# FROM STUDENT TO (UN)EMPLOYED PROFESSIONAL

Findings from the first graduate survey in Serbia, Bosnia and Herzegovina and Montenegro within the Tempus project CONGRAD

# CONGRAD

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October 2014



# CONGRAD

#### **CONGRAD** Consortium



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University of Banja Luka, Bosnia and Herzegovina



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#### **1** CONGRAD Project Objectives and Purpose of the Report

This report was created within the CONGRAD project – *Conducting graduate surveys and improving alumni services for enhanced strategic management and quality improvement* – financed with support of the EU Tempus programme. CONGRAD unites fourteen higher education institutions and one independent research institute from seven countries. The members of the CONGRAD Consortium are four universities in Serbia (University of Belgrade, University of Novi Sad, University of Kragujevac and Singidunum University), three polytechnics in Serbia (polytechnics in Užice, Niš and Subotica), University of Montenegro, two universities from Bosnia and Herzegovina (University of Banja Luka and University of Tuzla) and four university partners from EU countries: Bielefeld University (Germany), Charles University in Prague (Czech Republic), Universitat Politècnica de València (Spain), University of Jyväskylä (Finland). The coordinator of the project is Bielefeld University, Germany.

CONGRAD aimed at creating a starting point to enable higher education institutions (HEIs) in Serbia, Montenegro and Bosnia and Herzegovina to continuously and systematically collect information on graduates and conduct graduate surveys for the purpose of enhancing study programmes and facilitating modernisation of teaching processes and organisation of study programmes. In addition, CONGRAD was expected to contribute to the improvement of institutional self-evaluation processes by collecting systematic and reliable information on the links between study programmes and subsequent employment of graduates, as well as enable the evidence-based evaluation of higher education reforms. Taking into account previous study conditions and the graduates' professional careers, CONGRAD aimed at providing a general insight in country specific conditions of the transition from higher education to the labour market in each of the partner countries, thus enabling partner country HEIs to define and implement evidence-based strategic decisions.

This report represents the general descriptive survey report, offering an overview of results for the key topics covered by the survey. The report offers basic descriptive analyses intended for the broad public interested in higher education in the region and its relation to the labour market. Additional and more complex analysis based on the rich and reliable source of information such as the CONGRAD survey results shall be the subject of further scientific publications.

Professional support in the realisation of the survey was provided to the HEIs by the analytical unit of CONGRAD project, consisting of researchers of the Centre for Education Policy Predrag Lažetić and Ivana Živadinović, and teaching staff of the Department of Sociology, Faculty of Philosophy, University of Belgrade, Isidora Jarić and Ognjen Radonjić, and the Deputy Project Coordinator Jana Nöller of Bielefeld University. Members of the CONGRAD analytical unit together with the Deputy Project Coordinator developed this and other reports available on the official website of the CONGRAD project, www.congrad.org.

#### 2 Survey and Data

The graduate survey was conducted in Serbia, Bosnia and Herzegovina, and Montenegro in the period between March and July 2013. The survey included all graduates who completed their studies in calendar year 2007 and calendar year 2012, at the following institutions: University of Kragujevac, University of Montenegro, University of Tuzla and polytechnics in Niš and Subotica. In the case of University of Belgrade<sup>1</sup>, University of Novi Sad<sup>2</sup>, University of Banja Luka and the polytechnic in Užice, all graduates who completed their studies during the academic years 2006/07 and 2011/12<sup>3</sup> were included in the survey. The target group and their contact information were identified based on the administrative data provided by the respective student service offices. The contact data was updated during year 2012 to the extent possible, and the final graduate contact data list included 16,123 graduates of the 2007 cohort and 26,117 graduates of the 2012 cohort (Table 1). The survey targeted graduates of undergraduate and postgraduate studies.

The survey was conducted via an online questionnaire consisting of a total of 125 questions covering the following topics: socio-biographic background, education prior to studies, higher education, course of studies, study conditions and competences, situation after graduation, first significant job, current job, professional orientation and satisfaction, as well as a section related to the respondents' comments and recommendations. Respondents accessed the questionnaire by entering an individual PIN code, which they received with the invitation letter that was sent via e-mail or by postal mail to their home addresses. During the fieldwork period from March to July 2013, after the initial contact, up to three more reminders were sent to graduates who did not complete the questionnaire upon earlier contacts. The total response rate for the 2007 cohort was 30% and 36% for the 2012 cohort. For both cohorts the response rate was 34%<sup>4</sup>, which can be considered a satisfactory result for this kind of survey, as the response rate is similar to those obtained in other graduate surveys conducted across Europe (e.g. REFLEX or HEGESCO<sup>5</sup> projects).

<sup>&</sup>lt;sup>1</sup> 19 out of 31 faculties at the University of Belgrade participated in the survey.

<sup>&</sup>lt;sup>2</sup> 11 out of 14 faculties at the University of Novi Sad participated in the survey.

<sup>&</sup>lt;sup>3</sup> Hereafter only 2007 and 2012 will be used to make reference to the cohorts of respondents.

<sup>&</sup>lt;sup>4</sup> For analytical reasons, the completed questionnaire implies that respondents answered on the first mandatory question in the questionnaire (labelled as F2) in which they were asked whether they were ever employed after graduation.

<sup>&</sup>lt;sup>5</sup> For an overview of response rates obtained in other graduate surveys, see Allen, Pavlin & Van der Velden (2011).

	Complet	ed the quest	ionnaire	Con	tacted gradua	ites		Response rate	
	2007	2012	Total	2007	2012	Total	2007	2012	Total
University of Belgrade	1.811	2.900	4.711	5.807	7.124	12.931	31%	41%	36%
University of Novi Sad	1.095	2.240	3.335	3.885	6.318	10.203	28%	35%	33%
University of Kragujevac	290	969	986	1.557	2.539	4.096	19%	27%	24%
Singidunum University	154	519	673	403	1.633	2.036	38%	32%	33%
University of Banja Luka	396	824	1.220	996	1.910	2.876	41%	43%	42%
University of Tutla	330	388	718	984	1.898	2.882	34%	20%	25%
University of Montenegro	597	1.381	1.978	2.134	4.046	6.180	28%	34%	32%
Higher Business Technical School, Užice	31	116	147	84	232	316	37%	50%	47%
School of Higher Technical Professional Education, Niš	62	148	210	172	294	466	36%	50%	45%
Subotica Tech – College of Applied Sciences, Subotica	83	91	174	131	123	254	63%	74%	%69
Total for all institutions	4.849	9.303	14.152	16.123	26.117	42.240	30%	36%	34%

 Table 1:
 Number of respondents, number of contacted graduates and response rates according to type of institution/country by cohort (2007 and 2012 cohort)

Differences in the response rates across institutions are mostly caused by different degrees to which the graduates' contact data was updated and the general availability of contact information at various institutions and faculties.

Most graduates belonging to the target population could be contacted: An assessment on the basis of institutional data obtained from HEIs shows that more than 85% of graduates of the 2007 cohort and more than 95% of graduates of the 2012 cohort were contacted. Despite the efforts to acquire precise information on the graduate population of both cohorts, including data on gender, age, type of financing, disciplinary affiliation of all respondents<sup>6</sup> in order to identify the characteristics of the population, it was not possible to precisely define the population according to all listed criteria. Consequently, weighting was not possible. Nevertheless, the sample size, i.e. the large number of respondents who completed the questionnaire, in combination with the high response rate confirms the reliability of data obtained by the CONGRAD graduate survey.

The following tables show the number of respondents according to type of institution/country differentiated by field of study and level of degree for the 2007 and 2012 cohorts (see Table 2 and Table 3).

<sup>&</sup>lt;sup>6</sup> Personal information about the respondents (name and surname, contact information etc.) were available only to the HEIs, whereas other information required to characterise the population and to analyse the sample were gathered separately using a code that could not be linked to the respondents' personal information.

Mutue schaltUniversities intersitiesIf is columnation10 <t< th=""><th></th><th></th><th></th><th>2007</th><th></th><th></th><th></th><th></th><th>2012</th><th></th><th></th></t<>				2007					2012		
drate training and education science2829779787379797970ArtsTable fraction science14191010143192791010Humanifies12723712701431227010Humanifies237237117014314323010Humanifies23723711014314323010Usiness and administration23371101432402020Usiness and administration23212014771473202120Usiness and administration212321201471212021Usiness and administration2120147720212021Usiness and administration21201477202120Usiness and administration2121212121212121Usiness and administration212121212121212121Usiness and administration212121212121212121Usiness and administration212121212121212121Usiness and administration2121212121212121 <th></th> <th>Universities - Serbia</th> <th>Universities - Bosnia and Herzegovina</th> <th>Universities - Montenegro</th> <th>Polytechnics - Serbia</th> <th>Total</th> <th>Universities - Serbia</th> <th>Universities - Bosnia and Herzegovina</th> <th>Universities - Montenegro</th> <th>Polytechnics - Serbia</th> <th>Toatal</th>		Universities - Serbia	Universities - Bosnia and Herzegovina	Universities - Montenegro	Polytechnics - Serbia	Total	Universities - Serbia	Universities - Bosnia and Herzegovina	Universities - Montenegro	Polytechnics - Serbia	Toatal
Aff         Aff         14         19         10         43         79         43         39         0           Unmaintes         oxial and behavioural science         277         78         217         78         78         73         30	feacher training and e ducation science	282	67	62	0	458	334	192	62	0	605
Humanities         227         28         21         0         386         632         133         127         0           social and behvournation         271         74         190         0         336         632         133         127         0           normalism and information         63         7         190         0         33         147         300         0           normalism and information         63         7         14         7         38         39         17         300         0           alse set and ministration         63         7         14         7         38         147         300         17         30         17           alse set and ministration         21         20         14         0         273         14         10         11         1	Arts	14	19	10	0	43	62	43	39	0	161
social and behavioural science         271         74         190         0         335         433         147         330         0           Business and administration         35         37         11         0         83         75         38         39         0           Business and administration         35         37         11         0         83         75         38         39         0           Business and administration         217         35         21         0         273         147         30         0           Business and administration         217         20         14         75         147         30         0           Law         217         20         14         0         273         148         0         177         108           Mathematics         25         9         12         0         27         148         27         147         28         27         29         27         29         29         27         29         28         27         20         28         26         28         27         28         28         27         28         28         28         28         27 <td>Humanities</td> <td>237</td> <td>78</td> <td>21</td> <td>0</td> <td>336</td> <td>632</td> <td>143</td> <td>122</td> <td>0</td> <td>897</td>	Humanities	237	78	21	0	336	632	143	122	0	897
ournalism and information         35         37         11         0         83         75         38         39         0         0           Business and administration         633         0         653         14         773         1478         0         211         54           Law         217         35         21         0         273         81         108         10         211         54           Law         217         35         21         0         273         81         10         211         54           Law         217         20         14         0         213         21	social and behavioural science	271	74	190	0	535	433	147	330	0	910
Business and administration         693         0         65         14         773         1478         0         211         54           aw         217         35         217         35         213         273         81         108         21         54           first sciences         71         20         14         0         273         81         108         10 <td< td=""><td>ournalism and information</td><td>35</td><td>37</td><td>11</td><td>0</td><td>83</td><td>75</td><td>38</td><td>39</td><td>0</td><td>152</td></td<>	ournalism and information	35	37	11	0	83	75	38	39	0	152
aw         217         35         21         0         273         81         108         0           If sciences         71         20         14         0         148         30         17         0           Physical sciences         71         20         14         0         108         30         17         0           Physical sciences         50         45         8         0         108         42         9         0           Athematics         25         9         12         0         108         32         5         9         0           Athematics         331         21         5         68         20         27         19         10         0           Computing         331         21         21         9         20         27         19         20         27         25         28         27         26         26         26         26         26         26         26         26         26         26         27         25         26         26         27         25         26         26         26         26         26         26         26         26	Business and administration	693	0	65	14	772	1.478	0	211	54	1.743
If a clemes         71         20         14         0         165         148         30         17         0           hybical sciences         50         45         8         0         105         148         30         17         0           hybical sciences         25         9         12         0         161         5         88         27         19         10         9         10         9         10	WE	217	35	21	0	273	272	81	108	0	461
Physical sciences         50         45         8         0         103         148         42         9         0           Mathematics         25         9         12         0         46         27         19         10         9           Mathematics         161         5         68         20         27         19         10         0           Computing         131         21         51         99         502         815         46         99         75           Segletering         113         24         0         9         106         147         38         1         10         7           Mandacturing         133         215         51         14         30         147         38         1         10         7           Mandacturing         133         215         51         14         30         147         38         1         10         10           Mandacturing         134         21         14         27         147         138         14         10         10         10         14         10         10         10         10         10         10         10	ife sciences	71	20	14	0	105	148	30	17	0	195
Vathematics         25         9         12         0         46         27         19         10         0           Computing         161         5         68         20         254         332         5         86         92           Sinterening         113         121         51         51         815         46         99         75           Vandracturing         113         215         51         14         0         99         502         815         46         99         75           Vandracturing         113         214         13         14         0         90         147         38         1         10         75           Vandracturing         113         214         12         14         0         91         147         38         1         10         12 </td <td>Physical sciences</td> <td>50</td> <td>45</td> <td>80</td> <td>0</td> <td>103</td> <td>148</td> <td>42</td> <td>6</td> <td>0</td> <td>199</td>	Physical sciences	50	45	80	0	103	148	42	6	0	199
Computing         161         5         68         20         254         332         5         86         92         93         94         93	Mathematics	25	6	12	0	46	27	19	10	0	56
Engineering         331         21         51         99         502         815         46         99         75           Manufacturing         113         44         0         9         166         147         38         1         0           Manufacturing         113         44         0         9         166         147         38         1         0           Architecture and building         215         51         14         30         106         147         38         1         0           Actitecture and building         215         21         14         30         106         12         12         12         12           Actitecture and building         154         38         0         0         12         13         12	Computing	161	2	68	20	254	332	S	86	92	515
Manufacturing         113         44         0         9         166         147         38         1         0           Anotherture and building         215         51         14         30 <b>310</b> 408         62         72         72         72           Acritecture and building         215         51         14         30 <b>310</b> 408         62         72         72         72           Acritecture and building         154         38         0         0 <b>43</b> 63         63         64         10         10           Veterinary         134         280         53         9         0 <b>342</b> 379         68         40         0         14           Veterinary         18         2         0         14         24         39         53         13         14         10           Veterinary         18         2         0         0         34         24         10         10         14         10           Veterinary         18         2         14         24         24         24         24         24         24         24         24	Engineering	331	21	51	66	502	815	46	66	75	1.035
Architecture and building         215         51         14         30         310         408         62         72         72         72           Agriculture, forestry and fishery         154         38         0         0         192         190         78         41         10           Veterinary         134         38         0         0         192         190         78         41         10           Veterinary         43         0         0         0         192         190         78         41         10           Veterinary         280         53         9         0         342         379         68         40         0         0         10           Veterinary         18         2         0         14         24         39         58         13         14         10           Veterinary         18         2         0         14         24         39         58         13         14         14           Evolution services (hotel, catering security services, transport)         18         2         24         39         23         13         14           Evolution services (hotel, catering security services, t	Manufacturing	113	44	0	6	166	147	38	1	0	186
Agriculture, forestry and fishery         154         38         0         190         78         41         10           reterinary         43         0         0         0         43         63         63         63         63         0	Architecture and building	215	51	14	30	310	408	62	72	72	614
Veterinary         43         0         0         43         63         63         0         0         0         0         1           Health         280         53         9         0         342         379         68         40         0         0         1           Personal services (hotel, catering, security services, transport)         18         2         0         44         24         39         68         40         0         1           Evolutionmental protection         18         2         0         14         24         39         23         13         14           Evolutionmental protection         18         0         0         14         24         39         23         13         14           Evolutionmental protection         18         0         0         14	Agriculture, forestry and fishery	154	38	0	0	192	190	78	41	10	319
Health         280         53         9         0         342         379         68         40         0           ersonal services (hotel, ratering, security services, transport)         18         2         0         4         24         39         68         40         0         14           ersonal services (hotel, ratering, security services, transport)         18         2         0         4         24         39         23         13         14           invionmental protection         18         0         0         14         24         39         23         13         14           invionmental protection         18         0         0         14         24         39         23         13         14           invionmental protection         18         0         0         14         24         39         23         13         14           invionmental protection         3         5         0         14         24         24         24         26         27         12         26           invionmental protection         3         5         0         14         24         24         24         26         26         27	/ eterinary	43	0	0	0	43	63	0	0	0	63
Personal services (hotel, catering, security services, transport)     18     2     0     4     24     39     23     13     14       Environmental protection     18     0     0     0     18     69     2     12     26       Security services     3     5     0     11     19     3     5     0     11       Anter     23     1     16     0     8     3     5     0     11       Anter     23     1     16     0     13     5     0     11	Health	280	53	6	0	342	379	68	40	0	487
Environmental protection         18         0         0         18         69         2         12         26           Recurity services         3         5         0         11         19         3         5         0         11           Security services         23         1         16         0         40         83         5         0         11           Observe         23         1         16         0         80         83         6         30         0	Personal services (hotel, catering, security services, transport)	18	2	0	4	24	39	23	13	14	68
3         5         0         11         19         3         5         0         11           Other         23         1         16         0         40         83         6         39         0	Environmental protection	18	0	0	0	18	69	2	12	26	109
Dther         23         1         16         0         40         83         6         39         0           And         And <td< td=""><td>security services</td><td>œ</td><td>2</td><td>0</td><td>11</td><td>19</td><td>ŝ</td><td>5</td><td>0</td><td>11</td><td>19</td></td<>	security services	œ	2	0	11	19	ŝ	5	0	11	19
	Other	23	1	16	0	40	83	9	39	0	128
HCC /0C'T 000'T HCT'0 CH0'H 0/T 50C 570 TC7'C (	fotal	3.251	629	589	176	4.645	6.154	1.068	1.367	354	8.943

 Table 2:
 Number of respondents according to type of institution/country by field of study (2007 and 2012 cohort)

Table 3:	Number of respondents according to type of institution/country by degree level (2007 and
	2012 cohort)

			2007		
	Universities - Serbia	Universities - Bosnia and Herzegovina	Universities - Montenegro	Polytechnics - Serbia	Total
First cycle - Bachelor degree	2.843	652	385	162	4.042
Second cycle - Specialist degree, Master/Magistar degree	319	24	122	5	470
Third cycle - Doctoral degree*	18	1	0	0	19
Other*	1	2	1	0	4
Total	3.181	679	508	167	4.535

			2012		
	Universities - Serbia	Universities - Bosnia and Herzegovina	Universities - Montenegro	Polytechnics - Serbia	Toatal
First cycle - Bachelor degree	4.280	1.080	543	283	6.186
Second cycle - Specialist degree, Master/Magistar degree	1.666	32	594	58	2.350
Third cycle - Doctoral degree	42	2	2	0	46
Other*	5	7	1	1	14
Total	5.993	1.121	1.140	342	8.596

\*n < 30

In the following part of the report, the results are differentiated in four subgroups according to type of institution and country in order specify the differences between types of institution (universities and polytechnics) and differences between the three countries (Serbia, Bosnia and Herzegovina, and Montenegro) included in the survey. The four subgroups are as follows:

- 1. Universities Serbia
- 2. Universities Bosnia and Herzegovina
- 3. Universities Montenegro
- 4. Polytechnics Serbia

The report also provides information differentiated by field of study, i.e. study programmes that the respondents completed and which are classified in accordance with the International Standard Classification of Education (see annex to this report).

This approach provides institutions that participated in CONGRAD with the opportunity to compare information for each of the faculties at CONGRAD partner institutions (available in non-public institutional reports and faculty data overviews) with the regional average for each field of study.

#### **3** Methodological Approach

This overview of the CONGRAD graduate survey results has been envisaged, as the term overview suggests, to present the results obtained with the CONGRAD survey in a descriptive manner. A comprehensive research instrument, i.e. the CONGRAD guestionnaire, was used to collect the graduates' answers to a large number of questions. Depending on the analytical approach the respective items can be treated as dependent or independent variables. The authors focused in the presentation of results related to the questions targeting the following topics: (1) evaluation of the quality of study programmes and study conditions; (2) first significant job, type and quality of first significant job; (3) current employment and career status, type and quality of job that the graduates had at the time of the survey; (4) competences acquired during studies and competences required for current job with regard to generic competences. Within different subchapters of the report, the questions and items included in the analysis, i.e. the dependent variables have been listed separately and explicitly at the beginning of each chapter. A great majority of dependent variables, which were analysed descriptively in this report are variables that measure attitudes and/or perceptions of respondents on a 5-point Likert scale. In the questionnaire five response levels were marked with values from 1 to 5, while labels were only indicated for the scale anchors (e.g. value 1 was labelled as "not at all" and value 5 was labelled as "to a very high extent").

Even though there is a broad debate within the scientific community whether certain statistical methods for continuous variables can be applied to Likert-type scales for measuring attitudes and perceptions, the common analytical practice and convention in psychological and sociological research on individuals' attitudes (e.g. European Social Survey, World Value Survey) treats these variables as continuous. This is particularly the case if only the extreme values of the scale are labelled. Therefore this approach will be intentionally followed in the present report and in most cases dependent variables will be described by arithmetic mean, standard deviation, standard error, etc.

Dependent variables related to the analytical topics described above are presented in descriptive overviews in figures and tables, differentiated by selected independent variables. Selected independent variables used in this report are: (1) cohort, i.e. calendar or academic year in which graduates completed their studies; (2) system of studies according to which the graduates completed their studies, i.e. the Bologna system of studies or old/pre-Bologna system of studies; (3) type of institution (i.e. universities from Serbia, Bosnia and Herzegovina and Montenegro, and polytechnics from Serbia); (4) field of study or discipline the graduates completed.

When comparing the mean answers of graduates of different cohorts, systems of studies and type of institution, differences in means between groups (if these are variables measured on the Likert-type five degree scale or as continuous variables, e.g. salary, duration of the search for job in months, etc.) were tested using simple statistical techniques such as t-test or one-way ANOVA<sup>7</sup>. Basic assumptions for applying t-test and one-way ANOVA, i.e. at least interval scale (see above) and the independence of observations, can considered fulfilled; whereas the normal distribution and homogeneity of variance in certain cases were not completely satisfied. Nevertheless, since these are rather robust techniques, lack of to normal distribution in some cases causes only small inaccuracies especially bearing in mind the large sample size with several thousand respondents. Within this analysis, statistical significance has been reported based on a 95% confidence interval (p<0.05) and all confidence intervals demonstrated in the report relate

<sup>&</sup>lt;sup>7</sup> These techniques are used for rejecting the null hypothesis i.e. hypothesis that differences between means of two or more groups of respondents which can be observed in the sample are random and are the result of the sampling, so they cannot be generaliseed for the entire population i.e. in the case of the CONGRAD survey on all graduates.

to this confidence interval. Due to the large size of the sample and small standard errors, most differences between subgroups of respondents from different systems of studies or different cohorts are in fact statistically significant. Therefore in the key tables showing the differences between graduates from different systems of studies, the effect size (eta-squared) is also presented. Methods and statistically significant differences between groups and other indicators are explained in footnotes within the text as they first appear.

Differences in the distributions within certain categorical answers among graduates who belong to different types of institution are analysed by using pair-wise comparison for proportions taking into account Bonferroni correction. Statistically significant differences are stated in the text.

Comparisons between graduates of different fields of study are presented only descriptively in figures or tables. Comparisons by discipline are presented only in comparative perspective due to large differences in the number of respondents according to disciplines, which did not allow a reliable use of robust techniques.

In all figures the indicated percentages were rounded to integers, whereas in the text percentages are stated with one decimal.

#### 4 Evaluation of Study Programmes and Study Conditions

Graduates from seven universities and three polytechnics were asked to evaluate different aspects of the study programmes they completed in 2007 or 2012. The aspects analysed are related to the evaluation of study conditions and other elements of the completed study programmes, as well as to the evaluation of the modes of teaching and satisfaction with studies. In this part of the report special attention is paid to the analysis of the graduates' evaluation referring to: (1) cohort (cohort of respondents who graduated in 2007 compared to the cohort of respondents who graduated in 2012<sup>8</sup>); (2) type of institution the respondents graduated from (university/polytechnic); (3) system of studies they completed (old/pre-Bologna system of studies as opposed to the new/Bologna system of studies); (4) degree level (studies of the first, second and third cycle); and (e) field of study (classified based on ISCED).

In all countries of the region, as part of higher education reforms inspired by the Bologna Process, the higher education legislation and the system of studies were changed by introducing degrees organised in three cycles. Nevertheless, *Bologna* reforms and the introduction of new study programmes in the regional context included also a variety of ambitious additional objectives, such as improving the professional and practical relevance of study programmes, reorganisation of examination procedures, modularisation of study programmes, increase in efficiency of studies, student-centered teaching approach, etc. For these reasons, this part of the report is focused on analysing the graduates' responses with regard to the system of studies according to which they completed their studies, i.e. the comparative analysis of the graduates who completed their studies according to the old system of studies prior to the reform with graduates who completed their studies according to the new and reformed system of studies. One of the reasons for selecting the 2007 cohort and the 2012 cohort for the analysis of graduates belonging to the respective cohorts was to include graduates from both the old and the new system of studies and analyse their responses in the context of reforms which were and are still being implemented in HEIs participating in the CONGRAD survey.

#### 4.1 Study Programme Quality and Study Conditions – General Overview

Study conditions were assessed based on 12 items related to the organisation of studies, the performance of teaching staff and the quality of the contents of the study programme. A 5-point Likert scale (from 1 "very low" to 5 "very high") was applied for the assessment of the following 12 items:

- 1. Content of study programme
- 2. Schedule and coordination of courses
- 3. Possibility to complete study requirements in the provided time (obligations related to lectures, exercises, exams, etc.)
- 4. Organisation of exams
- 5. Organisation of teaching process within courses
- 6. Professional competence of teaching staff

<sup>&</sup>lt;sup>8</sup> Four HEIs that participated in this survey (University of Belgrade, University of Novi Sad, University of Banja Luka and Užice Polytechnic) keep their records on students and graduates according to the academic year that starts on 1 October and ends on 30 September; whereas the remaining six HEIs (University of Kragujevac, University of Montenegro, Singidunum University, University of Tuzla, Subotica Polytechnic and Niš Polytechnic) keep their records on the graduates according to the calendar year that begins on 1 January and ends on 31 December.

- 7. Professional advice and guidance provided by teaching staff related to teaching contents (discussion of written examinations, assignments)
- 8. Communication with teaching staff
- 9. Cooperation with fellow students
- 10. Performance of student service office
- 11. Use of contemporary teaching methods
- 12. Practice-oriented teaching contents within lectures and exercises

Figure 1 shows the distribution of responses to the 5-point Likert items for elements of study conditions included in the questionnaire. Graduates awarded the highest average marks to cooperation with fellow students (M=4.19) and professional competence of teaching staff (M=3.87). The lowest rated elements were practice-oriented teaching contents (M=2.59) and use of contemporary teaching contents (M=2.91).



Figure 1: Assessment of elements of study programmes and study conditions (5-point scale) (universities and polytechnics, 2007 and 2012 cohort)

Table 4 shows the comparative analysis of average ratings regarding the quality study differentiated by type of institution, degree level, cohort and system of studies (5-point scale from 1 "very low" to 5 "very high"). The analysis of variance (ANOVA), i.e. the t-test for the analysed elements of study programmes, indicates that there are statistically significant differences in the ratings by different groups of respondents with regard to the listed dimensions (for p<0.05). ANOVA was used for variables with more than two categories (type of institution: 4 categories; degree level: 3 categories), while t-test was applied for dichotomous variables (type of institution: university and polytechnic; system of studies: old and new; cohort: 2007 and 2012). Statistically significant results are marked with an asterisk (\*).

Generally speaking, the highest rated element of study conditions is *cooperation with fellow students* (M=4.19) followed by *professional competence of teaching staff* (M=3.87) and *possibility to complete study requirements in the provided time* (M=3.65). *Practice oriented teaching contents* (M=2.59) and *use of contemporary teaching methods* (M=2.91) are rated the lowest. This trend is persistent across all subgroups presented in Table 4: The lowest ratings are

given to practical contents and contemporary teaching methods for all types of institution, all degree levels, both cohorts and both systems of studies. Still, certain differences do exist: With regard to the differentiation by type of institution, polytechnics received better ratings than universities, except for the assessment of student services where the ratings are similar. Within the group of universities Montenegrin universities received the highest ratings in all dimensions except for *cooperation with fellow students* (M=4.15), which received the highest score at Serbian universities (M=4.20).

The same general trend is present in the case of results differentiated by degree level: *practice oriented teaching contents* received the lowest scores, even though third-cycle graduates (M=3.38) rated this dimension considerably better than first-cycle graduates (M=2.53) and second-cycle graduates (M=2.75). From a general point of view, third-cycle graduates gave the highest ratings on all dimensions when compared to the graduates from first-cycle and second-cycle levels. It has to be emphasised though that the number of PhD graduates who completed the CONGRAD questionnaire is very low, and cautious interpretation of the respective results is required. While 10,600 first-cycle graduates and 2,730 second-cycle graduates participated in the CONGRAD survey, only 52 third-cycle graduates are included in the sample.

Statistically significant differences occur also when graduates who completed studies according to the *old system of studies* are compared with those who completed their studies according to *reformed study programmes* in all dimensions except for the *cooperation with fellow students*. The greatest difference between the old and reformed systems has been measured in the *use of contemporary teaching methods* (M<sub>old\_programme</sub>=2.62; M<sub>new\_programme</sub>=3.15) and in *communication with the teaching staff* (M<sub>old\_programme</sub>=3.39; M<sub>new\_programme</sub>=3.82). Reforms inspired by the Bologna Process had a certain effect on the increase of communication between students and teachers. Results presented in the previous analysis show that graduates positively assessed this change. The same can be said about the other significant structural change which is related to the changes in the organisation of lectures and, maybe even more importantly, to the changes in the manner in which exercises, exams and grading system were organised. Reforms in this field definitely had an effect which is reflected also in answers of CONGRAD graduates: higher mean assessments were given by graduates who completed their studies according to the new system of studies compared to their colleagues who graduated according to the old system of studies.

The largest differences between systems of studies occurs in the mean assessment the graduates gave to *consultations with the teaching staff* ( $M_{old\_programme}=3.30$ ;  $M_{new\_programme}=3.72$ ) and the *possibility to complete study requirements in the provided time* ( $M_{old\_programme}=3.44$ ;  $M_{new\_programme}=3.86$ ). The criticism of the old system of studies usually targeted the high workload imposed to the students and cumbersome exams, which lead to an increase of time needed for students to finish their studies. One of the aims of the new system of studies was to decrease the students' workload and to enable the majority of students to complete their studies on time. A detailed analysis of the students' workload and in that sense, the comparison of new and old study programmes which would lead to the definitive conclusions of the success of the Bologna reform can and should not be solely based on this question, since such an analysis would require a more detailed assessment of the students' workload. Nevertheless, it is important to conclude that students who graduated according to the new and reformed system of studies gave significantly higher marks to the possibility to complete study requirements in time, which implies that a certain decrease of the students' workload during studies has been achieved.

As expected, the smallest differences between the new and the reformed types of studying occur in the dimensions that had not been encompassed by reforms, such as the *functioning of student service offices* and *professional competence of teaching staff.* The graphical display of the graduate answers (means) according to the new and old programmes is given in Figure 2.



(universities and polytechnics, 2007 and 2012 cohort)

Differences between the two cohorts are similar to the previously analysed differences between the two systems of studies. The highest difference in answers (means) by the two cohorts occurs in the *use of contemporary teaching methods* ( $M_{2007}$ =2.62,  $M_{2012}$ =3.06) and *consultations with teaching staff* ( $M_{2007}$ =3.34,  $M_{2012}$ =3.62), whereas the smallest difference occurs in *cooperation with fellow students* ( $M_{2007}$ =4.24,  $M_{2012}$ =4.17). The differences between the cohorts are on average smaller than the differences between the systems of studies, which may imply that the differences between cohorts can in fact be attributed to the differences between two systems of studies.

	umber of respondents	nsər	niversities - Serbia	bns sinsog - seitizsein erizegovina	niversities - Montenegro	olytechnics - Serbia	DARDNOD - 2911219vin	DARONOS - sointootylo	achelor degree	pecialist degree, faster/Magistar degree	octoral degree	ther	wəşsks Apnşs pji	məteye ybute angolo	۷00	210
of study programme	14.499	3,55	3,55*	ын 3,41*	а 3,72*	a,69*	a,56*	3,69*	3,53*	<b>3</b> ,64*	3,85*	3,00*	3,47*	3,63*	3,51*	3,59*
and coordination of courses	14.212	3,37	3,4*	3,1*	3,4*	3,58*	3,36*	3,58*	3,32*	3,54*	3,66*	2,79*	3,26*	3,46*	3,33*	3,39*
ty to complete study requirements in the provided	14.393	3,65	3,65*	3,49*	3,74*	3,99*	3,64*	3,99*	3,58*	3,91*	3,96*	3,47*	3,44*	3,86*	3,56*	3,70*
ition of exams	14.431	3,43	3,46*	3,12*	3,48*	3,76*	3,42*	3,76*	3,36*	3,71*	3,78*	2,80*	3,28*	3,57*	3,41	3,44
ition of teaching process within courses	14.130	3,32	3,36*	2,99*	3,37*	3,57*	3,31*	3,57*	3,27*	3,52*	3,63*	2,64*	3,19*	3,45*	3,26*	3,35*
onal competencies of teaching staff	14.427	3,87	3,91*	3,63*	3,97*	3,91*	3,88	3,91	3,85*	3,99*	4,33*	3,93*	3,83*	3,93*	3,86*	3,90*
onal advice and guidance provided by teaching cussion of written examinations, assignments	14.443	3,52	3,52*	3,32*	3,68*	3,82*	3,51*	3,82*	3,46*	3,74*	4,07*	3,20*	3,30*	3,72*	3,34*	3,62*
ication with teaching staff	14.473	3,61	3,59*	3,49*	3,79*	3,91*	3,6*	3,91*	3,55*	3,85*	4,29*	3,13*	3,39*	3,82*	3,44*	3,71*
tion with fellow students	14.449	4,19	4,2*	4,18*	4,15*	4,29*	4,19*	4,29*	4,19	4,23	4,35	4,31	4,19	4,23	4,24*	4,17*
ance of student service office	14.449	3,45	3,35*	3,57*	3,86*	3,45*	3,45	3,45	3,38*	3,71*	3,93*	3,47*	3,39*	3,50*	3,44	3,46
ontemporary teaching methods	14.381	2,91	2,94*	2,43*	3,1*	3,37*	2,89*	3,37*	2,83*	3,17*	3,60*	2,43*	2,62*	3,15*	2,62*	3,06*
oriented teaching contents	14.432	2,59	2,58*	2,32*	2,74*	3,06*	2,57*	3,06*	2,53*	2,75*	3,38*	2,27*	2,41*	2,70*	2,46*	2,65*

#### Table 4: Dimensions of study conditions for different respondent categories

The Graduates' assessment of study conditions was measured using a battery of questions on a Likert-type scale (from 1 "not at all" to 5 "to a very high extent"). Questions were designed to cover the following dimensions: (1) *quality and access to equipment in faculties/polytechnics* (1.1) *access to professional literature*, (1.2) *access to computers*, (1.3) *access to internet*; (2) *student mobility* (2.1) *number of student exchange programmes*, (2.2) *access to information about student exchange programmes*, (2.3) *quality of student exchange programmes*; (3) *acquiring professional and practical knowledge* (3.1) *internship(s) within study programme* (3.2) *individual expert occupational advice within the field of study*; and (4) *assessment of the functioning of career centres through the question* (4.1) *access to information on career opportunities provided by the Career Centre*<sup>9</sup>.

As it can be seen from Figure 3, the quality of equipment in HEIs was assessed better than other dimensions, with one half of students giving it (very) high marks of 4 and 5. It should be pointed out that the equipment here implies the availability of internet, computers and professional literature, which represent the minimum of equipment that HEIs should provide to their students. In this context, (very) low marks (values 1 and 2) for internet and computer availability were awarded by a third of graduates (30.6% of graduates gave (very) low marks to internet availability), whereas 27.9% of graduates assessed the availability of computers in the same way. For the availability of literature (very) low marks were given by 18.4% of graduates.

One fifth of graduates assessed the possibility for acquiring practical and professional knowledge with marks 4 and 5, whereas more than a half of graduates awarded marks 1 or 2 to the same question. In the previously analysed section, graduates' assessment of practice-oriented teaching contents was presented. Lower marks (values 1 and 2) were given by 50.9% of graduates, whereas marks 4 and 5 were awarded by 25.6% of respondents. To a similar question about the previous question: marks 1 and 2 were given by more respondents: 58.6%, whereas marks 4 and 5 were awarded by 29.9%. It can be concluded that internships and organised teaching practice were definitely missing from the structure of study programmes, and that special attention needs to be paid to organised internships that would be related to the study programme content.

Higher education reforms inspired by the Bologna Process implied the inclusion of students in the programmes of academic mobility in order to introduce them with other education systems and, broadly speaking, to help them to acquire international experience and intercultural competences. Increase of student mobility at the European level has been proclaimed as one of the most important aims of the Bologna Process. Through the CONGRAD questionnaire, the mobility dimension has been measured through the questions in which graduates assessed the availability of information, access to and quality of mobility programmes available during studies. Access to information on mobility programmes has been well evaluated by less than one fifth of graduates (16.1% - values 4 and 5), whereas the offer of mobility programmes was assessed poorly by 60% of respondents (values 1 and 2). Graduates' assessment on mobility programmes shows that the availability, quality and access to information on programmes improved in time. Even though the mean concerning this question is low in both cohorts, there is a statistically significant difference between two cohorts. Namely, graduates of the younger cohort assess better availability, quality and access to information about mobility programmes better than graduates from the older cohort. These results suggest that the increase of possibilities and the level of information on mobility programmes, next to the need for more practice and practical contents, represent the second dimension that the HEIs should address within institutional efforts aimed at the increase of quality of their study offer.

<sup>&</sup>lt;sup>9</sup>Questions in tables and figures have been shortened in order to provide a better overview.

The lowest rated dimension in this battery of question was the *access to information on career opportunities provided by career centre*<sup>10</sup>. Only 14.0% of graduates awarded marks 4 and 5 to this dimension, whereas 68.9% of graduates gave (very) low marks (values 1 and 2) to this dimension. The average mark awarded to the functioning of career centres is higher among the members of the younger cohort, which is understandable since this generation of students had more opportunities to get introduced with career centres and use their services.



Figure 3: Assessment of elements of study programmes and study conditions (5-point scale, in %)

Table 5 shows the distribution of graduate answers with regard to the type of HEI, cohort, study level and field of studies. The data in the table contain results of the ANOVA analysis and t-test for the analysed study programme elements. The ANOVA analysis has been conducted on variables with more than two categories (university type and study level – 4 or 3 categories), and the t-test was conducted on variables with two categories (type of HEI – university of polytechnic, system of studies – old or reformed, and cohorts – two categories). The existence of a statistical significance has been marked with an asterisk (\*).

Significant differences with regard to HEI type (university/polytechnic) exist in five out of nine dimensions: (1) *access to professional literature*, (2) *access to computers*, (3) *access to internet*, (4) *internship(s) within study programme*, and (5) *individual expert occupational advice in your field*. In all five dimensions, respondents from polytechnics awarded higher marks than the respondents from universities.

Statistically significant differences exist in all variables with regard to type of HEI and the country in which it is located. The graduates from the universities of Montenegro awarded higher marks to the aforementioned dimensions than the graduates from universities of Bosnia and Herzegovina and Serbia. Graduates from the universities of Bosnia and Herzegovina awarded lower marks to the aforementioned quality dimensions compared to their colleagues from Serbia.

<sup>&</sup>lt;sup>10</sup> Here it should be pointed out that career centres do not exist in all institutions involved in the project and that for a more detailed analyses of the functioning of career development centres, institutional information should be consulted.

In the answers to this battery of questions, the graduates from higher levels of studies awarded higher marks. The lowest marks were awarded by first-cycle graduates, whereas the highest marks were awarded by PhDs. Nevertheless, it is necessary to point out that not many PhDs responded to the analysed battery of questions: the average number of responses obtained from graduates of first-cycle studies was 7,676; the average number for the second-cycle studies was 2,098, whereas there were an average of 44 PhDs (at least 30 PhD graduates assessed each of the analysed individual study conditions).

When answers of graduates who completed their studies according to the old system of studies are compared with the answers of graduates who completed the Bologna system of studies, it can be concluded that *internship(s) within study programme* is the dimension in which the least progress was made. The difference between marks given by graduates who completed the old and the Bologna programmes is statistically significant, even though it is quite small  $(M_{old_programme}=2.23, M_{new_programme}=2.39)$ .

	Number of respondents	Mean	Universities - Serbia	Universities - Bosnia and Herzegovina	Universities - Montenegro	Polytechnics - Serbia	Universities - CONGRAD	Polytechnics - CONGRAD
Access to professional literature	13.868	3,48	3,52*	3,17*	3,56*	3,59*	3,48*	3,59*
Access to computers	13.371	3,40	3,48*	2,70*	3,52*	3,73*	3,38*	3,73*
Access to internet	13.035	3,33	3,44*	2,58*	3,45*	3,63*	3,33*	3,63*
Internship(s) within study programme	12.154	2,35	2,35*	2,22*	2,37*	2,81*	2,33*	2,81*
Number of student exchange programmes	9.498	2,30	2,34*	1,95*	2,40*	2,43*	2,30	2,43
Access to information about student exchange programmes	9.606	2,20	2,22*	1,91*	2,32*	2,31*	2,19	2,31
Quality of student exchange programmes	7.830	2,35	2,38*	1,99*	2,50*	2,36*	2,34	2,36
Individual expert occupational advice in your field	10.876	2,46	2,44*	2,30*	2,58*	2,86*	2,44*	2,86*
Access to information on career opportunities provided by Career Centre	8.755	2,04	2,09*	1,63*	2,14*	2,07*	2,04	2,07

#### Table 5: Dimensions of study conditions for different respondent categories

	Bachelor degree	Specialist degree, Master/Magistar degree	Doctoral degree	Other	Old study system	Bologna study system	2007	2012
Access to professional literature	3,46*	3,52*	4,04*	3,38*	3,36*	3,58*	3,32*	3,56*
Access to computers	3,31*	3,69*	4,2*	3,13*	3,05*	3,71*	2,96*	3,61*
Access to internet	3,25*	3,66*	4,02*	2,87*	2,97*	3,67*	2,85*	3,57*
Internship(s) within study programme	2,34*	2,38*	3,02*	1,64*	2,23*	2,42*	2,26*	2,40*
Number of student exchange programmes	2,26*	2,44*	3,08*	1,42*	2,07*	2,50*	2,02*	2,44*
Access to information about student exchange programmes	2,15*	2,34*	3,19*	1,27*	1,97*	2,38*	1,92*	2,33*
Quality of student exchange programmes	2,29*	2,51*	3,44*	1,44*	2,12*	2,54*	2,06*	2,49*
Individual expert occupational advice in your field	2,40*	2,62*	3,55*	1,91*	2,27*	2,58*	2,28*	2,54*
Access to information on career opportunities provided by Career Centre	1,99*	2,19*	2,49*	1,70*	1,78*	2,22*	1,74*	2,17*

#### 4.2 Use of Different Modes of Teaching

Modernisation of study programmes implies the introduction of teaching which is not limited to traditional *ex cathedra* lectures and the introduction of different interactive teaching methods. The acquiring and developing of generic competences, which will be analysed in more detail later on, is closely connected to the manner in which students adopt and reproduce study programme contents. It is believed that the aim of usage of different teaching methods is to respond to different learning styles; to stimulate the development of analytical and critical thinking; to enable students to connect the acquired theoretical knowledge with practical implications; and to successfully reproduce and apply the acquired knowledge. The aim of this part of the survey was to test how graduates evaluate the use of different teaching methods and to determine if differences exist in their use among different HEIs, within different fields of study and within the pre-Bologna and Bologna study programmes. Results for all respondents are shown in Figure 4.



Figure 4: Assessment of different modes of teaching (5-point scale, in %)

Respondents assessed that *lectures* and *theories and paradigms* were the only two modes of teaching which occured more than average (compared with mean answers on this battery of questions) than other modes of teaching within the study programmes they completed. Respondents assessed that other, more interactive teaching modes, such as *group assignments*, *participation in research projects*, *project and/or problem-based learning*, *written assignments* and *oral presentations* were present less than average (compared with mean answers on this battery of questions). The most common mode of teaching is *lecturing*, with 86.3% of respondents listing it as a mode of teaching.

The graduates' responses to this battery of questions mostly confirm the previous findings: the least used modes of teaching are internships and work placement – 42.4% graduates claim that during studies they had no opportunity for internship (value 1 on the 5-point scale), whereas 70.2\% of graduates claim to have had very few opportunities for internship or none at all –

marks 1 and 2 combined. Slightly more than one half of graduates (55.6%) assess that focus on facts and practical knowledge was present to a (very) small extent.

Study reform inspired by the Bologna Process included also a change in the grading and assessment system, which was mostly reflected in the introduction of continuous assessment and the broadening of the scope of activities which were assessed prior to the final examination. Such activities include the active participation of students in exercises and lectures, more frequent writing of seminar papers, and mandatory exercises and lectures. Consequently, a significant increase in the use of certain modes of teaching occurred, such as written assignments, oral presentations by students and group assignments. It was expected that these forms would be rated higher by graduates who completed their studies according to new study programmes, which was confirmed by the information obtained from the CONGRAD survey. Namely, multiple choice exams, group assignments, project and/or problem-based learning, written assignments, oral presentations by students are the dimensions in which highest differences exist (ANOVA: p<0.05) between graduates who completed their studies according to the reformed study programmes and graduates who completed their studies according to the pre-Bologna system of studies (Table 6). Information also shows that the use of lecturing has not decreased. Moreover, an increase in the use of this mode of teaching can be noticed. 85.8% respondents who completed their studies according to the pre-Bologna study programmes evaluated that lectures were present to a (very) high extent (marks 4 and 5), whereas for the generation that completed their studies according to the Bologna system of studies this percentage amounts to 88.3%. Other statistically significant differences in graduate evaluations with regard to the use of different modes of teaching show that graduates who studied according to the Bologna system of studies on average report a significantly higher presence of group assignments, written assignments, multiple choice exams and oral presentations. There is a very small, but statistically significant increase in the presence of internship(s) and work placement, and the decrease of theories and paradigm teaching. As for the presence of lectures, no substantial differences exist in this variable between universities of Bosnia and Herzegovina, Serbia and Montenegro. On the other hand, in polytechnics, lectures are less present than in universities. Due to the vocational orientation of their study programmes, polytechnic graduates have more opportunities for internship when compared to university graduates. Polytechnics also focus less on theories and paradigms in their teaching. On the other hand, respondents from polytechnics report a more frequent use of project and/or problem-based learning.

When compared to HEGESCO and REFLEX data<sup>11</sup> (Figure 5), CONGRAD polytechnics are the closest to the European average in terms of the frequency of use of lectures. Still, even the polytechnics exceed the European average by 10 percentage points. Universities of all three countries are among the countries, which apply lectures most frequently in Europe, behind only Lithuania and Estonia. Having in mind that HEGESCO and REFLEX projects included in their survey graduates who completed their studies 4 to 5 years ago, only the information on the older CONGRAD cohort served as the basis for comparison expressed in Figure 5.

<sup>&</sup>lt;sup>11</sup> HEGESCO conducted a graduate survey similar to the CONGRAD study in 2008 in Slovenia, Turkey, Lithuania, Poland and Hungary. This research can be seen as the addition to an identical survey entitled REFLEX which included graduates five years after their graduation in 2005 in 14 European countries. The overview of data and basic conclusions is available in: Allen, Pavlin & Van der Velden (2011), Competences and Early Labour Market Careers of Higher Education Graduates in Europe. Ljubljana: University of Ljubljana.



Figure 5: Lecture as a mode of teaching in comparison with HEGESCO and REFLEX countries (in %)

Differences in comparison with HEGESCO and REFLEX countries with regard to the field of studies (Table 6) show that internships are most common in *teacher training and education science* and *health*. The fields of study in which the fewest opportunities for internship were reported are *social and behavioural science*, *business and administration* and *law*. Group assignments as a mode of teaching are the most common in *teacher training and education science* and *personal services*. Group assignments were least frequently reported by respondents who completed their studies in the field of *health*. Written assignments are most common in *arts* and *humanities*, and the least common in *agriculture*, *forestry and fishery*, and *health*. *Oral presentations by students* are most frequent in *teacher training and education science*, whereas this aspect is least frequent in the field of *agriculture*, *forestry and fishery* and in the *other* field of study, which mostly includes sports studies. Multiple choice exams are most common in the field of *health*, whereas they are least used in the field of *engineering*. These differences demonstrate the existence of a variety of teaching approaches and teaching traditions in different fields of study.

#### Table 6: Modes of teaching by type of institution/country (universities and polytechnics, 2007 and 2012 cohort combined)

	Universities - Serbia	Universities - Bosnia and Herzegovina	Universities - Montenegro	Polytechnics - Serbia	Old study system	Bologna study system
Lectures	4,44*	4,42*	4,48*	4,30*	4,42*	4,48*
Group assignments	2,84*	2,79*	3,04*	3,14*	2,63*	3,10*
Participation in research projects	1,71*	1,56*	1,76*	1,99*	1,59*	1,78*
Internships, work placement	2,06*	2,06*	2,00*	2,49*	1,98*	2,10*
Facts and practical knowledge	2,45*	2,34*	2,58*	2,82*	2,29*	2,59*
Theories and paradigms	4,27*	4,14*	4,14*	3,83*	4,26	4,23
Project and/or problem-based learning	2,57*	2,26*	2,65*	2,89*	2,30*	2,80*
Written assignments	3,09*	3,01*	3,53*	3,49*	2,82*	3,44*
Oral presentations by students	2,99*	3,07*	3,40*	3,13*	2,67*	3,40*
Multiple choice exams	2,77*	2,37*	3,18*	2,81*	2,50*	2,95*

	Education	Humanities and arts	Social sciences, business and law	Science	Engineering manufacturing and construction	Agriculture	Health and welfare	Services	Other
Lectures	4,54*	4,50*	4,43*	4,39*	4,42*	4,46*	4,32*	4,58*	4,47*
Group assignments	3,08*	2,85*	2,84*	2,96*	2,99*	2,48*	2,40*	3,08*	2,80*
Participation in research projects	1,86*	1,59*	1,69*	1,71*	1,63*	1,57*	1,93*	1,84*	2,03*
Internships, work placement	2,79*	2,06*	1,81*	2,05*	1,9*	2,24*	2,73*	2,40*	3,06*
Facts and practical knowledge	2,81*	2,57*	2,32*	2,72*	2,35*	2,25*	2,54*	2,58*	3,00*
Theories and paradigms	4,24*	4,16*	4,30*	4,09*	4,19*	4,15*	4,33*	4,22*	3,85*
Project and/or problem-based learning	2,60*	2,25*	2,50*	2,74*	2,93*	1,94*	2,02*	2,58*	2,46*
Written assignments	3,58*	3,69*	3,32*	2,87*	2,87*	2,45*	2,48*	3,16*	2,98*
Oral presentations by students	3,40*	3,34*	3,26*	2,87*	2,68*	2,62*	2,79*	3,27*	2,67*
Multiple choice exams	2,87*	2,50*	2,96*	2,76*	2,30*	2,36*	3,87*	2,91*	2,97*

#### 4.3 Satisfaction with Studies

Graduates are generally satisfied with study programmes they completed (on a scale a 10-point scale from 1 "not at all" to 10 "to a very high extent", the majority of graduates awarded the mark 8 to the programme they completed). The average answer for this question is 6.57 ( $\pm$ 0.04, 95% confidence interval). Marks 1 to 4 were given by 19.1% of respondents, and these respondents can be designated as *unsatisfied*, whereas there were 70.4% of respondents (marks 6 to 10) who were *satisfied*. There were 6.2% *very unsatisfied* graduates (marks 1 and 2), whereas one fifth of graduates, i.e. 19.8%, were *very satisfied* (marks 9 and 10) (Figure 6).





Comparative analysis of responses given by graduates of universities in Serbia, Bosnia and Herzegovina and Montenegro and polytechnics from Serbia (Table 7) shows that the most satisfied graduates are the graduates of the universities of Montenegro (M=6.65). The least satisfied graduates are graduates from universities of Bosnia and Herzegovina (M=6.18).

	Mean	Std. error	N
Universities - Serbia	6,58	2,266	9.593
Universities - Bosnia and Herzegovina	6,18	2,280	1.905
Universities - Montenegro	6,87	2,309	1.941
Polytechnics	6,65	2,302	524
Total	6,57	2,282	13.963

#### Table 7: Satisfaction with the completed study programme according to type of institution/country

The ANOVA results show that there is a statistically significant difference between the analysed HEIs at the p<0.05 level in all four institution types:  $F_{3.13959}=30,772$ , p=0.000. Tukey's post hoc test shows that there is a statistically significant difference between the mean values of the following groups:

- Universities Serbia (M=6.58, SD=2.266) and Universities Bosnia and Herzegovina (M=6.18, SD=2.280)
- Universities Serbia (M=6.58, SD=2.266) and Universities Montenegro (M=6.87, SD=2.309)
- Universities Bosnia and Herzegovina (M=6.18, SD=2.280) and Universities -Montenegro (M=6.87, SD=2.309)
Universities – Bosnia and Herzegovina (M=6.18, SD=2.280) and Polytechnics - Serbia (M=6.65, SD=2.302)

Differences between mean values of the listed groups are, although statistically significant, very small (eta-squared<sup>12</sup> amounts to 0.01).

Comparison of graduates who completed their studies according to the old system of studies with the graduates who completed their studies according to the Bologna study programmes (Figure 7) shows that students who graduated according to the reformed study programmes (M=6.85  $\pm$ 0.06%, 95% confidence interval) are more satisfied than the students who studied according to the old system of studies (M=6.29  $\pm$ 0.06%, 95% confidence interval; t<sub>11681.060</sub> =-13.647, p=0.000). However, the real difference between mean values of answers of graduates who studied according to these two systems of studies (mean difference=0.56, 95% confidence interval; -0.640 to -0.479) is very small (eta-squared value amounts to 0.019).



#### 4.4 Looking Back: Retrospective Evaluation of Studies

The results presented in the previous chapter show that a great majority of graduates are satisfied with their studies. However, graduates are also able to evaluate their study programmes from the point of view of the labour market context and assess retrospectively the general benefit of studies they completed. Graduates were therefore asked to retrospectively assess if they would again choose to study or not; whether they would choose the same study programmes or not; and whether they would change faculties or not. In the case of negative answers, graduates were asked to give explanations.

The vast majority of graduates would again choose to study (94.5%). This supports the claim that even after graduation, a vast number of graduates still believe that higher education was a choice well made or at least that studying for a higher education degree is a necessary choice. Those who, hypothetically speaking, would not choose to study (n=763) most frequently list *difficulties in finding employment* as the reason (62.6%). In other words, somewhat more than

<sup>&</sup>lt;sup>12</sup> Eta-squared can have a value from 0 to 1 and expresses the effect size. This value has particular importance for analyses using large samples in which due to the size of the sample even the smallest differences become statistically significant. When the size of the effect is expressed, Cohen's classification was applied, according to which, values of eta-squared are

classified in the following way: low effect for eta-Squared 0.01, medium effect size for eta-squared 0.06 and high effect size for eta-squared 0.14.

three fifths of graduates who would retrospectively give up on studying would do so because of the poor state of the labour market and the inability to find employment within their profession. This reason is followed by *low quality of study programmes and poor study conditions* (16.0%) and *higher education diploma is not valued enough* (4.5%). There are 4.5% of this subgroup of graduates who would choose a profession that does not require higher education.

If they were retroactively given the opportunity to choose the faculty/polytechnic and study programme, almost two thirds of graduates ( $62.5\% \pm 0.8\%$ , 95% confidence interval) would choose the same faculty/polytechnic and the same study programme. 8.8% of graduates ( $\pm 0.5\%$ , 95% confidence interval) would choose the same study programme, but at a different faculty/polytechnic, whereas 17.5% ( $\pm 0.6\%$ , 95% confidence interval) of graduates would change both different faculty/polytechnic and different study programme (95% confidence intervals).



According to the types of institution (Figure 9), there are no significant differences between the answers of graduates who graduated from universities in Montenegro and Serbia, whereas there are slightly more graduates who would not choose the same faculty and the same study programme among the graduates of universities in Bosnia and Herzegovina. Graduates of all higher education institutions gave similar answers when asked if they would choose to study again. Most graduates who would again choose to study are Montenegrin university graduates (95.3%), followed by the graduates of universities (95.0%) and polytechnics (93.3%) in Serbia. The lowest percentage of those who would choose to study again was recorded among the graduates of universities in Bosnia and Herzegovina (91.5%).



re 9: Answers of graduates regarding the retroactive decision about study programme an faculty/polytechnic according to type of institution/country (in %)

The graduates who would retrospectively choose a different faculty/polytechnic usually list the following reasons for such a decision: *it is hard to find employment (lack of perspective)* (33.9%), *low quality of study programmes* and *poor study conditions* (25.1%), *I would choose to study something else* (14.3%), *lack of internships* (5.9%), whereas 4.8% would *go abroad*.



The graduates, who would, from current perspective, choose a different study programme gave similar answers. However, the answer *it is hard to find employment (lack of perspective)* occurs much more frequently (41.5% of answers). This answer is followed by *low quality of study programmes and poor study conditions* (23.2%). *Lack of internships* was listed as a reason by 10.9% of this subgroup of graduates (which is significantly higher when compared with the reasons for choosing a different faculty). 2.8% of respondents stated that *higher education diploma is not valued enough*.



When the graduates' answers are compared with regard to cohort, it shows that graduates of the 2007 cohort who would retrospectively enrol in another faculty, more often state that *it is hard to find employment (lack of perspective)*, whereas they less often mention the *low quality of study programmes and poor study conditions* in comparison with their younger colleagues (Figure 12). Interestingly, among respondents who would choose the same faculty but a

different study programme, the situation is opposite: the 2007 cohort much more often mentioned that *it is hard to find employment (lack of perspective),* and less often *the low quality of study programmes and poor study conditions* (Figure 13).







The results presented in this chapter show that graduates are mostly satisfied with the study programmes they completed and that a majority of them would not change their original

decision to attend the faculty and study programme they graduated from. Still, it should be pointed out that the graduates' responses were influenced not only by the experience of studying, but that their frame of reference when assessing their own educational institutions was significantly broader: they took into account the perceived quality of other HEIs, situation at the labour market, and opportunity costs of studying (which are not necessarily high at the macro level bearing in mind the high unemployment rate and the economic crisis that affected all three countries<sup>13</sup>). Therefore, the good assessment given by graduates should be interpreted in the context of other responses that graduates gave by responding to questions that directly relate to study conditions. Graduates of all HEIs that participated in the CONGRAD survey agree that internships, facts and practical knowledge and the linking of practical and theoretical knowledge are the elements that were lacking the most during their studies. Graduates namely had the opportunity to compare their knowledge and skills with the demands of different jobs they had (or tried to get). This is especially true for the 2007 cohort, since they reflected on the knowledge acquired during studies in the light of experiences they gained in the meantime. Therefore, their assessment should be interpreted with this in mind. The role of higher education in all three countries is certainly not limited only to the direct preparation for concrete jobs at the labour market. Also, no indications exist that any of the three analysed education systems demonstrate the inclination to limit the function of higher education in this way. Still. data show that 70.2% of respondents gave marks 1 or 2 to the presence of internships in their study programme, which supports the claim that there is a clear need for study programmes to focus more on the application of acquired theoretical knowledge.

As it was already explained, the intention behind the selection of cohorts of graduates within the CONGRAD survey was also to partially evaluate the effects of the higher education reforms in terms of the intended quality improvement of study programme and study conditions. The analysed dimensions of study programmes in most cases show that the reform of higher education systems had a positive effect: graduates who studied according to the new system of studies gave better marks to almost all study conditions measured by the CONGRAD questionnaire. Dimensions such as *facts and practical knowledge, use of contemporary teaching methods, internship(s) within study programme, offer and quality of student exchange programmes* were all assessed better by the generation that studied according to the new and reformed Bologna system of studies. It can be concluded that higher education institutions are on the right path in many aspects, and that the introduced changes had positive effects on the organisational segments or the segments relating to the teaching and assessment methods. With regard to the aspects graduates mostly complain about, such as the lack of *facts and practical knowledge* and *internships and work placement*, a small improvement was noted, which may be seen as a guideline for potential further reforms in the field of higher education in the region.

Results of the CONGRAD survey provide information on jobs and careers of graduates who acquired their degrees in different fields of study, thus providing a good information basis for the increase of professional relevance of study programmes and their contents. It should be pointed out that remarks pertaining to the lack of practical knowledge in study programmes are systemic and are present in the results of most graduate surveys around the world. This shows that higher education in its core function aims to provide a broad intellectual basis and prepare students for highly professional occupations. However, concrete training for work on specific jobs and within specific workplaces is usually left to the employers and their systems of inservice training. Graduates faced with concrete work tasks directly after academic reality usually feel underprepared for their specific work roles. They usually feel that they have a lack of practical knowledge and skills that are required within a concrete workplace. Therefore, it is quite common that the first phase of employment is marked by intensive in-job learning, which

<sup>&</sup>lt;sup>13</sup> Opportunity costs of studying at micro- and meso-levels in this context were not taken into account.

in the case of certain professions can last even for years. Consequently, it is understandable that graduates almost always assess that higher education did not provide them with enough knowledge to perform concrete work tasks. This fact should be taken into consideration when the results of study programme evaluation are interpreted.

On the other hand, the association between fields of study and professional fields varies in countries of different higher education traditions. The link between fields of study and potential professional and occupational fields and the range of jobs the students have access to in the region is rather strong, and it follows the professional/vocational tradition of higher education typical for continental European countries. Graduate surveys like CONGRAD therefore give higher education institutions in the region the opportunity to find out more about concrete requirements of occupations in different branches of economy in which graduates find employment after completing their studies. This crucial information should enable HEIs in the region to improve the organisation and relevance of internships and study programmes.

# 5 Career Patterns of Graduate Professionals

One of the aims of the CONGRAD survey was to monitor the careers of professionals with higher education degrees and to describe the process of transition from higher education to work within the social and cultural contexts of Western Balkan countries. Graduate survey results (e.g. Allen, Pavlin & Van der Velden (eds.) 2011) generally confirm that the first ten career years of professionals with higher education degrees more or less follow the same pattern, which consists of three phases: (1) initial transition phase to the labour market in which the graduate is focused on job search and developing strategies that enable him/her to become integrated in the professional community and position himself/herself in the labour market, (2) phase two in which concrete professional expertise is obtained; during this phase specific career patterns start to emerge, and (3) phase three in which young professionals take more responsibility for the job they perform owing to their improved professional skills. Comparative European graduate surveys such as REFLEX confirm that the initial phase usually ends 1-2 years after graduation. At that time, the second phase starts and usually lasts until the fifth year after graduation. The third phase usually ends 10 years after graduation. According to the results of the CONGRAD survey, career paths of graduates in the Western Balkans region mostly follow this pattern, even though deviations from this previously identified pattern occur due to: (a) delayed career start and/or (b) non-linear career path with alternating periods of employment and unemployment. These deviations can be explained by the conditions in which young professionals start their careers in Serbia, Bosnia and Herzegovina, and Montenegro: political and economic instability of (post)transition societies certainly affect the (in)ability of young professionals to smoothly develop their careers. For a large number of graduates from these countries, the career is postponed because they enrol in further studies; take care of family members (they become inactive in terms of work status), or cannot find a job even though they are actively searching for it (they remain unemployed and without any work experience). Based on the CONGRAD survey results, the career patterns of young professionals can be grouped in the following four categories:

- 1. Career without unemployment periods
- 2. Career with periods of unemployment
- 3. Unemployed without work experience, but actively searching for work
- 4. Inactive (no job, no active search for work)

For graduates of CONGRAD universities in Serbia, Bosnia and Herzegovina, and Montenegro, and polytechnics in Serbia, the following career patterns can be identified five years after graduation (2007 cohort) and one year after graduation (2012 cohort) respectively<sup>14</sup>:

<sup>&</sup>lt;sup>14</sup> Only categories with at least 30 respondents are included.



Figure 14: Graduate career patterns (universities and polytechnics, 2007 and 2012 cohort)

As expected, among the graduates of the 2012 cohort, there are significantly more unemployed respondents without work experience (41.2% ±1.0%, 95% confidence interval), than in the 2007 cohort (11.0% ±0.8%, 95% confidence interval). In the 2012 cohort there are considerably more inactive respondents (6.7% in the 2012 cohort compared to 1.5% in the 2007 cohort). This is probably due to the fact that some graduates enrolled in higher degree level studies without even looking for a job. When comparing institutions and cohorts, it can be concluded that in the 2007 cohort, in comparison to graduates of universities and polytechnics in the other two countries, Montenegrin university graduates experienced significantly more frequently careers without periods of unemployment (41.3%). Compared to university graduates in Serbia and in Bosnia and Herzegovina, in the 2007 cohort there are slightly more graduates of Serbian polytechnics (14.3%) and Montenegrin university graduates (13.1%) who were unemployed for a long period of time after graduation. However, regarding the long-term unemployment the differences between the types of institution are not statistically significant. On the other hand, among Montenegrin university graduates and graduates of Serbian polytechnics inactive respondents are statistically much more present in comparison to graduates of universities in Serbia and Bosnia and Herzegovina (Figure 14).

In the 2012 cohort there are significantly more Montenegrin university graduates (30.5%) and graduates of Serbian polytechnics (29.6%) who experienced careers without periods of unemployment in comparison to graduates of universities in Serbia and Bosnia and Herzegovina. The average for all institutions amounts to 23.8%. Statistically significant differences exist also between Serbian university graduates and graduates of universities in Bosnia and Herzegovina. Cases of respondents who were still unemployed at the time of the survey are most common among graduates of universities in Bosnia and Herzegovina (46.4%), whereas they are least common among Montenegrin university graduates (29.0%). The average for all CONGRAD institutions amounts to 41.2%. Statistically significant differences occur only between Montenegrin university graduates in comparison with other institutions.

With regard to the system of studies according to which the graduates completed their studies (pre-Bologna/old system of studies or Bologna system of studies), differences in career patterns occurring between pre-Bologna and Bologna graduates are due to the period of time after graduation (and being actually available for the labour market), and not due to differences between the two systems of studies.

Among the graduates who completed first-cycle studies according to the Bologna system of studies, there are twice as many graduates with no work experience (46.7%) compared to graduates who graduated according to the old system of studies (21.9%). This may be caused by the fact that graduates who completed their studies according to the new Bologna system of studies are younger on average, which means that at the time of the survey, they were mostly only looking for their first job. In addition, among graduates who completed first-cycle studies according to the Bologna system of studies there is a considerably larger share of inactive graduates (9.9%, compared to 1.9% according to the old system of studies; Figure 15). Most of the inactive graduates are unemployed because they decided to enrol in higher degree level studies. This can be perceived as consequence of changing conditions in the labour market compared to year 2007, i.e. before the financial crisis, when most of the graduates of the 2007 cohort who completed their studies according to the old system of studies started to search for jobs. For graduates who obtained their first-cycle degree in the Bologna system of studies, difficulties in finding employment affected the graduates' decision to enrol in higher degree level studies in order to increase their work-relevant qualifications.



Graduate career patterns by system of studies - First-cycle degree (universities and polytechnics, 2007 and 2012 cohort combined, in %)

Similar to the graduates with first-cycle degrees, a nearly identical career pattern can be identified for graduates who completed second-cycle studies according to different systems of study (pre-Bologna and Bologna).<sup>15</sup> Among graduates who completed second-cycle studies according to the Bologna system of studies the share of unemployed graduates without work experience (29.3%) is more than twice as high as among graduates who completed second-cycle studies according to the old system of studies (specialist and magister studies) (12.2%) (Figure 16).



<sup>&</sup>lt;sup>15</sup> Due to small sample size, career patterns of PhD level graduates are not included in the analysis.

Taking into account fields of study, in the 2007 cohort the number of university graduates who experienced careers without periods of unemployment is highest among graduates who completed their studies in the fields of *computing* (59.1%) and *teacher training and education science* (44.1%). On the other hand, only 20.0% of graduates who completed their studies in the field of *health* and 22.9% of graduates in *agriculture, forestry and fishery* experienced no periods of unemployment. The share of graduates who five years after graduation were still unemployed and did not have work experience is particularly pronounced among graduates who completed study programmes in the fields of *health* (20.6%) and *life sciences* (23.8%) (Figure 17).



Figure 17: Graduate career patterns by field of study (universities, 2007 cohort, in %)

On the other hand, in the 2012 cohort the share of university graduates, whose career started successfully without an unemployment period is highest among the graduates who completed their studies in *computing* (48%) and *mathematics* (46.4%). At the same time, only 13.6% of graduates who completed their studies in the fields of *health* and *agriculture, forestry and fishery* experienced no unemployment periods in this early career stage. Most respondents who were unemployed at the time of the survey and did not have any work experience are graduates of *life sciences* (63.7%) and *health* (57.5%). The average for graduates of all disciplines is 41.2% (Figure 18).



Figure 18: Graduate career patterns by field of study (universities, 2012 cohort, in %)

Usually graduates experience a relatively unstable period in the labour market during the first few years after graduation. Sometimes they change employers and jobs that cannot be considered significant for their professional careers several times<sup>16</sup>. Within the group of graduates of universities and polytechnics in the 2007 cohort, graduates who continued or started their careers without unemployment periods had an average of 2.06 employers. They changed employers less often than graduates who experienced unemployment periods, who had an average of 2.30 employers (Figure 19).

<sup>&</sup>lt;sup>16</sup> The first significant job is defined as a job lasting or contracted for more than six months.



2007 and 2012 cohort, in %)

Among the graduates of the 2007 cohort who had no work experience five years after graduation the average duration of unemployment and active job search amounts to 21.31 months (±2.01, 95% confidence interval) for all types of institutions. This indicates that the respective graduates had significant periods of inactivity in addition to their active job search. Some of the reasons for inactivity are the continuation of studies and taking care of children and family members (Figure 20). Graduates without any work experience of Serbian polytechnics and universities in Bosnia and Herzegovina on average spent more time unemployed in comparison to graduates with no work experience of the universities in Serbia and Montenegro.



When analysing the responses of graduates of the 2007 cohort, who have been unemployed for a longer period of time, according to fields of study, it shows that the shortest duration of unemployment period was reported by graduates who completed study programmes in *manufacturing* (8.4 months) and *journalism and information* (9.5 months). Graduates of *physical sciences* (45.2 months) and *humanities* (33.2 months) reported the longest unemployment periods.

The findings on graduates' career patterns of graduates from CONGRAD universities and polytechnics do not imply a general problem of long-term unemployment of young professionals in the 2007 cohort. Among the respondents of this cohort, the share of unemployed graduates without any work experience amounts to 11% (one in ten university graduates). Long-term unemployment is present to a certain extent among graduates of all fields of study, but not to a substantial extent. Therefore, this might be considered as a problem specific for graduates of certain fields of study, e.g. *life sciences* (biology and ecology), *health, sports studies*; and to a lesser extent among graduates of *physical sciences, law* and *arts*.

Regarding the respondents of the 2012 cohort, graduates who experienced careers without periods of unemployment (23.8%) had an average of 1.40 employers. They changed employers less frequently than graduates who experienced periods of unemployment (28.3%), who had 1.50 employers on average (Figure 19). The average duration of unemployment and active job search in the period after graduation among graduates with no work experience lasted 9.7 months on average (41.2% of the 2012 cohort). Bearing in mind that at the time of the survey 0.5 to 1.5 years passed since the respondents completed their studies this represents almost the entire period after graduation (Figure 20). The longest average duration of unemployment without any work experience between 0.5 and 1.5 years after graduation was reported by university graduates in Bosnia and Herzegovina (10.1 months), while the shortest average duration was reported by Montenegrin university graduates (7.1 months). Statistically significant differences in the duration of unemployment without any work experience in comparison with graduates Serbian universities and

polytechnics, and university graduates in Bosnia and Herzegovina. With regard to fields of study, in the 2012 cohort the period of unemployment and active job search is shortest among graduates who completed study programmes in the field of *arts* (7.97 months). On the other hand, this period is longest among graduates in the fields of *physical sciences* (10.9 months) and *agriculture, forestry and fishery* (10.5 months). The average duration for all fields of study amounts to 9.7 months.

In the following part of this report, selected findings related to the three key phases of transition from graduation to early professional career are presented. Firstly, right after graduation, many graduates experience a *transition phase*, which implies working in parallel to studies or actively searching for a job searching while continuing studies. Secondly, the survey provides information on the graduates' *first significant job*. The first significant job is defined as job that the graduates continued or started right after completing studies, lasting or contracted for more than six months. Thirdly, the survey aimed at obtaining information on the *current work status of graduates*, i.e. the job the graduates had at the time of the survey (March to July 2013), i.e. depending on the cohort one year and five years after graduation.

## 6 Situation right after Graduation

Figure 21 shows the graduates' employment status right after completing their studies at CONGRAD universities and polytechnics for both cohorts included in the survey.



The analysis of both cohorts shows that almost half of the graduates of CONGRAD universities and polytechnics were employed/self-employed, or they were employed/self-employed and continued studies or other trainings right after graduation (48.7%  $\pm$ 0.82%, 95% confidence interval). The share of graduates who continued to work on their jobs/continued to be selfemployed or found new jobs/became self-employed was highest among Montenegrin university graduates (53.1%  $\pm$ 1.12%, 95% confidence interval). The share of graduates who continued to study after graduation is also highest among Montenegrin university graduates, amounting to 22.3% ( $\pm$  0.94%, 95% confidence interval). With regard to the graduates who continued to study after graduation without looking for a job, there are statistically significant differences between the three countries, whereas there are no differences between Serbian universities and Serbian polytechnics. With regard to the graduates who continued to study after graduation and who were searching for employment at the same time there is a higher share of Serbian university graduates compared to other types of institution.

The largest share of university graduates who were employed, i.e. who continued to work on their jobs/are self-employed in the same position as during studies or found new jobs/became self-employed right after graduation, can be identified for the fields of *computing* (68.5%) and *mathematics* (66.7%). In comparison to graduates of other fields of study, graduates of *life sciences* (24.4%) and *environmental protection* (32.7%) continued to work in their old jobs or found new jobs right after graduation substantially less frequently. As illustrated in the previous analysis of career patterns, due to facing lower chances for employment graduates who completed study programmes in the fields of *arts* (25.5%), *life sciences* (36.1%) and *environmental protection* (23.8%) most frequently decided to continue studying (Figure 22).



combined, in %)

As Figure 23 illustrates, more than a third of the graduates of CONGRAD universities and polytechnics continued to work on jobs/were self-employed in the same positions as during studies (36.8%) right after graduation. This type of transition from higher education to the world of work is especially pronounced among Serbian polytechnics graduates (53.8%) and among Montenegrin university graduates (46.4%). Between Serbian polytechnics graduates and Montenegrin university graduates there are no statistically relevant differences, whereas differences between graduates of universities in Serbia and universities Bosnia and Herzegovina are statistically significant.



The largest share of graduates who continued to work in the same position as before graduation completed their studies in the field *journalism and information* (61.8%) and *teacher training and education science* (55.3%).



Figure 24: Graduates continuing the same job as before graduation or starting a new job right after graduation by fields of study (universities, 2007 and 2012 cohort combined, in %)

As much as 69.0% of graduates of CONGRAD universities and polytechnics who were employed or self-employed right after graduation worked in jobs that were to a high extent related to their field of study (values 4 and 5 on the 5-point Likert scale). There are no statistically significant differences between graduates of universities in Serbia, Bosnia and Herzegovina, and Montenegro, whereas substantial differences exist between graduates of polytechnics and university graduates. Only 47.5% of polytechnics graduates worked on jobs that were to a high extent related to their field of study (Figure 25).



igure 25: Extent to which the job right after graduation was related to the field of study (5-point scale, universities and polytechnics, 2007 and 2012 cohort combined, in %)

Graduates who completed their studies in *veterinary* (84.6%), *medical sciences* (81.5%) and *arts* (80.7%) reported most frequently that their jobs right after graduation were to a high extent (values 4 and 5 on the 5-point Likert scale) related to their field of study (Figure 26).



Figure 26: Extent to which the job right after graduation was related to the field of study by field of study (5-point scale, universities, 2007 and 2012 cohort, in %)

With regard to the extent to which the job right after graduation was related to the field of study, ANOVA analysis (F = 4.686, p=0.000) and post-hoc Tukey test show that there are statistically significant differences between certain fields of study in the 2007 cohort. Statistically relevant differences exist between the fields of *arts* (4.86 ±0.16, 95% confidence interval), *law* (4.38 ±0.18, 95% confidence interval) and *architecture and building* (4.30 ±0.14, 95% confidence interval) and the following fields: *humanities* (3.86 ±0.14, 95% confidence interval), *business and administration* (3.82 ±0.12, 95% confidence interval), *engineering* (3.78 ±0.16, 95% confidence interval) and *agriculture, forestry and fishery* (3.83 ±0.25, 95% confidence interval) (Table 8).

The situation is similar in the 2012 cohort (F=7.449, p=0.000). Compared to other fields of study the (self-)employment of graduates in the field of *informatics and computing* ( $4.21 \pm 0.16$ , 95%

confidence interval)<sup>17</sup> is to the greatest extent related to the study programme they completed, whereas the least relation between (self-)employment right after graduation and the former study programme is observed for graduates in *social sciences* (3.46 ±0.18, 95% confidence interval)<sup>18</sup> and *business, management and administration* (3.46 ±0.1, 95% confidence interval)<sup>19</sup> (Table 8).

		Mean	Std. deviation	Std. error			Mean	Std. deviation	Std. error
Teacher training and	2007	4,15	1,46	0,08		2007	3,78	1,37	0,08
education science	2012	4,02	1,53	0,09	Engineering	2012	3,74	1,42	0,07
cudation science	Prosek	4,09	1,49	0,06		Prosek	3,76	1,40	0,05
	2007	4,86	0,44	0,08		2007	3,86	1,36	0,13
Arts	2012	3,87	1,47	0,20	Manufacturing	2012	3,98	1,43	0,18
	Prosek	4,22	1,30	0,14		Prosek	3,91	1,39	0,11
	2007	4,10	1,45	0,09	A rehits sture and	2007	4,30	1,13	0,08
Humanities	2012	3,89	1,54	0,09	huilding	2012	3,92	1,38	0,09
	Prosek	3,98	1,51	0,06	building	Prosek	4,12	1,27	0,06
Control and the band around	2007	3,86	1,35	0,07		2007	3,83	1,52	0,13
science	2012	3,46	1,50	0,09	Agriculture, forestry and	2012	3,52	1,66	0,17
Stichlee	Prosek	3,68	1,43	0,06	insitery	Prosek	3,70	1,58	0,11
lournalism and	2007	4,07	1,40	0,18		2007	4,54	1,04	0,20
information	2012	3,98	1,52	0,19	Veterinary	2012	4,42	1,02	0,21
	Prosek	4,02	1,46	0,13		Prosek	4,48	1,02	0,14
Business and	2007	3,82	1,28	0,06		2007	4,43	1,10	0,09
administration	2012	3,46	1,42	0,05	Health	2012	4,29	1,30	0,11
	Prosek	3,61	1,38	0,04		Prosek	4,36	1,19	0,07
	2007	4,38	1,14	0,09	Personal services (hotel,	2007	3,95	1,25	0,27
Law	2012	4,16	1,40	0,11	catering, security	2012	4,47	0,98	0,16
	Prosek	4,27	1,28	0,07	services, transport)	Prosek	4,28	1,11	0,14
	2007	3,95	1,46	0,22	Faulteanmentel	2007	4,33	1,32	0,44
Life sciences	2012	3,97	1,57	0,29	protection	2012	3,75	1,57	0,26
	Prosek	3,96	1,49	0,17	P	Prosek	3,87	1,53	0,23
	2007	3,93	1,56	0,20		2007			
Physical sciences	2012	4,07	1,37	0,14	Security services	2012	3,71	1,50	0,57
	Prosek	4,01	1,45	0,12		Prosek	3,71	1,50	0,57
Mathematics	2007	3,80	1,47	0,25		2007	3,87	1,58	0,33
	2012	4,33	1,34	0,23	Other	2012	3,88	1,62	0,22
	Prosek	4,06	1,42	0,17		Prosek	3,87	1,60	0,18
Computing	2007	4,17	1,15	0,08	CONGRAD universities and polytechnics	2007	4,03	1,33	0,02
	2012	4,21	1,30	0,08		2012	3,81	1,47	0,03
	Prosek	4,19	1,23	0,06		Prosek	3,91	1,41	0,02

# Table 8: Extent to which the job right after graduation was related to the field of study by field of study (5-point scale, universities, 2007 and 2012 cohort)

#### 6.1 Differences between Systems of Studies

Patterns of transition to the labour market right after graduation are significantly different between graduates who completed first-cycle studies according to the old system of studies and graduates who completed first-cycle studies according to the reformed Bologna system of studies. One of the most important objectives of the higher education reforms inspired by the Bologna Process was the reorganisation of first-cycle studies in order to enable graduates to achieve equal or even better recognition in the labour market compared to graduates who

<sup>&</sup>lt;sup>17</sup> Statistically significant difference exists in comparison with *humanities* and *social and behavioural sciences, engineering* and *agriculture, forestry and fishery.* 

<sup>&</sup>lt;sup>18</sup> Statistically significant difference exists in comparison with *teacher training and education science, humanities, law, physical sciences, computing, and health.* 

<sup>&</sup>lt;sup>19</sup> Statistically significant difference exists in comparison with *teacher training and education science, humanities, law, physical sciences, computing, engineering, and architecture and building.* 

completed first-cycle equivalent studies according to the old system of studies. At the same time the efficiency of studies and the professional relevance of study programmes should be increased, and the average duration of studies should be shortened in order to enable graduates to enter the labour market quickly.

In contrast to the intentions of the reforms, entering the labour market was not facilitated for first-cycle graduates who completed the reformed study programmes. However, reasons thereof should not only be pursued in poorly designed higher education reforms. Figure 27 and Figure 28 illustrate the employment situation of graduates right after graduation according to the old and new systems of studies at CONGRAD universities and polytechnics. A considerably high share of graduates who completed first-cycle studies according to the old system of studies (57.8%) continued to work in the same job/self-employment as during studies, or found a new job/selfemployment after graduation, while only 30.8% of graduates who completed first-cycle studies according to the new system of studies did so.

The changed social and educational<sup>20</sup> conditions, consequences of the global financial crisis and the internal long-term instability that affected all countries in the region, increasingly forced the new generation of Bologna graduates to continue their studies in order to improve their competitiveness in the labour market. In contrast to only 7.9% of first-cycle graduates who completed their studies according to the old system of studies, as much as 33.5% of graduates who completed the reformed Bologna study programmes decided to enrol in the higher level degree studies or to continue other professional trainings directly after graduation.

Of course, it should be taken into account that the majority of graduates who completed their studies according to the old system of studies in year 2007 entered the labour market at a time when the effects of the world financial crisis were not apparent yet, whereas the graduates who acquired their degrees according to the Bologna system of studies did so during the particularly difficult year of 2013.





studies (universities and polytechnics, 2007 and 2012 cohort combined, in %)

<sup>&</sup>lt;sup>20</sup> For many jobs the first-cycle degree is no longer sufficient. Due to the devaluation of academic degrees the second-cycle degree is now considered to be the standard academic qualification.



(universities and polytechnics, 2007 and 2012 cohort combined, in %)

When second-cycle graduates of CONGRAD universities who completed their studies either according to the old system of studies or according to the Bologna system of studies are analysed in combination, it shows that more than half of them continued to work in the job/self-employment they had prior to graduation or found a job/became self-employed right after graduation (54.4%).<sup>21</sup> The largest share of graduates who continued a job/self-employment they had prior to graduation or found a new job/became self-employed right after graduation can be identified in the group of Montenegrin university graduates (60.4%). A third of the second-cycle graduates were unemployed right after graduation (30.0%). The situation among Montenegrin university graduates is slightly different (25.7%) and also among the respondents from universities of Bosnia and Herzegovina (37.5%) (Figure 29).



<sup>21</sup> Due to the small sample size PhD graduates were not included in the analysis.

# 7 First Significant Job

In the graduate survey questionnaire, special attention was paid to the characteristics of the first significant job that graduates of CONGRAD universities and polytechnics found after graduation. The first significant job is defined as the first job after graduation lasting or contracted for longer than six months. This definition is common in surveys that examine the transition period between studies and employment, because it enables the differentiation between the concepts of first significant employment and short-term temporary jobs (which do not last longer than six months), which graduates often find immediately after graduation, but cannot be considered as relevant for their future careers. This means that the first employment lasting longer than six months represents the first step in the career of young professionals. Finding the first significant employment and the duration of the search for such a job are the most important indicators for measuring the success of study programmes and their adaptation to existing social and economic conditions.

Within the period of five years after graduation, the majority of graduates of CONGRAD universities and polytechnics of the 2007 cohort (74.9%) have succeeded to find (or continue) a first significant job or self-employment, i.e. a job lasting more than six months (Figure 30). It is interesting to note that the share of graduates of CONGRAD universities and polytechnics in the 2007 cohort who were self-employed is almost negligible (1.9%, n=91). On the other hand, as much as 12.5% of graduates of the 2007 cohort did not acquire any work experience within five years after graduation. 12.6% acquired certain professional experience that could not be described as significant at the time the survey took place, i.e. it did not last or was not contracted for more than 6 months.



Within the 2012 cohort, for graduates who were surveyed in the period 0.5 to 1.5 years after graduation, the situation is substantially different. Within this sub-sample, almost one half of the graduates (48.1%) from the moment of graduation until completing the questionnaire did not have any work experience (Figure 31). More than a third of the graduates of the 2012 cohort (39.2%) became (self-)employed or continued to work on a job (self-employment) they had prior to graduation. Out of all of respondents of this cohort, 20.7% succeeded in finding new significant employment or self-employment after graduation. More than a tenth of the graduates of the 2012 cohort (12.7%) acquired work experience that could not be characterised as significant at the time of the survey, i.e. the respective job did not last or was not contracted for more than 6 months.



Figure 31: Graduates' success in finding first significant job (universities and polytechnics, 2012 cohort)

Based on the described differences between the two cohorts of graduates, it can be stated that finding the first significant employment or self-employment is a challenging and sometimes longlasting process in the countries of the region. With the deepening of the social and economic crisis in all economic systems of the countries in the region it became even more difficult. In many cases, finding the first significant job is postponed due to the prolongation of studies, which is particularly pronounced in the 2012 cohort of graduates who completed reformed Bologna study programmes.<sup>22</sup> However, the fact that the majority of graduates succeeded to find employment lasting longer than six months in the period of five years after graduation is encouraging. It is also important to note that between the two cohorts the difference in the number of those who were employed during studies and continued to work in the respective job after graduation is substantially smaller than expected: In the 2012 cohort, 17.3% of graduates were in such a situation, whereas this was the case for 21.5% of graduates in the 20017 cohort. Of course, a certain decrease can be noted in the share of graduates who were studying and working during their course of studies. This is clearly associated with establishing the new Bologna system of studies, which makes studying and working in parallel more difficult.

Figure 32 and Figure 33 illustrate the success of graduates who completed their studies at different CONGRAD universities and polytechnics in 2007 or 2012 in finding a first significant employment. Analysis of the 2007 cohort shows that among CONGRAD universities and polytechnics significant differences exist only between Montenegrin universities and other CONGRAD universities and polytechnics. In comparison to other institutions, the share of graduates who remain unemployed within the first five years after graduation (17.3%) and of those who continued to work in a job they had prior to graduation (29.2%) is much higher for Montenegrin universities. Montenegrin graduates less frequently find new employment lasting longer than six months (43.2%) and new employment that lasting up to six months (8.1%) (Figure 32).

<sup>&</sup>lt;sup>22</sup> As indicated in the previous chapter, 33.5% of graduates who completed first-cycle studies according to the Bologna system of studies continue to studying or participate in other additional training programmes.



Figure 32: Graduates' success in finding first significant job by type of institution/country (2007 cohort, in %)

With regard to the 2012 cohort, the most pronounced deviations from the CONGRAD average can be noted for Montenegrin universities and Serbian polytechnics (Figure 33). The percentage of Montenegrin graduates who were never employed (34.7%) is substantially lower than the average percentage. On the other hand, among graduates of polytechnics in Serbia, the unemployment rate is higher (54.6%) than the average. The situation is similar also in the case of employment lasting longer than six months. In comparison to the CONGRAD average, a higher share of Montenegrin graduates found a first significant employment (30.3%), whereas on the other hand graduates of Serbian polytechnics had great difficulties to accomplish this task (9.3%).



Figure 33: Graduates' success in finding first significant job by type of institution/country (2012 cohort, in %)

Taking into account both cohorts, slightly more than a half of CONGRAD university graduates (51.1%) found a first significant job or self-employment (or continued to work in a job they had prior to graduation), i.e. a job lasting or contracted for more than six months in the period after

graduation (Figure 34). Compared to the CONGRAD average university graduates who completed study programmes in the fields of *informatics and computing* (69.8%), *mathematics* (63.7%) and *veterinary* (58.5%) were substantially more successful in finding a first significant job, while graduates in the fields of *life sciences* (29.4%) and *environmental protection* (39.6%) succeeded to do so to a significantly lower extent.

As much as 36.0% of university graduates of both cohorts acquired no work experience at all during the entire period after graduation. Graduates of the following fields of study are dominant among the unemployed graduates: *life sciences* (59.9%), *arts* (46.8%) and *medical sciences* (45.6%), whereas *mathematics* (20.6%) and *informatics and computing* (22.2%) are significantly below the CONGRAD average.



Figure 34:

Graduates' success in finding first significant job by field of study (universities, 2007 and 2012 cohort combined, in %)

#### 7.1 Strategies for Finding the First Significant Job

Graduates of CONGRAD universities and polytechnics who found employment lasting longer than six months after studying or continued to work at the job they had before graduation lasting longer than six months (both cohorts) were asked how they found their job  $(n=6,855)^{23}$ . Answers of respondents demonstrate (Figure 35) that in the regional context of societies and labour market conditions in Serbia, Bosnia and Herzegovina, and Montenegro, *relying on social networks of relatives and friends* in finding employment still provides the best results (32.8% ±1,1%, 95% confidence interval). This strategy for finding the first significant job was most common among graduates in Serbia, where university graduates found their first employment through personal contacts in 36.0% of cases (±1.4%, 95% confidence interval), and graduates of polytechnics in 39.2% of cases (±6.4%, 95% confidence interval). On the other hand only 23.5% (±2.4%, 95% confidence interval) of Montenegrin university graduates found their first significant job through personal contacts, which is significantly less in comparison with graduates from other HEIs in the region.

The second most successful job search strategy (entire sample) is *reading ads in newspapers and websites*, with 21.2% ( $\pm$ 1.1%, 95% confidence interval) of respondents finding employment this way. In comparison with other types of institution, this strategy provides the best results among university graduates in Bosnia and Herzegovina who found employment this way in 29.5% of cases ( $\pm$  2.5%, 95% confidence interval), and it is least effective among graduates of Serbian polytechnics who found employment this way in only 14.9% of cases.

The third most effective strategy for finding the first employment is the job search via institutions specialised in counselling and providing support related to employment search (Employment Agencies in Montenegro and in Bosnia and Herzegovina or the National Employment Service in Serbia) with 12.7% ( $\pm 0.7\%$ , 95% confidence interval) of respondents who find employment through these institutions. In Montenegro, this is the most common way for university graduates to find employment, with as much as 30.1% ( $\pm 2.6\%$ , 95% confidence interval) of graduates reporting that they found a job with support by the employment agency. Finding the first significant job through the National Employment Service is least frequent among Serbian university graduates, with only 8.6% of graduates who found first significant employment this way. Other job search strategies were reported by less than 8% of graduates (e.g. 7.0% through independent contact with employers; 6.2% with help from the higher education institution, etc.).

<sup>&</sup>lt;sup>23</sup> Self-employed graduates are not included in the analysis, because they did not respond to the questions related to job search.



When analysing successful job search strategies according to field of study (Figure 36), it shows that *personal contacts* are most important among graduates who completed their studies in the following fields: *architecture and construction; business, management and administration;* and *agriculture, forestry and fisheries. Reading advertisements,* as a strategy to find employment is most common among those who graduated in *mathematics,* while finding employment through state institutions offering support with job search employment is most frequent among graduates in the field of *teacher training and education science*.



Figure 36: Strategies used for finding first significant job by field of study (universities, 2007 and 2012 cohort combined, in %)

## 7.2 Number of Contacted Employers and the Duration of Job Search

Graduates of CONGRAD universities and polytechnics who successfully found a first significant job on average contacted 6.80 ( $\pm$ 0.27, 95% confidence interval) employers before finding the respective job (Table 9). Graduates of the 2007 cohort contacted slightly more employers (7.60  $\pm$ 0.02, 95% confidence interval) than graduates of the 2012 cohort, who contacted 6.52 ( $\pm$ 0.02, 95% confidence interval) employers on average before finding a first significant employment.

Among the graduates in Serbia, Bosnia and Herzegovina, and Montenegro, the average duration of searching for the first significant employment amounted to 5.17 months ( $\pm$ 1.74, 95% confidence interval). There are no statistically significant differences between the two cohorts or between graduates who studied according to the old system of studies and the Bologna system (F=23.268, p=0.000), i.e. between Serbian universities (M=7.6 months  $\pm$ 0,37 months; 95%

confidence interval), Montenegrin universities (M=4.88 months  $\pm 0.49$ , 95% confidence interval) and universities in Bosnia and Herzegovina (M=5.27 months  $\pm 0.53$ , 95% confidence interval) (Table 10).

On the other hand, when the duration of the search for first significant job is considered, the differences between the cohorts (F=48.050, p=0.000) and the systems of study (F=33.539, p=0.000) are quite substantial. Graduates of the 2007 cohort and graduates who completed their studies according to the old system of studies on average spent more time on searching for a job in comparison with the 2012 cohort (M=5.67 months for the 2007 cohort, M=4.65 months for the 2012 cohort), and in comparison with graduates who completed their studies according to the Bologna system of studies (M=5.45 months for the old system of studies, M=4.52 months for the Bologna system). When comparing CONGRAD universities and polytechnics, significant differences in the duration of the job search occur between Serbian universities (M=5.03 months  $\pm 0.22$  months; 95% confidence interval) and polytechnics (M=6.86  $\pm 1.34$  months; 95% confidence interval) and polytechnics and countries there are no statistically significant differences.

Table 9:	First significant job – Average number of contacted employers by type of
	institution/country (universities and polytechnics, 2007 and 2012 cohort combined)

	Mean	Std. deviation	Std. error	Ν
Universities - Serbia	7,62	12,101	0,191	3.996
Universities - Bosnia and Herzegovina	5,27	7,578	0,268	799
Universities - Montenegro	4,88	7,665	0,249	950
Polytechnics	5,67	8,907	0,655	185
Total - all CONGRAD institutions	6,80	10,939	0,142	5.930

#### Table 10: First significant job – Average duration of job search by type of institution/country (universities and polytechnics, 2007 and 2012 cohort)

	Mean	Std. deviation	Std. error	N
Universities - Serbia	5,03	7,207	0,114	3.996
Universities - Bosnia and Herzegovina	5,41	8,143	0,288	799
Universities - Montenegro	5,25	7,345	0,238	950
Polytechnics	6,86	9,348	0,687	185
Total - all CONGRAD institutions	5,17	7,442	0,097	5.930

Differences regarding the average duration of job search are also apparent between disciplines. Statistically significant differences exists between the field of *teacher training and education science* and the fields of *humanities; social sciences; business, management and administration; law; mathematics; informatics and computing; engineering; architecture and construction; and personal services.* On the other hand, *informatics and computing* is statistically different from the following fields: *teacher training and education science; social sciences; agriculture, forestry and fisheries;* and *medical sciences* (Table 11).

	Mean	Std. deviation	Std. error	N
Teacher training and education science	9,23	13,461	0,818	271
Arts*	5,32	8,074	1,526	28
Humanities	5,92	8,877	0,608	213
Social and behavioural science	6,11	8,561	0,458	349
Journalism and information	5,42	7,466	1,026	53
Business and administration	5,87	7,291	0,325	504
Law	5,20	5,706	0,417	187
Life sciences	7,63	10,832	1,410	59
Physical sciences	5,43	7,006	0,897	61
Mathematics	2,73	2,453	0,427	33
Computing	3,26	4,354	0,342	162
Engineering	4,24	5,794	0,340	291
Manufacturing	6,31	10,217	0,997	105
Architecture and building	4,28	7,228	0,515	197
Agriculture, forestry and fishery	7,34	9,482	0,832	130
Veterinary*	4,25	5,275	0,997	28
Health	6,64	6,897	0,484	203
Personal services*	1,44	1,365	0,341	16
Environmental protection*	3,31	5,313	1,474	13
Other*	7,58	8,733	2,003	19
CONGRAD universities - all fields of study	5,83	8,339	0,154	2.922

#### Table 11: First significant job – Average duration of job search in months by field of study (universities, 2007 and 2012 cohort)

\*n < 30

## 7.3 Type and Quality of the First Significant Job

The quality and type of graduates' first significant job or self-employment is to a great extent dependent on the level of the professional and disciplinary specificity of the study programme they completed. For this reason, in this part of the report, the analysis will focus on the type and quality of the graduates' first significant job with regard to type of institution, and in the case of university graduates also with regard to different fields of study.

#### 7.3.1 Relation between Studies and First Significant Job

Graduates who succeeded in finding a first significant (self)employment were asked to assess the extent to which their first significant job was related to the contents of the study programme they completed on a 5-point Likert scale (from 1 "not at all" to 5 "to a very high extent").

As illustrated in Figure 37, for the majority of graduates of universities and polytechnics in Serbia, Bosnia and Herzegovina, and Montenegro (71.7%  $\pm$ 1.1%, 95% confidence interval), the first significant (self-)employment was to a high extent related to their field of study (values 4 and 5 on the 5-point scale). The share of graduates whose first significant (self)employment was not at all related to their field of study (value 1 on the 5-point scale) is only 9.0% ( $\pm$ 1.2%, 95% confidence interval). Graduates who obtained their degree in 2007 indicated more frequently than graduates of the 2012 cohort that their first significant job was to a high extent related to their field of study (values 4 and 5 on the 5-point scale; 73.4% for the 2007 cohort, 70.1% for the 2012 cohort).

When comparing universities and polytechnics in different countries, it can be concluded that the relation between first significant job and the completed study programme is more pronounced among graduates of universities in Bosnia and Herzegovina and in Serbia, than among graduates of Montenegrin universities and Serbian polytechnics

In general, for more than a half of the graduates of CONGRAD universities and polytechnics, the first significant job was *to a high extent* related to the field of study. Only a rather small share of graduates stated that their first significant job was *not at all* related to the discipline they studied (less than 10.0% in all countries). Only the graduates of Serbian polytechnics do not comply with this trend. One in five of the polytechnics graduates worked in jobs they assessed as *not at all* related to the study contents, and only 33.9% reported that their first significant job was *to a great extent* related to the study contents.



Figure 37: xtent to which the first significant job was related to the field of study by field of study (5point scale, universities, 2007 and 2012 cohort combined, in %)

Taking into account both cohorts statistically significant differences in the share of university graduates who indicated that their first significant (self-)employment was to a high extent related to their field of study (values 4 and 5 on the 5-point scale)<sup>24</sup> exist between the following

<sup>&</sup>lt;sup>24</sup> The average for graduates of all fields of study is 77.5% (values 4 and 5 on the 5-point scale).

disciplines: informatics and computing  $(81.0\%)^{25}$  and medical sciences  $(88.7\%)^{26}$ ; and the fields of: business, management and administration  $(61.8\%)^{27}$  and social sciences  $(67.8\%)^{28}$ .

More than a half of the graduates of universities and polytechnics in Serbia, Bosnia and Herzegovina, and Montenegro (both cohorts) who were (self-)employed longer than six months found employment in the private sector (53.1% ±1.6%; 95% confidence interval), followed by the state sector (42.5% ±1.6%; 95% confidence interval). For the private sector, the share of employed graduates who obtained their degree at universities (57.0% ±1.4%; 95% confidence interval) and polytechnics (65.7% ±6.1%; 95% confidence interval) was above average in Serbia. In the state sector, graduates who obtained their degree at Montenegrin universities (51.9% ±1.6%; 95% confidence interval) and universities in Bosnia and Herzegovina (50.5% ±1.4%; 95% confidence interval) were employed more frequently than Serbian graduates (39.1% ±1.1%; 95% confidence interval). Employment in the NGO sector is generally very rare in all three countries included in the CONGRAD survey. It is slightly more common among graduates in Bosnia and Herzegovina (see Figure 38), and among graduates in the following disciplines: journalism and information, social sciences and law (see Figure 39). In the private sector, the most frequently employed are graduates of polytechnics and universities in Serbia, whereas employment in the private sector is less frequent in Bosnia and Herzegovina and Montenegro. This demonstrates a higher level of development of the private sector in Serbia.



In comparison with the CONGRAD average, the share of graduates who found employment in the *state sector* is pronounced for the following fields of study: *teacher training and education science* (76.8%), *medicine* (71.3%), *life sciences* (69.4%), *physics and chemistry* (67.3%), *mathematics* (64.1%), *humanities* (58.5%), *arts* (50.0%), *law* (48.5%) and *agriculture, forestry and fisheries* (45.6%).

Graduates who found employment in the *private sector*, predominantly completed their studies in the fields *business, management and administration* (72.0%), *architecture, construction and transport* (72.0%), *manufacturing and processing* (71.0%), *informatics and computing* (68.5%),

<sup>&</sup>lt;sup>25</sup> There is a statistically significant difference in comparison with *humanities, business, management and administration, engineering* and *agriculture, forestry and fisheries.* 

<sup>&</sup>lt;sup>26</sup> There is a statistically significant difference in comparison with *humanities, business, management and administration, engineering* and *agriculture, forestry and fisheries.* 

<sup>&</sup>lt;sup>27</sup> There is a statistically significant difference in comparison with *humanities, informatics and computing, veterinary, medical sciences* and *personal services*.

<sup>&</sup>lt;sup>28</sup> There is a statistically significant difference in comparison with *law, informatics and computing, veterinary* and *medical sciences.* 

*veterinary* (66.1%) and *engineering* (60.8%) (see Figure 39). Graduates who least frequently found employment in the *private sector* are those who studied *teacher training and education science* (19.3%), *life sciences* (23.5%), *medicine* (26.3%) and *physics and chemistry* (31.3%). This is not surprising since health and education are dominant in the public sector.



Figure 39: First significant job – Sector by field of study (universities, 2007 and 2012 cohort combined, in %)

The largest number of graduates of CONGRAD universities and polytechnics in Serbia, Bosnia and Herzegovina and Montenegro found their first significant employment in the branch of *education* (20.6%). Among them, the graduates of universities in Bosnia and Herzegovina are the most numerous in this branch (29.9%). A significant share of graduates found their first significant job in the branch of *information and communication*<sup>29</sup> (10.6%) and the branch of *professional, scientific, innovative and technical activities*<sup>30</sup> (9.3%). Other important branches for the graduates' first significant employment are *financial and insurance activities* (7.1%), *health and social protection* (6.9%), *wholesale and retail trade and repair of motor vehicles and motorcycles* (5.9%), *construction* (5.8%), *other service activities* (5.7%) and *public administration and defence* (5.4%). In all other branches of activities the share of graduates who found first significant jobs (both cohorts) is lower than 5% (see Figure 40).

<sup>&</sup>lt;sup>29</sup> Graduates of Serbian universities (11.3%) and polytechnics (17.0%) are dominant in this category.

<sup>&</sup>lt;sup>30</sup> Graduates of Serbian unviersities (10.9%) and polytechnics (10.4%) are dominant in this category.
When comparing universities in Serbia, Bosnia and Herzegovina, and Montenegro, and polytechnics in Serbia, it shows that in the branches of *information and communication* and *construction* polytechnics graduates are employed to a higher extent than university graduates. In the branch of *education* though polytechnics graduates are employed much less, which could be expected due to their educational profiles.





Figure 41: First significant job – Branches of economic activities by field of study (universities, 2007 and 2012 cohort combined, in %)

The distribution of branches of activities according to fields of study falls well into the graduates' professional profiles (Figure 41). This is supported by the earlier finding that most graduates succeeded in finding employment that is *to a high extent* or *to a very high extent* related to their field of study.

In general, it can be concluded that a greater variety of branches in which graduates find jobs can be found within certain disciplines, such as *social sciences*, whereas graduates in the fields of

*engineering* and *health* find their first significant job in rather restricted areas or branches (see Figure 8).

For example, medical professionals are employed predominantly in the branch of *human health and social work activities* (81.6%), journalists in the branch of *information and communication* (62.0%), farmers and similar vocations in the branch of *agriculture, forestry and fisheries* (52.0%), architects in the branch of *construction* (55.0%). For other professional profiles the relation with certain branches of activities is not as strong; e.g. lawyers, graduates of business, management and administration (even though they can work in different sectors of business and economy), and graduates in the field of arts.

With regard to the jobs performed by graduates of CONGRAD universities and polytechnics in Serbia, Bosnia and Herzegovina, and Montenegro, most respondents indicated positions that usually require a high level of professional qualifications. Most of them succeeded in finding employment in positions that usually require higher education (see Figure 42). Most of the graduates who found a first significant employment (n=6,064) were employed as engineer, technician or associate professional (38.2%), and professionals (27.2%), whereas 19.0% worked as clerical support workers in their first job. With regard to the CONGRAD average, positions as clerical support worker were most frequent among Montenegrin university graduates (30.7%). As expected, for the jobs as engineers, technicians or associate professionals, graduates of Serbian polytechnics were hired most frequently, since polytechnics offer different kinds of professional technical knowledge (56.9%). Graduates of Serbian universities (40.5%) were also rather frequently employed in this field. For jobs of professionals, graduates of universities in Bosnia and Herzegovina (29.9%) and Serbian university graduates (28.7%) were employed slightly more frequently compared to the average. Lower employment positions which usually do not require a higher education, i.e. occupational positions classified in the groups of service and sales workers, craft and related trade workers, plant and machine operators and assemblers or *elementary occupations*, are present only to a negligible extent. This confirms once more the strong link between professional and disciplinary specificity of studies and subsequent employment (see Figure 42).



As illustrated in Figure 43, there is a strong association between the field of study and the branch of activities in which graduates started their first significant employment. As

professionals, the graduates of the following fields of study were most frequently employed: medicine (76.6%), humanities (68.0%), teacher training and education sciences (64.8%), mathematics (64.3%), veterinary (63.8%), arts (62.8%), and journalism and information (40.7%). In the position of *technician and associate professional*, graduates of the following disciplines were most frequently employed: *engineering* (82.5%), *architecture and construction* (80.8%), *manufacturing and processing* (74.5%), *informatics and computing* (68.2%), *agriculture* (59.9%), *physics and chemistry* (50.4%) and *life sciences* (48.1%). *Clerical support workers* were mostly graduates of the following fields of study: *social sciences* (41.0%), *law* (39.5%), *business, management and administration* (37.6%) and *journalism and information* (26.7%).



combined, in %)

# 7.4 Quality of the First Significant Job

Job quality is a concept that can be measured in various ways. In the present report the quality of jobs is assessed based on the following indicators: (1) security of employment measured by the type of contract (type of contract and its duration); (2) wage level measured by the average *net* salary, and (3) extent to which acquired knowledge and skills are required in the first significant job. These elements related to the quality of the first significant job are presented separately for graduates of CONGRAD universities and polytechnics in Serbia, Bosnia and Herzegovina and Montenegro.

#### 7.4.1 Type of Contract in the First Significant Job

Figure 44 and Figure 45 provide information on the working contract graduates had in their first significant job – both regarding the duration of the contract (permanent contract or fixed-term contract) and the type of contract.

Usually, graduates of CONGRAD universities and polytechnics started their professional career by signing a regular working contract (84.4%  $\pm$ 1.1%, 95% confidence interval). Slightly more graduates started their career with a fixed-term contract (50.2%  $\pm$ 1.1%, 95% confidence interval) than by signing a permanent contract (45.3%). A very small share of graduates was selfemployed (4.5%). In comparison with the CONGRAD average, permanent contracts are more frequent among the graduates of Serbian universities (48.2%  $\pm$ 1.4%, 95% confidence interval) and Serbian polytechnics (62.2%  $\pm$ 6.1%, 95% confidence interval). Substantially lower is the share of Montenegrin university graduates with a permanent working contract for the first significant job (29.4%  $\pm$ 2.7%, 95% confidence interval). In comparison with the CONGRAD average, fixed-term contracts at the beginning of the career are more frequent among Montenegrin university graduates (66.7%  $\pm$ 2.6%, 95% confidence interval), whereas they are below average among graduates of Serbian universities (47.0%  $\pm$ 1.3%, 95% confidence interval) and Serbian polytechnics (29.6%  $\pm$ 6.2%, 95% confidence interval) (see Figure 44).



Figure 44: First significant job – Duration of the working contract (universities and polytechnics, 2007 and 2012 cohort combined, in %)

For the entire sample, *contracts for services* and *contracts for temporary jobs* in the first significant job are rare (10.2% in total). Still, it should be noted that these types of non-permanent working contracts are not equally distributed across countries and institutions, even though the differences are quite small. *Contracts for services* are more frequent among

Montenegrin university graduates (7.5%) in comparison with the CONGRAD average<sup>31</sup>, whereas *contracts for temporary jobs* are slightly more frequent among graduates of polytechnics  $(7.2\%)^{32}$  (see Figure 45).



igure 45: First significant job – Type of contract (universities and polytechnics, 2007 and 2012 cohort combined, in %)

Graduates of certain fields of study started their professional career with a certain type of contract. For example, in comparison with the CONGRAD average, *fixed-term contracts were* more frequently signed by graduates who completed their studies in *life sciences* (71.6%), *law* (65.7%), *humanities* (60.5%), *journalism and information* (56.9%), *social sciences* (56.1%), *medicine* (54.8%), *physics and chemistry* (53.3%), *teacher training and education science* (51.9%), *manufacturing and processing* (51.6%). Graduates who completed a study programme in *informatics and computing* (62.5%), *mathematics* (54.0%), *veterinary* (54.1%), *business, management and administration* (51.5%), *agriculture, forestry and fishery* (48.2%), *architecture and construction* (47.7%), and *manufacturing and processing* (46.5%) signed most frequently *permanent contracts* (see Figure 46).

<sup>&</sup>lt;sup>31</sup> CONGRAD average for *contracts for services* is 5.5% (n=337).

<sup>&</sup>lt;sup>32</sup> CONGRAD average for contracts for temporary jobs is 4.7% (n=290).



polytechnics, 2007 and 2012 cohort combined, in %)

#### 7.4.2 Salary in the First Significant Job

Figure 47 and Table 12 provide information on the average monthly net salary graduates of CONGRAD universities and polytechnics earned in their first significant job (n=5,672). Based on the average net salary in EUR, it can be concluded that graduates of universities in Serbia, Bosnia and Herzegovina, and Montenegro have similar average net salaries amounting to 406.17 EUR ( $\pm$ 12.1 EUR, 95% confidence interval) in Serbia, 406.73 EUR ( $\pm$ 18 EUR, 95% confidence interval) in Bosnia and Herzegovina, and 406.07 EUR ( $\pm$ 25.5 EUR, 95% confidence interval) in Montenegro. As expected, graduates of polytechnics earned net salaries below average (346.16 EUR  $\pm$ 53.9 EUR, 95% confidence interval) (see Table 12).



Figure 47: First significant job – Average net salary in EUR (universities and polytechnics, 2007 and 2012 cohort combined)

 Table 12:
 First significant job – Average net salary in EUR (universities and polytechnics, 2007 and 2012 cohort combined)

	Mean	Std. deviation	Std. error	Median	N
Universities - Serbia	406	380	6	354	3.764
Universities - Bosnia and Herzegovina	407	256	9	383	753
Universities - Montenegro	406	406	13	350	972
Polytechnics	346	372	28	292	183
Total - all CONGRAD institutions	404	370	5	354	5.672

Figure 48 and Table 13 show the average monthly *net* salary of university graduates in Serbia, Bosnia and Herzegovina, and Montenegro according to the field of study (n=5,241). The highest salaries in the first significant job were reported by respondents who obtained their degree in the following fields of study: *business, management and administration* (409.76 EUR), *physics and chemistry* (422.95 EUR), *architecture and construction* (430.18 EUR), *life sciences* (433.69 EUR), *medicine* (490.96 EUR), *engineering* (501.32 EUR) and *informatics and computing* (553.16 EUR). Salaries below the average level were earned by graduates in the following disciplines: *mathematics* (405.46 EUR), *manufacturing and processing* (397.89 EUR), *social sciences* (386.03 EUR), *environmental protection* (382.63 EUR), *arts* (377.47 EUR), *agriculture, forestry and fisheries* (334.36 EUR), *humanities* (330.22 EUR), *teacher training and education science* (325.07 EUR), *personal services* (321.86 EUR), *journalism and information* (298.53 EUR), *law* (287.60 EUR) and *veterinary* (278.80 EUR).



2012 cohort combined)

	Mean	Std. deviation	Std. error	Median	N
Teacher training and education science	325	281	13	345	438
Arts	377	340	39	300	77
Humanities	330	294	14	310	450
Social and behavioural science	386	307	12	342	605
Journalism and information	299	214	23	300	89
Business and administration	410	334	11	354	967
Law	288	201	12	283	303
Life sciences	434	341	39	364	76
Physical sciences	423	328	29	381	131
Mathematics	405	245	32	392	57
Computing	553	340	19	496	319
Engineering	501	458	19	408	578
Manufacturing	398	247	21	372	137
Architecture and building	430	299	16	354	353
Agriculture, forestry and fishery	334	279	20	300	193
Veterinary	279	214	28	266	57
Health	491	638	38	443	278
Personal services	322	208	36	346	34
Environmental protection	383	236	42	341	32
Security services*	102			102	1
Other	566	1145	141	310	66
CONGRAD universities - all fields of study	405	375	5	354	5.241

# Table 13: First significant job – Average net salary in EUR by field of study (universities, 2007 and 2012 cohort)

\*n < 30

The median salaries earned in the first significant job were, for all fields of study except for *teacher training and education science*, lower than the arithmetic mean of the graduates' salaries. This implies that salaries some graduates earned were higher than the average, which increases the gap between the arithmetic mean and the median (see Table 13).

#### 7.4.3 Utilisation of Acquired Knowledge and Skills in the First Significant Job

When analysing the extent to which knowledge and skills acquired during studies were required in the first significant job, it shows that more than a half of the graduates of CONGRAD universities and polytechnics in Serbia, Bosnia and Herzegovina, and Montenegro (53.8%, n=6,151) were able to use the knowledge and skills they acquired during studies to a high extent in their first significant job (values 4 and 5 on the 5-point scale) (see Figure 49). This is most common among graduates who completed study programmes in the field of veterinary, in which no respondent awarded the lowest mark (value 1).

Taking into account both cohorts, there are statistically significant differences between fields of study regarding the extent to which knowledge and skills acquired during studies are used in the first significant job. Graduates of the following disciplines stated more frequently than the average that the respective skills were required to a high extent (values 4 and 5 on the 5-point

scale) in the first significant job<sup>33</sup>: medical sciences (69.2%)<sup>34</sup>, education and education sciences (66.8%)<sup>35</sup>, humanities (65.4%)<sup>36</sup> and informatics and computing (62.1%)<sup>37</sup>. In the following fields of study the share of those stating that skills acquired upon graduation were required in the job to a high extent was below average: business, management and administration (45.8%)<sup>38</sup>, social sciences (44.9%)<sup>39</sup>, and journalism and information (41.3%)<sup>40</sup> (see Figure 49).





<sup>&</sup>lt;sup>33</sup> Average is 54.4% (for values 4 and 5 on the 5-point scale).

<sup>&</sup>lt;sup>34</sup> Statistically significant differences exist with regard to the following fields: social sciences, journalism and information, business, management and administration, law, production and manufacturing, engineering, architecture and construction and agriculture, forestry and fisheries.

<sup>&</sup>lt;sup>35</sup> Statistically significant differences exist with regard to the following fields: *social sciences, journalism and information, business, management and administration, engineering and architecture and construction.* 

<sup>&</sup>lt;sup>36</sup> Statistically significant differences exist with regard to the following fields: social sciences, journalism and information, business, management and administration and engineering.

<sup>&</sup>lt;sup>37</sup> Statistically significant differences exist with regard to social sciences, journalism and information, business, management and administration and engineering.

<sup>&</sup>lt;sup>38</sup> Statistically significant differences exist with regard to *education and educational sciences, arts, humanities, physics and chemistry, informatics and computing* and *medical sciences*.

<sup>&</sup>lt;sup>39</sup> Statistically significant differences exist with regard to the following fields: *education and educational sciences, arts, humanities, physics and chemistry, informatics and computing* and *medical sciences.* 

<sup>&</sup>lt;sup>40</sup> Statistically significant differences exist with regard to the following fields: *education and education sciences, humanities, informatics and computing* and *medical sciences*.

The utilisation of professional knowledge acquired during studies in the first significant job is highest among respondents who were employed as *professionals*<sup>41</sup>, followed by those who were employed as *engineers, technicians and associate professionals*<sup>42</sup>, and *managers (chief executives), senior officials and legislators*<sup>43</sup>, *clerical support workers*<sup>44</sup> and those working in *crafts and related trade*.

<sup>&</sup>lt;sup>41</sup> Variance analysis shows that these respondents use the knowledge acquired during studies in their jobs more than respondents who were employed as: (a) *managers (chief executives), senior officials and legislators,* (b) *engineers, technicians and associate professionals,* (c) *clerical support workers,* (d) *service and sales workers,* (e) *plant and machine operators, and assemblers* and (e) those working at *elementary occupations.* 

<sup>&</sup>lt;sup>42</sup> Variance analysis shows that these respondents use the knowledge acquired during studies in their job less than respondents who were employed as *professionals*, and more than respondents who were employed as: (a) *managers (chief executives)*, senior officials and legislators, (b) clerical support workers, (c) service and sales workers, (d) plant and machine operators, and assemblers, and (e) those working at elementary occupations.

<sup>&</sup>lt;sup>43</sup> Variance analysis shows that these respondents use the knowledge acquired during studies in their job less than respondents who were employed in the following positions: (a) professionals, and (b) engineers, technicians and associate professionals; on the other hand, they use this knowledge more than the respondents who worked as: (a) clerical support workers, (b) service and sales workers, (c) plant and machine operators, and assemblers, and (d) those working at elementary occupations.

<sup>&</sup>lt;sup>44</sup> Statistical analysis shows that these respondents on the one hand use the knowledge acquired during studies in the work place less than those respondents who were employed as: (a) *professionals*, (b) *engineers*, *technicians and associate professionals*, and (c) *managers (chief executives), senior officials and legislators,* and on the other hand they use this knowledge more than respondents who were employed as: (a) *service and sales workers*, (b) *plant and machine operators, and assemblers*, and (c) those working at *elementary occupations*.

#### 8 Current Career and Work Status

As explained in the introduction to the chapter on graduates' careers, one of the objectives of the CONGRAD project was to find out more about the graduates' transition from completing their studies to starting their professional careers. This was achieved by analysing the first significant job after graduation. The first job lasting or contracted for more than six months represents the first career step, which is usually followed by a second phase of obtaining concrete and job-specific expertise. During this period professional career patterns begin to develop. Comparative research shows that this second phase usually ends four to five years after the starting the first significant job (Allen & Van der Velden 2009, Teichler 2009). Therefore the CONGRAD graduate survey does not only monitor the first significant job or self-employment, but also the work status and the job graduates had at the time of the survey (March to July 2013), i.e. depending on the cohort one year and five years after graduation respectively. The assumption is that graduates of the 2007 cohort who graduated five years prior the survey, after a period of job search and shorter engagements or probation periods, at the time of the survey were in the second career phase. Analysis of the current work status of graduates according to cohort shows that certain patterns exist (see Figure 50).



Figure 50 shows the graduates' work and career status at the time of the survey. Most graduates of the 2012 cohort had no work experience and were actively searching for their first job (43.4%  $\pm$ 1.04%, 95% confidence interval) or were inactive, i.e. unemployed or not looking for employment (8.4%  $\pm$ 0.6%, 95% confidence interval). A small share of graduates of the younger cohort (7.8%  $\pm$ 0.57%, 95% confidence interval) had been employed longer than six months after graduation, even though they were unemployed at the time of the survey. Among the graduates who were employed at the time of the survey, only one in ten had changed the company or the institution they worked in (11.3%  $\pm$ 0.63%, 95% confidence interval), whereas others still worked in the same job, i.e. their first significant job.

Among the graduates of the 2007 cohort, the situation is substantially different. As expected, in the second phase of their careers certain career mobility is already noticeable. A considerable share of graduates made career progress within a certain company (job in the same company/institution, but in a different position) or they changed the company/institution. As the survey results show, almost four in five graduates who completed their studies five years prior to the survey were either employed or self-employed. 41.7% (±1.44%, 95% confidence interval) of those who had a job at the time of the survey had changed either their position in the company/institution or the company/institution they worked in. On the other hand 12.5% (±0.96%, 95% confidence interval) still had no work experience. The number of inactive, i.e. not

employed or self-employed and not actively looking for a job, is negligible in this cohort. Also the number of self-employed graduates is quite small and amounts to only 3.3% (±0.52%, 95% confidence interval).

Based on the previously presented results, it can be concluded that the analysis of the type and quality of jobs performed by graduates of different types of HEIs in Serbia, Bosnia and Herzegovina, and Montenegro should be restricted to graduates of the 2007 cohort. Most of them successfully finalised the job search process, acquired first work experiences, and completed the transition from higher education to the world of work. The graduates' jobs five years after graduation are an important indicator of typical jobs and careers of graduates of certain fields of study. Bearing this in mind, the following analysis of the current employment or self-employment shall be based exclusively on the responses by the graduates of the older cohort. In accordance with the descriptive nature of this report, general results and statistically significant differences between countries, types of institution, degree levels and fields of study are illustrated.

# 8.1 Differences between Graduates according to Type of Institution and Degree Level

The following results demonstrate the current work and career status of graduates five years after graduation with regard to the type of institution they graduated from and the country in which the HEI is located (Figure 51). The type of institution and the country where the graduates completed their studies significantly influence their employment and career status ( $\chi^2_{18, 4512}$  = 8.78, p<0.01, V=0.08), but the effect is rather weak. Differences between certain types of institution (for p<0.05) are statistically significant in some aspects of career mobility. Differences between HEIs in terms of graduates who five years after graduation worked for the same company or organisation but in a different position are not statistically significant. On the other hand, changes of company or institution the respondents worked in during the first five years after graduation are significantly more frequent among Serbian university graduates in comparison with graduates of universities in Bosnia and Herzegovina. Self-employment is most frequent among graduates of polytechnics, but statistically significant differences exist only with regard to graduates of universities in Bosnia and Herzegovina. The share of currently unemployed graduates, and graduates who had a first significant job but are currently unemployed and searching for a job, is highest among graduates of universities in Bosnia and Herzegovina, whereas it is lowest among Montenegrin university graduates. Statistically significant differences of currently unemployed exist only between the graduates of universities in Bosnia and Herzegovina and Montenegrin university graduates. Long-term unemployment, i.e. the share of graduates who were unemployed five years after graduation and had no working experience, even though they were looking for a job, is lowest among Serbian university graduates (11.6%), and highest among Montenegrin university graduates (15.6%). Differences between these subgroups of graduates are small, but statistically significant (p<0.05). Generally speaking, at the level of the CONGRAD sample the total unemployment rate five years after graduation (current and long-term unemployment combined), amounts to 21%. Taking into account similar comparative studies in Europe (e.g. HEGESCO and REFLEX project; Allen & Van der Velden 2009)<sup>45</sup> the unemployment rate among graduates in Serbia, Bosnia and Herzegovina, and Montenegro is among the highest in Europe.

<sup>&</sup>lt;sup>45</sup> It should be pointed out that the comparative graduate surveys within REFLEX and HEGESCO projects were conducted before the start of the global financial and economic crisis, which in most countries resulted in



Figure 51: Current job and career status five years after graduation (universities and polytechnic 2007 cohort, in %)

Between graduates of first-cycle degrees (academic or professional studies) and graduates of second-cycle degrees (magister, specialist and master studies)<sup>46</sup>, there are no statistically significant differences in terms of career and work status five years after graduation. Graduates of both degree levels are distributed to a similar percentage between rather similarly across the categories of employed, changed employers and companies, self-employed, currently unemployed and long-term unemployed. The only statistically significant differences occur among graduates who changed their jobs but remained in the same company or organisation. In this category there are significantly more graduates who completed second-cycle degrees than graduates of first-cycle degrees. This indicates that second-cycle degrees may ensure career progress and promotion within the company to some extent, but generally speaking even higher level degrees do not prevent temporary or long-term unemployment after graduation.

# 8.2 Differences in Current Work and Career Status Five Years after Graduation with Regard to Fields of Study at Universities

The field of study in which CONGRAD university graduates obtained their degree significantly affects the employment situation after graduation. Due to differences between supply and demand for experts of various professional profiles in Serbia, Bosnia and Herzegovina, and Montenegro the field of study proves to be one of the reasons for the difficulties in finding employment. The field of study has a statistically significant and medium-sized effect on the work and career status of university graduates five years after graduation ( $\chi^2_{85,4088}$ =453.5, p<0.01, V=0.15)<sup>47</sup>. Figure 52 illustrates the differences in graduate work and career status five years after graduation with regard to field of study in which graduates of the 2007 cohort completed their studies. The data are ranked according to share of employed and self-employed graduates. The total employment level is highest (over 80%) among graduates who completed

the increase of unemployment and affected the careers of young professionals with higher education degrees.

<sup>&</sup>lt;sup>46</sup> Due to the small sample size PhD graduates are not included in the analysis.

<sup>&</sup>lt;sup>47</sup> Due to the small sample size graduates who completed their studies in the field of *personal services* are not included in the analysis.

their studies the following fields: *computer science, engineering and engineering trades*<sup>48</sup>, *mathematics and statistics, architecture and building* (including studies of transport), and *business and administration*. The highest proportion of long-term unemployment after graduation (over 20%) is reported for graduates of *life sciences* (biology and environmental science), *medical sciences*, and graduates of *other fields of study* (dominated by sport studies).



2007 cohort, in %)

Self-employment is pronounced (over 5%) only among *lawyers, veterinarians, journalists* and *engineers* (field of manufacturing and processing). Career stability during the first five years of their career, i.e. employment in the same position with the same employer, is especially pronounced among graduates of *teacher training and education science* and graduates of *mathematics and statistics* and *physical sciences,* who are predominantly employed in the state sector. Changing companies and institutions during the first five years after graduation is most common (over 40% of graduates) among graduates who completed study programmes in the

<sup>&</sup>lt;sup>48</sup> According to ISCED *engineering and engineering trades* includes most study programmes of mechanical engineering and vehicle production as well as the field of energy, electronics and automation, and chemical engineering.

fields of architecture and building, computing, business and administration, and journalism and information.

# 8.3 Where Do Graduates Find Employment Five Years after Graduation

Five years after graduation, the graduates from CONGRAD universities are almost equally employed in the *state* and *private sectors*, whereas almost two thirds of graduates of Serbian polytechnics work in the *private sector*. A statistically significant difference in comparison with all other groups of institutions exists in favour of employment in the *state sector* among graduates of universities in Bosnia and Herzegovina with regard to Serbian graduates (universities and polytechnics). In comparison with Montenegrin university graduates, there are no statistically significant differences (Figure 53). The respective differences may to a certain extent be explained by the different structures of the countries' economies and a somewhat greater presence of employment opportunities in the *private sector* in Serbia. Having in mind the high share of graduates who completed study programmes intended for future teachers and doctors in the CONGRAD sample the rather high representation of the *state sector* is also not surprising.



Figure 53: Current job five years after graduation – Sector (universities and polytechnics, 2007 cohort, in %)

As illustrated in Figure 54, graduates who just completed study programmes for teachers, medical professionals and lawyers are represented above the average level in the *state sector*. On the other hand, in the *private sector* veterinarians, managers and different engineers are employed above the average level. Employment in the *NGO sector* is present to a significant extent only among graduates of *journalism and information* and *social sciences*.



Figure 54: Current job five years after graduation – Sector by field of study (universities, 2007 cohort, in %)

Five years after graduation, the largest share of CONGRAD graduates work in the following branches: education (22.9% ±1.45%, 95% confidence interval), information and communication (9.9% ±0.52%, 95% confidence interval), human health and social work (8.7% ±0.98%, 95% confidence interval), finance and insurance (8.7% ±0.98%, 95% confidence interval), professional, scientific and technical activities (8.6% ±0.97%, 95% confidence interval), public administration (6% ±0.82%, 95% confidence interval), manufacturing (6% ±0.82%, 95% confidence interval), wholesale and retail trade (5.2% ±0.39%, 95% confidence interval) and construction (5% ±0.37%, 95% confidence interval). Other branches of economic activities are represented with less than 5%. This employment structure according to branches is a reflection of the economic structure in Serbia, Bosnia and Herzegovina and Montenegro. The work force in the public sector and in the service industry is composed to a large extent of employees with higher education degrees. Substantial differences between countries or types of institutions with regard to the employment structure of graduates in different activity branches occur only rarely. In comparison with graduates in Serbia and Bosnia and Herzegovina, Montenegrin university graduates are significantly less represented in the manufacturing industry. On the other hand, Montenegrin graduates work more frequently in the branch of accommodation and food service activities. The share of graduates who five years after graduation worked in the branch of information and communication and in the branch of financial and insurance activities is significantly lower among graduates in Bosnia and Herzegovina in comparison with other graduates. At the same time compared to other countries, employment in education is substantially higher in Bosnia and Herzegovina. Employment in public administration sector is pronounced among Montenegrin university graduates (see Figure 55).



Figure 55: Current job five years after graduation – Branches of economic activities (universities and polytechnics, 2007 cohort, in %)

The analysis of the employment structure according to economic activity branches and fields of study demonstrates the orientation towards certain professions in specific economic activity branches, which usually employ graduates of particular professional profiles. Most fields of study are dominated by one or two economic activity branches within which the majority of graduates with certain professional profiles are employed. This shows the segmentation of the work force with higher education according to professions. Greater variety in terms of economic activity branches in which graduates find employment exists only in the case of graduates of the following disciplines: *law, social sciences* and *business and administration* (see Figure 56).



Figure 56: Current job five years after graduation – Branches of economic activities by field of study (universities, 2007 cohort, in %)

When analysing the occupational categories of graduates five years after graduation (Figure 57), it can be concluded that more than 80% of university graduates in Serbia and Bosnia and Herzegovina and 70% of Montenegrin university graduates work in jobs belonging to higher occupational categories according to the *International Standard Classification of Occupations (ISCO-08)*: manager, senior official and legislator; professional; engineer, technician or associate professional. Statistically significant differences exist between university graduates and graduates of polytechnics, who in accordance with the professional and vocational nature of

their studies work less frequently as *professionals*, and more frequently as *engineers*, *technicians* and associate professionals. In addition, polytechnics graduates in comparison with university graduates are represented more frequently in the lower occupational categories, which generally do not require higher education, such as *service and sales workers* and *elementary occupations*. When comparing current job and first significant job it shows that five years after graduation the proportion of graduates in the position of manager (chief executive), senior officer and legislator which demonstrates progress in the work place among a certain number of graduates (14.8%  $\pm$  1.25%, 95% confidence interval in comparison with 7.5% on the first job) is almost twice as high.

Having a position as *clerical worker* is significantly more frequent among Montenegrin university graduates, which is in accordance with the greater share of employment in the state administration sector among this group of graduates. On the other hand, five years after graduation only few university graduates worked in jobs not requiring academic qualifications, such as *service and sales workers* and *elementary occupations*. Polytechnics graduates worked in such jobs somewhat more frequently. In total, these occupations are present among only 4.5% of graduates for all types of institutions ( $\pm$  0.73%, 95% confidence interval). Five years after graduation, the percentage of graduates still worked in a first significant job not requiring higher education qualifications, has been nearly halved. It can be concluded that respondents usually did not work in such first jobs for a longer period, but consider this to be a transitory solution until they find an adequate job that requires higher education qualifications.



Figure 57: Current job five years after graduation – Occupations (universities and polytechnics, 2007 cohort, in %)

Five years after graduation, graduates of *manufacturing and processing, business and administration*, and *veterinary* in comparison with graduates of other fields of study were more often employed in management positions. The category of *professionals* is dominated by doctors and teachers, whereas occupations not requiring higher education (service and sales workers, elementary occupations and agricultural workers) are more frequent among school teachers, pedagogues, veterinarians and those who completed their studies in the field of services and sport studies (Figure 58).



### 8.4 Quality of Graduate Jobs Five Years after Graduation

Previous analysis showed that five years after graduation most graduates of universities and polytechnics in Serbia, Bosnia and Herzegovina, and Montenegro were employed or self-employed in economic activity branches that can be considered as adequate to the level and type of qualifications they possess. There is a significant association between fields of study on the one hand and occupations and economic activity branches on the other hand. This relationship is strongly influenced by the concept of *profession/vocation* that study programmes are based on, and which significantly affects the job search and future careers of graduates.

The association between field of study and type of occupation of graduates five years after graduation does not necessarily mean that all graduate jobs are of good quality. The definition of a good and high quality job is the subject of theoretical and methodological debate in different scientific disciplines (see Green 2006). Most researchers agree that job quality is a multidimensional concept which cannot be measured by only one indicator. More appropriately, different indicators such as wage level, work organisation, work autonomy, job security, skill utilisation, type of contract, possibility to combine work with family obligations, etc. have to be

acknowledged. In the following overview of results related to the current work situation of graduates, the job quality shall be presented with regard to four selected indicators:

- Type of contract and work engagement
- Wage level five years after graduation
- Utilisation of knowledge and skills acquired during studies in current job
- Overall satisfaction with current work situation

#### 8.4.1 Type of Contract and Work Engagement

Generally speaking for all CONGRAD institutions, about two thirds of employed graduates (65.7% ±1.61%, 95% confidence interval) had *permanent contracts* five years after graduation. This type of contract is significantly less frequent in first significant job (45.3% ±1.2%, 95% confidence interval). This difference confirms that five years after graduation the transition phase from studies to concrete professional careers is over for most graduates. Over time the percentages of fixed-term and/or temporary employment decrease. Fixed-term contracts which imply job insecurity and a generally weaker job quality are most frequent among graduates of life sciences (55.5%), humanities (45.6%), and physics and chemistry (43.8%). Differences between types of institution in this respect are statistically significant only between Montenegrin university graduates and other institutions in Serbia and Bosnia and Herzegovina: Among Montenegrin graduates *fixed-term contracts* were more frequent than among graduates from the other two countries. This indicates a lower average quality of graduate employment with regard to the duration of the employment contract. Self-employment and other types of contracts, such as contracts for temporary jobs and services are very rare among the group of graduates who completed their studies five years prior to the survey. Only 2.8% (±0.56%, 95% confidence interval) of graduates are self-employed five years after graduation. These are mostly law graduates who work as lawyers, and graduates from the field of sport studies. Differences between countries, institutions and graduates of different fields of study can be explained in the best possible way when the application of *fixed-term contract* is analysed according certain branches of economic activity. Figure 60 shows that *fixed-term contracts* are most frequent in the education branch. The fact that teachers work as temporary replacements explains the large number of fixed-term contracts among graduates in the fields of humanities and natural sciences since they mostly work as teachers. Fixed-term contracts are also pronounced in the branch of accommodation and food service activities and in public administration, in which Montenegrin university graduates are employed more often than graduates from other countries and types of institution.



2007 cohort, in %)



Figure 60: Current job five years after graduation – Type of contract by branches of economic activities (universities and polytechnics, 2007 cohort, in %)

In the CONGRAD survey graduates were asked to state the duration of their standard weekly working hours according to the contract in their job five years after graduation. In addition, they were asked about the actual amount of time they spend at work weekly on average. A large difference between the contracted working week and the actual work week (in the form of overtime which is either reimbursed or not) is usually understood as an indicator of a job's intensity. Implicitly this difference can also be interpreted as one of the dimensions of job quality, e.g. with respect to the balance between private and professional life at individual level. Five years after graduation four fifths of the graduates of CONGRAD universities and polytechnics (79.9%) had a full-time contract of 40 weekly working hours. Only 9% of graduates had contracts for 20 and less working hours per week, and about 5% of graduates had more than 40 working hours according their contract (4.8%). Figure 61 illustrates the average duration of the contracted working week and the average duration of the actual working week in different economic activity branches in which graduates worked five years after graduation. The shortest average work week according to official contract is reported for the education branch, in which teachers who work in schools often do not teach for the full number of contracted hours. Differences between economic activity branches regarding duration of work week specified in the contract, even though statistically significant ( $F_{20.2761}$ =7.28, p=0.000), account for only 5% of the variation in the answers related to the average contracted work week (eta-squared = 0.05). On the other hand, differences in the actual work week of those employed in different branches of economic activity are greater ( $F_{20.2873}$ =19.2, p=0.000), and the economic activity branch in which respondents work accounts for 11.8% of the variance in answers to the question about the real duration of the work week. In economic activity branches such as real estate activities, education, arts, entertainment and recreation, public administration and defence, and compulsory social security, the average duration of the contracted and actual working week are almost equal. In almost every other economic activity branch the average actual working week is longer than the contracted one. The largest discrepancies can be identified in the field of *accommodation and food service activities* and *construction*, which demonstrates the frequency of overtime work in these branches of economy.



Figure 61: Current job five years after graduation – Working hours by branches of economic activities (universities and polytechnics, 2007 cohort, in %)

#### 8.4.2 Salaries Five Years after Graduation

With regard to the wage level of graduate jobs five years after graduation, an increase in the level of income is noticeable in comparison to the first significant job within the same group of respondents. (The arithmetic mean for salaries of CONGRAD graduates of the 2007 cohort in their first significant job was 423 EUR<sup>49</sup>; the median was 380 EUR.) The average salary of graduates of CONGRAD universities and polytechnics five years after graduation amounts to 589

<sup>&</sup>lt;sup>49</sup> Differences with regard to the chapter on first significant employment are a consequence of different analytical approaches. Here, only the graduates of the 2007 cohort were taken into consideration, whereas in the chapter on first significant job graduates of both cohorts who found a first significant job were included in the analysis.

EUR: the median is 450 EUR. Statistically significant differences in the average salaries between university graduates of different countries do not exist. As expected, the only statistically significant difference is with regard to type of institution, i.e. between university graduates and graduates of polytechnics. When analysing the average *net* salaries according to the university graduates' field of study the differences are considerably larger. These differences are particularly striking when comparing different economic activity branches in which graduates worked five years after graduation. Within these groups there are in certain cases large standard deviations large standard deviations, and substantial differences between arithmetic means and medians, which implies that there are a certain number of respondents with extremely high salaries. Therefore the data in Figure 62 and Figure 63 are ranked according to medians, and not arithmetic means of net salaries. Five years after graduation, the graduates employed in the sectors of electricity, gas, steam and air conditioning supply, information and communication, mining and quarrying, construction, banking and insurance had the highest average net salaries. Engineers, technologists and graduates of business and administration are mostly employed in the aforementioned branches. Graduates who work in education; administrative and support service activities; agriculture, forestry and fishing; and in arts, recreation and entertainment had the lowest level average salaries five years after graduation. These are branches in which mostly teachers, professors, philologists, journalists, artists and veterinarians are employed.



Figure 62: Current job five years after graduation - Net salary in EUR by branches of economic activities (universities and polytechnics, 2007 cohort)



Figure 63: Current job five years after graduation – Net salary in EUR by field of study (universities, 2007 cohort)

#### 8.4.3 Utilisation of Knowledge and Skills Acquired During Studies and Necessary Qualifications

Utilisation of knowledge, abilities and skills in the job is considered as one of the basic indicators of a job's quality, and this dimension of quality is seen as particularly important for the assessment of the quality of jobs performed by those who work as *professionals* or *engineers*. Most graduates of CONGRAD universities and polytechnics who were employed five years after graduation worked in jobs requiring a higher education degree. The share of university graduates who worked in jobs not requiring higher education is rather small (about 5.0%), whereas the share is much higher in the case of polytechnics graduates. One in four respondents of polytechnics reported that their jobs do not require higher education at all. In comparison to university graduates in Serbia and Bosnia and Herzegovina, the situation of Montenegrin university graduates is significantly different. This is due to the fact that in the case of Montenegro first-cycle degrees usually do not provide direct access to the labour market (see Figure 64).



Figure 64: Current job five years after graduation – Required level of educational qualifications by type of institution/country (universities and polytechnics, 2007 cohort, in %)

When analysing the extent to which knowledge and skills acquired during studies were used in the current job (requiring higher education) by graduates who completed their studies five years prior to the survey, it can be concluded that 62.0% of graduates of CONGRAD universities do have the opportunity to use the knowledge and skills they acquired during studies in their jobs to a *high extent* (values 4 and 5 on a 5-point scale).

The ANOVA analysis (ANOVA) ( $F_{19,2937}$ =5.77, p=0.000) shows that among the graduates of different fields of study there are small but statistically significant differences regarding the degree to which graduates were able to use the knowledge and skills they acquired during studies in their jobs. Five years after graduation graduates working in the branches of *education* and *health*, e.g. graduate *physicists, chemists,* and *medical professionals* reported to use their knowledge and skills to the highest extent; followed by graduates of *humanities,* i.e. teachers and pedagogues. Working in jobs that do not require the utilisation of knowledge and skills acquired during studies to full extent was most frequent among graduate *journalists.* 



Figure 65: Current job five years after graduation – Utilisation of knowledge and skills acquired during studies in jobs requiring higher education qualification by field of study (universities, 2007 cohort, in %)

#### 8.4.4 Job Satisfaction

Job satisfaction is usually understood as an aggregate indicator of job quality, and not as a constituent element of quality. In most sources and surveys on the quality of jobs and job conditions (see Green 2006) the dominant perception is that objective job characteristics such as salaries, work organisation, skill utilisation, exposure to risk at work and social environment in the job are combined with personal values and aims of individuals to make the assessment of job satisfaction. This obviously does not mean that each element of job quality affects general job satisfaction equally. Also, each element cannot equally account for the variation in responses to this question. CONGRAD graduates were asked to assess their general job satisfaction five years after graduation on a 10-point Likert scale. In general, graduates who were working or selfemployed five years after graduation are satisfied with their jobs (M=7.25, SD=2.21 for graduates of the 2007 cohort). Differences are not statistically significant with regard to type of institution. However, they are significant with regard to the branch of economic activity they work in. These differences are small, and a small part of the variation in job satisfaction is explained by the activity branch the graduates are working in  $(F_{10,3110}=5.56, p=0.000, eta$ square=0.035). Figure 66 shows the average job satisfaction among university graduates according to different economic activity branches. Graduates who worked in the branches water supply, sewerage, waste management and remediation activities; electricity, gas, steam and air conditioning supply; education; and real estate activities are most satisfied with their current

jobs five years after graduation. Graduates who worked in *wholesale and retail trade* and in *administrative and support service activities* are least satisfied.



activities (universities and polytechnics, 2007 cohort)

## 9 Job Requirements and Acquired Competences

One of the objectives of the CONGRAD graduate survey was to conduct a comparative analysis<sup>50</sup> of the level of competences that the graduates acquired upon graduation and the graduates' assessment of the competence level required in their job at the time of the survey. Competences in this context are defined knowledge, abilities and skills that a person possesses. In the framework of this report the analysis is restricted to *generic competences*. Generic competences, unlike subject specific competences (specific for a certain academic/professional field), are characterised by a higher degree of generalisation and applicability in different work contexts. This implies that generic competences are relevant in the employment context regardless of the type of job that a person performs.

It has to be emphasized that the respondents were asked to assess their competences by themselves in the survey questionnaire. Their actual competence level was not tested or measured. The analysis of the subjective competence assessment respectively does not aim to measure the objective level of competences the respondents possess. The marks awarded by respondents are analysed in a comparative perspective, taking into account differences in the self-assessment of competences between different groups of respondents.

In addition, it should be pointed out that the assessment of the competence level on the one hand largely depends on individual factors such as self-confidence and specific qualities of different persons' sets of values, and on the other hand on the social context, i.e. the reference framework that individuals (unconsciously) apply when performing any kind of evaluation. The authors of this report are aware of the limitations of the chosen methodology and in the analysis of data, and ensured that the respondents' answers were analysed exclusively in a comparative perspective. Most of all, this means that the self-assessment of the difference between the acquired competence level and the level of competences required in a job can be considered to be reliable since it is based on the personal comparison of each person, i.e. the same individual measurement schemes and reference frameworks. The perceived deficit or surplus of certain competences with regard to job requirements represents crucial information that may influence the development of study programme curricula so as to increase the relevance of higher education studies and to prepare future graduates for challenges expected in the workplace in the best possible way.

In the survey, graduates assessed the level of competences they acquired at the time of graduation and the level of competences required in their current job. The respondents assessed the following competences:

- 1. Command of your field of study or discipline
- 2. Knowledge of other fields or disciplines
- 3. Ability of analytical thinking
- 4. Ability to recognise and close own knowledge gaps
- 5. Ability to negotiate
- 6. Ability to adapt to changing conditions
- 7. Ability to take initiative
- 8. Ability to make your meaning clear to others
- 9. Ability to mobilize the capacities of others (leadership)
- 10. Ability to work in team
- 11. Ability to present products, ideas or reports to an audience
- 12. Ability to write reports, memos or documents

<sup>&</sup>lt;sup>50</sup> For the assessment of knowledge, skills and attitudes, relevant items were presented in a 5-point Likert scale from 1 "not at all" (lack of a certain competence) to 5 "to a very high extent" (sufficiency of a certain competence).

- 13. Ability to perform well under pressure
- 14. Ability to organise and plan
- 15. Ability to use time efficiently
- 16. Ability to use computers and the Internet
- 17. Ability to generate new ideas (creativity)
- 18. Willingness to question your own and others' ideas
- 19. Ability to write and speak in foreign language
- 20. Ability to apply theoretical knowledge and skills in practice

### 9.1 Level of Acquired and Required Competences

Figure 67 shows the ranking of competences required in the current job. The five highest rated competences in jobs that require higher education belong to the domain of organisational abilities:

- 1. Ability to use computers and the Internet (M=4.59, n=5627, SD=0.771)
- 2. Ability to use time efficiently (M=4.46, n=5639, SD=0.784)
- 3. Ability to organise and plan (M=4.44, n=5638, SD=0.805)
- 4. Ability to adapt to changing conditions (M=4.38, n=5713, SD=0.804)
- 5. Ability to work in team (M=4.36, n=5639, SD=0.784)



Figure 67: The level of acquired and required generic competences

On the other hand, the least required competences are the *ability to write and speak in foreign language* (M=3.63, n=5605, SD=1.353) and *knowledge of other fields or disciplines* (M=3.63, n=5685, SD=0.989). The average value of all generic competences is above 3.0, which means that these competences were generally assessed as highly required in current jobs. Among the jobs not requiring higher education, the most common competence is the *ability to perform well under pressure* (M=4.04, n=584, SD=1.204), which demonstrates a relatively low quality of such jobs.

In the case of CONGRAD graduates who work in jobs requiring higher education it can be concluded that the perceived competence level the graduates obtained upon graduation is generally lower than the competence level required in their current job. This deficit also applies for professional knowledge and all generic skills. The largest absolute gap between the level of acquired competences and the level of required competences was reported for the *ability to apply theoretical knowledge in practice* (1.17 difference) and the *ability to write reports, memos or documents* (0.98 difference).

#### 9.2 Job Requirements in Different Economic Activity Branches

When analysing the required competences in jobs that require higher education degrees that graduates had at the time of the survey<sup>51</sup>, differences can be observed with regard to the economic activity branches in which the respondents worked. There are statistically significant differences between different economic activity branches for all competences assessed by respondents, but in most cases these are small differences that account for the low percentage of common variance in answers (eta-squared). Economic activities mostly differ with regard to work requirements in the domain of ability to present products, ideas or reports to an audience and command of study field (Table 14).

	F	Eta	Eta-square
Command of your study field or discipline*	26,345	0,297	8,8%
Knowledge of other fields or disciplines*	1,949	0,085	0,7%
Ability of analytical thinking*	6,084	0,149	2,2%
Ability to recognize and close own knowledge gaps*	3,422	0,113	1,3%
Ability to negotiate*	5,374	0,14	2,0%
Ability to adapt to changing conditions	1,884	0,083	0,7%
Ability to take initiative*	3,352	0,111	1,2%
Ability to make your meaning clear to others*	2,446	0,095	0,9%
Ability to mobilize the capacities of others (leadership)*	6,168	0,15	2,3%
Ability to work in team*	4,516	0,128	1,6%
Ability to present products, ideas or reports to an audience*	26,914	0,303	9,2%
Ability to write reports, memos or documents*	7,558	0,166	2,8%
Ability to perform well under pressure*	10,235	0,193	3,7%
Ability to organize and plan*	5,763	0,146	2,1%
Ability to use time efficiently*	3,744	0,118	1,4%
Ability to use computers and internet*	15,958	0,238	5,7%
Ability to generate new ideas (creativity)*	14,269	0,226	5,1%
Willingness to question your own and others' ideas*	6,408	0,154	2,4%
Ability to write and speak in foreign language*	13,877	0,223	5,0%
Ability to apply theoretical knowledge in practice*	10,329	0,193	3,7%

#### Table 14: Variance in the level of required generic competences by economic activity branches

A more detailed analysis of the level of requirement related to different generic competences in different branches of economy provides insight into the average level of required competences in different economic activity branches. Table 15 shows economic branches in which the average level of requirements for certain competences differs for at least one standard deviation in both directions from the total average for all activity branches (see shaded cells in the table). A particularly high level of professional knowledge is expected from graduates employed in agriculture, forestry and fishing, community activities, scientific research, education and health. Employees in the fields of administration, trade and arts, entertainment and recreation are facing requirements for professional knowledge that are below average.

<sup>&</sup>lt;sup>51</sup>Only the jobs that, according to respondents, require higher education were included in the analysis.
Requirements for generic competences in the field of *accommodation and food service activities* and in *real estate activities* are generally above the average requirements with regard to same generic competences. Job requirements in terms of generic knowledge, abilities and skills are generally lower among employees with higher education in *public administration* and *administrative and support service activities* with regard to the requirements in other activity branches. Among required competences in which the differences between branches are most pronounced, such as the *ability to present products, ideas or reports to an audience,* the highest level of demand can be noted among the employees in the sector of *education* and the sector of *arts, entertainment and recreation.* This ability is required below the average level among graduates employed in the sector of *human health and social work activities* and *administrative and support service activities*.

#### Table 15: Competence requirements by economic activity branches

ni əgbəlwoni lisitərərəti alı knowledge in prəctice	4,338	3,977	4,212	4,110	4,163	4,204	3,847	4,043	4,196	4,092	4,169	4,182	4,349	3,836	4,054	4,456	4,413	4,160	4,142	4,155	0,161	4,316	3,994
ngierot ni kesqt bns etinv ot ytilidA egeugnel	3, 323	3, 225	3,862	3,619	3,245	3,546	3,755	3,649	4, 326	3,971	3, 766	4,182	4,089	3, 333	3,322	3,442	3,085	3,575	3, 761	3, 636	0,337	3,972	3,299
bns nwo vour ondraso to question your own and others' ideas	4,076	4,073	4,244	4,123	4,122	4,125	4,056	4,221	4,333	4,221	4,034	4, 455	4,298	3,800	3,964	4,328	3,997	4,163	4,232	4,151	0,149	4,300	4,002
(yivitesıs) zesbi wən ətsıənəg ot yilidA	4,098	4,073	4,243	4,059	4,082	4,074	4,075	4,183	4,489	4,294	4,062	4,455	4,340	3,814	3,961	4,496	3,869	4,350	4,324	4,176	0,195	4,370	3,981
təmətni brıs zrətuqmos əzu ot ytilidA	4,353	4,442	4,645	4,744	4,633	4,739	4,657	4, 711	4,444	4,821	4,765	4,545	4,753	4,610	4,693	4,400	4,281	4,275	4,580	4,584	0, 166	4,750	4,418
ylinde efficienty to use of the efficienty	4,394	4,395	4,498	4, 359	4, 367	4,480	4,517	4,500	4,705	4,371	4,563	4,818	4,426	4,312	4, 317	4,557	4,402	4, 370	4,546	4,468	0,128	4,596	4,340
nelq bne əsineşıo ot yrilidA	4, 378	4, 381	4,568	4,314	4,449	4,478	4,552	4,578	4,644	4,249	4, 509	4,818	4, 378	4, 331	4,348	4, 551	4, 314	4,395	4, 534	4,462	0,136	4,598	4,325
əruzsərq nəbnu lləw mrotroq ot yşilidA	4,265	4,386	4,519	4,305	4,043	4,520	4,456	4,522	4,545	4,381	4,534	4, 727	4,345	4,202	4,339	4,021	4,393	4,305	4,380	4,378	0,168	4,547	4,210
Ability to write reports, memos or documents	4,059	4,209	4,236	4,174	4,347	4,091	4,216	4,345	4,178	3,874	4,371	4,182	4,214	4,301	4,548	4,115	4,035	3,728	4,126	4,176	0,177	4,353	3,999
Ability to present products, ideas or reports to an audience	3,644	3,523	3,610	3,455	3,592	3,386	3,642	3,535	3,761	3,561	3,621	3,909	3,774	3,264	3,532	4,409	3,390	4,075	3,805	3,657	0,257	3,914	3,400
msət ni Yrow ot yilidA	4,383	4,304	4,458	4,447	4,571	4,542	4,278	4,478	4,583	4, 461	4,326	4,091	4,354	4,128	4,281	4,249	4,521	4,259	4,367	4,373	0, 137	4,510	4,235
shiity to asitize the capacities of others (leadership)	3, 962	3, 857	4, 210	3,843	3, 830	4, 032	3, 936	4,090	4, 298	3,705	3, 738	4,182	3, 625	3,560	3,669	3,887	3, 874	3, 925	4, 028	3, 908	0,196	4, 104	3, 712
zrərdro of neələ gninsəm ruoy əxem of yfilidA	4,311	4,302	4,373	4,291	4,204	4,282	4,347	4,369	4,468	4,251	4,333	4,636	4,305	4,070	4,287	4,429	4,316	4,215	4,380	4,325	0,112	4,437	4,213
əvüsitini ələt ot yilidA	4,279	4,273	4,370	4,170	4,140	4,240	4,288	4,357	4,565	4,235	4,261	4,545	4,170	3,988	4,012	4,281	4,209	4,259	4,411	4,266	0,143	4,409	4,123
znoifibnos gnigneds of fqebe of yfilidA	4,364	4,429	4,450	4,303	4,280	4,400	4,438	4,495	4,596	4,383	4,377	4,636	4,355	4,221	4,258	4,364	4,449	4,259	4,456	4,395	0,106	4,502	4,289
stsifogan of yfilidA	4,015	4,000	4,136	3,955	4,000	4,014	4,346	4,180	4,511	3,888	4,155	4,727	3,809	3,983	3,964	4,031	4,047	4,099	4,344	4,116	0,219	4,335	3,897
nwo szolz bns színgozsi vy yilidA knowledge gaps	4, 038	4, 048	4, 104	4, 070	4,060	4, 139	4, 035	4,000	4, 106	4, 174	4, 093	4,364	4, 261	3, 840	3, 943	4,174	4, 194	4, 025	3, 967	4,086	0,115	4, 201	3, 971
gnixnirts lesisylene to ysilidA	3,954	4,071	4,303	4,174	4,080	4,116	4,114	4,083	4,044	4,358	4,321	4,636	4,373	3,829	4,129	4,209	4,140	3,988	4,028	4,155	0,177	4,333	3,978
sənilqissib ıo tlielf or disciplines	3,656	3,690	3,716	3,519	3,549	3,572	3,567	3,682	3,682	3,572	3,548	4,091	3,647	3,564	3,557	3,719	3,466	3,595	3,673	3,635	0,128	3,763	3,507
Sommand of your study field or discipline	4,269	3,848	3,904	4,094	4,314	4,156	3,392	3,888	3,915	3,938	3,951	3,818	4,272	3,500	3,912	4,489	4,429	3,671	3,812	3,977	0,286	4,263	3,691
	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Ele ctricity, gas, steam and air conditi oning supply	Wate r supply; sewerage; waste managment and reme diation activities	Construction	Wholesale and retail trade; repair of motor vehicles and motoroydes	Transporting and storage	Accommodation and food service activities	Information and communication	Financial and insurance activities	Real e state activities	Professional, scientific and te chnical activities	Administrative and support service activities	Public administration and defence; compulsory social security	Education	Human health and social work activities	Arts, entertainment and recreation	Other services activities	Ave rage for all branches (M)	Std. Deviation	M+STDDEV	M-STDDEV

### 9.3 Competence Gap

Figure 68 and Table 14 illustrate the assessment of the level of acquired competences at the time of graduation and the evaluation of the level of competences required in the graduates' jobs at the time of the survey. Still, for a more detailed understanding of competences on both levels, an analytical variable has been created which uses a scale to compare competences acquired upon graduation and the competences required in the current job. Theoretical values on such a scale measuring the competence gap are denoted as integers in a continuous series from -4 to 4. The scale demonstrates the assessment of the degree of congruence between competences required in the job and the competences acquired during studies on a scale from -4 (extreme average lack of competences) to 4 (extreme average competence surplus). The value 0 represents the ideal average congruence between the acquired competences and competences required in the job. Values between -1 and 0 (or 0 and 1) represent a relatively *small* average deficit (or surplus) of competences. Values between -1 and -1.99 (or 0 and 1.99) represent a *moderate* average deficit (or surplus) of competences, whereas the values between -2 and -2.99 (or 2 and 2.99) and the values between -3 and -4 (or 3 and 4) represent a *high* and *extremely high* deficit (or surplus) of competences.

Consequently, respondents with negative values on this analytic scale believe that during studies they acquired a level of competences, which is lower than the required competence level in their current job. On the other hand, cases with positive values believe that higher education enabled them to acquire a level of competences higher than expected in their job.

As illustrated in Figure 68, slightly more than a third of graduates (34.3%) consider the levels of competences acquired during studies and required in a job to be corresponding. On average, slightly more than a half of the graduates included in the CONGRAD survey report some kind of competence deficit, with the majority (around 30%) reporting a *small* or *high* or *extremely high deficit* of competences in one of the surveyed fields (*high* competence deficit is reported by 8% of graduates, whereas 2.3% of respondents on average assess that they have an *extremely high deficit* of all competences combined).



Figure 68: Competence gap with regard to job requirements

The highest deficits can be observed for the following competences (values -3 and -4 combined): (1) *ability to apply theoretical knowledge in practice*; (2) *ability to write reports, memos or documents*; 3) *ability to write and speak in foreign language*. A surplus of competences with regard to job requirements is rare. Competences with the highest surplus with regard to job requirements (values 3 and 4 combined) are (1) *ability to present products, ideas and reports to an audience,* and (2) *ability to write and speak in foreign language*. It is interesting to note that the *ability to write and speak in a foreign language* is extremely polarised and appears as a competence with both the highest surplus and the highest deficit with regard to other competences.

For the purpose of improving study programmes' curricula in certain fields of study it is useful to explore which competences the graduates who work in jobs that require higher education consider to be lacking.

Table 16 shows the average values regarding the gap between the competences acquired during studies and competences required in the current job. In accordance with the previously described scale, values smaller than -1 demonstrate a moderate average lack of certain competences and the value of 0 represents the ideal average congruence between competences in the two aforementioned levels. Values between -1 and 0 represent a relatively small average lack of competences. The overview includes graduates of both cohorts who are employed at the time of the survey.

As for the *command of study field or discipline*, unlike most graduates who have a relatively small average competence gap, graduate lawyers assess that they have an moderate deficit of competences. In terms of *knowledge of other fields or disciplines*, a moderate deficit is present among the employed graduates of *journalism and information* and *agriculture*, *forestry and fishery*. With competences such as the *ability of analytical thinking*, *leadership*, *creativity and learning ability, ability to recognize and close own gaps in knowledge*, and *ability to negotiate*, only a small lack of competences was noted in all graduate groups. A moderate deficit of competences to take initiative is present among employed journalists, biologists and ecologists. Graduates in the field of life sciences express a moderate lack of *ability to work in team* with regard to their jobs.

#### Table 16: Average deficit of competences among graduates of different fields of study at universities

	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
ni sgbslwonal koretical knowledge in Practice	-1,252	-1,592	-0,982	-1,034	-0,867	-0,925	-0,830	-1,018	-1,150	-1,000	-0,974	-0,623	-1,323	-1,692	-1,234	-1,241	-0,672	-1,415	-1,094
ngiərot ni Asəqz bns ətrw ot ytilidA Əşsugnəl	-0,934	-1,200	-0,666	-0,450	-0,310	-0,271	-0,723	-0,737	-0,385	-1,117	-0,500	-0,444	-0,975	-0,554	-1,138	-0,940	0,016	-0,520	-0,645
bns nwo your own and others' ideas	-0,624	-0,960	-0,481	-0,371	-0,553	-0,506	-0,484	-0,386	-0,584	-0,922	-0,628	-0,527	-0,834	-0,864	-0,852	-0,657	-0,220	-0,725	-0,576
(yźiviżses) zesbi wen szenesz (creativity)	-0,686	-1,039	-0,568	-0,578	-0,690	-0,834	-0,603	-0,554	-0,698	-1,247	-0,893	-0,655	-1,108	-1,067	-0,986	-0,782	-0,532	-0,692	-0,737
temetri bne stetuqmos esu ot yfilidA	-0,911	-1,027	-0,691	-0,781	-0,522	-0,818	-0,385	-0,375	-0,843	-1,303	-0,834	-0,370	-1,190	-1,341	-0,877	-0,624	-0,271	-0,769	-0,768
yltnsizifte efficiently	-0,784	-0,961	-0,753	-0,763	-0,685	-0,910	-0,783	-0,947	-0,884	-1,231	-0,911	-0,870	-0,952	-1,129	-0,964	-0,875	-0,770	-0,843	-0,850
nsiq bns əsinsşıo ot yilidA	-0,768	-1,107	-0,662	-0,786	-0,708	-0,876	-0,674	-0,857	-0,761	-1,197	-0,911	-0,836	-1,073	-1,146	-1,007	-0,763	-0,733	-1,170	-0,813
ənızsərq nəbru lləw mrotnəq ot yilidA	-0,719	-0,882	-0,793	-0,786	-0,500	-0,538	-0,527	-0,719	-0,893	-1,211	-0,698	-0,673	-0,976	-1,268	-1,085	-0,682	-0,355	-0,808	-0,761
Ability to write reports, memos or documents	-1,128	-1,640	-0,883	-1,005	-0,929	-0,549	-0,694	-1,333	-1,216	-1,218	-0,820	-0,527	-1,415	-2,030	-1,142	-0,989	-0,131	-1,373	-1,002
Ability to present products, ideas or reports to an audience	-0,437	-1,066	-0,287	-0,363	-0,705	-0,708	-0,575	-1,250	-0,619	-0,842	-0,743	-0,455	-1,095	-0,953	-0,885	-0,671	-0,311	-0,451	-0,585
mest ni khow ot ytilidA	-0,583	-1,147	-0,486	-0,620	-0,470	-0,733	-0,608	-0,737	-0,850	-0,925	-0,718	-0,483	-0,760	-0,968	-0,671	-0,678	-0,323	-0,692	-0,660
zahte the capacities of others (leadership)	-0,794	-0,908	-0,424	-0,568	-0,570	-0,755	-0,625	-0,684	-0,725	-0,802	-0,771	-0,632	-0,891	-0,592	-0,809	-0,702	-0,222	-0,588	-0,644
zıərtro ot neələ gninsəm vuoy əxlem ot ytilidA	-0,689	-1,053	-0,596	-0,610	-0,574	-0,593	-0,750	-0,707	-0,716	-0,775	-0,724	-0,596	-0,782	-0,833	-0,807	-0,719	-0,177	-0,596	-0,679
evitsitini exist ot ytilidA	-0,739	-1,025	-0,594	-0,668	-0,513	-0,682	-0,628	-0,596	-0,768	-1,136	-0,701	-0,607	-0,802	-0,771	-0,879	-0,723	-0,475	-0,577	-0,694
snoitibnos gnignerb of tqebe of yilidA	-0,686	-0,805	-0,605	-0,664	-0,500	-0,716	-0,522	-0,603	-0,811	-0,864	-0,703	-0,603	-0,714	-0,802	-0,681	-0,633	-0,476	-0,577	-0,663
ətsitogən ot ytilidA	-0,983	-0,975	-0,729	-0,779	-0,538	-0,738	-0,724	-0,845	-0,788	-0,963	-0,741	-0,586	-0,958	-0,981	-0,900	-0,844	-0,563	-0,979	-0,802
nwo əsolə bns əsningası və trildA knowledge gaps	-0,413	-0,577	-0,343	-0,343	-0,250	-0,290	-0,383	-0,140	-0,522	-0,550	-0,519	-0,333	-0,612	-0,606	-0,321	-0,354	-0,238	-0,360	-0,397
gnishrich lesitylene to yrilidA	-0,615	-0,907	-0,656	-0,585	-0,457	-0,548	-0,566	-0,431	-0,703	-0,838	-0,692	-0,534	-0,849	-0,970	-0,600	-0,500	-0,371	-0,765	-0,631
Knowledge of other fields or disciplines	-0,907	-0,962	-0,672	-0,684	-0,667	-0,861	-0,524	-0,603	-0,877	-1,038	-0,762	-0,397	-1,080	-0,974	-0,801	-0,798	-0,238	-0,692	-0,758
Command of your study field or discipline	-0,539	-0,338	-0,320	-0,240	-0,466	-0,318	-0,609	-0,431	-0,713	-0,388	-0,570	-0,339	-0,667	-1,031	-0,361	-0,341	-0,338	-0,788	-0,459
			u,	.uce							tion science		shery						
	Architecture and building	ife sciences	Susiness and administratio	ocial and behavioural sciever	hysical sciences	Humanities	Computing	Mathematics	Health	ournalism and information	feacher training and educa.	Other	Agriculture, forestry and fis	aw	Manufacturing	ingineering	Arts	/eterinary	fotal for all disciplines

A moderate lack of the *ability to present products, ideas or reports to an audience* is present among graduate biologists, mathematicians and graduates of the field of agriculture, forestry and fishery. The moderate deficit of the *ability to write reports, memos or documents* is present in almost all groups of graduates, and graduates employed as lawyers even perceived a very high average deficit of competences in this field. A moderate deficit in the *ability to perform well under pressure* is perceived by employed journalists, lawyers and engineers, including those employed in the field of manufacturing and processing. Regarding the *ability to organise and plan, efficiently manage time, use computers and the Internet* and *creativity*, a moderate deficit of competences is present among graduates in the fields of journalism and information, law, life sciences and in the field of agriculture, forestry and fisheries. The moderate average deficit of the *ability to write and speak in foreign language* was perceived among graduate journalists, biologists and ecologists and those working in manufacturing and processing. A moderate deficit of the *ability to apply theoretical knowledge in practice* was perceived in almost all groups of graduates in the fields of *education, arts, humanities, business and administration, physical sciences* and *computing*.

If the answers of respondents who graduated according to the old system of studies are compared with answers of graduates who completed their studies according to the Bologna system of studies, relatively small improvements of the study programme reforms can be perceived. These improvements relate to the decrease of the lack of competences between the acquired competences during studies and required competences in the current job. Figure 69 shows the differences between graduates who studied according to the old and the Bologna system of studies. For all 20 competences taken into consideration, employed graduates who work in jobs requiring higher education and who studied according to the new Bologna system of studies report smaller average perceived competence gaps in comparison with graduates who completed their studies according to the old system of studies. Based on the t-test (p < 0.05) statistically significant decreases of the average deficit of competences (marked with an asterisk in Figure 69) can be noted for all listed competences. On the other hand, the strength of the effect is different between the two systems of studies (eta-value from 0.085 to 0.222). In general, the perceived competence gap on average is rather small and medium strong with regard to only few competences. At the same time, the largest effect is observed for the ability to use computers and the internet, where the variance accounted for by different systems of studies amount to 4.9%. When comparing the two systems of studies, the highest decrease of the average competence deficit is observed for the ability to use computers and the internet and for the *ability to present products, ideas or reports to an audience*. In different institutions, the decrease of deficit in certain types of generic competences in case of some abilities is not statistically significant, which shows the varying character of the study programme reform that took place in the region<sup>52</sup>. Variations between types of institution are too high to allow for general conclusions on the general success of study programme reform in the spirit of the Bologna Process. Also, the strength of the system of studies effect on the average perceived deficit of generic competences varies. Therefore, it is necessary to further analyse these findings at the institutional level with regard to particular universities and study programmes.

<sup>&</sup>lt;sup>52</sup>More detailed demonstration is part of the institutional reports within the CONGRAD project





## **10 Instead of a Conclusion**

The previous chapters presented the key findings of the CONGRAD survey which examined the initial phases of graduate career development, as well as their transition from studies to employment and their early professional careers. The report provides an overview for the broader public interested in higher education in the Western Balkans and serves as incentive for further development of HEIs in the region.

In a nutshell, the results of the CONGRAD survey confirm the existence of a strong professional focus within higher education in Serbia, Bosnia and Herzegovina and Montenegro. In the tradition of higher education in continental Europe that the countries included in the CONGRAD survey belong to, expectations from higher education are not only focused on the personal development of individuals, but also on the need to train them for a certain profession or to at least provide a broad spectrum of professionally applicable knowledge, abilities and skills. The professional orientation of higher education cannot be considered wrong in itself, since it definitely contributes to the quality of the professional labour force and the development of the society and the economy. Still, problems may be caused when transitional struggles in the society and the economy do not provide young highly educated professionals with the opportunitie to find adequate professional employment and work. Therefore, it comes as no surprise that the results demonstrate on the one hand a generally difficult employment situation of graduates in the countries included in the survey, and on the other hand a vast utilisation of the acquired knowledge, abilities and skills among graduates who succeded in becoming employed or self-employed. Higher education institutions and the quality of their study programmes therefore can only partially be held accountable for the problem of (un)employment and employability, particularly in the context of underdeveloped economies in the participating countries and in the context of the financial and economic crisis present during the time of the survey. Nevertheless, this should not discourage HEIs from continuing to work on the improvement of the professional relevance of their study programmes most of all through the development of internship and placement programmes, by introducing practically applicable contents in teaching, by enabling working and studying in parallel, etc. Graduate surveys prove to be a valuable instrument for providing an evaluation review of the success of reforms within study programmes, faculties or universities. As confirmed by the CONGRAD survey reforms aiming at the introduction of the Bologna system of studies resulted in certain improvements. Having in mind the specificities, dynamics and the focus of reforms implemented locally in certain faculties and polytechnics, it is in this specific context that the CONGRAD survey and the obtained data can achieve their true evaluation, interpretation and implementation potential.

This report is to be understood as the beginning of systemic research of the relation between higher education and the world of work in Serbia, Bosnia and Herzegovina, and Montenegro, which provides an insight into the situation at the time of the survey, but without the opportunity to follow long-term trends. The report aims at introducing this topic to the professional and scientific community in the region and hopes to motivate HEIs in the region to conduct similar graduate surveys in the future. Finally it should be stressed that decision making processes on reforms of study programmes and higher education policies are considered to be more responsible and more successful in the long run if they are based on empirical research, and not on anecdotal evidence and preconceptions of individuals.

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## **12 Abbreviations**

- HEI Higher education institution
- ISCO International Standard Classification of Occupations
- ISCED International Standard Classification of Education

## **13** Annex 1: Classification of Occupations

Classification of occupations based on the International Standard Classification of Occupations – ISCO-08

#### 1 MANAGERS (EXECUTIVES), SENIOR OFFICIALS AND LEGISLATORS

- 11 Chief executives, senior officials and members of executive and legislative bodies
  - 111 Executive and legislative officers
  - 112 Managing directors and chief executives
- 12 Administrative and commercial managers
  - 121 Business services and administration managers
  - 122 Sales, marketing and development managers
- 13 Production and specialized services managers
  - 131 Production managers in agriculture, forestry and fisheries
  - 132 Manufacturing, mining, construction and distribution managers
  - 133 Information and communications technology service managers
- 14 Hospitality, retail and other services managers
  - 141 Hotel and restaurant managers
  - 142 Retail and wholesale trade managers
  - 143 Other services managers

#### 2 PROFESSIONALS AND ARTISTS

- 21 Science and engineering professionals
  - 211 Physical and earth science professionals
  - 212 Mathematicians, actuaries and statisticians
  - 213 Life science professionals
  - 214 Engineering professionals (excluding electrotechnology)
  - 215 Electrotechnology engineers
  - 216 Architects, planners, surveyors and designers
- 22 Health professionals
  - 221 Medical doctors
  - 222 Nursing and midwifery professionals
  - 223 Traditional and complementary medicine professionals
  - 225 Veterinarians
  - 226 Other health professionals
- 23 Teaching professionals
  - 231 University and higher education teachers
  - 232 Applied studies and vocational education teachers
  - 233 General secondary education and arts teachers
  - 234 Primary school and early childhood teachers
  - 235 Other teaching professionals

- 24 Business and administration professionals
  - 241 Finance professionals
  - 242 Administration professionals
  - 243 Sales, marketing and public relations professionals
- 25 Information and communications technology professionals
  - 251 Software and applications developers and analysts
  - 252 Database and network professionals
- 26 Legal, social and cultural professionals
  - 261 Legal professionals
  - 262 Librarians, activists and curators
  - 263 Social and religious professionals
  - 264 Authors, journalists and linguists
  - 265 Creative and performing artists

#### 3 ENGINEERS, ASSOCIATE PROFESSIONALS AND TECHNICIANS

- 31 Science and engineering associate professionals
  - 311 Physics, chemistry and engineering science technicians and associate professionals
  - 312 Mining, manufacturing and construction supervisors
  - 313 Process control technicians and operators
  - 314 Life science technicians and related associate professionals (except for medical professionals)
  - 315 Ship and aircraft controllers and technicians
- 32 Nurses and health associate professionals
  - 321 Medical and pharmaceutical technicians
  - 322 Nursing and midwifery associate professionals
  - 323 Traditional and complementary medicine associate professionals
  - 324 Veterinary technicians and assistants
  - 325 Other health associate professionals
- 33 Business and administration associate professionals
  - 331 Financial and mathematical associate professionals
  - 332 Sales and purchasing agents and brokers
  - 333 Business services agents
  - 334 Administrative and specialized secretaries
  - 335 Customs, tax and regulatory government associate professionals
- 34 Legal, social, cultural and related associate professionals
  - 341 Legal, social and religious associate professionals
  - 342 Sports and fitness workers
  - 343 Artistic, cultural and culinary associate professionals
- 35 Information and communications technology technicians and associate professionals
  - 351 Information and communications technology operations and user support technicians
  - 352 Telecommunications and broadcasting technicians

#### 4 CLERICAL SUPPORT WORKERS

- 41 General and keyboard clerks
  - 411 General office clerks
  - 412 Secretaries (general)
  - 413 Keyboard operators
- 42 Customer services clerks
  - 421 Tellers, money collectors and related clerks
  - 422 Client information workers
- 43 Numerical and material recording clerks
  - 431 Bookkeeping, financial, statistical and numerical clerks
  - 432 Production, storage and transport clerks
  - Other clerical support workers

#### 5 SERVICE AND SALES WORKERS

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- 51 Personal service workers
  - 512 Cooks
  - 511 Travel attendants, conductors, stewards and guides
  - 513 Waiters and bartenders
  - 514 Hairdressers, beauticians and related workers
  - 515 Building and housekeeping supervisors
  - 516 Other personal services workers
- 52 Sales workers
  - 521 Street and market salespersons
  - 522 Shop salespersons
  - 523 Cashiers and ticket clerks
  - 524 Other sales workers
- 53 Personal care workers
  - 531 Child care workers and teachers' aides
  - 532 Personal care workers in health services
- 54 Protective services workers
  - 541 Protective services workers

#### 6 SKILLED AGRICULTURAL, FORESTRY AND FISHERY WORKERS

- 61 Market-oriented skilled agricultural workers
  - 611 Market gardeners and crop growers
  - 612 Market animal producers
  - 613 Mixed crop and animal producers
- 62 Market-oriented skilled forestry, fishery and hunting workers
  - 621 Forestry and related workers
  - 622 Fishery workers, hunters and trappers
- 63 Subsistence farmers, fishers, hunters and gatherers

- 631 Subsistence crop farmers
- 632 Subsistence livestock farmers
- 633 Subsistence mixed crop and livestock farmers
- 634 Subsistence fishers, hunters, trappers and gatherers

#### 7 CRAFT AND RELATED TRADES WORKERS

- 71 Building and related trades workers, excluding electricians
  - 711 Building frame and related trades workers
  - 712 Building finishers and related trades workers
  - 713 Painters, building structure cleaners and related trades workers
- 72 Metal, machinery and related trades workers
  - 721 Sheet and structural metal workers, moulders and welders, and related workers
  - 722 Blacksmiths, toolmakers and related trades workers
  - 723 Machinery mechanics and repairers
  - Handicraft and printing workers
    - 731 Handicraft workers

73

- 732 Printing trades workers
- 74 Electrical and electronic trades workers
  - 741 Electrical equipment installers and repairers
  - 742 Electronics and telecommunications installers and repairers
- 75 Food processing, wood working, garment and other craft and related trades workers
  - 751 Food processing and related trades workers
  - 752 Wood treaters, cabinet-makers and related trades workers
  - 753 Garment and related trades workers
  - 754 Other craft and related workers

#### 8 PLANT AND MACHINE OPERATORS AND ASSEMBLERS

- 81 Stationary plant and machine operators
  - 811 Mining and mineral processing plant operators
  - 812 Metal processing and finishing plant operators
  - 813 Chemical and photographic products plant and machine operators
  - 814 Rubber, plastic and paper products machine operators
  - 815 Textile, fur and leather products machine operators
  - 816 Food and related products machine operators
  - 817 Wood processing and papermaking plant operators
  - 818 Other stationary plant and machine operators
- 82 Assemblers
  - 821 Assemblers
- 83 Drivers and mobile plant operators
  - 831 Locomotive engine drivers and related workers
  - 832 Car, van and motorcycle drivers

- 833 Heavy truck and bus drivers
- 834 Mobile plant operators
- 835 Ships' deck crews and related workers

#### 9 ELEMENTARY OCCUPATIONS

- 91 Cleaners and helpers
  - 911 Domestic, hotel and office cleaners and helpers
  - 912 Vehicle, window, laundry and other hand cleaning workers
- 92 Agricultural, forestry and fishery labourers
  - 921 Agricultural, forestry and fishery labourers
- 93 Labourers in mining, construction, manufacturing and transport
  - 931 Mining and construction labourers
  - 932 Manufacturing labourers
  - 933 Transport and storage labourers
- 94 Food preparation assistants
  - 941 Food preparation assistants
- 95 Street and related sales and service workers
  - 951 Street and related sales and service workers
  - 952 Street vendors (excluding food)
- 96 Refuse workers and other elementary workers
  - 961 Refuse workers
  - 962 Other elementary workers
- 99 Occupations that cannot be sorted
  - 999 Occupations that cannot be sorted

#### 0 ARMED FORCES OCCUPATIONS

- 01 Commissioned armed forces officers
  - 011 Commissioned armed forces officers
- 02 Non-commissioned armed forces officers
  - 021 Non-commissioned armed forces officers
- 03 Armed forces occupations, other ranks
  - 031 Armed forces occupations, other ranks

## 14 Annex 2: Classification of Economic Activities

Classification of economic activities based on NACE Rev. 2

#### 1 AGRICULTURE, FORESTRY AND FISHING

- 01 Crop and animal production, hunting and related service activities
- 02 Forestry and logging
- 03 Fishing and aquaculture

#### 2 MINING

- 05 Mining of coal
- 06 Extraction of crude petroleum and natural gas
- 07 Mining of metal ores
- 08 Other mining
- 09 Mining support service activities

#### 3 MANUFACTURING

- 10 Manufacture of food products
- 11 Manufacture of beverages
- 12 Manufacture of tobacco products
- 13 Manufacture of textiles
- 14 Manufacture of wearing apparel
- 15 Manufacture of leather and related products
- 16 Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- 17 Manufacture of paper and paper products
- 18 Printing and reproduction of recorded media
- 19 Manufacture of coke and refined petroleum products
- 20 Manufacture of chemicals and chemical products
- 21 Manufacture of basic pharmaceutical products and pharmaceutical preparations
- 22 Manufacture of rubber and plastic products
- 23 Manufacture of other non-metallic mineral products
- 24 Manufacture of basic materials
- 25 Manufacture of fabricated metal products, except machinery and equipment
- 26 Manufacture of computer, electronic and optical products
- 27 Manufacture of electrical equipment
- 28 Manufacture of machinery and equipment n.e.c.
- 29 Manufacture of motor vehicles, trailers and semi-trailers
- 30 Manufacture of other transport equipment
- 31 Manufacture of furniture
- 32 Other manufacturing

33 Repair and installation of machinery and equipment

#### 4 ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY

35 Electricity, gas, steam and air conditioning supply

#### 5 WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES

- 36 Water collection, treatment and supply
- 37 Sewerage
- 38 Waste collection, treatment and disposal activities; materials recovery
- 39 Remediation activities and other waste management services

#### 6 CONSTRUCTION

- 41 Construction of buildings
- 42 Civil engineering
- 43 Specialised construction activities

#### 7 WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES

- 45 Wholesale and retail trade and repair of motor vehicles and motorcycles
- 46 Wholesale trade, except of motor vehicles and motorcycles
- 47 Retail trade, except of motor vehicles and motorcycles

#### 8 TRANSPORTATION AND STORAGE

- 49 Land transport and transport via pipelines
- 50 Water transport
- 51 Air transport
- 52 Warehousing and support activities for transportation
- 53 Postal and courier activities

#### 9 ACCOMMODATION AND FOOD SERVICE ACTIVITIES

- 55 Accommodation
- 56 Food and beverage service activities

#### 10 INFORMATION AND COMMUNICATION

- 58 Publishing activities
- 59 Motion picture, video and television programme production, sound recording and music publishing activities
- 60 Programming and broadcasting activities
- 61 Telecommunications
- 62 Computer programming, consultancy and related activities
- 63 Information and service activities

#### 11 FINANCIAL AND INSURANCE ACTIVITIES

- 64 Financial service activities, except insurance and pension funding
- 65 Insurance, reinsurance and pension funding, except compulsory social security
- 66 Activities auxiliary to financial services and insurance activities

#### 12 REAL ESTATE ACTIVITIES

- 68 Real estate activities
- 13 PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES

- 69 Legal and accounting activities
- 70 Activities of head offices; management consultancy activities
- 71 Architectural and engineering activities; technical testing and analysis
- 72 Scientific research and development
- 73 Advertising and market research
- 74 Other professional, scientific and technical activities
- 75 Veterinary activities

#### 14 ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES

- 77 Rental and leasing activities
- 78 Employment activities
- 79 Travel agency, tour operator and other reservation services and related activities
- 80 Security and investigation activities
- 81 Services to buildings and landscape activities
- 82 Office administrative, office support and other business support activities

#### 15 PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY

84 Public administration and defence; compulsory social security

#### 16 EDUCATION

85 Education

#### 17 HUMAN HEALTH AND SOCIAL WORK ACTIVITIES

- 86 Human health activities
- 87 Residential care activities
- 88 Social work activities without accommodation

#### 18 ARTS, ENTERTAINMENT AND RECREATION

- 90 Creative, arts and entertainment activities
- 91 Libraries, archives, museums and other cultural activities
- 92 Gambling and betting activities
- 93 Sports activities and amusement and recreation activities

#### 19 OTHER SERVICE ACTIVITIES

- 94 Activities of membership organisations
- 95 Repair of computers and personal and household goods
- 96 Other personal service activities

#### 20 ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS-AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE

- 97 Activities of households as employers of domestic personnel
- 98 Undifferentiated goods- and services-producing activities of private households for own use

#### 21 ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES

99 ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES

# **15** Annex **3**: International Standard Classification of Education (ISCED)

Classification of fields of study based on the International Standard Classification of Education - ISCED

## 1 Education

Teacher	training	and	education	science

- 140 Teacher training and education science (broad programmes)
- 141 Teaching and training
- 142 Education sciences
- 143 Training for pre- school teachers
- 144 Training for teachers at basic levels
- 145 Training for teachers with subject specialization
- 146 Training for teachers of vocational subjects
- 147 Teachers Adult Education
- 2 Humanities and Arts
  - 21 Arts
    - 210 Arts (broad programmes)
    - 211 Fine arts
    - 212 Music and performing
    - 213 Audio- visual techniques and media production
    - 214 Designs (Graphic Design, Industrial Design, Fashion, Textile)
    - 215 Craft skills
  - 22 Humanities
    - 220 Humanities (broad programmes)
    - 221 Religion
    - 222 Languages and Philological Sciences
    - 223 Mother tongue
    - 224 History, philosophy and related subjects
    - 225 History and archaeology
    - 226 Philosophy and ethics
    - 227 History and Art
    - 227 Theology
- 3 Social sciences, Business and Law
  - 31 Social and behavioral science
    - 310 Social and behavioral science (broad programmes)
    - 311 Psychology
    - 312 Sociology and cultural studies
    - 313 Political science and civics

- 314 Economics
- 315 Social Work
- 316 International Relations, European Studies, Area Studies
- 317 Anthropology
- 318 Development Studies
- 32 Journalism and information
  - 321 Journalism and reporting
  - 322 Library, information, archive
- 34 Business and administration
  - 340 Business and administration (broad programmes)
  - 341 Wholesale and retail sale
  - 342 Marketing and Sales Management
  - 343 Finance, banking insurance
  - 344 Accounting and taxation
  - 345 Management and administration
  - 346 Secretarial and office work
  - 347 Working life
- 38 Law
  - 380 Law
- 4 Science, Mathematics, and Computing
  - 42 Life science
    - 421 Biology and biochemistry
    - 422 Environmental science
  - 44 Physical science
    - 440 Physical science (broad programmes)
    - 441 Physics Nuclear and High Energy Physics, Astronomy, Astrophysics
    - 442 Chemistry
    - 443 Earth science
  - 46 Mathematics and statistics
    - 461 Mathematics
    - 462 Statistics
  - 48 Computing
    - 481 Computer science
    - 428 Computer use
- 5 Engineering, Manufacturing and Construction
  - 52 Engineering and engineering trades
    - 520 Engineering and engineering trades (broad programmes)
    - 521 Mechanics and metal work
    - 522 Electricity and energy

- 523 Electronics and automation
- 524 Chemical and process
- 54 Manufacturing and processing
  - 540 Manufacturing and processing (broad programmes)
  - 541 Food processing
  - 542 Textiles, clothes, footwear, leather
  - 543 Materials (wood, paper, plastic, glass)
  - 544 Mining and extraction
- 58 Architecture and building
  - 581 Architecture and town planning
  - 582 Building and civil engineering
- 6 Agriculture and veterinary
  - 62 Agriculture
  - 62 Agriculture, forestry, and fishery
    - 620 Agriculture, forestry, and fishery (broad programmes)
    - 622 Horticulture
    - 623 Forestry
    - 624 Fisheries
  - 64 Veterinary
    - 640 Veterinary
    - 641 Animal Husbandry
- 7 Health and Welfare
  - 72 Health
    - 720 Health (broad programmes)
    - 721 Medicine
    - 722 Medical services
    - 723 Nursing, Midwifery, Physiotherapy
    - 724 Dental studies
    - 725 Medical diagnostic and treatment technology
    - 726 Therapy and rehabilitation
    - 727 Pharmacy
  - 76 Social services
    - 761 Child care and youth services
    - 762 Social work and counselling
- 8 Services
  - 81 Personal services
    - 810 Personal services (broad programmes)
    - 811 Hotel, restaurant and catering
    - 812 Travel, tourism and leisure

	813	Sports
	814	Domestic services
	815	Hair and beauty services
84	Transpo	rt services
	840	Transport services
85	Environ	mental protection
	850	Environmental protection (broad programmes)
	851	Environmental protection technology
	852	Natural environments and wild life
	853	Community sanitation services
86	Security	services (broad programmes)
	861	Protection of persons and property
	862	Occupational health and safety
	863	Military and defence





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