



Escola Tècnica Superior
d'Enginyeria Industrial de Barcelona

UNIVERSITAT POLITÈCNICA DE CATALUNYA

Business Administration Department

Creation of a composite indicator to assess students' academic satisfaction at Engineering Schools

Bachelor Thesis

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Barcelona, January 2016

Annexes

Content

1. AHP Data
2. Survey Raw Data
3. Statistical Software Data

General

General

	MSI	SR	RI CD	1,25 DC	DIM EM	6 O	VPL	VPLN	AW=LAM.V	
MSI motivation	1,0000	3,0000	1,0000	1,0000	5,0000	1,0000	12,0000	0,23525019	1,4451	MU
SR student resources	0,3333	1,0000	0,3333	0,3333	1,0000	1,0000	4,0000	0,07841673	0,5034	0,0621
CD class dynamics	1,0000	3,0000	1,0000	1,0000	3,0000	3,0000	12,0000	0,23525019	1,5101	CR=ci/ri
DC development compet	1,0000	3,0000	1,0000	1,0000	7,0000	1,0000	14,0000	0,27445855	1,5892	0,0497
EM evaluation	0,2000	1,0000	0,3333	0,1429	1,0000	1,0000	3,6762	0,07206871	0,4197	
O organization	1,0000	1,0000	0,3333	1,0000	1,0000	1,0000	5,3333	0,10455564	0,8432	
							51,0095	1	6,3107	

Matrix 3: 2

	MSI	SR	CD	DC	EM	O			AW=LAM.V	
MSI motivation	1,0000	3,0000	0,3333	1,0000	1,0000	1,0000	7,3333	0,13681592	0,9453	MU
SR student resources	0,3333	1,0000	0,3333	0,2000	1,0000	1,0000	3,8667	0,0721393	0,4710	0,1141
CD class dynamics	3,0000	3,0000	1,0000	1,0000	3,0000	5,0000	16,0000	0,29850746	2,0448	CR=ci/ri
DC development compet	1,0000	5,0000	1,0000	1,0000	3,0000	5,0000	16,0000	0,29850746	1,9154	0,0913
EM evaluation	1,0000	1,0000	0,3333	0,3333	1,0000	0,3333	4,0000	0,07462687	0,5224	
O organization	1,0000	1,0000	0,2000	0,2000	3,0000	1,0000	6,4000	0,11940299	0,6716	
							53,6000	1	6,5705	

Matrix 3: 3

	MSI	SR	CD	DC	EM	O			AW=LAM.V	
MSI motivation	1,0000	1,0000	1,0000	0,3333	1,0000	1,0000	5,3333	0,13333333	0,8778	MU
SR student resources	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	6,0000	0,15	1,0000	0,1022
CD class dynamics	1,0000	1,0000	1,0000	1,0000	3,0000	1,0000	8,0000	0,2	1,2667	CR=ci/ri
DC development compet	3,0000	1,0000	1,0000	1,0000	1,0000	0,3333	7,3333	0,18333333	1,1333	0,0818
EM evaluation	1,0000	1,0000	0,3333	1,0000	1,0000	1,0000	5,3333	0,13333333	0,8667	
O organization	1,0000	1,0000	1,0000	3,0000	1,0000	1,0000	8,0000	0,2	1,3667	
							40,0000	1	6,5111	

matrix 3: 4

	MSI	SR	CD	DC	EM	O			AW=LAM.V	
MSI motivation	1,0000	0,3333	0,3333	0,3333	1,0000	1,0000	4,0000	0,09375	0,6042	MU
SR student resources	3,0000	1,0000	1,0000	1,0000	0,3333	1,0000	7,3333	0,171875	1,0729	0,1167
CD class dynamics	3,0000	1,0000	1,0000	1,0000	1,0000	1,0000	8,0000	0,1875	1,1875	CR=ci/ri
DC development compet	3,0000	1,0000	1,0000	1,0000	3,0000	1,0000	10,0000	0,234375	1,5313	0,0933
EM evaluation	1,0000	3,0000	1,0000	0,3333	1,0000	1,0000	7,3333	0,171875	1,1875	
O organization	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	6,0000	0,140625	1,0000	
							42,6667	1	6,5833	

matrix 3:5

	MSI	SR	CD	DC	EM	O			AW=LAM.V	
MSI motivation	1,0000	1,0000	1,0000	0,3333	0,2000	0,3333	3,8667	0,0819209	0,4896	MU
SR student resources	1,0000	1,0000	1,0000	0,3333	0,3333	1,0000	4,6667	0,09887006	0,6610	0,0987
CD class dynamics	1,0000	1,0000	1,0000	1,0000	1,0000	0,3333	5,3333	0,11299435	0,8682	CR=ci/ri
DC development compet	3,0000	3,0000	1,0000	1,0000	1,0000	1,0000	10,0000	0,21186441	1,3616	0,0789
EM evaluation	5,0000	3,0000	1,0000	1,0000	1,0000	3,0000	14,0000	0,29661017	1,9209	
O organization	3,0000	1,0000	3,0000	1,0000	0,3333	1,0000	9,3333	0,19774011	1,1921	
							47,2000	1	6,4934	

Synthesis matrix

	MSI	SR	CD	DC	EM	O	vpl	vpln	aw=lam.v	
MSI motivation	1,0000	1,2457	0,6444	0,5173	1,0000	0,8027	5,2101	0,1335	0,8052	MU
SR student resources	0,8027	1,0000	0,6444	0,4670	0,6444	1,0000	4,5586	0,1168	0,7175	0,0158
CD class dynamics	1,5518	1,5518	1,0000	1,0000	1,9332	1,3797	8,4166	0,2156	1,3268	CR=ci/ri
DC development compet	1,9332	2,1411	1,0000	1,0000	2,2902	1,1076	9,4720	0,2426	1,4560	0,0127
EM evaluation	1,0000	1,5518	0,5173	0,4366	1,0000	1,0000	5,5058	0,1410	0,8237	
O organization	1,2457	1,0000	0,7248	0,9029	1,0000	1,0000	5,8734	0,1505	0,9499	
							39,0365	1,0000	6,0791	

iteracion 1

	vpl	vpln	DIF	DIF(%)
	6,0000	6,9536	3,7079	3,4222
	5,3985	6,0000	3,3312	3,1780
	9,9346	11,5577	6,0000	5,6174
	10,8069	12,9039	6,6129	6,0000
	6,1383	7,0871	3,8404	3,5355
	7,1644	8,1616	4,3169	4,0786
				7,3590
				6,0000
				37,0805
				0,15625506
				0,03709482
				3,70948187
				237,30747
				1

iteracion 2

	vpl	vpln	DIF	DIF(%)	Pesos locales
	222,4748511	256,599285	136,405993	127,004128	MSI 0,13255269
	199,0472175	229,687756	122,040151	113,589087	SR 0,11860671
	365,8371747	421,926922	224,342392	208,870591	CD 0,21797518
	400,7769464	462,085505	245,748734	228,861007	DC 0,2387725
	228,0559533	263,049246	139,800372	130,172465	EM 0,13587346
	262,1682766	302,434888	160,788173	149,666219	O 0,15621946
				263,824909	
				229,42319	
				1368,30566	
				0,15621946	
				-0,0002279	
				-0,0227861	
				1	1

							dif
5,0000	18,3333	15,4000	53,0000	16,3333	108,0667	0,49164488	0,07714194
1,4952	5,0000	4,2000	15,4000	4,6000	30,6952	0,13964673	-0,06021452
1,9143	6,3333	5,0000	18,3333	5,6667	37,2476	0,16945652	-0,17433851
0,5302	1,9143	1,4952	5,0000	1,6286	10,5683	0,04807984	0,00192545
1,6286	5,6667	4,6000	16,3333	5,0000	33,2286	0,15117203	-0,00044621
					219,8063		1

Social Interaction and Motivation	
Justice Perception	0,18056
Peer Interaction	0,30353
Student Engagement	0,18940
Student Professor Collaboration	0,15604
Student Professor InfoExchange Efficiency	0,17047

Motivation Social Interaction

dif %						vpl	vpln	dif	dif%
7,71419356	136,591111	474,879365	385,380952	1361,44444	421,247619	2779,54349	0,48979267	-0,00378163	-0,37816346
-6,02145245	38,648254	134,559365	109,213333	385,380952	119,302222	787,104127	0,13869825	-0,00683842	-0,68384225
-17,4338512	47,5608466	165,634921	134,559365	474,879365	146,92381	969,558307	0,17084912	0,00815102	0,81510249
0,19254505	13,678458	47,5608466	38,648254	136,591111	42,2237037	278,702373	0,04911108	0,02099809	2,09980928
-0,04462078	42,2237037	146,92381	119,302222	421,247619	130,333333	860,030688	0,15154889	0,00248672	0,24867208
						5674,93899		1	

Motivation Social Interaction

				vpl	vpln	dif	dif%
91748,5297	319239,065	259232,615	915390,899	283202,315	0,48982466	6,5323E-05	0,0065323
25982,5699	90406,4042	73412,9757	259232,615	80201,0227	0,13871511	0,000121482	0,01214821
31996,9315	111333,395	90406,4042	319239,065	98765,7175	0,17082447	-0,000144298	-0,01442976
9195,84007	31996,9315	25982,5699	91748,5297	28385,0199	0,04909452	-0,000337197	-0,03371968
28385,0199	98765,7175	80201,0227	283202,315	87616,721	0,15154124	-5,04427E-05	-0,00504427
				578170,796			
							1

Student Resources

Student Resources

RI 1,35 DIM 7

Matrix 2: 1

	LA	FA	P	IR	SI	PA	WA	VPL	VPLN	AW=LAM.V
LA	1,00	0,33	0,14	1,00	0,11	1,00	1,00	4,59	0,0546128	0,42204921 CI
FA	3,00	1,00	0,20	1,00	0,33	1,00	1,00	7,53	0,08968593	0,66635171 0,12809756
P	7,00	5,00	1,00	3,00	1,00	5,00	7,00	29,00	0,34525114	2,78714237 CR=C/RI
IR	1,00	1,00	0,33	1,00	0,33	3,00	1,00	7,67	0,09127329	0,69998866 0,09488708
SI	9,00	3,00	1,00	3,00	1,00	3,00	1,00	21,00	0,25000945	1,89564987
PA	1,00	1,00	0,20	0,33	0,33	1,00	0,20	4,07	0,04841453	0,39967497
WA	1,00	1,00	0,14	1,00	1,00	5,00	1,00	10,14	0,12075286	0,89772856
								84,00	1	7,76858536

Matrix 2: 2

	LA	FA	P	IR	SI	PA	WA	VPL	VPLN	AW=LAM.V
LA	1,00	3,00	3,00	5,00	9,00	1,00	1,00	23,00	0,2714805	2,0028853 CI
FA	0,33	1,00	1,00	1,00	5,00	1,00	0,33	9,67	0,1141005	0,80949526 0,10514483
P	0,33	1,00	1,00	1,00	5,00	0,33	0,33	9,00	0,1062315	0,65998426 CR=C/RI
IR	0,20	1,00	1,00	1,00	3,00	0,33	1,00	7,53	0,0889197	0,68494023 0,07788506
SI	0,11	0,20	0,20	0,33	1,00	0,14	0,20	2,19	0,02581781	0,19556338
PA	1,00	1,00	3,00	3,00	7,00	1,00	3,00	19,00	0,2242665	1,88357627
WA	1,00	3,00	3,00	1,00	5,00	0,33	1,00	14,33	0,1691835	1,39442425
LR								84,72	1	7,63086896

Matrix 3: 3

	LA	FA	P	IR	SI	PA	WA	LR
LA	1,00	0,33	0,33	1,00	3,00	3,00	1,00	9,67
FA	3,00	1,00	1,00	1,00	3,00	5,00	5,00	19,00
P	3,00	1,00	1,00	7,00	5,00	7,00	5,00	29,00
IR	0,33	1,00	0,14	1,00	3,00	5,00	1,00	11,48
SI	0,33	0,33	0,20	0,33	1,00	0,33	1,00	3,53
PA	0,33	0,20	0,14	0,20	3,00	1,00	1,00	5,88
WA	1,00	0,20	0,20	1,00	1,00	1,00	1,00	5,40
								83,95
								1
								7,90383815

Matrix 4: 4

	LA	FA	P	IR	SI	PA	WA	
LA	1,00	1,00	1,00	1,00	0,33	1,00	3,00	
FA	1,00	1,00	1,00	0,33	1,00	3,00	0,33	
P	1,00	1,00	1,00	0,20	3,00	3,00	0,33	
IR	1,00	3,00	5,00	1,00	7,00	5,00	1,00	
SI	1,00	1,00	0,33	0,14	1,00	1,00	0,11	
PA	0,33	0,33	0,33	0,20	1,00	1,00	0,20	
WA	5,00	3,00	3,00	1,00	9,00	5,00	1,00	
								7,53
								7,67
								9,53
								23,00
								4,59
								3,40
								27,00
								82,72
								1
								7,31154776

Matrix 5: 5

	LA	FA	P	IR	SI	PA	WA	
LA	1,00	1,00	3,00	5,00	5,00	3,00	5,00	
FA	1,00	1,00	5,00	3,00	7,00	3,00	7,00	
P	0,33	0,20	1,00	1,00	1,00	0,33	3,00	
IR	0,20	0,33	1,00	1,00	3,00	5,00	3,00	
SI	0,20	0,14	1,00	0,33	1,00	1,00	1,00	
PA	0,33	0,33	3,00	0,20	1,00	1,00	1,00	
WA	0,20	0,14	0,33	0,33	1,00	1,00	1,00	
								23,00
								27,00
								6,87
								13,53
								4,68
								6,87
								4,01
								85,95
								1
								7,87880332

matriz de sintesis

	LA	FA	P	IR	SI	PA	WA	
LA	1,00	0,80	0,84	1,53	1,72	1,93	1,00	
FA	1,25	1,00	1,00	1,00	2,04	2,14	1,31	
P	1,18	1,00	1,00	1,33	2,37	1,63	1,63	
IR	0,58	1,00	0,75	1,00	2,29	2,63	1,25	
SI	0,58	0,49	0,42	0,44	1,00	0,68	0,47	
PA	0,52	0,47	0,61	0,38	1,48	1,00	0,65	
WA	1,00	0,76	0,61	0,80	2,14	1,53	1,00	
								8,83
								9,74
								10,16
								9,49
								4,08
								5,11
								7,85
								55,24
								1
								7,09437451

Iteracion 1

	VPL	VPLn	DIF	DIF(%)
	6,89	6,49	6,16	7,27
	7,86	7,00	6,77	7,99
	8,25	7,46	7,00	8,45
	7,24	6,52	6,33	6,89
	3,35	2,98	2,85	3,45
	4,08	3,57	3,44	4,00
	6,18	5,51	5,27	6,23
				15,57
				16,84
				17,78
				15,94
				6,08
				7,00
				4,60
				11,18
				7,00
				8,40
				9,10
				9,60
				8,40
				3,84
				4,60
				4,60
				7,00
				8,40
				9,60
				8,40
				4,60
				4,60
				7,00
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				4,60
				7,00
				8,40
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Competences Development

Matrix 4 competence development

	1	RI	1,11	DIM	5				
	DAAP	BHS	SSE	TKA	CF	VPL	VPLn	LAM	MAX
DAAP	1,0000	3,0000	7,0000	1,0000	5,0000	17,0000	0,4193	2,25440451	CI
BHS	0,3333	1,0000	5,0000	1,0000	3,0000	10,3333	0,2549	1,15879728	0,0904
SSE	0,1429	0,2000	1,0000	0,3333	1,0000	2,6762	0,0660	0,32158797	CR=ci/ri
TKA	1,0000	1,0000	3,0000	1,0000	1,0000	7,0000	0,1727	1,13201785	0,0814
CF	0,2000	0,3333	1,0000	1,0000	1,0000	3,5333	0,0872	0,49463629	
						40,5429	1,0000	5,3614	
						1,0000			

	2								
	DAAP	BHS	SSE	TKA	CF	VPL	VPLn	LAM	MAX
DAAP	1,0000	0,3333	3,0000	1,0000	5,0000	10,3333	0,2549	1,24148461	CI
BHS	3,0000	1,0000	3,0000	1,0000	5,0000	13,0000	0,3206	1,96499883	0,1171
SSE	0,3333	0,3333	1,0000	0,3333	3,0000	5,0000	0,1233	0,54866494	CR=ci/ri
TKA	1,0000	1,0000	3,0000	1,0000	5,0000	11,0000	0,2713	1,45525018	0,1055 LO ACEPTO
CF	0,2000	0,2000	0,3333	0,2000	1,0000	1,9333	0,0477	0,25816303	
						41,2667	1,0179	5,4686	

	3								
	DAAP	BHS	SSE	TKA	CF	VPL	VPLn	LAM	MAX
DAAP	1,0000	0,3333	0,2000	0,3333	1,0000	2,8667	0,0718	0,3967724	MU
BHS	3,0000	1,0000	1,0000	0,2000	1,0000	6,2000	0,1553	0,85642738	0,2081
SSE	5,0000	1,0000	1,0000	3,0000	3,0000	13,0000	0,3255	2,18196995	CR=ci/ri
TKA	3,0000	5,0000	0,3333	1,0000	5,0000	14,3333	0,3589	1,9015025	0,1875 LA TRANSFORMO
CF	1,0000	1,0000	0,3333	0,2000	1,0000	3,5333	0,0885	0,49582638	
						39,9333	1,0000	5,8325	

	4								
	DAAP	BHS	SSE	TKA	CF	VPL	VPLn	LAM	MAX
DAAP	1,0000	1,0000	1,0000	0,3333	0,1429	3,4762	0,0980	0,46845638	MU
BHS	1,0000	1,0000	1,0000	1,0000	0,3333	4,3333	0,1221	0,71812081	0,0443
SSE	1,0000	1,0000	1,0000	0,3333	0,3333	3,6667	0,1034	0,54899329	CR=ci/ri
TKA	3,0000	1,0000	3,0000	1,0000	1,0000	9,0000	0,2537	1,40268456	0,0399
CF	7,0000	3,0000	3,0000	1,0000	1,0000	15,0000	0,4228	2,03892617	
						35,4762	1,0000	5,1772	

	5								
	DAAP	BHS	SSE	TKA	CF	VPL	VPLn	LAM	MAX
DAAP	1,0000	1,0000	1,0000	0,3333	0,1111	3,4444	0,0784	0,39787727	MU
BHS	1,0000	1,0000	1,0000	0,3333	0,3330	3,6663	0,0835	0,49387634	0,1098
SSE	1,0000	1,0000	1,0000	0,1429	0,3333	3,4762	0,0791	0,4318491	CR=ci/ri
TKA	3,0000	3,0000	7,0000	1,0000	0,3333	14,3333	0,3263	1,51019599	0,0989
CF	9,0000	3,0030	3,0003	3,0000	1,0000	19,0033	0,4326	2,60549914	
						43,9236	1,0000	5,4393	

Synthesis matrix

	DAAP	BHS	SSE	TKA	CF	VPL	VPLn	LAM	MAX
DAAP	1,0000	0,8027	1,3324	0,5173	0,8312	4,4837	0,1652	0,82479849	MU
BHS	1,2457	1,0000	1,7188	0,5818	1,1073	5,6537	0,2083	1,02872937	0,0076
SSE	0,7505	0,5818	1,0000	0,4366	1,0000	3,7689	0,1389	0,69581022	CR=ci/ri
TKA	1,9332	1,7188	2,2902	1,0000	1,5281	8,4703	0,3121	1,57576593	0,0069
CF	1,2030	0,9031	1,0000	0,6544	1,0000	4,7605	0,1754	0,90547883	
						27,1371	1,0000	5,0306	

iteracion 1

							DIF	DIF(%)
	5	4,02045374	6,0605317	2,6273646	4,6742669	22,3826169	0,16395685	-0,007729
	6,23832482	5	7,53722761	3,28314922	5,85800236	27,916704	0,20449507	-0,0187878
	4,27291468	3,41962041	5	2,25439643	3,93532135	18,8822529	0,13831603	-0,0041151
	9,56467967	7,70184194	11,6385558	5	8,85659761	42,7616751	0,31323725	0,00353797
	5,54661929	4,47842108	6,6538473	2,89315744	5	24,5720451	0,17999482	0,02539072
						136,515294	1	2,53907214

iteracion 2

							DIF	DIF(%)	PESOS LOCALES
	127,033311	102,098137	152,58898	66,6596266	117,414147	565,794202	0,1639055	-0,0003133	DAAP 0,16391
	158,483558	127,376251	190,36921	83,1618682	146,478563	705,869451	0,20448404	-5,39E-05	BHS 0,20448
	107,452159	86,362291	129,093538	56,3830974	99,3243836	478,615469	0,13865061	0,00241312	SSE 0,13865
	242,54812	194,935788	291,333587	127,277647	224,192707	1080,28785	0,31294969	-0,0009189	TKA 0,31295
	139,507484	112,12041	167,580988	73,2082999	128,969539	621,386722	0,18001016	8,5221E-05	CF 0,18001
						3451,95369	1	0,00852205	

Organization

	CTO	WSSS	FS	AB	QSM	RI	1,11	DIM	5
CTO	1,0000	5,0000	3,0000	1,0000	1,0000	11,0000	0,3055	1,57498	MU
WSSS	0,2000	1,0000	1,0000	1,0000	0,1429	3,3429	0,0928	0,44618	0,0844
FS	0,3333	1,0000	1,0000	1,0000	0,3333	3,6667	0,1018	0,55567	CR=ci/ri
AB	1,0000	1,0000	1,0000	1,0000	1,0000	5,0000	0,1389	1	0,0760
QSM	1,0000	7,0000	3,0000	1,0000	1,0000	13,0000	0,3610	1,76065	
						36,0095	1,0000	5,3375	

	CTO	WSSS	FS	AB	QSM
CTO	1,0000	3,0000	1,0000	0,3333	0,2000
WSSS	0,3333	1,0000	0,3333	0,1111	0,1429
FS	1,0000	3,0000	1,0000	0,3333	1,0000
AB	3,0000	9,0000	3,0000	1,0000	17,0000
QSM	5,0000	7,0000	1,0000	1,0000	15,0000
					45,7873

	CTO	WSSS	FS	AB	QSM
CTO	1,0000	5,0000	0,3333	1,0000	1,0000
WSSS	0,2000	1,0000	0,1429	0,2000	0,3333
FS	3,0000	7,0000	1,0000	1,0000	13,0000
AB	1,0000	5,0000	1,0000	1,0000	3,0000
QSM	1,0000	3,0000	1,0000	0,3333	1,0000
					40,5429

	CTO	WSSS	FS	AB	QSM	LWV	Nlww	λmax						
CTO	1,0000	3,0000	1,0000	0,2000	0,3300	5,5300	0,1246	0,6447	CI					
WSSS	0,3333	1,0000	0,1429	0,1429	0,2000	1,8190	0,0410	0,2158	0,0653	1,01335079	1	0,98682511	1,98915009	0,54611212
FS	1,0000	7,0000	1,0000	1,0000	11,0000	0,2478	1,24588	CR=CI/RI		0,50272727	1,15757576	1	1,37272727	0,99449036
AB	5,0000	7,0000	1,0000	1,0000	15,1000	0,3402	1,76885	0,0588	lo acepto	1,83112583	0,84326711	0,72847682	1	0,79690949
QSM	3,0303	5,0000	1,0000	0,9091	1,0000	10,9394	0,2464	1,38593	veo que hago	1,53185596	0,83142066	1,00554017	1,25484765	1
						44,3884	1,0000	5,2612						

We take 45 and modify it
0,3136 1,10035088
0,285

	CTO	WSSS	FS	AB	QSM
CTO	1,0000	5,0000	1,0000	1,0000	9,0000
WSSS	0,2000	1,0000	0,3333	0,3333	0,2000
FS	1,0000	3,0000	1,0000	0,3333	6,3333
AB	1,0000	3,0000	1,0000	0,3333	6,3333
QSM	1,0000	5,0000	3,0000	3,0000	13,0000
					36,7333

Synthesis matrix

	CTO	WSSS	FS	AB	QSM
CTO	1,0000	4,0760	1,0000	0,5818	0,5806
WSSS	0,2453	1,0000	0,2959	0,2540	0,1936
FS	1,0000	3,3798	1,0000	0,8027	0,6444
AB	1,7188	3,9363	1,2457	1,0000	1,0192
QSM	1,7222	5,1648	1,5518	0,9811	1,0000
					10,4200
					35,3942

iteracion 1

							DIF	DIF(%)
	5	16,8208	4,8318	3,5715	3,1879	33,412	0,1867	-0,09539
	1,556664	5	1,454	1,0783	0,9793	10,068	0,05626	0,00119
	5,318721	17,3235	5	3,6781	3,342	34,662	0,19369	0,00415
	7,404379	24,3527	6,9566	5	4,6014	48,315	0,26997	0,0665
	7,949754	26,4562	7,5763	5,5221	5	52,504	0,29338	-0,00346
						178,96	1	

iteracion 2

							DIF	DIF(%)	PESOS LOCALES
	128,6712	423,227	121,77	89,229	80,933	843,83	0,18671	5,3E-05	0,00528
	39,06962	128,541	36,983	27,099	24,576	256,27	0,0567	0,00782	0,78151
	133,9566	440,689	126,8	92,912	84,265	878,62	0,19441	0,0037	0,37007
	185,5327	610,321	175,61	128,7	116,72	1216,9	0,26925	-0,00269	-0,2686
	201,8645	664,007	191,06	140,01	126,98	1323,9	0,29293	-0,00153	-0,1533
						4519,5	1		1

UNIVERSITY	STUDENT	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10	Student 11	Student 12
ETSEIB	FIELD OF STUDY	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial	Materials	Industrial	Industrial	Industrial	Industrial
	Year	4	4	4	4	4	4	4	3	4	2	3	3
Social Int./Mot.	Justice Perception (JP)	6	6	6	6	7	4	3	4	7	7	8	6
	Peer interaction: competitive vs collaborative (PI)	8	7	7	7	5	5	8	5	3	3	2	3
	Student engagement (SE)	6	3	1	2	3	6	4	6	6	6	7	6
	Student/Professor Collaboration (SPC)	3	5	1	3	6	2	5	5	5	5	5	2
	Student/Professor Info Exchange Efficiency (SPIEE)	7	8	5	5	7	5	7	6	7	7	5	8
Student Resources	Accessibility to labs (LA)	8	8	1	1	6	5	7	3	1	1	1	3
	Accessibility to facilities (FA)	8	8	8	9	8	6	7	6	9	9	9	8
	Possibility of carrying out projects at uni (P)	8	4	3	4	6	4	6	4	5	5	5	4
	Interactive Resources: moodle or similar (IR)	9	9	9	8	8	8	7	6	7	7	5	7
	Startup Incubators (SI)	5	3	2	2	1	3	2	6	2	2	2	6
	Direct access to publications and specialized magazines (PA)	5	7	5	6	8	5	6	5	5	5	5	5
	Workshop Access (WA)	7	7	4	6	5	5	7	6	5	5	5	8
Class Dynamics	Open Discussion (OD)	6	4	2	2	4	3	5	3	8	8	7	6
	Hands-on Practice (HOP)	7	7	5	6	4	6	7	2	4	4	8	7
	Case Method (CM)	5	5	1	2	7	6	7	4	8	8	8	5
	Degree of students participation (DSP)	3	3	2	4	4	4	5	5	1	1	1	6
	Theory links to practice (TLP)	6	5	7	8	6	7	5	2	3	3	3	3
	Problem solving seminars (PSS)	8	6	3	3	6	4	7	4	9	9	9	4
Competences Development	Deep analytical approach to problems (DAAP)	3	2	3	4	4	4	3	3	7	7	7	6
	Balance do-by-hand/ Software Approach (BHS)	7	5	4	6	4	3	6	4	6	6	6	8
	Soft Skill Enhancement (SSE)	8	7	2	1	7	5	5	5	6	6	6	6
	Technical Professional Competence Acquired (TPCA)	7	5	2	4	6	3	5	3	5	5	5	2
	Creative Factor (CF)	4	4	1	1	3	2	4	2	1	1	1	3
Evaluation Methodology	Balance Oral/Written Exams (BOWE)	3	2	4	5	4	6	3	3	1	1	1	6
	Possibility to retake exams (ERP)	2	5	3	6	7	4	4	4	2	2	2	6
	Continuous Evaluation (CE)	4	7	8	6	5	6	5	4	7	7	7	8
	Balance between Done-in-Class and appears in the exam (BCE)	3	5	1	5	5	4	5	1	3	3	3	3
	Accessibility to older exams (AOE)	5	1	2	2	3	2	3	7	8	8	8	7
Organization	Courses timetable/Overlapping (CTO)	6	8	5	6	9	8	7	4	9	9	9	7
	WS vs SS (WSSS)	10	10	8	3	10	9	10	9	9	9	9	7
	Flexible syllabus (FB)	5	4	3	4	3	2	5	6	8	8	8	5
	Appropriate Bibliography (AB)	4	6	4	4	7	5	4	6	7	7	7	9
	Quality synthesis material (QSM)	4	6	6	6	5	6	5	6	8	7	8	8

Student 13	Student 14	Student 15	Student 16	Student 17	Student 18	Student 19	Student 20	Student 21	Student 22	Student 23	Student 24	Student 25	Student 26	Student 27	Student 28	Student 29	Student 30
Industrial	Industrial	Chemical	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial	Chemical	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial
3	3	2	2	3	4	3	4	5	4	4	3	2	4	4	4	3	5
8	7	8	7	7	5	3	4	3	7	7	8	4	2	5	4	5	6
10	6	7	4	6	3	2	2	5	8	8	2	3	1	5	4	4	7
3	4	5	5	3	4	3	3	4	6	5	2	3	5	6	3	3	8
8	3	1	5	3	2	4	3	3	1	1	1	2	3	3	7	2	4
8	5	6	8	5	7	6	6	2	2	7	3	1	2	4	2	3	6
8	7	1	1	1	3	2	1	1	1	2	3	4	6	3	4	1	3
7	7	8	7	3	5	3	3	9	4	6	3	5	4	4	7	4	6
5	2	8	6	3	3	2	2	2	5	5	1	4	2	3	7	1	4
7	7	6	7	6	5	4	5	8	5	2	4	5	5	6	7	1	7
8	1	1	4	5	1	2	2	4	1	1	3	4	5	5	5	1	4
3	1	1	8	7	5	5	6	5	2	2	6	8	9	7	7	2	4
8	6	7	10	5	7	3	7	6	6	4	7	7	7	5	5	6	8
7	1	6	6	6	6	4	2	3	2	5	2	6	6	3	1	5	5
1	4	7	2	6	6	3	2	5	3	4	5	3	3	6	3	3	7
5	5	6	5	7	4	5	1	5	7	3	2	3	7	5	4	4	5
2	1	4	3	3	3	3	3	1	2	3	1	4	2	4	1	1	4
1	3	3	2	5	2	1	2	3	4	3	3	3	8	5	5	1	6
1	7	8	10	6	2	4	6	7	4	2	5	3	4	2	2	3	5
6	6	6	9	4	4	6	3	5	6	4	7	4	7	7	3	4	6
5	8	1	3	5	6	7	2	6	8	7	1	3	2	2	6	6	7
7	7	7	3	4	2	2	2	4	6	5	1	5	9	3	4	1	4
6	4	1	2	3	5	3	3	5	7	4	1	4	6	7	3	2	5
1	1	5	4	3	4	6	1	1	8	1	2	5	2	2	1	1	4
1	1	1	1	2	9	1	1	4	5	2	2	2	1	2	3	1	3
8	1	1	4	3	1	2	5	7	1	1	1	6	9	4	1	1	5
5	7	8	7	5	6	3	5	5	3	3	4	1	9	5	1	3	6
5	7	7	5	3	2	4	4	2	3	3	2	1	3	5	2	1	7
10	4	4	9	4	8	9	7	2	4	4	3	10	10	6	6	5	8
6	7	4	10	3	8	7	4	7	1	6	3	6	10	7	4	4	8
7	9	8	10	6	6	8	5	5	8	8	10	10	10	8	8	7	10
8	7	1	6	4	3	8	7	6	2	5	4	4	10	2	3	3	6
3	7	8	6	7	8	7	7	8	7	7	10	9	10	8	4	5	6
5	6	6	8	5	5	6	6	7	4	7	5	6	9	6	5	6	4

Student 31	Student 32	Student 33	Student 34	Student 35	Student 36	Student 37	Student 38	Student 39	Student 40	AHP		Weighting		Agreg. Results	Category	Categ. Score	
Industrial	Industrial	Industrial	Industrial	Industrial	Industrial	Chemical	Industrial	Industrial	Material	MEDIA	Hierarchy1 W	Hierarchy2 W	Global Weights				
5	6	5	4	5	3	5	6	7	5	6	5,825	0,13255269	0,18056	0,023933714	0,139413882	SIM	0,698248203
7	5	5	6	8	6	6	6	7	7	7	5,625	0,13255269	0,30353	0,040233718	0,226314664	SR	0,608437893
8	7	6	8	8	7	9	6	8	8	8	5,625	0,13255269	0,18940	0,025105479	0,129920856	CDy	1,044108687
9	6	7	9	9	8	7	5	9	7	7	5,175	0,13255269	0,15604	0,020683522	0,075494854	Cde	1,140541318
5	6	4	5	3	4	4	5	4	3	3	3,65	0,13255269	0,15604	0,020683522	0,075494854	EM	0,680885142
7	5	7	6	8	7	6	7	6	6	6	5,625	0,13255269	0,17047	0,022596257	0,127103946		
5	5	4	5	6	4	3	4	3	4	4	3,5	0,11860671	0,16385	0,019433709	0,068017983	O	0,989523898
8	7	8	8	8	6	6	7	6	8	8	6,5	0,11860671	0,17859	0,021181972	0,13768282		5,16174514
5	5	5	6	5	3	3	3	3	3	3	4,1	0,11860671	0,18834	0,022338388	0,09158739		
6	9	4	9	7	6	5	6	7	7	7	6,325	0,11860671	0,16418	0,01947285	0,123165774		
4	3	4	6	4	4	3	3	3	2	2	3,225	0,11860671	0,07566	0,008973784	0,028940452		
5	4	4	5	4	3	5	3	4	3	3	4,875	0,11860671	0,09019	0,010697139	0,052148553		
8	5	8	7	8	9	7	7	8	8	8	6,475	0,11860671	0,13919	0,016508868	0,10689492		
7	5	6	5	7	7	5	5	6	5	5	4,8	0,21797518	0,13272	0,028929666	0,138862396		
8	7	7	9	8	8	7	7	7	6	6	5,35	0,21797518	0,16635	0,036260171	0,193991916		
6	6	5	6	5	5	4	4	4	4	4	4,95	0,21797518	0,09280	0,020228097	0,100129079		
6	4	6	4	4	5	4	4	5	5	5	3,275	0,21797518	0,15377	0,033518043	0,109771592		
6	8	7	6	8	7	6	6	8	6	6	4,65	0,21797518	0,25190	0,054907948	0,255321957		
7	7	7	8	7	8	6	6	7	7	7	5,575	0,21797518	0,20246	0,044131255	0,246031746		
8	8	9	7	9	9	7	6	8	7	7	5,7	0,2387725	0,16391	0,0391372	0,223082043		
7	9	8	9	8	7	6	6	8	6	6	5,6	0,2387725	0,20448	0,048824201	0,273415524		
5	4	5	6	6	5	5	5	5	3	3	4,725	0,2387725	0,13865	0,033105807	0,156424939		
7	7	8	7	9	7	6	7	6	5	5	4,8	0,2387725	0,31295	0,074723854	0,358674499		
5	6	3	4	5	5	3	3	3	4	4	3	0,2387725	0,18001	0,042981438	0,128944313		
5	6	7	6	6	5	4	4	5	5	5	3,35	0,13587346	0,07916	0,010755743	0,036031739		
5	6	6	5	4	6	5	3	4	3	3	3,875	0,13587346	0,19969	0,027132571	0,105138714		
7	7	5	6	7	6	4	5	6	5	5	5,45	0,13587346	0,25270	0,034335223	0,187126967		
7	8	9	7	8	8	5	6	6	6	6	4,425	0,13587346	0,20741	0,028181514	0,124703201		
9	9	10	9	10	8	8	7	9	9	9	6,425	0,13587346	0,26104	0,035468408	0,227884521		
9	8	8	9	10	9	7	8	8	10	10	6,95	0,15621946	0,18679	0,029180233	0,202802619		
10	9	10	10	9	9	7	8	10	10	10	8,45	0,15621946	0,05656	0,008835773	0,074662279		
5	5	4	5	5	6	4	4	4	9	9	5,025	0,15621946	0,19403	0,030311262	0,152314091		
7	7	6	8	9	7	4	6	7	6	6	6,6	0,15621946	0,25621	0,040024988	0,26416492		
7	6	5	6	8	7	7	4	8	8	8	6,175	0,15621946	0,30641	0,047867205	0,295579989		
														1	5,16174514	Overall Result	

UNIVERSITY	STUDENT	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10	Student 11	Student 12
TOR VERGATA	FIELD OF STUDY	Civil1	Informatics2	Mechanics2	Mechanics2	Organization	Organization	Organization	Structures	Structures	Structures	Structures	Informatics4
	Year	2	2	2	2	4	4	3	3	4	4	4	4
Social Int./Mot.	Justice Perception (JP)	7	7	6	6	7	7	9	5	6	5	5	7
	Peer interaction: competitive vs collaborative (PI)	7	4	6	6	6	6	5	6	7	7	6	5
	Student engagement (SE)	5	8	7	6	5	8	7	6	6	4	7	7
	Student/Professor Collaboration (SPC)	8	7	8	6	5	5	3	6	5	6	7	8
	Student/Professor Info Exchange Efficiency (SPIEE)	5	6	8	8	7	6	8	6	6	7	5	8
Student Resources	Accessibility to labs (LA)	8	9	5	4	5	1	2	5	5	4	5	7
	Accessibility to facilities (FA)	8	7	5	4	5	3	3	5	5	4	5	6
	Possibility of carrying out projects at uni (P)	6	8	6	6	5	2	2	5	5	5	5	6
	Interactive Resources: moodle or similar (IR)	8	5	5	6	7	8	7	4	4	4	4	6
	Startup Incubators (SI)	8	8	7	6	6	2	4	6	6	6	7	7
	Direct access to publications and specialized magazines (PA)	10	7	7	6	5	7	7	6	7	7	6	5
	Workshop Access (WA)	8	6	7	7	6	7	8	7	7	7	6	9
Class Dynamics	Open Discussion (OD)	7	3	6	5	7	8	6	7	6	7	7	5
	Hands-on Practice (HOP)	8	4	5	6	6	6	3	4	3	4	4	4
	Case Method (CM)	8	8	6	6	5	7	7	6	6	6	5	4
	Degree of students participation (DSP)	7	6	7	5	5	3	2	5	6	6	5	3
	Theory links to practice (TLP)	8	8	6	5	6	3	8	5	6	6	5	8
	Problem solving seminars (PSS)	8	9	7	6	4	2	1	6	6	5	5	1
Competences Development	Deep analytical approach to problems (DAAP)	6	8	6	7	7	6	4	7	7	7	7	9
	Balance do-by-hand/ Software Approach (BHS)	6	9	7	6	5	4	2	6	3	6	5	8
	Soft Skill Enhancement (SSE)	7	7	5	5	6	8	9	3	5	5	5	1
	Technical Professional Competence Acquired (TPCA)	7	6	7	6	5	6	5	7	7	6	7	7
	Creative Factor (CF)	8	4	6	5	4	5	7	6	6	6	6	8
Evaluation Methodology	Balance Oral/Written Exams (BOWE)	8	8	5	5	5	8	5	6	6	6	6	3
	Possibility to retake exams (ERP)	8	10	5	5	6	8	8	8	10	8	9	1
	Continuous Evaluation (CE)	6	8	6	6	5	6	1	5	4	5	6	1
	Balance between Done-in-Class and appears in the exam (BCE)	7	7	6	5	6	5	7	5	4	4	5	4
	Accessibility to older exams (AOE)	10	6	6	7	6	8	8	6	6	6	6	7
Organization	Courses timetable/Overlapping (CTO)	6	8	6	6	4	6	8	5	6	6	7	10
	WS vs SS (WSSS)	7	9	7	6	5	5	4	7	8	7	7	5
	Flexible syllabus (FB)	7	6	7	6	4	4	2	6	4	6	5	6
	Appropriate Bibliography (AB)	7	8	6	6	5	8	9	6	6	7	6	8
	Quality synthesis material (QSM)	7	7	5	8	6	9	8	6	6	6	5	10

Student 13	Student 14	Student 15	Student 16	Student 17	Student 18	Student 19	Student 20	Student 21	Student 22	Student 23	Student 24	Student 25	Student 26	Student 27	Student 28	Student 29	Student 30
Civile3	Organization	Organization	Organization	Electronic2	Informatics 2	Organization	Energetic	Informatics	Biomedical	Organization	Energetica	Organization	Energetica	Mechanical	Organization	Organization	Biomedica
3	5	3	3	2	2	3	2	2	2	5	3	3	4	3	5	5	3
8	7	6	6	7	7	8	9	7	6	5	6	6	8	6	5	6	7
6	1	5	4	8	7	10	8	10	1	3	5	4	1	6	3	6	5
7	7	7	7	10	7	8	8	9	7	5	5	5	4	5	7	6	6
5	2	5	5	5	5	9	7	10	6	3	4	4	7	2	5	5	6
8	8	5	9	9	5	8	6	9	6	7	7	8	8	7	8	5	8
5	1	4	6	7	4	7	5	5	1	2	2	5	7	1	3	3	1
4	5	4	7	5	3	8	7	6	6	2	5	6	5	1	6	5	2
4	3	5	7	7	7	7	8	7	7	5	3	4	7	3	3	7	2
5	8	6	6	3	7	9	7	8	6	7	4	4	4	6	6	5	9
4	6	5	5	8	7	9	7	8	7	3	3	5	7	3	5	6	6
1	6	5	5	7	5	8	9	4	3	2	2	6	4	4	4	5	5
7	7	4	6	6	6	8	9	4	5	5	3	7	8	5	7	4	1
6	6	5	8	9	6	9	8	4	1	4	2	4	2	5	7	6	8
3	2	5	5	8	6	8	7	9	8	2	2	4	2	1	6	2	6
7	7	6	6	8	6	7	8	8	7	5	3	3	2	5	6	6	8
7	5	6	7	7	7	7	7	9	6	5	2	4	2	7	3	2	9
7	5	6	7	6	6	6	7	9	7	5	2	5	7	7	6	3	8
6	6	6	6	7	6	6	7	4	8	2	1	4	2	6	3	1	5
8	8	6	7	9	6	8	8	3	4	7	4	7	7	7	9	7	8
5	5	5	5	9	6	6	8	9	3	4	4	4	5	4	6	5	2
6	6	6	5	6	7	7	9	4	1	4	2	4	4	1	7	6	5
6	2	7	5	7	6	8	7	6	8	4	2	5	8	3	4	6	5
7	3	7	5	6	5	6	6	10	7	8	2	5	3	5	2	5	6
3	6	7	5	8	7	8	8	5	6	8	7	8	9	7	6	6	7
3	6	6	8	10	8	9	9	9	8	7	7	8	8	6	9	6	8
6	7	6	6	8	7	8	7	1	8	2	3	6	9	6	9	5	6
7	4	7	8	7	6	8	9	3	7	7	5	6	10	8	3	8	8
6	6	7	6	9	6	5	7	7	6	7	2	7	5	7	4	7	9
7	6	8	7	7	8	9	8	8	8	7	6	6	7	5	4	6	7
7	6	8	7	7	7	8	5	8	6	7	6	7	7	6	5	7	6
6	7	6	7	5	7	7	5	6	7	2	6	4	7	4	3	6	5
6	4	6	8	5	7	7	6	6	5	4	5	7	8	6	8	7	7
6	6	6	7	5	7	8	7	6	7	7	7	6	5	4	7	7	9

Student 31	Student 32	Student 33	Student 34	Student 35	Student 36	Student 37	Student 38	Student 39	Student 40	AHP	Weighting		Agreg. Results	Category	Categ. Score	
Biomedica	Energetica	Energetica	Organization	Organization	Informatics	Informatics	Electronic	Environment	Organization	MEDIA	Hierarchy1 W	Hierarchy2 W	Global Weights			
4	4	3	3	3	2	2	3	4	5							
6	7	7	7	6	8	6	8	8	6	6,65	0,13255269	0,18056	0,023933714	0,159159196	SIM	0,82063364
6	7	1	8	5	6	9	5	2	2	5,375	0,13255269	0,30353	0,040233718	0,216256234	SR	0,63792942
8	8	4	7	7	7	8	7	7	6	6,625	0,13255269	0,18940	0,025105479	0,166323802	CDy	1,23889256
7	8	2	7	5	8	7	6	8	1	5,7	0,13255269	0,15604	0,020683522	0,117896074	Cde	1,37567146
8	9	7	7	8	9	8	8	9	1	7,125	0,13255269	0,17047	0,022596257	0,160998332	EM	0,87331046
1	6	3	4	8	8	6	7	3	1	4,4	0,11860671	0,16385	0,019433709	0,085508322	O	0,99126348
1	7	4	4	5	8	8	6	5	1	4,9	0,11860671	0,17859	0,021181972	0,103791664		5,93770102
1	9	2	6	5	8	7	5	4	3	5,175	0,11860671	0,18834	0,022338388	0,115601157		
9	6	6	7	7	8	10	4	8	1	6,1	0,11860671	0,16418	0,01947285	0,118784383		
6	6	2	6	6	7	9	4	6	5	5,85	0,11860671	0,07566	0,008973784	0,052496635		
3	6	1	6	4	7	10	6	9	2	5,475	0,11860671	0,09019	0,010697139	0,058566837		
1	9	5	7	8	8	8	6	7	4	6,25	0,11860671	0,13919	0,016508868	0,103180425		
9	8	2	7	8	9	10	8	7	1	6,075	0,21797518	0,13272	0,028929666	0,17574772		
5	6	1	7	7	8	9	7	7	6	5,15	0,21797518	0,16635	0,036260171	0,186739882		
8	6	2	7	6	9	8	6	7	2	6,075	0,21797518	0,09280	0,020228097	0,122885687		
9	6	3	7	8	10	5	7	6	7	5,75	0,21797518	0,15377	0,033518043	0,19272875		
10	8	6	6	7	9	3	6	6	7	6,275	0,21797518	0,25190	0,054907948	0,344547373		
4	7	2	7	5	10	3	5	6	1	4,9	0,21797518	0,20246	0,044131255	0,216243149		
8	7	8	7	8	8	6	6	8	2	6,8	0,2387725	0,16391	0,0391372	0,266132963		
2	8	4	7	7	8	8	2	4	6	5,45	0,2387725	0,20448	0,048824201	0,266091894		
1	6	3	7	5	6	7	2	4	7	5,1	0,2387725	0,13865	0,033105807	0,168839616		
7	5	3	6	6	7	10	3	5	7	5,85	0,2387725	0,31295	0,074723854	0,437134545		
9	5	4	6	7	7	8	2	3	1	5,525	0,2387725	0,18001	0,042981438	0,237472443		
7	5	7	7	8	8	6	9	6	2	6,425	0,13587346	0,07916	0,010755743	0,069105649		
9	7	8	7	8	9	6	9	10	5	7,7	0,13587346	0,19969	0,027132571	0,208920798		
1	5	7	7	7	6	8	4	5	3	5,55	0,13587346	0,25270	0,034353223	0,19056049		
7	5	8	6	8	8	8	5	7	3	6,275	0,13587346	0,20741	0,028181514	0,176839002		
8	5	6	7	6	8	7	7	6	2	6,425	0,13587346	0,26104	0,035468408	0,227884521		
2	7	6	7	7	7	8	8	4	6	6,6	0,15621946	0,18679	0,029180233	0,192589537		
7	7	7	6	8	8	7	8	4	7	6,65	0,15621946	0,05656	0,008835773	0,058757888		
5	6	4	7	5	7	6	5	3	6	5,425	0,15621946	0,19403	0,030311262	0,164438595		
8	7	6	7	6	9	7	6	2	5	6,425	0,15621946	0,25621	0,040024988	0,257160547		
5	6	7	6	7	9	8	7	4	7	6,65	0,15621946	0,30641	0,047867205	0,318316912		
													1	5,937701023	Overall Result	

UNIVERSITY	STUDENT	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10	Student 11	Student 12	Student 13
SAPIENZA	FIELD OF STUDY	Aerospatial	Aerospatial	Biomedical	Biomedical	Structures	Structures	Electronic	Organization	Organization	Organization	Energetic	Civil	Civile
	Year	4	4	5	5	3	3	3	3	3	3	3	4	5
Social Int./Mot.	Justice Perception (JP)	6	7	6	6	8	7	8	6	6	6	2	7	7
	Peer interaction: competitive vs collaborat	3	3	2	1	6	6	6	5	6	7	3	9	9
	Student engagement (SE)	5	6	6	6	6	6	7	5	4	5	5	4	3
	Student/Professor Collaboration (SPC)	3	3	5	5	5	7	6	3	5	5	3	1	2
	Student/Professor Info Exchange Efficiency	8	8	8	9	8	8	7	7	7	6	4	5	5
Student Resources	Accessibility to labs (LA)	4	2	1	1	5	6	7	4	6	5	1	2	2
	Accessibility to facilities (FA)	6	2	8	7	7	8	7	6	6	6	3	6	6
	Possibility of carrying out projects at uni (P)	5	4	5	5	6	6	6	5	5	5	1	2	3
	Interactive Resources: moodle or similar (I)	6	2	6	5	7	7	4	4	6	5	2	3	2
	Startup Incubators (SI)	4	4	5	3	6	6	4	3	5	6	3	4	5
	Direct access to publications and specialize	4	4	8	8	8	8	8	5	6	2	9	1	2
	Workshop Access (WA)	6	5	6	6	8	8	6	5	7	7	8	6	6
Class Dynamics	Open Discussion (OD)	6	7	7	7	6	5	6	5	5	6	6	2	1
	Hands-on Practice (HOP)	5	5	5	6	5	5	6	5	4	3	2	1	1
	Case Method (CM)	7	6	6	6	7	7	7	6	6	5	5	6	7
	Degree of students participation (DSP)	4	4	7	7	6	6	7	6	6	6	4	5	4
	Theory links to practice (TLP)	6	4	4	5	5	5	6	6	5	5	4	1	2
Problem solving seminars (PSS)	5	4	5	5	6	5	5	5	4	6	1	5	3	
Competences Development	Deep analytical approach to problems (DA)	8	8	6	6	6	6	6	6	6	6	3	7	7
	Balance do-by-hand/ Software Approach (E)	4	6	6	6	5	5	1	5	6	4	1	6	4
	Soft Skill Enhancement (SSE)	4	5	6	6	5	5	1	5	6	5	3	1	2
	Technical Professional Competence Acquir	7	3	6	7	5	6	4	6	5	6	6	1	2
	Creative Factor (CF)	5	4	2	2	5	5	2	4	6	5	1	2	1
Evaluation	Methodology	Balance Oral/Written Exams (BOWE)	8	4	6	6	7	7	7	7	6	3	6	5
		Possibility to retake exams (ERP)	5	1	8	8	8	8	7	7	5	7	9	8
		Continuous Evaluation (CE)	4	2	6	5	5	5	5	5	5	3	1	6
	Organization	Balance between Done-in-Class and appea	8	8	6	6	5	6	7	7	3	5	5	2
		Accessibility to older exams (AOE)	7	6	7	6	6	6	5	7	4	2	4	4
		Courses timetable/Overlapping (CTO)	3	4	6	5	5	5	6	7	6	5	1	6
		WS vs SS (WSSS)	7	1	7	6	7	6	6	7	7	7	1	7
		Flexible syllabus (FB)	7	6	8	6	6	7	6	4	6	5	1	5
		Appropriate Bibliography (AB)	6	7	7	7	6	6	8	7	5	5	9	4
		Quality synthesis material (QSM)	7	7	8	9	6	6	7	7	7	7	6	6

Student 14	Student 15	Student 16	Student 17	Student 18	Student 19	Student 20	Student 21	Student 22	Student 23	Student 24	Student 25	Student 26	Student 27	Student 28	Student 29	Student 30	Student 31
Civil	Civil	Environment	Environment	Environment	Environment	Environment	Civil	Civil	Chemical	Organization	Organization	Organization	Organization	Organization	Organization	Electronic	Electronic
5	5	3	4	3	4	4	3	4	2	3	5	5	5	5	5	3	3
7	8	7	6	6	8	8	7	6	5	7	7	7	8	6	6	6	6
5	4	7	8	8	7	4	5	4	3	3	3	5	7	6	7	4	4
6	5	5	5	4	5	7	6	6	6	5	7	5	6	6	6	6	9
5	3	4	4	7	4	6	3	3	3	5	2	7	8	2	4	6	6
7	3	4	5	7	5	8	5	6	7	3	4	5	7	6	4	8	7
6	1	2	4	1	3	3	2	2	6	5	5	5	6	4	2	6	7
7	1	3	3	5	2	5	7	4	5	6	4	5	7	2	2	6	5
5	1	1	1	4	1	6	6	5	2	5	3	3	6	2	3	6	3
6	2	6	6	8	3	8	5	6	3	6	2	2	6	2	5	6	4
6	1	2	2	5	2	6	3	5	8	7	2	2	6	2	4	7	5
5	1	5	1	6	3	8	7	6	6	7	5	3	7	4	6	7	3
3	2	5	6	6	6	8	5	5	7	8	7	4	8	6	7	8	3
4	3	6	6	6	5	7	6	7	8	7	5	5	8	7	7	5	7
6	4	3	3	3	2	7	8	7	7	6	6	4	8	5	5	5	6
4	5	7	6	7	7	7	7	8	7	5	6	4	7	6	6	7	7
5	4	5	5	8	5	6	6	7	6	8	7	6	6	7	7	7	7
7	6	5	6	5	6	5	7	7	8	7	6	5	6	6	6	7	6
6	6	3	4	3	4	6	6	6	9	7	5	1	6	6	6	1	6
3	3	6	6	7	6	7	8	8	7	5	6	3	7	6	8	8	8
2	4	4	4	5	4	5	6	4	4	5	3	3	7	5	6	6	7
3	3	3	2	1	1	4	6	6	5	5	5	5	8	4	6	5	4
4	7	6	6	3	7	4	7	6	8	6	6	3	8	5	7	5	6
6	4	3	2	2	2	4	4	5	7	3	7	4	7	5	5	6	7
1	1	5	5	5	5	5	6	7	7	4	6	6	8	5	6	8	7
10	10	6	9	8	6	10	7	6	10	5	7	8	8	5	7	8	7
8	5	5	3	3	3	5	6	6	8	5	5	7	7	4	6	7	3
3	3	6	5	6	7	7	6	7	7	7	6	6	7	4	7	8	6
3	3	6	3	3	3	5	8	6	10	5	5	5	8	4	6	6	6
5	6	4	5	5	5	5	6	5	7	7	7	5	7	5	7	6	7
6	6	3	2	7	2	4	6	5	8	7	6	4	5	5	6	7	6
4	4	5	4	5	5	4	6	6	6	5	6	3	7	6	6	7	6
6	6	7	5	6	6	7	8	5	9	8	5	6	7	5	6	7	7
4	8	4	4	5	4	6	8	4	9	8	8	6	8	5	7	8	7

Student 32	Student 33	Student 34	Student 35	Student 36	Student 37	Student 38	Student 39	Student 40	AHP	Weighting			Aggregated Results	Category	Categ. Score
Informatics	Mechanic	Biomedical	Electronic	Biomedical	Biomedical	Informatics	Structures	Chemical	MEDIA	Hierarchy1 W.	Hierarchy2 W.	Global Weights			
2	3	5	3	5	5	2	4	2							
8	8	7	7	6	7	8	6	4	6,6	0,13255269	0,18056	0,023933714	0,15796251	SIM	0,75064777
3	6	8	4	7	7	3	7	6	5,275	0,13255269	0,30353	0,040233718	0,212232862	SR	0,58509399
7	7	6	8	7	5	5	5	4	5,675	0,13255269	0,18940	0,025105479	0,142473596	CDy	1,2167168
2	4	5	4	6	4	1	6	7	4,35	0,13255269	0,15604	0,020683522	0,08997332	Cde	1,24695255
9	7	7	8	7	8	9	8	5	6,55	0,13255269	0,17047	0,022596257	0,148005484	EM	0,80213298
7	4	5	5	7	3	9	3	5	4,1	0,11860671	0,16385	0,019433709	0,079678209	O	0,97291191
9	6	5	8	7	2	9	4	6	5,325	0,11860671	0,17859	0,021181972	0,112794003		5,574456
5	6	5	6	6	5	5	2	5	4,15	0,11860671	0,18834	0,022338388	0,092704309		
7	7	6	7	7	7	7	6	6	5,125	0,11860671	0,16418	0,01947285	0,099798354		
5	5	5	3	7	2	5	5	7	4,425	0,11860671	0,07566	0,008973784	0,039708993		
5	8	5	3	6	9	5	3	7	5,35	0,11860671	0,09019	0,010697139	0,057229695		
8	8	6	6	7	8	7	6	6	6,25	0,11860671	0,13919	0,016508868	0,103180425		
3	8	6	6	7	7	3	10	6	5,85	0,21797518	0,13272	0,028929666	0,169238545		
8	5	6	4	6	3	8	2	6	4,9	0,21797518	0,16635	0,036260171	0,177674839		
8	6	6	8	7	7	7	6	6	6,375	0,21797518	0,09280	0,020228097	0,128954116		
4	7	6	9	8	7	7	8	7	6,175	0,21797518	0,15377	0,033518043	0,206973918		
10	4	6	7	7	7	10	6	7	5,825	0,21797518	0,25190	0,054907948	0,319838796		
6	6	7	3	6	1	3	7	5	4,85	0,21797518	0,20246	0,044131255	0,214036586		
9	8	5	7	6	3	10	6	8	6,375	0,2387725	0,16391	0,0391372	0,249499653		
9	3	4	5	6	5	8	5	5	4,825	0,2387725	0,20448	0,048824201	0,235576769		
1	4	4	5	7	5	1	6	6	4,225	0,2387725	0,13865	0,033105807	0,139872035		
8	6	7	5	6	7	10	6	7	5,75	0,2387725	0,31295	0,074723854	0,42966216		
6	6	4	6	7	6	5	6	6	4,475	0,2387725	0,18001	0,042981438	0,192341934		
4	4	8	6	8	8	3	8	6	5,725	0,13587346	0,07916	0,010755743	0,061576629		
7	10	8	10	7	10	7	10	4	7,475	0,13587346	0,19969	0,027132571	0,20281597		
7	5	7	3	6	5	3	8	4	5,05	0,13587346	0,25270	0,034335223	0,173392878		
8	6	6	6	7	8	5	8	6	5,975	0,13587346	0,20741	0,028181514	0,168384548		
5	10	6	7	7	5	7	6	4	5,525	0,13587346	0,26104	0,035468408	0,195962954		
9	8	5	8	7	7	10	9	6	5,975	0,15621946	0,18679	0,029180233	0,174351892		
10	6	5	7	6	5	9	7	6	5,8	0,15621946	0,05656	0,008835773	0,051247481		
2	6	6	8	6	7	3	6	5	5,425	0,15621946	0,19403	0,030311262	0,164438595		
10	9	6	7	7	7	9	5	7	6,55	0,15621946	0,25621	0,040024988	0,26216367		
9	8	5	7	8	8	8	10	2	6,7	0,15621946	0,30641	0,047867205	0,320710272		
												1	5,574456002	Overall Result	

UNIVERSITY	STUDENT	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10	Student 11
		Aerospace	Aerospace	Electrical	Aerospace	Aerospace	biomedical	bioMedical	bioMedical	Aerospace	Mechanical	Mechanical
TU DELFT	Year	2	3	4	5	5	4	4	3	4	5	4
Social Int./Mot.	Justice Perception (JP)	8	7	6	6	6	9	8	5	8	9	7
	Peer interaction: competitive vs collaborative (PI)	7	7	8	8	9	7	8	6	5	8	8
	Student engagement (SE)	6	7	7	8	8	8	6	7	6	8	5
	Student/Professor Collaboration (SPC)	7	8	8	7	5	6	7	8	4	7	8
	Student/Professor Info Exchange Efficiency (SPIIE)	5	7	7	7	5	8	8	5	6	7	8
Student Resources	Accessibility to labs (LA)	8	5	6	6	8	10	9	10	5	7	8
	Accessibility to facilities (FA)	9	7	9	8	9	10	9	7	6	6	5
	Possibility of carrying out projects at uni (P)	8	7	8	7	8	8	7	6	6	7	8
	Interactive Resources: moodle or similar (IR)	9	8	7	6	8	5	6	5	6	8	7
	Startup Incubators (SI)	5	4	7	7	9	8	6	6	8	7	8
	Direct access to publications and specialized magazines (PA)	8	7	7	8	9	9	7	5	7	7	8
	Workshop Access (WA)	9	6	8	9	8	7	6	5	5	8	8
Class Dynamics	Open Discussion (OD)	8	6	7	9	9	9	6	8	7	7	8
	Hands-on Practice (HOP)	7	5	8	9	5	9	7	7	6	7	7
	Case Method (CM)	6	5	6	8	6	8	6	7	5	6	5
	Degree of students participation (DSP)	6	5	6	8	7	7	5	6	5	7	7
	Theory links to practice (TLP)	6	3	7	8	5	7	6	3	5	5	8
	Problem solving seminars (PSS)	4	7	6	5	7	6	5	4	6	6	6
Competences Development	Deep analytical approach to problems (DAAP)	6	5	6	7	7	8	6	4	8	7	8
	Balance do-by-hand/ Software Approach (BHS)	6	4	8	8	8	8	8	3	7	7	8
	Soft Skill Enhancement (SSE)	6	5	6	9	9	7	8	5	8	6	6
	Technical Professional Competence Acquired (TPCA)	6	5	7	9	8	7	7	6	7	7	7
	Creative Factor (CF)	5	2	7	8	7	7	5	4	6	8	7
Evaluation Methodology	Balance Oral/Written Exams (BOWE)	2	5	7	4	8	8	5	6	6	9	7
	Possibility to retake exams (ERP)	6	7	7	5	8	8	10	8	6	9	8
	Continuous Evaluation (CE)	5	7	6	8	5	8	6	7	6	6	5
	Balance between Done-in-Class and appears in the exam (BCE)	7	7	7	9	9	8	8	4	6	8	7
	Accessibility to older exams (AOE)	10	8	6	7	9	6	5	5	5	7	7
	Courses timetable/Overlapping (CTO)	8	7	7	7	8	8	7	6	6	9	7
Organization	WS vs SS (WSSS)	7	6	7	5	5	6	6	6	5	5	5
	Flexible syllabus (FB)	5	7	6	6	5	8	6	5	4	6	5
	Appropriate Bibliography (AB)	6	9	7	6	9	6	7	6	5	8	7
	Quality synthesis material (QSM)	8	8	7	5	8	9	8	8	7	8	7

Student 12	Student 13	Student 14	Student 15	Student 16	Student 17	Student 18	Student 19	Student 20	Student 21	Student 22	Student 23	Student 24	Student 25	Student 26	Student 27	Student 28	Student 29	Student 30
Aerospace	Applied Earth	Biomedical	Offshore & D	Civil	Biomedical	Civil	Nuclear	Aerospace	Aerospace	Nuclear	Energy	Computer sci	Applied phys	Energy	Mechanical	Molecular Sc	Electrical	Mechanical
3	4	5	4	2	3	4	5	3	4	5	5	5	4	3	4	3	4	5
7	6	6	8	7	10	9	9	9	9	8	9	7	5	8	7	8	7	8
7	8	7	7	7	6	9	7	8	9	7	7	9	3	5	9	3	3	4
6	7	7	8	6	7	8	6	8	8	8	8	8	6	8	8	5	5	6
6	7	2	7	7	8	9	7	7	7	7	7	9	6	7	9	7	6	7
6	8	5	8	8	7	10	7	6	9	7	9	8	7	4	10	7	7	3
8	7	4	7	5	8	10	8	5	5	8	8	8	6	8	10	8	8	8
8	6	8	7	8	10	10	9	7	9	7	9	9	9	6	10	8	8	8
6	6	5	8	8	10	7	8	8	6	7	8	9	5	5	8	6	6	6
7	7	8	8	9	6	6	5	7	7	6	6	8	6	6	10	5	5	3
6	7	5	7	7	8	7	7	7	7	7	8	9	5	8	9	6	6	6
6	8	10	6	9	10	9	9	9	7	7	6	9	6	10	9	5	5	5
6	8	9	7	7	8	6	8	9	7	8	8	9	6	7	9	7	7	7
6	6	9	7	5	10	7	8	8	9	7	8	9	8	1	10	2	2	4
7	6	7	6	5	6	7	9	7	8	7	9	8	5	6	7	6	7	6
6	6	8	6	7	6	7	8	8	8	8	8	9	8	4	9	4	4	6
6	5	6	6	4	7	6	6	7	7	7	7	7	3	7	7	3	3	3
6	5	7	6	6	8	8	9	7	7	7	7	8	5	4	7	5	5	7
5	7	5	6	6	4	6	7	7	6	8	10	7	5	10	9	8	8	7
6	6	5	8	7	10	7	8	8	6	6	8	9	8	8	9	7	7	5
6	7	8	7	7	4	7	8	8	6	7	6	9	8	8	9	6	4	6
5	8	5	5	6	7	5	6	9	9	6	6	8	3	6	8	1	1	4
6	6	9	7	8	10	9	8	7	7	8	7	7	8	5	9	6	6	6
6	5	8	6	6	7	7	7	6	7	6	5	8	4	4	9	2	2	4
4	6	2	8	4	7	9	9	8	8	8	7	7	3	1	7	1	1	1
7	8	10	8	6	10	10	9	9	9	8	7	9	5	9	6	9	8	6
6	6	5	7	6	7	9	7	7	7	8	8	6	4	8	8	7	7	6
6	6	10	7	7	7	9	9	9	8	7	8	6	3	8	7	7	7	5
5	7	9	6	7	4	8	7	7	8	8	9	9	3	10	7	6	5	4
7	6	8	7	8	7	9	7	8	8	8	9	9	5	8	8	8	7	7
5	6	5	7	3	4	9	5	5	5	7	10	7	3	1	8	5	5	2
6	7	9	6	5	4	10	6	5	4	7	7	7	3	4	8	1	1	3
6	7	8	6	7	6	9	9	6	9	8	8	8	7	9	9	7	6	7
6	7	8	6	7	6	8	8	7	9	8	9	8	8	7	9	7	7	5

Student 31	Student 32	Student 33	Student 34	Student 35	Student 36	Student 37	Student 38	Student 39	Student 40	AHP		Weighting			Agreggated Results	Category	Categ. Score	
Mechanical	Geomatic	Electrical	Electrical	Aerospace	Aerospace	Materials Sci	Maritime Tex	Aerospace	Aerospace	MEDIA	MEDIA	Hierarchy1 V	Hierarchy2 V	Global Weights				
6	5	4	4	5	5	3	3	4	4	4,025								
8	7	9	8	5	3	9	8	7	8	7,45	7,45	0,13255269	0,18056	0,023933714	0,178306167	SIM	0,93639863	
7	7	7	8	6	8	6	8	9	7	6,975	6,975	0,13255269	0,30353	0,040233718	0,280630183	SR	0,8643209	
8	8	8	9	6	5	8	8	6	7	7,05	7,05	0,13255269	0,18940	0,025105479	0,17699363	CDy	1,41027914	
7	8	8	10	5	5	5	7	5	6	6,825	6,825	0,13255269	0,15604	0,020683522	0,141165036	Cde	1,59004983	
7	9	9	10	5	6	6	7	7	7	7,05	7,05	0,13255269	0,17047	0,022596257	0,159303612	EM	0,93821939	
7	6	9	8	5	8	10	7	6	6	7,325	7,325	0,11860671	0,16385	0,019433709	0,142351922	O	1,08023882	
7	7	10	8	5	8	4	8	8	9	7,875	7,875	0,11860671	0,17859	0,021181972	0,166808032		6,81950671	
7	9	10	8	5	5	4	6	6	6	6,95	6,95	0,11860671	0,18834	0,022338388	0,155251795			
9	6	10	9	8	6	8	7	6	8	6,925	6,925	0,11860671	0,16418	0,01947285	0,134849484			
8	6	9	7	6	5	10	6	6	5	6,875	6,875	0,11860671	0,07566	0,008973784	0,061694763			
8	6	10	10	5	5	7	8	6	7	7,475	7,475	0,11860671	0,09019	0,010697139	0,079961115			
9	9	8	10	5	6	8	7	8	7	7,475	7,475	0,11860671	0,13919	0,016508868	0,123403788			
4	8	9	7	4	7	7	7	5	6	6,85	6,85	0,21797518	0,13272	0,028929666	0,198168211			
7	6	8	7	4	7	7	7	6	6	6,775	6,775	0,21797518	0,16635	0,036260171	0,245662666			
7	6	8	6	4	7	7	7	9	6	6,625	6,625	0,21797518	0,09280	0,020228097	0,134011141			
7	6	7	6	4	5	7	7	5	5	5,875	5,875	0,21797518	0,15377	0,033518043	0,196918505			
6	8	8	6	3	7	8	7	7	7	6,35	6,35	0,21797518	0,25190	0,054907948	0,348665469			
8	7	7	6	5	7	5	8	7	7	6,5	6,5	0,21797518	0,20246	0,044131255	0,286853157			
7	7	8	7	6	8	6	8	7	6	7	7	0,2387725	0,16391	0,0391372	0,273960403			
7	8	7	8	6	5	7	7	8	7	6,9	6,9	0,2387725	0,20448	0,048824201	0,336886986			
7	6	10	8	5	3	4	8	6	8	6,2	6,2	0,2387725	0,13865	0,033105807	0,205256004			
7	5	9	7	6	7	6	8	5	7	7,05	7,05	0,2387725	0,31295	0,074723854	0,52680317			
6	5	8	6	6	1	8	7	3	5	5,75	5,75	0,2387725	0,18001	0,042981438	0,247143267			
5	5	7	6	4	3	5	6	4	8	5,525	5,525	0,13587346	0,07916	0,010755743	0,059425481			
8	7	10	7	7	9	8	5	10	9	7,875	7,875	0,13587346	0,19969	0,027132571	0,213668998			
4	5	10	7	6	8	8	7	4	7	6,55	6,55	0,13587346	0,25270	0,034335223	0,224895713			
6	5	9	9	5	4	4	8	7	7	7	7	0,13587346	0,20741	0,028181514	0,1972706			
8	5	10	6	5	7	6	8	7	8	6,85	6,85	0,13587346	0,26104	0,035468408	0,242958595			
7	7	10	9	7	7	8	6	7	7	7,475	7,475	0,15621946	0,18679	0,029180233	0,218122241			
8	7	8	5	7	7	6	6	5	5	5,725	5,725	0,15621946	0,05656	0,008835773	0,050584798			
7	6	9	5	7	5	3	6	5	5	5,6	5,6	0,15621946	0,19403	0,030311262	0,169743066			
6	7	9	7	6	5	8	7	6	6	7,125	7,125	0,15621946	0,25621	0,040024988	0,285178038			
8	6	10	8	5	8	9	6	7	8	7,45	7,45	0,15621946	0,30641	0,047867205	0,356610675			
															1	6,819506707	Overall Result	

Annex 3: Statistical tests TFG

Principal Components Analysis

Análisis de componente principal: JP; PI; SE; SPC; SPIEE; LA; FA; P; IR; SIE; PA; WA; OD; HOP

Todos los componentes

Análisis de los valores y vectores propios de la matriz de correlación

Valor propio	9,0111	2,6422	2,0927	1,7759	1,4222	1,3646	1,2163	1,1262	0,9966	0,9654
Proporción	0,273	0,080	0,063	0,054	0,043	0,041	0,037	0,034	0,030	0,029
Acumulada	0,273	0,353	0,417	0,470	0,513	0,555	0,592	0,626	0,656	0,685
Valor propio	0,9240	0,8304	0,8005	0,7327	0,6447	0,6086	0,5850	0,5500	0,5143	0,4821
Proporción	0,028	0,025	0,024	0,022	0,020	0,018	0,018	0,017	0,016	0,015
Acumulada	0,713	0,738	0,763	0,785	0,804	0,823	0,841	0,857	0,873	0,887
Valor propio	0,4314	0,4038	0,3872	0,3545	0,3358	0,2976	0,2816	0,2597	0,2507	0,2078
Proporción	0,013	0,012	0,012	0,011	0,010	0,009	0,009	0,008	0,008	0,006
Acumulada	0,901	0,913	0,924	0,935	0,945	0,954	0,963	0,971	0,978	0,985
Valor propio	0,1777	0,1714	0,1557							
Proporción	0,005	0,005	0,005							
Acumulada	0,990	0,995	1,000							

Variable	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
JP	0,107	-0,036	-0,145	-0,177	-0,112	0,499	0,125	0,137	-0,048	0,152
PI	0,051	-0,019	0,058	-0,438	-0,111	-0,078	-0,211	0,193	0,160	0,508
SE	0,169	-0,083	-0,269	-0,075	-0,165	0,069	-0,216	0,192	0,044	-0,225
SPC	0,155	-0,145	-0,002	-0,263	0,213	-0,069	-0,355	-0,220	-0,114	0,072
SPIEE	0,141	-0,108	-0,173	-0,207	0,004	0,350	-0,112	-0,136	-0,326	-0,335
LA	0,139	-0,014	-0,097	-0,369	0,269	-0,084	-0,036	-0,059	0,156	-0,301
FA	0,163	0,323	0,202	-0,158	0,192	0,095	0,111	-0,011	0,014	-0,104
P	0,239	0,091	0,215	-0,131	0,055	0,014	0,018	-0,040	-0,024	-0,082
IR	0,173	0,139	0,123	-0,139	0,066	-0,007	0,110	-0,005	-0,571	0,199
SIE	0,230	-0,121	0,195	0,005	0,131	-0,146	-0,062	-0,091	-0,001	-0,105
PA	0,176	-0,017	0,262	0,200	0,370	-0,057	-0,081	0,113	-0,229	0,080
WA	0,048	-0,027	-0,009	-0,067	0,470	0,328	-0,043	0,372	0,398	0,029
OD	0,229	-0,100	0,109	0,182	-0,107	0,139	-0,299	0,145	-0,063	0,049
HOP	0,225	0,134	0,078	-0,030	-0,057	-0,076	0,206	0,351	-0,016	-0,131
CM	0,211	-0,074	0,030	0,051	-0,135	0,097	-0,060	0,149	-0,105	0,266
DSP	0,218	-0,267	0,017	0,006	-0,058	-0,073	0,146	0,043	0,163	0,150
TLP	0,221	-0,089	-0,079	0,005	-0,012	-0,191	0,412	0,084	0,039	0,089
PSS	0,196	0,194	0,187	0,041	-0,211	0,146	0,108	0,073	0,153	0,018
DAAP	0,177	0,072	-0,277	0,126	-0,176	0,114	-0,059	-0,004	-0,000	-0,033
BHS	0,178	0,203	0,048	-0,148	-0,232	-0,179	-0,055	0,013	0,148	-0,336
SSE	0,192	0,116	0,198	0,089	-0,137	-0,044	-0,142	-0,052	-0,077	-0,006
TPCA	0,203	-0,005	-0,210	-0,026	-0,015	-0,361	0,062	0,087	0,081	-0,022
CF	0,226	-0,143	-0,024	0,044	-0,152	-0,228	-0,008	0,048	-0,013	-0,012
BOWE	0,171	-0,322	0,000	0,011	0,031	0,000	0,154	-0,092	0,045	-0,144
PRE	0,148	-0,351	-0,098	0,056	0,213	-0,059	0,070	-0,285	0,066	0,160
CE	0,165	0,160	0,129	0,064	-0,035	0,246	0,274	-0,332	0,099	0,003
BCE	0,206	-0,101	-0,252	-0,011	-0,059	0,081	0,205	-0,079	-0,066	0,084
AOE	0,173	0,117	-0,173	0,265	-0,065	-0,023	-0,397	-0,010	0,007	0,023
CTO	0,120	0,313	-0,360	-0,064	0,094	-0,039	-0,002	-0,229	0,079	0,209

WSS	0,024	0,418	-0,221	-0,120	0,123	-0,185	-0,038	-0,063	-0,023	0,168
FS	0,170	0,061	0,248	0,157	-0,041	0,079	-0,201	-0,257	0,368	0,044
AB	0,079	0,110	-0,208	0,338	0,317	-0,074	0,005	0,332	-0,123	-0,101
QSM	0,137	0,125	-0,173	0,308	0,146	0,138	0,038	-0,207	0,098	0,106

Variable	PC11	PC12	PC13	PC14	PC15	PC16	PC17	PC18	PC19	PC20
JP	-0,243	0,194	0,149	-0,367	-0,286	0,041	-0,088	-0,295	-0,026	0,106
PI	-0,202	-0,029	0,247	0,280	-0,140	-0,010	-0,119	0,080	0,109	-0,134
SE	-0,038	0,214	-0,419	0,172	-0,005	0,169	0,117	-0,270	0,087	0,198
SPC	-0,003	0,054	-0,181	-0,058	0,299	-0,121	-0,225	-0,306	0,120	-0,215
SPIEE	-0,093	-0,260	-0,045	0,051	0,077	-0,139	0,113	0,208	-0,019	-0,215
LA	0,095	0,264	0,038	-0,133	-0,236	-0,330	0,015	0,371	-0,091	0,140
FA	-0,158	-0,173	-0,035	0,046	-0,062	0,116	-0,130	0,174	-0,035	0,071
P	0,057	-0,049	0,164	-0,288	0,095	0,182	0,324	-0,176	0,018	-0,091
IR	-0,048	-0,162	-0,003	0,149	0,075	-0,105	-0,080	-0,038	-0,054	0,423
SIE	0,084	-0,090	-0,013	-0,183	-0,281	0,177	-0,108	-0,287	0,064	-0,035
PA	0,130	0,079	0,012	0,017	-0,058	0,237	-0,001	0,062	-0,117	-0,102
WA	0,200	-0,096	0,094	0,092	0,215	0,046	0,129	-0,042	-0,121	0,129
OD	-0,016	0,043	0,050	0,164	-0,057	-0,150	-0,065	0,206	-0,190	-0,319
HOP	-0,052	0,011	-0,241	0,187	-0,062	0,065	-0,041	-0,168	-0,219	-0,229
CM	0,100	0,104	-0,262	-0,255	0,199	0,223	0,097	0,451	0,327	0,222
DSP	0,020	-0,241	-0,139	0,024	-0,051	-0,093	0,242	0,007	0,079	-0,144
TLP	-0,072	-0,082	-0,066	-0,118	0,018	-0,203	-0,097	-0,011	-0,265	0,100
PSS	0,203	-0,047	-0,325	0,007	0,012	-0,277	-0,107	0,045	0,142	-0,119
DAAP	0,383	-0,216	0,243	-0,157	-0,175	0,244	-0,259	0,152	0,014	-0,110
BHS	-0,257	-0,134	0,180	0,038	0,066	0,300	-0,148	0,085	0,146	0,010
SSE	-0,024	0,559	0,236	0,006	0,014	-0,036	0,289	0,040	-0,121	0,012
TPCA	-0,027	0,210	0,052	-0,105	0,339	0,088	-0,248	0,058	-0,135	-0,018
CF	-0,045	-0,150	0,119	-0,102	-0,182	-0,292	0,350	-0,035	0,050	0,044
BOWE	-0,009	-0,032	0,227	0,464	0,029	0,161	0,143	-0,001	0,261	0,262
PRE	-0,052	0,065	-0,172	0,010	-0,321	0,195	-0,162	0,116	-0,005	-0,020
CE	0,188	0,302	0,016	0,321	-0,089	-0,097	-0,165	-0,090	0,205	-0,066
BCE	0,217	0,026	0,329	0,029	0,391	-0,069	-0,025	-0,130	-0,048	-0,125
AOE	0,121	-0,150	0,066	0,168	-0,172	-0,113	-0,080	-0,140	-0,278	0,348
CTO	-0,021	0,044	-0,169	0,070	0,013	0,080	0,089	0,088	-0,121	0,054
WSS	0,243	-0,094	-0,018	0,009	-0,159	0,001	0,334	-0,135	0,243	-0,143
FS	-0,141	-0,178	0,010	-0,199	0,199	-0,209	-0,103	-0,078	0,069	0,255
AB	-0,226	0,077	0,147	-0,046	-0,052	-0,281	-0,186	-0,029	0,542	-0,049
QSM	-0,530	-0,036	-0,032	0,029	0,073	0,110	0,217	0,063	-0,115	-0,189

Variable	PC21	PC22	PC23	PC24	PC25	PC26	PC27	PC28	PC29	PC30
JP	-0,186	0,044	0,155	-0,151	0,044	0,212	-0,143	0,066	0,081	0,016
PI	-0,007	0,049	0,007	0,155	-0,144	-0,088	0,250	-0,087	-0,103	-0,072
SE	0,096	-0,158	-0,044	0,188	0,036	-0,048	0,150	-0,125	-0,322	-0,076
SPC	0,019	0,091	-0,302	-0,306	0,168	0,090	-0,143	-0,059	0,128	0,007
SPIEE	0,056	0,039	0,343	0,145	-0,095	0,000	0,225	-0,139	0,176	-0,000
LA	-0,145	-0,101	-0,159	-0,080	-0,244	0,051	-0,044	0,093	-0,145	0,065
FA	-0,261	-0,055	-0,151	0,203	0,431	-0,277	-0,141	0,010	0,020	-0,052
P	-0,130	0,151	-0,051	0,059	0,155	-0,208	0,226	-0,192	-0,038	-0,165
IR	0,301	-0,135	-0,007	0,110	-0,035	0,136	-0,139	0,135	-0,099	0,075
SIE	0,157	-0,077	-0,034	0,223	-0,383	-0,160	0,085	0,428	0,191	-0,201
PA	-0,162	0,141	0,283	-0,242	-0,137	0,248	0,173	-0,119	-0,357	0,022
WA	0,371	0,092	-0,004	0,050	0,050	0,065	-0,037	0,040	0,143	0,110
OD	-0,004	-0,172	-0,058	-0,002	0,049	0,028	-0,221	0,017	0,072	-0,208
HOP	-0,137	-0,040	-0,039	-0,059	-0,237	-0,124	-0,347	-0,185	-0,003	0,151
CM	-0,099	0,080	-0,156	-0,055	-0,221	-0,156	-0,036	-0,055	0,223	0,115
DSP	-0,006	-0,319	0,301	-0,256	0,140	-0,151	-0,075	0,234	0,125	0,135
TLP	0,134	-0,148	-0,199	-0,200	0,010	0,065	0,429	-0,341	0,173	-0,194
PSS	-0,081	0,198	-0,044	0,092	0,197	0,366	0,272	0,371	-0,152	-0,056
DAAP	0,234	-0,129	-0,199	-0,011	0,070	0,101	-0,133	-0,159	-0,128	-0,180
BHS	0,222	0,048	0,062	-0,363	0,003	0,133	0,095	0,108	-0,010	0,355
SSE	0,243	-0,257	0,023	-0,001	0,262	-0,006	0,081	0,073	0,118	0,041
TPCA	-0,099	0,160	0,348	0,397	0,039	0,213	-0,132	0,035	0,256	-0,094
CF	0,189	0,538	-0,067	0,101	0,059	-0,002	-0,310	-0,104	-0,173	0,053
BOWE	-0,297	-0,015	-0,093	-0,105	0,043	0,273	-0,104	0,024	0,094	-0,342

PRE	0,085	-0,003	0,068	0,207	0,338	0,008	0,037	-0,108	-0,106	0,352
CE	0,171	0,217	0,075	-0,003	-0,197	-0,157	-0,019	-0,240	0,184	0,093
BCE	-0,214	-0,115	-0,101	0,078	-0,084	-0,240	0,064	0,221	-0,353	0,281
AOE	-0,313	0,171	-0,021	-0,082	0,026	-0,140	0,220	0,040	0,282	0,237
CTO	0,121	0,156	0,269	-0,320	0,019	-0,245	-0,098	0,190	-0,148	-0,411
WSS	-0,137	-0,272	0,026	0,121	-0,034	0,333	-0,045	-0,164	0,184	0,155
FS	-0,056	-0,281	0,248	0,083	-0,172	0,052	-0,157	-0,290	-0,225	-0,043
AB	0,034	-0,055	0,073	-0,034	0,093	-0,195	0,090	-0,007	-0,029	-0,055
QSM	0,022	0,033	-0,364	0,130	-0,232	0,203	0,052	0,134	-0,009	0,058

Variable	PC31	PC32	PC33
JP	-0,027	-0,054	0,067
PI	0,138	0,066	-0,047
SE	-0,060	0,083	0,267
SPC	0,150	0,032	0,021
SPIEE	0,194	-0,129	-0,083
LA	-0,063	0,206	-0,026
FA	0,184	-0,127	0,367
P	-0,362	0,337	-0,286
IR	-0,158	0,223	-0,092
SIE	0,050	-0,219	0,050
PA	0,143	-0,002	0,271
WA	-0,019	-0,085	-0,036
OD	-0,575	-0,153	0,123
HOP	0,185	-0,043	-0,434
CM	0,015	-0,120	-0,013
DSP	0,099	0,423	0,201
TLP	-0,027	-0,209	0,132
PSS	0,049	-0,025	-0,192
DAAP	0,262	0,253	-0,049
BHS	-0,216	-0,123	0,049
SSE	0,361	-0,114	-0,133
TPCA	-0,017	0,193	0,093
CF	0,093	-0,157	0,189
BOWE	0,056	-0,087	-0,162
PRE	-0,154	-0,146	-0,313
CE	-0,095	0,179	0,231
BCE	-0,037	-0,245	0,071
AOE	0,029	0,106	-0,059
CTO	-0,048	-0,172	-0,152
WSS	-0,128	-0,211	0,083
FS	0,063	-0,100	-0,105
AB	-0,011	0,035	-0,133

The main deliberation that can be made through this set of data is that of concluding that a less complicated index will not deliver results with a high degree of reliability. The basic idea of PCA is to reduce the number of variables that explain a phenomenon according to their coefficients (loadings). The PCA seeks to replace p (more or less correlated) variables by $k < p$ uncorrelated linear combinations (projections considering the geometric approach) of the original variables. Those k **principal components** are ranked by importance through their explained variance, and each variable contributes with varying degree to each component. There are several criteria to decide which variables to keep and which variables to remove. The largest variance criteria advises to keep with a series of k components that are used as new features, instead of the original variables. However, one can decide to keep only the first component and select the $j < p$ variables that have the highest absolute coefficient; the number j might be based on the proportion of the number of variables (e.g., keep only the top 10% of the p variables) or a fixed cutoff (e.g., considering a threshold on the normalized coefficients). Assuming that our interest is that of explaining the 90% of the variance would mean taking into account 21 principal components that would substitute former variables. Given the interest of having an accurate and not

a simple index and taking into account the considerations attached in subsection 4.6.8 it seems appropriate to not reduce the number of variables that define the index to reduce its complexity.

Some of the problems of using PCA are that (i) measurements from all the original values have been needed to carry out the projection in a lower dimensional space (in cases where data has a cost this is definitely a disadvantage) that (ii) only linear correlations are taken into account and (3) only first order interactions between variables are considered (higher order interactions are obviated).

Research has provided some solutions for such problems. (1) may be partially solved by using a principal feature analysis or stepwise method that has not been applied due to lack of time and lack of reliability of raw data. For (2) it is possible to use Kernel PCA to embed nonlinear relationships into a lower dimensional space. (3) may be partially solved by using decision trees.

Data proof that most likely reports have been conditioned by the nature of respondents

Cuenta de variables discretas: ETSEIB; SAPIENZA; TOR VERGATA; TU DELFT

ETSEIB		SAPIENZA		TOR VERGATA		TU DELFT	
	Conteo		Conteo		Conteo		Conteo
1	96	1	45	1	40	1	16
2	97	2	63	2	59	2	21
3	155	3	98	3	59	3	43
4	165	4	119	4	99	4	68
5	202	5	243	5	195	5	159
6	197	6	334	6	300	6	262
7	188	7	247	7	293	7	329
8	130	8	124	8	186	8	263
9	61	9	27	9	67	9	118
10	29	10	19	10	22	10	41
N=	1320	67	1	N=	1320	N=	1320
		N=	1320				

Cuenta de variables discretas: ETSEIB; SAPIENZA; TOR VERGATA; TU DELFT

ETSEIB	Conteo	Porcentaje	CntAcum	PrcAcum
1	96	7,27	96	7,27
2	97	7,35	193	14,62
3	155	11,74	348	26,36
4	165	12,50	513	38,86
5	202	15,30	715	54,17
6	197	14,92	912	69,09
7	188	14,24	1100	83,33
8	130	9,85	1230	93,18
9	61	4,62	1291	97,80
10	29	2,20	1320	100,00
N=	1320			

SAPIENZA	Conteo	Porcentaje	CntAcum	PrcAcum
1	45	3,41	45	3,41
2	63	4,77	108	8,18
3	98	7,42	206	15,61

4	119	9,02	325	24,62
5	243	18,41	568	43,03
6	335	25,38	903	68,41
7	247	18,71	1150	87,12
8	124	9,39	1274	96,52
9	27	2,05	1301	98,56
10	19	1,44	1320	100,00
N=	1320			

TOR					TU				
VERGATA	Conteo	Porcentaje	CntAcum	PrcAcum	DELFT	Conteo	Porcentaje	CntAcum	PrcAcum
1	40	3,03	40	3,03	1	16	1,21	16	1,21
2	59	4,47	99	7,50	2	21	1,59	37	2,80
3	59	4,47	158	11,97	3	43	3,26	80	6,06
4	99	7,50	257	19,47	4	68	5,15	148	11,21
5	195	14,77	452	34,24	5	159	12,05	307	23,26
6	300	22,73	752	56,97	6	262	19,85	569	43,11
7	293	22,20	1045	79,17	7	329	24,92	898	68,03
8	186	14,09	1231	93,26	8	263	19,92	1161	87,95
9	67	5,08	1298	98,33	9	118	8,94	1279	96,89
10	22	1,67	1320	100,00	10	41	3,11	1320	100,00
N=	1320				N=	1320			