Italian*
Bonet, A. (1978) <i>Morfología y ciudad. Arquitectura y urbanismo durante el Antiguo Régimen en España.</i>	1	Spanish
Busquets, J. (2004) <i>Barcelona. La construcción urbanística de una ciudad compacta.</i>	2	Spanish
Busquets, J. and Correa, F. (2006) <i>Ciudades: X formas: una nueva mirada hacia proyecto urbanístico.</i>	3	Spanish
Caniggia, G. and Maffei, G. L. (1979) <i>Architectural composition and building typology.</i>	1	Italian*
Capel, H. (1975) <i>Capitalismo y morfología urbana en España.</i>	3	Spanish
Capel, H. (2002, 2005, 2013) <i>La morfología de las ciudades. Vol. I, II, III.</i>	4	Spanish
Castex, J. et al. (1980) <i>Versailles, lecture d'une ville.</i>	1	French*
Enguita, A. and Higuera, E. (2008) <i>La ciudad contemporánea: análisis de su génesis y estructura.</i>	2	Spanish
Esteban, J. (1999) <i>Proyectos de ensanche en las ciudades del entorno de Barcelona.</i>	1	Spanish
Esteban, J. and Noguera, J. (1980) <i>Elementos de ordenación urbana.</i>	7	Spanish
Ezquiaga, J. M. (1990) <i>Formas construidas, formas del suelo. Reflexiones en torno a los nuevos, proyectos de extensión residencial.</i>	2	Spanish
Ferrer, A. (1996) <i>Els polígons de Barcelona. L'habitatge massiu i la formació del l'area metropolitana.</i>	2	Spanish
Font, A. (2007) <i>Morfologías metropolitanas contemporáneas de baja densidad.</i>	1	Spanish
García, A. (1968) <i>Resumen histórico del urbanismo en España.</i>	1	Spanish
Hernández, A. and López de Lucio, R. (1995) <i>Los nuevos ensanches de Madrid. Morfología residencial en la periferia, 1985-1993.</i>	1	Spanish
Komossa, S. et al. (2005) <i>Atlas of the Dutch urban block.</i>	2	English
Kostof, S. (1991) <i>The city shaped: urban patterns and meanings through history.</i>	3	English
Kostof, S. and Castillo, G. (1992) <i>The city assembled: the elements of urban form through history.</i>	1	English
Lewis, D. N. (1971) <i>The growth of cities.</i>	1	English*
López de Lucio, R. (1999) <i>Madrid: la transformación de la ciudad en veinte años de ayuntamientos demográficos 1979-1999.</i>	1	Spanish
López de Lucio, R. (2011) <i>Morfología y características de las nuevas periferias. Nueve paisajes residenciales en la región urbana de Madrid.</i>	1	Spanish
Lynch, K. (1959) <i>The image of the city.</i>	1	English*
Marshall, S. (2004) <i>Streets and patterns.</i>	1	English
Martí, C. (2000) <i>Las formas de la residencia en la ciudad moderna.</i>	4	Spanish
Martí, L. et al. (1972) <i>Estructura del espacio urbano.</i>	2	Spanish
Monclús, F. J. and Oyón, J. L. (1998) <i>Elementos de composición urbana.</i>	1	Spanish
Moneo, R. (1978) <i>On typology.</i>	2	Spanish
Morris, A. E. J. (1979) <i>History of urban form: prehistory to Industrial Revolution.</i>	16	English*
Panerai, P. R. et al. (1977) <i>Urban forms: the death and life of the urban block.</i>	7	French*
Panerai, P. R. et al. (1980) <i>Éléments d'analyse urbaine.</i>	3	French*
Panerai, P. R. et al. (1999) <i>Urban analysis.</i>	1	French*
Pérez, J. (2005) <i>Manzanas, bloques, casas: formas construidas y formas de suelo.</i>	5	Spanish
Pérez, J. (2008) <i>Elementos del proyecto urbano.</i>	1	Spanish
Rasmussen, S. E. (1937) <i>London, the unique city.</i>	1	English*
Rasmussen, S. E. (1951) <i>Towns and buildings: described in drawings and words.</i>	1	English*
Rossi, A. (1984) <i>The architecture of the city.</i>	8	Italian*
Rowe, C. and Koetter, F. (1984) <i>Collage city.</i>	8	English*
Sitte, C. (1889) <i>The art of building cities: city building according to its artistic fundamentals.</i>	6	German*
Solá-Morales, M. (1971) <i>Las formas de crecimiento urbano.</i>	19	Spanish
Solá-Morales, M. (1982) <i>Siglo XIX: Ensanche y saneamiento de ciudades.</i>	5	Spanish
Solá-Morales, M. (2008) <i>De cosas urbanas.</i>	5	Spanish
Tarcuchi, M. J. et al. (2011) <i>Forma y ciudad. En los límites de la arquitectura y el urbanismo.</i>	6	Spanish
Terán, F. (1989) <i>La ciudad hispanoamericana: el sueño de un orden.</i>	1	Spanish
Terán, F. (1999) <i>Historia del urbanismo en España en los siglos XIX y XX.</i>	3	Spanish
Ureña, J. M. et al. (2012) <i>El hábitat unifamiliar en ciudades históricas de regiones metropolitanas policéntricas: el caso de Toledo.</i>	3	Spanish

Note: some references listed here as Spanish were first published in Catalan

* translated into Spanish

currently a marginal field in Spanish architectural programmes. Rectifying this could be achieved in various ways. The most immediate way of alleviating the problem would be by increasing the presence and depth of urban morphology in urban studies modules. However, in the long term we believe it is necessary to create graduate programmes specifically in urban studies in which students are better trained in urban morphology. This implies providing students and tomorrow's professionals with: (a) a deeper theoretical background; (b) an up-to-date set of information and tools; and (c) a sensitivity to inter-disciplinarity that encourages awareness of the great influence of urban form in other aspects of human life.

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