Daniel Torres-Salinas Bibliometrics in practice: how to generate reports for institutions.



Introduction

Objectives and index

Año	Minutes	Financiación			
Ato	proyectos concedidos	promedio por proyecto	Tinano 10		
2012	85	66.368 €	5,707	9 T 68	
2013	81	74.066 €	5.999	155 €	
2014	100	60.473.4	6.047	300 f	
2015	83	88,439 €	7,252	072.4	
2016	99	86.196.6	8.533	4044	
Total	4431	74.832 €	33.524	532 4	
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★ Learn how to design bibliometric reports at the institutional level (e.g., universities, hospitals, research centers). We are going to concentrate in a specific report: the annual memory (University of Granada - UGR).
 ★ Mission of the bibliometrics units

- ★ Talk Index
 - What information sources can we use
 - Content and selection of bibliometrics indicators
 - Making data available online
 - Examples of different reports

Type of bibliometric Reports

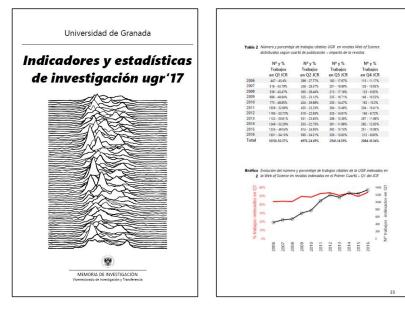
If you are working for a bibliometric unit or research evaluation unit What kind of bibliometric reports can you offer to your institution?

Annual	Reports on a	Reports on
memory	specific	demand by
	topics	policy
	relevant to	managers
	the institution	

Type of bibliometric Reports

- Specific topics, for example gender, collaboration
- Specific areas, for example humanities
- Specific information sources, for example altmetrics
- Specific document type, for example books
- Reports on demand, examining a program
- Publication ... Open Access
- Reports on new social media

Case Study: University of Granada



For this course we are going to take as a case study the annual memory from the University of Granada

"Indicators and statistics at the University of Granada"

Download at:

https://tinyurl.com/y8ywsdu3

Structure of a bibliometric report

For an annual memory we have to consider at least the following sections:

Indicadores y estadísticas de investigación ugr'17

Contenido

- 1. Highlights ugr'17
- 2. Fuentes e indicadores
- 3. Indicadores globales
- 4. Ranking de Shanghai
- 5. Comparativa de universidades
- 6. Disciplinas y especialidades
 - 7. Áreas y universidades
 - 8. Excelencia científica
 - 9. Proyectos y contratos
- 10. Investigadores destacados

Main sections

- 1) Summary
- 2) Sources and indicators
- 3) General view
- 4) Fields and disciplines
- 5) Benchmarking and comparisons
- 6) Funding information

Information Sources

Types of sources



★ External database

- Bibliographic databases and Citation Indexes: Scopus or Web of Science Core Collection,
- Bibliometric suites: Incites or Scival

★ Internal databases

- Current Research Information Systems (CRIS)
- Institutional administrative databases (Projects, Staff, etc...)

★ Other complementary sources

- World University Rankings
- Online academic profiles
- 0

Types of sources



UNIVERSIDAD DE GRANADA

★ External database

In-Cites for bibliometric indicators (Around 60% of the report)

★ Internal databases

• e-proyecta: internal management database for projects

★ Other complementary sources

- ARWU (Shanghai) Benchmarking and verification of scientific policies
- Google Scholar Profiles to identify outstanding researchers and promote internet visibility

Incites for reports

InCites What's New?

- ★ At the University of Granada we use InCites from Clarivate Analytics.
 We recommend this bibliometric suite if:
 - you are working in large and multidisciplinary institutions
 - you don't have time for normalization and data cleaning
- ★ Advantages: indicators are already calculated, you can download raw data and use them for your report
- ★ Disadvantages: non-normalization for authors, inaccurate information for institutions due to errors in the organization enhanced field...

Bibliometric suites (Incites or Scival) are expensive (between 35.000-60.000 Euros) depending institution's size.

Incites for reports

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3	Autonomous University of Barcelona	2	19764	1.38	53.07	114		e main a	Jvanaų	JC
4	Complutense University of Madrid	3	15443	1.09	44.93	86				· .
5	University of Valencia	4	14121	1.46	51.2	107	ot	InCites is	nrovid	PU
6	University of Granada	5	12989	1.3	50.47	91			provid	CU
7	Autonomous University of Madrid	6	12338	1.45	55.76	106				
8	University of Basque Country	7	11897	1.17	51.11	83		useful dat	asets	
9	University of Sevilla	8	11099	1.1	42.13	76				

Content and indicators

What indicators

- Which bibliometric indicators should you use?
 - **Easy interpretation**. Complex indicators are difficult to comprehend and should be avoided.
 - **Standard indicators** approved by the international community.
 - They have to reflect the **different dimensions** of research performance

What indicators

Useful indicators for reports. Four types of dimensions seven indicators

01	Production	Number of documentsNumber of citable documents
02	Collaboration	Number of documents with international collaboration
03	Impact	% of papers in first quartile journalsCategory Normalized Citation Impact
04	Excellence	 % Highly Cited Papers Papers in top journals (Science & Nature)

Contextualization of performance



- ★ Bibliometric indicators make sense when comparing with different aggregation levels, i.e. compare university with the national average. How is our institution performing in comparison with the national average?.
- ★ Some indicators for benchmarking are the Category Normalized Citation Impact (InCites), relative indicators like percentage of papers in first quartile journals or percentage of papers in international collaboration
- ★ In Granada, we compare different indicators with three geographical regions: Spain, European Union and USA
- ★ Without contextualization there is no meaning!

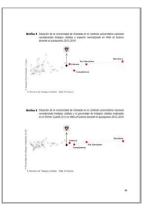
Contextualization of performance

- ★ Example for the publication profile in high impact factor journals
- ★ Indicator > Percentage of papers in first quartile journals

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2011	52.88%	52.17%	52.10%	57.19%
2012	53.73%	53.62%	52.98%	57.25%
2013	50.81%	53.34%	53.13%	57.17%
2014	53.26%	54.38%	53.3%	57.52%
2015	49.54%	53.25%	52.82%	55.72%
2016	54.15%	54.14%	52.94%	55.07%

★ The publication profile of the University of Granada is quite similar to the national and international standards

Benchmarking & Comparisons



★ It is important to compare also our institution with other similar institutions. We have to select a coherent and homogeneous benchmarking group taking into account at least this variables:

- **Size of research output** How many papers?
- **Size of staff** How many faculty?
- **Same institutional objectives** Focus on teaching or research?
- Similar disciplinary profile Humanities, Life Sciences...?
- ★ At the University of Granada we compare our results with Spanish historical universities with a multidisciplinary profile.
- ★ Data from other institutions is retrieved from the Shanghai Ranking

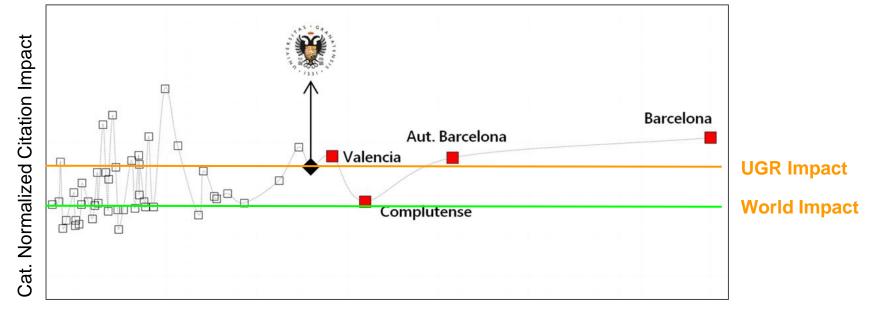
Benchmarking & Comparisons

★ Example: benchmarking of the university of Granada with Spanish universities.

Nombre Universidad	Nr of Citable Papers	Category Normalized Citation Impact	% International Collaboration	% First Quartile	
University of Barcelona	30047	1.54	52.40%	60.53%	
Autonomous University of Barcelona	18647	1.39	50.98%	58.50%	All universities
Complutense University of Madrid	14802	1.06	43.58%	53.39%	perform better than
University of Valencia	13332	1.40	50.88%	56.74%	Granada according
University of Granada	12393	1.32	48.39 %	52.28%	Ŭ
Autonomous University of Madrid	11860	1.47	54.33%	62.04%	based on the
University of Basque Country	10984	1.22	50.25%	57.63%	percentage of
Universitat Politecnica de Valencia	8217	1.08	41.77%	55.26%	papers in First
University of Santiago De Compostela	7642	1.29	50.88%	56.50%	
Pompeu Fabra University	5942	1.91	59.95%	66.13%	Quartile Journals

★ UGR performs well according to the number of citable papers, impact and collaboration, but has to improve the share of papers in first Quartile journals

Benchmarking & Comparisons



Nr of Citable Papers

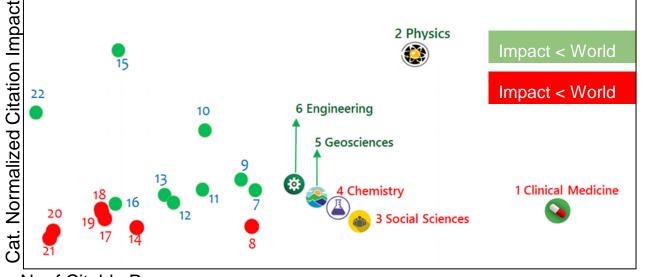
★ If we are working at universities it is important also to represent in a bivariate graph the position of our institution within our national university system

Fields and disciplines

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- ★ Another question that we have to adress in our report is the thematic profile of our institutions; detecting best fields fields and disciplines
- ★ For this we must consider the use of different aggregation levels. Select at least one general level for an overview of the fields (for example Essential Science Indicators, 22 fields) and a more specific discipline level (for example Web of Science Categories, more than 200 categories).
- ★ Differentiate always between Science and Social Social Sciences / Humanities

Fields and disciplines



Nr of Citable Papers

1 Clinical Medicine, 2 Physics, 3 Social Sciences, 4 Chemistry, 5 Geosciences, 6 Engineering, 7 Mathematics, 8 Psychology, 9 Agricultural Science, 10 Computer Sciences, 11 Ecology, 12 Biology, 13 Plant & Animal Science, 14 Neuroscience, 15 Space Science, ... We can see the general scientific profile of the UGR according ESI classification.

In this case we can identify very productive but low impact areas (1, 3, 4); very productive and high impact areas (2); relatively productive but with high impact areas (15) and not productive and low impact areas (14, 17,)

Take care when choosing a classification, for example ESI does not have an specific field for the Humanities

Fields and disciplines

Web of Science Category Social Sciences and Humanities	Nr Citable Papers	Categoy Normalized Citation Impact	% International Collaboration	% First Quartil Journals	16 10	4 MANAGMENT		2 INFORMATION SCIENCE
EDUCATION & EDUCATIONAL RESEARCH	193	0.82	26.94%	11.61%	Line 20 0 17 0 18		3 ECONOMICS	×
INFORMATION SCIENCE & LIBRARY SCIENCE	172	1.07	25.58%	43.37%		,		
ECONOMICS	138	1.10	52.90%	27.27%	21 1 3 9	S LINGUISTIC		EDUCATIONAL RESEARCH
MANAGEMENT	114	1.12	28.95%	23.91%	0 19 14 01	6	Impacto N	
LANGUAGE & LINGUISTICS	102	0.62	22.55%		22 E		mayor a la	i media mundial Iormalizado
LINGUISTICS	101	0.34	28.71%	11.96%	X: Número de Trabajos Web of Science		menor a la	a media mundial
BUSINESS	85	1.10	28.24%	18.18%				
SOCIAL SCIENCES, INTERDISCIPLINARY	82	0.95	36.59%	51.25%				
HISTORY	70	0.51	5.71%	5.00%				

★ In this example we have the second level of presentation of the data at the disciplinary level, the WoS categories applied to the social sciences and the humanities.

Combining fields and institutions

University of Basedone Autonomeus University of Basedone Completense University of Model Disinently of valencia	Web of Science		Porcentaje Documentos	Porcantajo Documentos
Autonomera University of Bacolore Completione University of Madrid University of Valencia		Normalizado	Primer Cuartil	Colaboración
Autonomera University of Bacolore Completione University of Madrid University of Valencia	12052	19	68.08%	Avternacional 60.52%
Completion as University of Madrid University of Valencia	9228	1.56	67.81%	61,44%
Delversity of Usiencia	7962	116	60.315	52.15%
	7636	1.64	67,295	62.78%
Autonomous University of Madrid	7477	1.85	71.10%	61.075
University of Bassare Country	7015	1.33	64.23%	58.31%
University of Granada	6885	1,72	62,00%	54,03%
Polytechnic University of Catalonia	5257	0.98	56,29%	\$2,92%
University of Sevila	\$257	1.07	60,27%	45,07%
Universitat Politecnica de Valencia	5064	1.07	\$9,59% 62.08%	45,72%
University of Santiage De Compositele	4901	142	62,08%	50,17%
University of Sentiage De Compositelo Polytechnic Chivensity of Madrid	4575	0.97	55,21%	45,30%
Polytechnic University of Madrid University of Ovjetio	4129	2.02	54,625	40,30%
Universidad de la Labaria	3400	2.11	72,71%	71.47%
University of Vigo	2945	125	57 395	0.85%
Porrging Falses University	2625	2.14	75.44%	65.77%
Universidad de Castilla La Marcha	2723	1.05	56,21%	44,47%
University of Marcia	2658	1.05	55,13%	45.75%
Universidad de Corejotas	2639	1.24	67,39%	42,71%
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★ Another interesting option to complete the report is to compare the performance of our institution with other universities in different scientific fields.

★ At University of Granada we check its position in five different fields (Natural Science, Engineering, Health Sciences, Social Sciences and Humanities) and compare its results with the Spanish university system.

Combining fields and institutions

In this example we can **Category Normalized Citation Impact** Nr of citable papers see the position of the Pompeu Fabra University University of Barcelona Universidad de la Laguna Autonomous University of ... University of Granada in University of Oviedo Complutense University of Madrid field of Natural the Autonomous University of Madrid University of Valencia University of Granada Autonomous University of Madrid Sciences according to University of Valencia University of Basque Country Autonomous University of ... two different bibliometric University of Granada University of Barcelona University of Sevilla indicators. University of Santiago De... Polytechnic University of Catalonia University of Basque Country Universitat Politecnica de Valencia University of Vigo University of Zaragoza Universidad de Cordoba University of Santiago De.. Complutense University of Madrid Polytechnic University of Madrid University of Zaragoza University of Oviedo University of Sevilla Universidad de la Laguna Universitat Politecnica de Valencia University of Vigo Universidad de Castilla-La Mancha Pompeu Fabra University University of Murcia Universidad de Castilla-La Mancha Polytechnic University of Catalonia University of Murcia Polytechnic University of Madrid Universidad de Cordoba

Non bibliometric Indicators: funding



In order to complement the information provided by bibliometric indicators we can include information on other inputs

Table Evolución ar 18 proyectos de			ayectos, financiaci excelencia de la C			
Año		Número reyectos recedidos	Franciación promedio por proyecto	Tinani 10		
2012		85	66.368 €	5,707	ORT #	
2013		81	74.065 €	5.999	355 €	
2014		100	60.473.4	6.047		
2015		83	88,439.4	7,252	072.4	
2016		99	86.195 €	8.533	4044	
Total		4481	74.832 €	33.524	532 €	
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- ★ We use the number of projects and total funding in competitive programmes to contextualize our results. We consider two calls a) Spanish R&D National programmes and b) European funding from the European Commission.
- ★ Nr. of project and total funding are important indicators but also success rate (Nr of applications / Proposals selected for funding). It is important also to compare these indicators with national or UE average and do benchmarking with other institutions

Non bibliometric Indicators: funding

	Total Applications	Proposals selected for funding	Sucess Rate	Total Funding
UNIVERSIDAD DE BARCELONA	191	125	65%	13.194.445€
UNIVERSIDAD DE GRANADA	171	99	54%	8.533.404€
UNIVERSIDAD COMPLUTENS E DE MADRID	188	99	53%	9.422.754€
UNIVERSIDAD DE SEVILLA	189	91	48%	11.665.489€

★ In the University of Granada we focus on national research programmes. In this example we can see the results of four Spanish universities in the last year. We can see that the University of Granada is the second university in Spain with a larger number of projects conceded

Indicators at author level

		Nr of papers	H Index	Starting Year
Agriculture				
AGRONOMY	GARCIA DEL MORAL GARRIDO, LUIS FERNANDO	58	23	1988
Biology				
ECOLOGY	ZAMORA RODRIGUEZ, REGINO	121	40	1990
ENVIRONMENTAL SCIENCES	OLEA SERRANO, NICOLAS	221	41	1979
FISHERIES	DE LA HIGUERA, MANUEL	76	26	1988
GENETICS & HEREDITY	MARTINEZ CAMACHO, JUAN PEDRO	180	28	1980
MICROBIOLOGY	VALDIVIA, EVA	127	40	1981
MICROBIOLOGY	MAQUEDA ABREU, MERCEDES	103	36	1982
ORNITHOLOGY	SOLER CRUZ, MANUEL	152	32	1988
ORNITHOLOGY	MARTIN VIVALDI, MANUEL	54	18	1998
ZOOLOGY	SOLER CRUZ, MANUEL	152	32	1988
Health sciences				
DENTISTRY & ORAL SURGERY MEDICINE	TOLEDANO PEREZ, MANUEL	196	39	1995
DENTISTRY & ORAL SURGERY MEDICINE	OSORIO RUIZ, RAQUEL	235	37	1993

★ For authors we have included the researchers with the highest H-index in Web of Science for different scientific categories

Indicators at author level

TOP 50 INVESTIGADORES UGR

		Citas	h-index	
1	SERGIO NAVAS CONCHA	85045	70	Ciencias Exactas y Naturales
2	JUAN ANTONIO AGUILAR SAAVEDRA	71307	111	Ciencias Exactas y Naturales
3	FRANCISCO HERRERA TRIGUERO	53124	115	Ingeniería v Tecnología
4	ENRIQUE HERRERA VIEDMA	21740	72	Ingeniería v Tecnología
5	ANGEL GIL HERNANDEZ	21154	70	Ciencias de la Salud
6	EDUARDO BATTANER LOPEZ	20452	49	Ciencias Exactas y Naturales
7	NICOLAS OLEA SERRANO	14744	53	Ciencias de la Salud
8	ANTONIO BOLIVAR BOTIA	14617	58	Ciencias Sociales y Jurídicas
9	ROBERTO PITTAU	14386	47	Ciencias Exactas y Naturales
10	FRANCISCO B ORTEGA PORCEL	14018	63	Ciencias de la Salud
11	JONATAN RUIZ RUIZ	12948	66	Ciencias de la Salud
12	ANTONIO BUENO VILLAR	12698	57	Ciencias Exactas y Naturales
13	CARLOS MORENO CASTILLA	12211	54	Ciencias Exactas y Naturales
14	JOSE LUIS VERDEGAY GALDEANO	11765	47	Ingeniería v Tecnología
15	ANDREW STEPHEN KOWALSKI	11397	31	Ciencias Exactas y Naturales
16	OSCAR CORDON GARCIA	11287	50	Ingeniería v Tecnología
17	CARMEN BATANERO BERNABEU	11137	51	Ciencias Sociales y Jurídicas
18	DARIO ACUÑA CASTROVIEJO	10536	60	Ciencias de la Salud
19	JOSE RIVERA UTRILLA	10176	52	Ciencias Exactas y Naturales
20	ALBERTO FERNANDEZ GUTIERREZ	9955	49	Ciencias Exactas y Naturales
21	ANTONIO SEGURA CARRETERO	9808	50	Ciencias Exactas y Naturales
22	MANUEL JOAQUIN CASTILLO GARZON	9772	50	Ciencias de la Salud
23	REGINO ZAMORA RODRIGUEZ	9558	52	Ciencias Biológicas
24	JOSE GUTIERREZ PEREZ	9412	39	Ciencias Sociales y Jurídicas
25	JUAN DIAZ GODINO	9406	51	Ciencias Sociales y Jurídicas
26	SALVADOR GARCIA LOPEZ	8873	35	Ingeniería y Tecnología
27	JUAN DE DIOS LUNA DEL CASTILLO	8100	48	Ciencias Exactas y Naturales
28	MARIA AMPARO VILA MIRANDA	8043	44	Ingeniería v Tecnología
29	FATIMA OLEA SERRANO	7329	33	Ciencias de la Salud
30	GERMAINE ESCAMES ROSA	7271	50	Ciencias de la Salud
31	FRANCISCO DEL AGUILA GIMENEZ	7218	48	Ciencias Exactas y Naturales
32	MARIANA FATIMA FERNANDEZ CABRERA	6741	37	Ciencias de la Salud
33	JORGE CASTRO GUTIERREZ	6644	31	Ciencias Biológicas
34	JOSE MANUEL SANCHEZ RUIZ	6612	44	Ciencias Exactas y Naturales
35	JOSE LUIS VILCHEZ QUERO	6570	48	Ciencias Exactas y Naturales
36	JUAN LUPIAÑEZ CASTILLO	6558	43	Ciencias de la Salud
37	ROQUE HIDALGO ALVAREZ	6497	41	Ciencias Exactas y Naturales
38	MIGUEL CARLOS MOYA MORALES	6341	37	Ciencias Sociales y Jurídicas
39	ANGEL VICENTE DELGADO MORA	6323	39	Ciencias Exactas y Naturales
40	MANUEL LOZANO MARQUEZ	6275	29	Ingeniería v Tecnología
41	JUAN MANUEL DUARTE PEREZ	6205	43	Ciencias de la Salud
42	JOSE LUIS QUILES MORALES	6184	45	Ciencias de la Salud
43	VICENTE ENRIQUE CABALLO MANRIQUE	6180	37	Ciencias de la Salud
44	LUCAS ALADOS ARBOLEDAS	5977	42	Ciencias Exactas y Naturales
45	JUAN JULIAN MERELO GUERVOS	5958	31	Ingeniería v Tecnología
46	JUAN CARLOS BRAGA ALARCON	5850	43	Ciencias Exactas y Naturales
47	ENRIQUE RUIZ ARIOLA	5825	40	Ciencias Exactas y Naturales
48	JULIO JUAN GALVEZ PERALTA	5750	41	Ciencias de la Salud
49	ALEJANDRO FERNANDEZ BARRERO	5711	38	Ciencias Exactas y Naturales
50	JESÚS GONZÁLEZ LÓPEZ	5539	41	Ciencias de la Salud

 \star Finally, we include the most outstanding researchers in "Google Scholar Profiles". We review all profiles and only include those with correct information. We have analyzed a total of 2000 University of Granada profiles and approved 1,700. These profiles have been classified into five different scientific areas. In the report we present a summary of the 200 most cited researchers

Link to google scholar profile

Making data available online

Transparency and availability of data

- ★ To promote institutional transparency, reproducibility, verification of results and data reuse by other departments, we share our data in an standardized way.
- ★ Livemetrics Portal. We have developed a portal that includes a dynamic version of the report with the main indicators



Examples and resources

Institutional reports



An in-depth bibliometric analysis of the international research output of the University of Granada

BIBLIOMETRIC REPORT Report Code: 1013-05 May 2014



CWTS BIBLIOMETRIC REPORT Bibliometric impact analysis of the Academy of Finland's Centre of **Excellence Programmes** December 15th, 2015 Universiteit Leiden



Bibliometric re	port for the	Gurdon	Institute	and
	comparator	researc	h institut	ions

5th February 2013

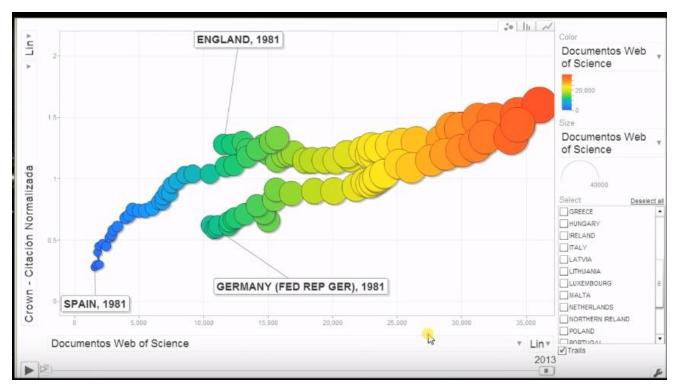
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Granada and Modena - Collaboration

UNIMORE Le Collaborazioni internazionali in UNIMORE dal 2012 al 2017: Analisi UGR 2002-2011. 10 AÑOS DE COLABORACIÓN CIENTÍFICA bibliometrica e mappatura individuale [Report, Ver. 1.0] **CEIBioTic** Ufficio Bibliometrico (SBA) 06/04/2018

Videoreports



Daniel Torres-Salinas Bibliometrics in practice: how to generate reports for institutions.

