Survey on rights and responsibilities of researchers

- additional analysis -

In total 1302 participants took part in this survey. Distributions according to some characteristic are given in following tables.

	Research area	Frequency	Percent
Valid	social	162	12.4
	engineering	226	17.4
	medicine	278	21.4
	agriculture	17	1.3
	sciences	508	39.0
	humanities	111	8.5
	Total	1302	100.0

	Age	Frequency	Percent
Valid	until 25	27	2.1
	25-29	265	20.4
	30-3	347	26.7
	35-39	189	14.5
	40-44	162	12.4
	45-49	125	9.6
	50-54	98	7.5
	over 55	89	6.8
	Total	1302	100.0

	Gender	Frequency	Percent
Valid	female	840	64.5

	male	462	35.5
	Total	1302	100.0

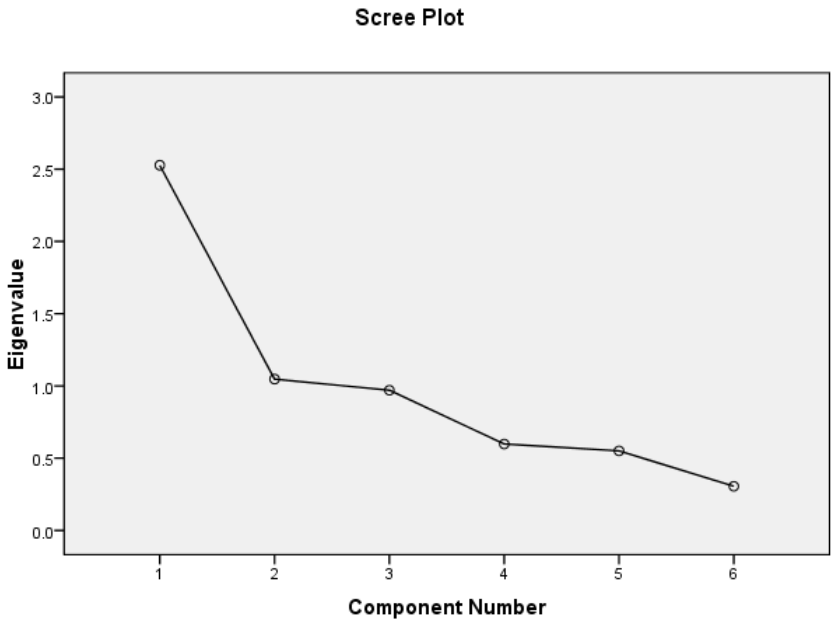
	Phd student	Frequency	Percent
Valid	no	685	52.6
	yes	617	47.4
	Total	1302	100.0

	Work type	Frequency	Percent
Valid	R1	140	10.8
	R2	617	47.4
	R3	302	23.2
	non-acad	243	18.7
	Total	1302	100.0

For several part of a questionnaire, including questions which have scaled answers regarding certain aspects of University satisfaction, we performed factor analysis in order to detect whether it is possible to calculate total scores for those parts. These kind of scores show higher measurement stability and reliability than individual items.

Factor analysis on questions regarding ethical aspects showed that one principal component can be extracted, based on Catel scatter diagram criteria, meaning that it is possible to calculate one total score. This principal component explains 42.12% of individual items variability which is satisfactory.

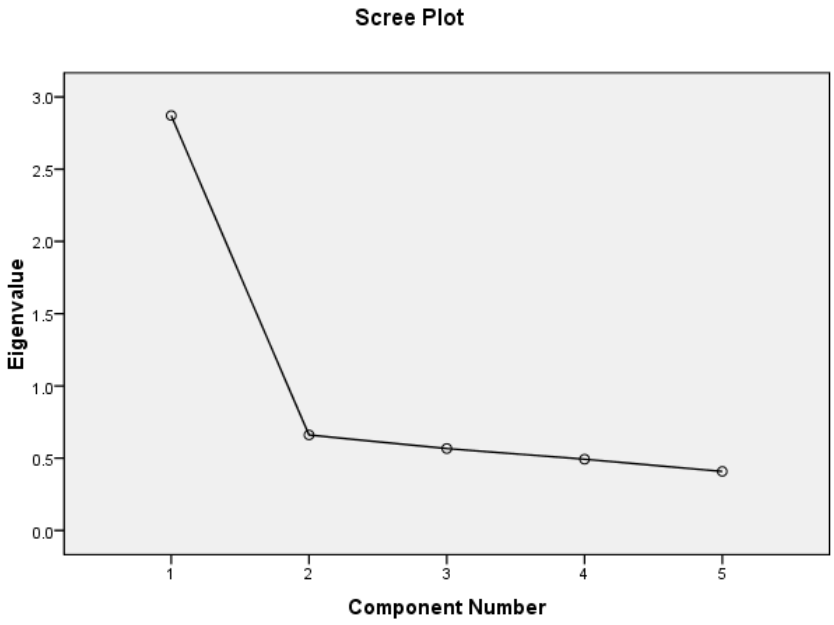
Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
2.527	42.121	42.121	2.527	42.121	42.121



	ethical aspects
Work according to ethics	.853
Ethical issues solving	.783
Gender equality	.696
Topic selection independence	.635
Knowing ethics	-.443
Knowing codex	.319

Factor analysis on questions regarding professional aspects showed that one principal component can be extracted, based on Catel scatter diagram criteria, meaning that it is possible to calculate one total score. This principal component explains 57.42% of individual items variability which is satisfactory.

Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
2.871	57.420	57.420	2.871	57.420	57.420

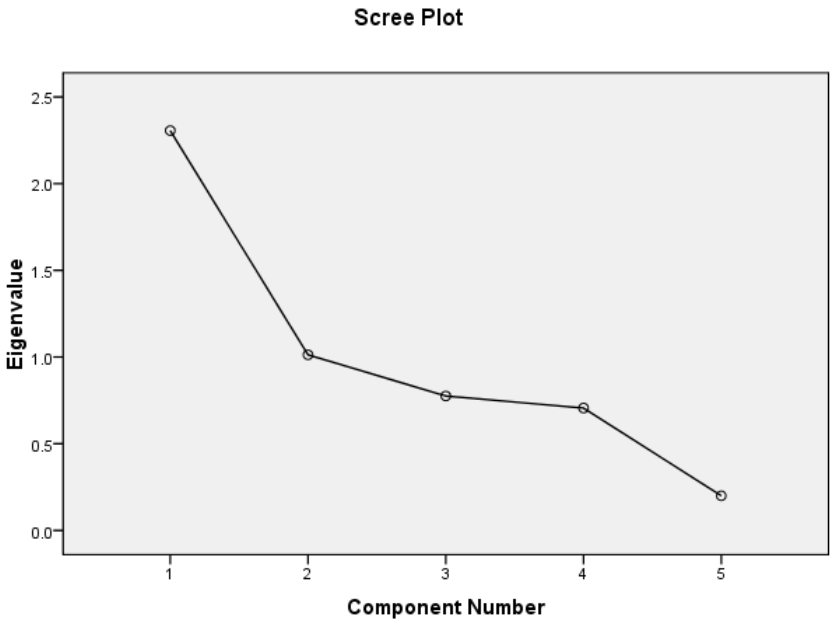


	professional aspects
Obligations awareness	.793
Results protection	.780
Management equality	.755
Results PR	.745
Researchers evaluation	.712

Factor analysis on questions regarding employment showed that one principal component can be extracted, based on Catel scatter diagram criteria, meaning that it is possible to calculate one total score. This principal component explains 46.12% of individual items variability which is satisfactory.

Only one item, regarding number of candidates applying for a job, did not correlate with others, and therefore it was not included in further analysis (total score was calculated without this item).

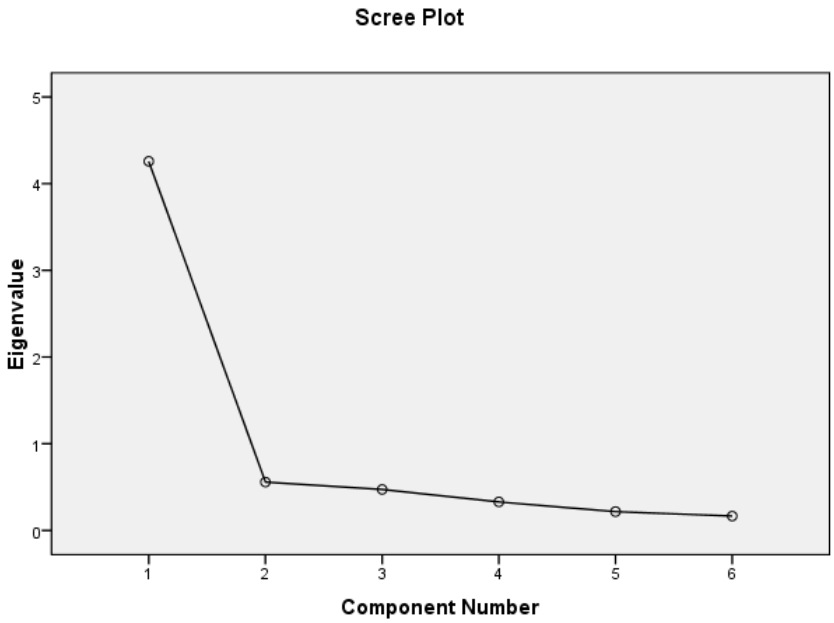
Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
2.306	46.119	46.119	2.306	46.119	46.119



	employment
Fairness	.893
Transparent	.876
Standardized	.625
Interview	.584
Number of candidates	

Factor analysis on questions regarding services quality showed that one principal component can be extracted, based on Catel scatter diagram criteria, meaning that it is possible to calculate one total score. This principal component explains 70.96% of individual items variability which is more than satisfactory.

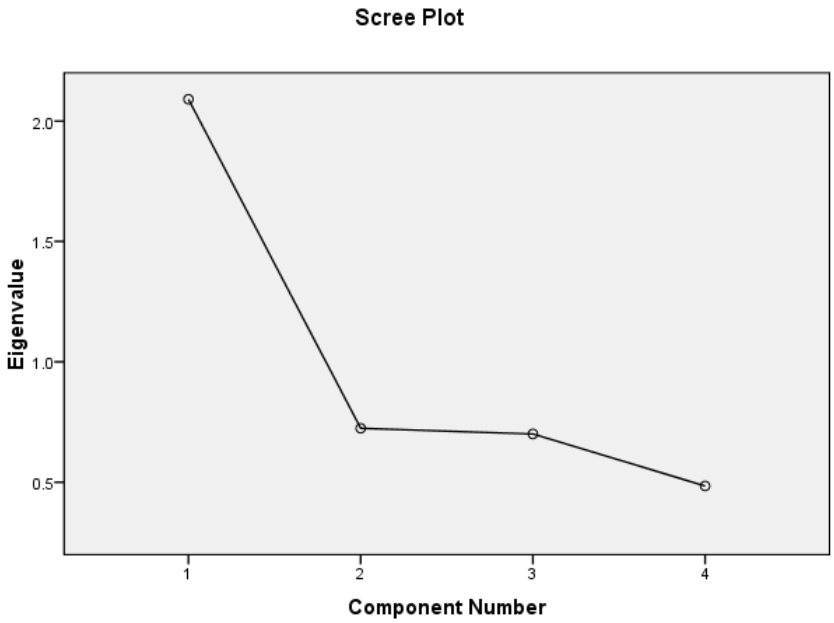
Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
4.257	70.956	70.956	4.257	70.956	70.956



	services quality
Career	.892
HR	.887
EURAXESS	.868
Account management	.812
Legal	.808
Student service	.780

Factor analysis on questions regarding development aspects showed that one principal component can be extracted, based on Catel scatter diagram criteria, meaning that it is possible to calculate one total score. This principal component explains 52.27% of individual items variability which is more than satisfactory.

Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
2.091	52.267	52.267	2.091	52.267	52.267



	development
Mentorship	.805
Evaluation	.725
Information non-availability	-.685
Motivation	.670

In the following part we tried to determine relations of various aspects of satisfaction with University (ethic aspects, professional aspects, employment, services quality, development) with participant characteristics.

T test for independent samples showed that gender differences are significant on ethical aspects and services quality. Differences are such that male participants show higher satisfaction with these two aspects, ethical and services quality.

	gender	N	Mean	Std. Deviation	Std. Error Mean
Ethical aspects	female	840	11.5690	3.12474	.10781
	male	462	12.3896	2.83604	.13194
Professional aspects	female	840	16.7440	4.68456	.16163
	male	462	16.9589	4.69139	.21826

Employment	female	840	7.3762	2.88168	.09943
	male	462	7.5195	2.94907	.13720
Services quality	female	815	6.5951	3.35060	.11737
	male	452	7.2389	3.48840	.16408
Development	female	840	12.0012	3.63420	.12539
	male	462	11.7489	3.69583	.17195

	t	df	Sig.
Ethical aspects	-4.682	1300	.000
Professional aspects	-.791	1300	.429
Employment	-.851	1300	.395
Services quality	-3.229	1265	.001
Development	1.191	1300	.234

T test for independent samples showed that differences between PhD students and those who are not, are significant on ethical aspects, professional aspects and employment. Differences are such that PhD students show higher satisfaction with ethical and professional aspects, but lower satisfaction with employment. **It means that PhD student appreciate University more on its ethical and professional aspects but they probably feel uncertain on their own future employment which is why they show less satisfaction on this aspect.**

	PhD	N	Mean	Std. Deviation	Std. Error Mean
Ethical aspects	no	685	11.6730	3.12618	.11945
	yes	617	12.0681	2.95121	.11881
Professional aspects	no	685	16.3912	4.84815	.18524
	yes	617	17.2966	4.45554	.17937
Employment	no	685	7.7212	2.84383	.10866
	yes	617	7.1005	2.94036	.11837
Services quality	no	665	6.8662	3.07954	.11942
	yes	602	6.7791	3.74912	.15280
Development	no	685	11.9460	3.64888	.13942
	yes	617	11.8736	3.66807	.14767

	t	df	Sig.
Ethical aspects	-2.338	1300	.020
Professional aspects	-3.496	1300	.000
Employment	3.870	1300	.000
Services quality	.453	1265	.650
Development	.357	1300	.721

One way analysis of variance showed that differences between research areas are significant on ethical aspects, employment and services quality.

On ethical aspects science and engineering show less satisfaction than others.

On employment, social sciences show lower level of satisfaction than others.

On service quality, science shows smallest level of satisfaction, and engineering shows largest, while other groups are in between.

		N	Mean	Std. Deviation	Std. Error
Ethical aspects	social	162	12.6358	2.55804	.20098
	engineering	226	11.6372	3.10716	.20669
	medicine	278	12.2950	3.03042	.18175
	sciences	508	11.4055	3.03187	.13452
	humanities	111	12.3153	3.25292	.30875
	Total	1285	11.8724	3.04216	.08487
Professional aspects	social	162	17.0432	4.36153	.34267
	engineering	226	16.8761	4.66597	.31038
	medicine	278	17.1906	4.74737	.28473
	sciences	508	16.6732	4.69919	.20849
	humanities	111	16.5946	4.97882	.47257
	Total	1285	16.8607	4.68544	.13071
Employment	social	162	6.9321	2.89597	.22753
	engineering	226	7.4425	2.93617	.19531
	medicine	278	7.3094	3.07276	.18429
	sciences	508	7.7165	2.79447	.12398
	humanities	111	7.2523	2.85870	.27134
	Total	1285	7.4412	2.90729	.08110

Services quality	social	158	6.9557	3.41474	.27166
	engineering	221	7.7376	3.70919	.24951
	medicine	269	6.9926	3.56809	.21755
	sciences	496	6.3206	3.11725	.13997
	humanities	107	6.7850	3.40374	.32905
	Total	1251	6.8353	3.42089	.09672
Development	social	162	11.8642	3.47396	.27294
	engineering	226	11.6947	3.61351	.24037
	medicine	278	11.7734	3.65810	.21940
	sciences	508	12.1358	3.72624	.16533
	humanities	111	11.8739	3.76374	.35724
	Total	1285	11.9230	3.66292	.10218

	df1	df2	F	Sig.
Ethical aspects	4	1280	7.978	.000
Professional aspects	4	1280	.699	.593
Employment	4	1280	2.655	.032
Services quality	4	1246	6.979	.000
Development	4	1280	.779	.539

One way analysis of variance showed that differences between age groups are significant on ethical, professional aspects, employment and development. Youngest group of participants (below 25) was removed from analysis because of the small number of members.

On ethical, professional aspects and development, youngest group (25-29) and older groups (above 45) show higher satisfaction than middle age groups (30-44).

On employment, only older groups (above 55) show higher satisfaction than all younger groups.

		N	Mean	Std. Deviation	Std. Error
Ethical aspects	25-29	265	12.4075	2.77023	.17017
	30-34	347	11.4006	3.00064	.16108
	35-39	189	11.0000	3.09426	.22507
	40-44	162	11.7160	3.03288	.23829

	45-49	125	12.0400	3.23639	.28947
	50-54	98	12.0408	3.34885	.33829
	above 55	89	13.2584	2.71581	.28788
	Total	1275	11.8322	3.06062	.08571
Professional aspects	25-29	265	17.9321	4.24120	.26053
	30-34	347	16.3487	4.55817	.24470
	35-39	189	15.4392	4.30274	.31298
	40-44	162	17.0123	4.75615	.37368
	45-49	125	16.4640	5.29081	.47322
	50-54	98	17.1429	5.18324	.52359
	above 55	89	17.3708	4.83919	.51295
	Total	1275	16.7710	4.68967	.13134
Employment	25-29	265	7.2377	2.91939	.17934
	30-34	347	7.3256	2.91210	.15633
	35-39	189	7.0423	2.67739	.19475
	40-44	162	7.7160	2.83822	.22299
	45-49	125	7.2720	3.13507	.28041
	50-54	98	8.0306	3.05771	.30887
	above 55	89	8.4045	2.71661	.28796
	Total	1275	7.4392	2.90915	.08147
Services quality	25-29	259	6.7297	3.88352	.24131
	30-34	339	6.9617	3.33287	.18102
	35-39	181	6.5359	2.77190	.20603
	40-44	157	6.4713	3.10616	.24790
	45-49	122	6.8934	3.29740	.29853
	50-54	94	7.7553	4.09743	.42262
	above 55	89	6.8652	3.00829	.31888
	Total	1241	6.8356	3.39977	.09651
Development	25-29	265	12.3698	3.55570	.21843
	30-34	347	11.3458	3.60575	.19357
	35-39	189	11.3492	3.40287	.24752
	40-44	162	12.0432	3.50749	.27557
	45-49	125	12.1600	4.02693	.36018
	50-54	98	12.2143	3.96700	.40073
	above 55	89	12.6517	3.71147	.39342
	Total	1275	11.8855	3.65692	.10241

	df1	df2	F	Sig.
Ethical aspects	6	1268	8.782	.000
Professional aspects	6	1268	6.381	.000
Employment	6	1268	3.550	.002
Services quality	6	1234	1.815	.093
Development	6	1268	3.709	.001

One way analysis of variance showed that differences between work type groups are significant on all aspects (ethical, professional aspects, employment, services quality and development).

On ethical and professional aspects R1 researchers and participants with non-academic careers show higher satisfaction than R2 researchers and R3 researchers.

On employment only participants with non-academic careers show less satisfaction than all other groups (R1 researchers, R2 researchers and R3 researchers).

On services quality only participants with non-academic careers show less satisfaction than all other groups (R1 researchers, R2 researchers and R3 researchers).

On development, only R3 researchers show less satisfaction than all other groups (R1 researchers, R2 researchers and non-academic careers participants). **This is important finding showing that R2 researchers do not feel too much space for development**.

		N	Mean	Std. Deviation	Std. Error
Ethical aspects	R1	140	12.4000	2.77139	.23422
	R2	617	11.6418	3.14731	.12671
	R3	302	11.6192	3.04736	.17536
	non-acad	243	12.4033	2.85784	.18333
	Total	1302	11.8602	3.04975	.08452
Professional aspects	R1	140	18.0429	4.59100	.38801
	R2	617	16.3274	4.88070	.19649
	R3	302	16.5662	4.52243	.26024
	non-acad	243	17.6831	4.19198	.26892
	Total	1302	16.8203	4.68631	.12988

Employment	R1	140	7.7143	2.82915	.23911
	R2	617	7.7828	2.81661	.11339
	R3	302	7.6821	2.92627	.16839
	non-acad	243	6.0412	2.74960	.17639
	Total	1302	7.4270	2.90545	.08052
Services quality	R1	134	7.7090	4.16903	.36015
	R2	602	6.8488	3.00062	.12230
	R3	296	7.2635	3.40660	.19800
	non-acad	235	5.7064	3.66593	.23914
	Total	1267	6.8248	3.41300	.09588
Development	R1	140	12.3929	3.99585	.33771
	R2	617	11.9546	3.64646	.14680
	R3	302	11.2351	3.55606	.20463
	non-acad	243	12.3663	3.49640	.22429
	Total	1302	11.9117	3.65676	.10134

	df1	df2	F	Sig.
Ethical aspects	3	1298	5.777	.001
Professional aspects	3	1298	8.643	.000
Employment	3	1298	23.949	.000
Services quality	3	1263	13.434	.000
Development	3	1298	5.593	.001

Pearson correlation coefficient shows that all aspects of satisfaction are positively correlated among themselves. All correlations are significant and have middle level of intensity, meaning that we might extract some general satisfaction or dissatisfaction out of them. On the other hand, since correlations are not high, there are some discrepancies between various aspects, meaning that we can treat them as separate aspects, too.

	N=1302	Ethical aspects	Professional aspects	Employment	Services quality
Professional aspects	Correlation	.624**			
	Sig.	.000			
Employment	Correlation	.475**	.567**		
	Sig.	.000	.000		
Services quality	Correlation	.293**	.348**	.350**	
	Sig.	.000	.000	.000	
Development	Correlation	.496**	.631**	.541**	.315**
	Sig.	.000	.000	.000	.000

We also tried to test whether development can be predicted by other aspects of satisfaction. For this purpose we used multiple regression analysis.

Analysis showed that development can be predicted by other aspects, with 45.4% success rate. All predictors are significant, but with different effect size: professional aspects show contribution, than employment, than ethic aspects and services quality shows smallest.

We cannot claim causality in these relations, but if we assume at least smallest level of dependence, we might suggest beginning with professional and employment aspects increasing if we would like to increase development aspects. Once again this is just an assumption since these relations are not causal.

R	R Square	df1	df2	F	Sig.
.674	.454	4	1262	262.256	.000[a]

	Beta	t	Sig.	correlation	partial
Ethical aspects	.112	4.110	.000	.494	.115
Professional aspects	.402	13.754	.000	.627	.361
Employment	.238	9.103	.000	.539	.248
Services quality	.059	2.622	.009	.315	.074