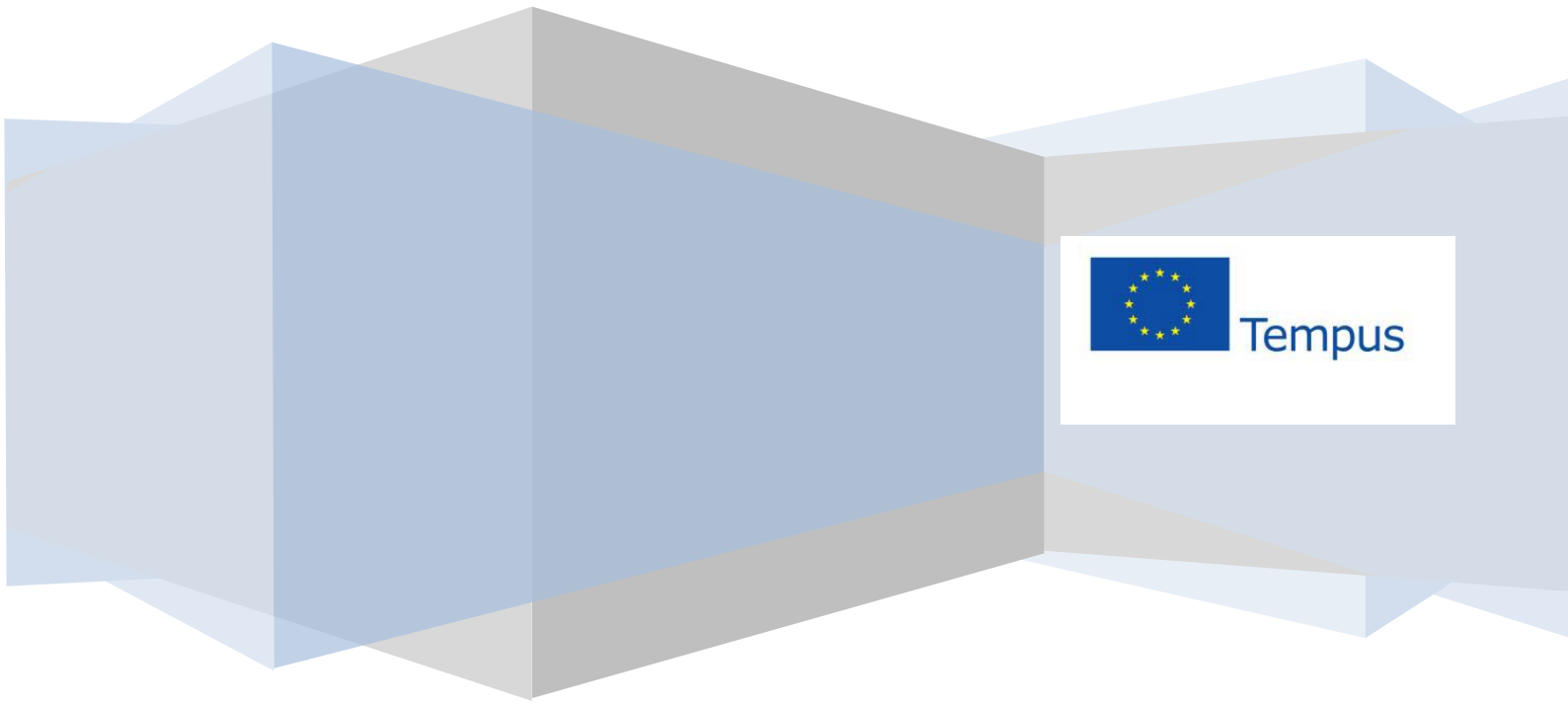
M A N U A L

For Graduates' Profile Report Development

Appendix to D.4.2



«HEN-GEAR Tempus»

530373-TEMPUS-1-2012-1-IT-TEMPUS-SMGR (2012-3056)

HIGHER EDUCATION NETWORK FOR HUMAN CAPITAL ASSESSMENT AND GRADUATES EMPLOYABILITY IN ARMENIA

M A N U A L
For Graduates' Profile Report Development

Created by: AlmaLaurea, HEN-GEAR consortium, Irina Vanyan, PhD in Economics, Associate Professor-NUACA
Editor: Varazdat Hovhannisyan, PhD in Engineering-NUACA

This Manual was created by *the Higher Education Network for Human Capital Assessment and Graduates Employability in Armenia* (HEN-GEAR) project (530373-TEMPUS-1-2012-1-IT-TEMPUS-SMGR) executed within European Union Tempus project. The main approaches of inquiry considering in the Manual are based on many years of experience of the AlmaLaurea interuniversity consortium of Bologna (Italy).

This project is funded by the European Commission. This publication reflects only the view of authors and the Commission cannot be responsible for any using of the information contained therein.

Table of Content

1. What is the goal of Graduates' Profile Report?

The Graduates' Profile Report (hereinafter Report) is a survey which looks at the features of Armenian graduates in a certain year. The survey Report contains an analysis of the features and performance of graduates in a particular year, focusing on a number of variables. These include: age at graduation, examination average grades, parents' educational qualifications, secondary school qualification type, study experience abroad, use of laboratories, traineeships or internships, data referred graduate thesis defense information, assessment of university experience, knowledge of foreign languages, IT skills, work experience during study, intention to pursue further studies, preferred professional field, desired job characteristics.

The first Report on Armenian Graduates' Profile is released in 2015, within the HEN-GEAR Tempus project (October 2012 – October 2015) and it is based on the AlmaLaurea Interuniversity Consortium (Italy, Bologna) (hereinafter AlmaLaurea) experience, who is a project partner. Since 1998 AlmaLaurea issues Graduates' Profile Reports and as of today out of Italian 78 registered universities the data on 72 universities' graduates are covered by the Reports.

The objectives of the Report development in Armenia are:

- to outline the main features of the Armenia universities' graduates,
- to provide the information to those, who are interested in Armenia's universities or involved in a policy development for education system further progress,
- to promote the assessment culture with the education system,
- to provide a tool kit for the university study programs choice.

2. To whom the Report is addressed?

The Report is addressed to all those who are interested in the higher education system of Armenia, including youth and their families, people in charge with guidance activities, companies (public/private, Armenian/foreign), the RoA Ministry of Education and Science, the RoA Ministry of Labor and Social Affairs, universities and researchers, as well as the governing bodies of the universities, faculties and assessment units.

3. Which groups of Students are surveyed?

The study looks to graduates, who achieved their qualifications in the universities involved in the HEN-GEAR consortium in a certain year. In 2015, when the first Report development process was launched in Armenia, the universities' consortium includes eight state universities of the Republic of Armenia, particularly: Yerevan State University (YSU), Engineering National University of Armenia (ENUA), Armenian State University of Economics (ASUE), National University of Architecture and Construction of Armenia (NUACA), Armenian

National Agrarian University (ASAU), Yerevan State Academy of Fine Arts (YSAFA), Gavar State University (GSU) and Gyumri State Pedagogic University (GSPU). The number of Armenia universities' consortium members is expected to be increased in a future.

4. Information sources

The database information reflected the Armenian Graduates' features is collected from different sources and at different times. It includes:

- information from the administrative sources that is provided by the universities and it includes data on faculties, degree of study program, study duration, average quality grades, final thesis title, supervising professors, etc.
- information collected from the on-line platform where the students fill out the questionnaires before their graduation that includes self-assessment on study experiences abroad, work experiences during studies, etc., as well as self-assessments on the knowledge of foreign languages and IT skills, preferable business field, desire to study continuation, etc.

The database is formed from the combining of the information received from the administrative sources and graduates' questionnaires. The created database is a basis for the research of graduates features and Report development.

5. How to access the data?

The results of graduates' survey have to be visible and accessible for large number of stakeholders as much as possible. For this purpose the annual reports have to be published regularly and data on-line accessibility should be provided.

6. Some useful advices

A reliable Report development requires a comprehensive and reliable database that was formed on the accurate information. For this purpose, it is necessary to:

- collaborate with the universities' administrative offices, constantly monitor their work and explain the objectives and advantages of the Report,
- ensure a compliance between administrative and questionnaires' data,
- monitor the students that fill-out the questionnaires seeking for their number increasing.

7. Exclusion criteria

For a purpose to create the surveyed Armenian students' sample, we referred to the methodology used by AlmaLaurea that is the application of several exclusion criteria. Our approach is thus an adaptation of AlmaLaurea's researchers' many years work based in Italy. The Almalaurea's exclusion criteria are presented below. They have to be applied in the following consistency: first of all they have to be addressed to the graduates, then to questionnaires and eventually to universities.

7.1. Exclusion criteria addressed to the graduates

It is very important, so to run a properly the survey, to carefully assess the exclusion criteria addressed to the graduates. Despite the AlmaLaurea experience described below is not typical for Armenia, however it worth to consider it here.

Actually in 2001-2005, the Italian universities included a few specific groups of students. For some of them the professional qualifications were recognized without a proper faculties attending. A question related to this was raised: “Which graduates have to be surveyed?” It was decided that in a survey will be included those students who earned at list half of the credits (ECTS) required for the qualification degree getting through the educational process organized by the university. Otherwise, students’ assessment of the university experience couldn’t be considered as a reliable and meaningful. Sometimes it is not possible to identify immediately the specific groups’ students in accessible administrative data. Significant efforts should be made for analysis and to determine what practical features are needed to identify them effectively. Thus, currently the specific groups’ students are not involved in the Italian survey, although their work experience is considered by the universities as an educational activity and they gain at least half of total credits. This applies to sort of professions, such as health care operators, representatives of the police or military forces, government officials and other specialists. Currently, the graduates of these professions in different universities fill out the survey’s questionnaire very seldom. When the students, that are eligible to be interviewed, are selected, the exclusion criteria apply to the questionnaires.

7.2. Exclusion criteria addressed to the questionnaires

In the Italian experience of AlmaLaurea, within the survey framework the questionnaires are excluded in cases of non-compliance with the following three main criteria:

- completeness of questionnaire filling out,
- plausibility of answers,
- time spent for questionnaire completion.

In Armenian Graduates' survey to identify the questionnaire completeness the AlmaLaurea experience is used.

Particularly, the questionnaire completeness criterion is satisfied, if:

1) the graduate presented a comprehensive information at least for 3 sections of the questionnaire (out of total 6 sections) that are considered as essential for the Report (particularly, parents' qualifications degree, university's experience assessment, study experience abroad, work experience during the study, to pursue further study),
2) for each section of the questionnaire, excluding the personal data section, the ratio between the number of answers provided and the number of answers required is calculated. Then, the average of these ratios is determined. If the average is more than 25%, the compliance of the questionnaire with the plausibility criterion is considered.

So, in Italy, if above mentioned criteria are met, a plausibility criterion's satisfaction of questionnaire should be examined, i.e. whether the questionnaire is "suspicious" or it has a doubtful answers. In Armenia survey the same sequence is applied. The questions concerning different areas (foreign language knowledge, IT skills, relations with the academic staff, services and life conditions provided by the university to students, preferable business areas, the main features of desirable work, geographical location of desirable work, preferable type of contracts) of questionnaire developed for Armenia universities are grouped in 6 sets of questions. The questionnaire is considered as a "suspicious", if the distinction between answers to different questions is very minor (the same answer is repeated for different questions responding), the graduate answered to question without its reading (Table 1).

Table 1. An example of "suspicious" answers – the example of similar answers.

Are you interested in working in the following business areas? (Answer to all the questions)

Business fields	Yes	More yes than no	More no than yes	No
Administration	**X**			
Accounting	**X**			
Technical assistance	**X**			
Management	**X**			
Control	**X**			
Finance	**X**			
Legal	**X**			
Marketing, communications, public relations	**X**			
Organization, planning	**X**			
Human resources, reqruitment, training	**X**			
Production	**X**			
Research and development	**X**			
Iinformation systems	**X**			

Purchases	**X**			
Logistics, distribution	**X**			
Secretary, general affairs	**X**			
Marketing, sales	**X**			

The questionnaire satisfies the plausibility criterion, if at least in five sections no "suspicious" answers were found.

So, in Italy, another plausibility feature concerns to inconsistencies between answers responded to similar questions that may be located in different sections of the questionnaire. AlmaLaurea's experience allowed identifying inconsistencies of answers concerning to following four areas:

- inconsistencies concerning study experience,
- inconsistencies concerning work,
- inconsistencies concerning foreign languages knowledge,
- inconsistencies concerning IT skills.

A consistency check is a simple comparison between the answers provided by a graduate to two similar questions. If these answers are inconsistent, it means there has been a misunderstanding or a lack of attention while filling in the questionnaire. If less than 2 inconsistencies are found in a questionnaire, the questionnaire meets second plausibility criterion. On the contrary, if many inconsistencies are found, the reliability of the answers is questioned.

When criteria for completeness and plausibility are fulfilled, the most complex criterion on average time spent to each answer is applied. Thanks to its many years of experience, AlmaLaurea has conducted a careful analysis and empirically proved that the questionnaire cannot be correctly compiled if the average time spent on each question is less than 4 seconds.

Ultimately, if a questionnaire fulfils the three criteria (completeness, plausibility and time spent on the questionnaire), so it can be used for the purpose of the Graduates' Profile survey and is included in the analysis. As the Armenian Graduates' survey is a pilot, the questionnaires fulfill only the completeness criterion as it is mentioned above.

7.3. Exclusion criteria addressed to the universities

For the Italian universities, provided that university collected successfully graduates' information from administrative source, the university with its graduates' data is included in the survey, if the ratio between the number of questionnaires eligible for the survey and total number of graduates is high. The university is involved in the survey, if this ratio is $\geq 50\%$. Otherwise the university's participation is not considered. This criterion is very important for Italian universities survey that

includes almost all universities of the country with huge number (more than 90%) of eligible questionnaires. However, this criterion is not applied to Armenian survey because it is a pilot.

8. Cleaning the database and representativeness assessing: general rules (applying to both the Italian and the Armenian case)

8.1. Have all or almost all questionnaires been collected?

Among Italian universities which are part of AlmaLaurea, for example, not all the faculties have always managed to collect questionnaires from all their graduates or at least a good percentage of them. Sometimes, whole universities or single faculties have not succeeded to do so. AlmaLaurea aimed to solving this problem by the appropriate measures, particularly a specific division of AlmaLaurea constantly monitors the rate of filled-in questionnaires for each university and interacts with administrative offices to eliminate a failures and to solve the problems raised because different reasons.

In general, participation in the survey increases when the faculties and students are aware that the questionnaire is a tool to assess their university experience, but it also works as a CV which can help them find a job.

Graduates, who already have a job or do not intend to immediately look for one, are also required to fill in the questionnaire, in order to provide their feedback on the degree course and the university they have just completed.

Three times in a year – at the end of each graduation session – AlmaLaurea gets a contact with all the graduates who have not yet filled in the questionnaire, encouraging them to do this (excepting those graduates who have explicitly stated that they do not wish to be part of the database). In some universities, this measure has led to a significant increase in the number of collected questionnaires. It is worth to apply this approach for Armenian Graduates' survey in a future.

8.2. Has the questionnaire been entirely filled in?

In a practice not only graduates' questionnaire not filling, but also partially or in an unreliable manner filling cases are met. Sometimes, some sections are not completed, with no specified reason. All these situations should be monitored. In general, such kind of questionnaires are not considered as an eligible for the survey, however they are taken into account for statistics results presentation (for instance, in calculation of ratio between number of questionnaires filled in accuracy and number of registered graduates).

8.3. Checking that the questionnaire is clear and consistent

Checking that the questionnaire is clear and consistent is the most difficult task when assessing a questionnaire. Sometimes, interviewees do not follow the rules. It may happen, for example when two answered are selected instead of required choice of one, or essential questions are ignored and instead of them not required questions are responded, or the "other" option of answer is selected however no adding any information in the relevant space.

8.4. Has the interviewee taken the questionnaire seriously?

Explaining how to assess whether a questionnaire has been filled out by the graduate in a serious manner is not easy. Let's do this through the examples. For example, if the questions have to be answered through the scale including from 1 to 4 scores and the same score is assigned to sort of mutually exclusion questions, so it is clearly the case of not seriousness. In addition, not seriousness is clear when some graduates deliberately provide nonsensical answers. It is recommended to outline preliminary some idea on main features that will assess the seriousness of the questionnaire filling in. Otherwise, during the analysis of data it will be necessary systematically to assess this.

9. Statistical analysis

The completion of the questionnaires eligibility assessment and selection of the questionnaires that are eligible for the survey allow going to the next stage which is a statistical data analysis. At this stage, statistical software should be employed (SPSS, SAS, Stata or others). By making simple statistical operations, a descriptive analysis of the main results (correlation charts, diagrams, etc. created on the basis of ratio between surveyed variables) has to be implemented. The correlation charts are useful for the purpose to identify the possible link between two variables (dependent and independent).

Obviously, the different methods of analysis could be applied depending on the types of variables that are in a focus of survey. For instance, in case of quantitative variables, for data interpretation or conclusions making, the summary measures can be used, such as mean, median and mode. The standard deviation or variance can be used for the analysis of some variables. As for the qualitative variables, the graphs and charts presented the main features could be used as useful tool to display the frequencies related to two categorical variables (absolute values) at once. For a more in-depth study, following a first descriptive analysis of the main features, a multivariate statistical analysis may be performed. It could be used, for example, to determine the influence of some variables on others and the correlations between different variables. Multivariate analysis need to be interpreted carefully and with the help of specialists.

10. The modes of results display

Representing and disseminating the results of statistical analysis in an effective manner is another crucial step in the process. Indeed, statistical accuracy and a clean database are not sufficient to guarantee a good analysis of data. The main results summarized via charts and tables are more clear not only for the specialists, but also for the general public. An incomplete or unclear table or a poor communication of the results can compromise the whole survey. It is therefore important to look at the examples of graphical delivery of the noteworthy variables survey results. Here, the attention is focused on the univariate, bivariate or multivariate charts presenting the descriptive analysis results.

The results of analysis can be described by using of charts and tables. It is important that the titles of them reflect clearly the content of the results. The titles have to include all of the elements that are necessary for the data interpretation, so that the reader doesn't need to refer to the text. The titles have to communicate with:

- the subject of analysis,
- the surveyed variables,
- the type of the statistical analysis performed.

10.1. Tabular display of the results

A well-designed table should be:

- efficient (shouldn't be a large),
- comprehensive (it should contain all of the information required to understand the data correctly),
- appropriate (it should be consistent with the aims of the survey).

In other words the tables should be filled out by the "economical" manner, i.e. they should include only the information that is necessary for the proper understanding of the table, as an excess of the figures may confuse the reader. Compared with the charts, the tables allow a larger quantity of the information to be displayed.

10.2. Graphical display of the results

Graphical representation is an effective tool to help readers to understand the data. Usually, compared to the tables, the charts contain less volume of the data and more condensed information. However, charts certainly have a strong communicative impact and, again, they are easy to understand for the general public, even with little statistical skills.

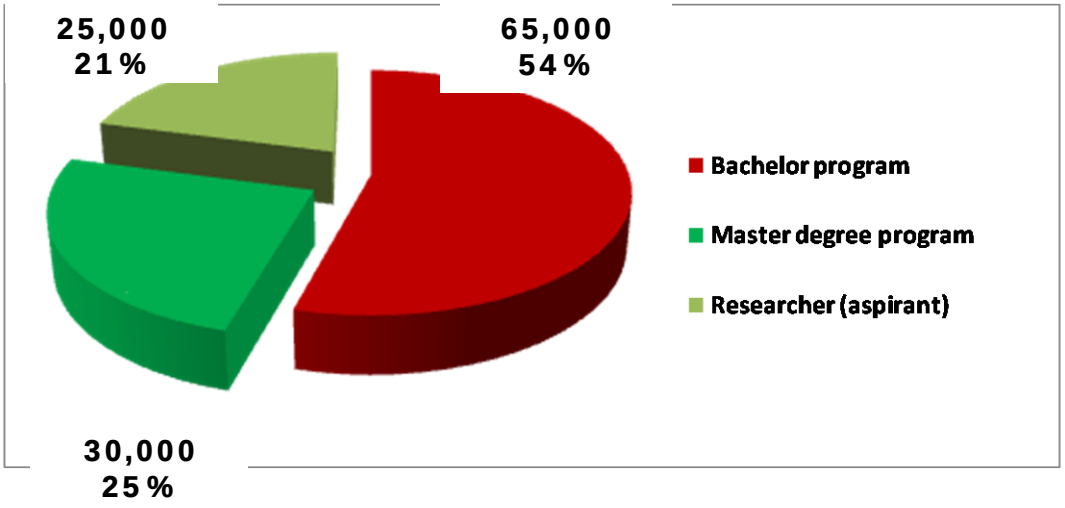
To draw a chart correctly, the following aspects should be taken into account.

- The scale of the axes, from which the reader's visual's perception of the considered variables' differences will depend.
- If bar graphical display is selected to make a survey results more visible (for instance, to show the difference between male and female interviewees` answers), the answers to the same question should be in a basis of this.
- The color distinction is used for each variable's different answers representation.
- The chart's title should include the subject of analysis, surveyed variables and the type of statistical analysis performed.

The most important information reported in the tables can be separated and underlined by the charts. Since the charts cannot contain all of the values reported in the table, the most important data should be selected with the purpose of the graphical display. Univariate, bivariate or multivariate analyses have different graphical representations.
A range of the examples of variables analysis results graphical display are presented below. It is recommended to follow some examples of the aforementioned graphs' types.

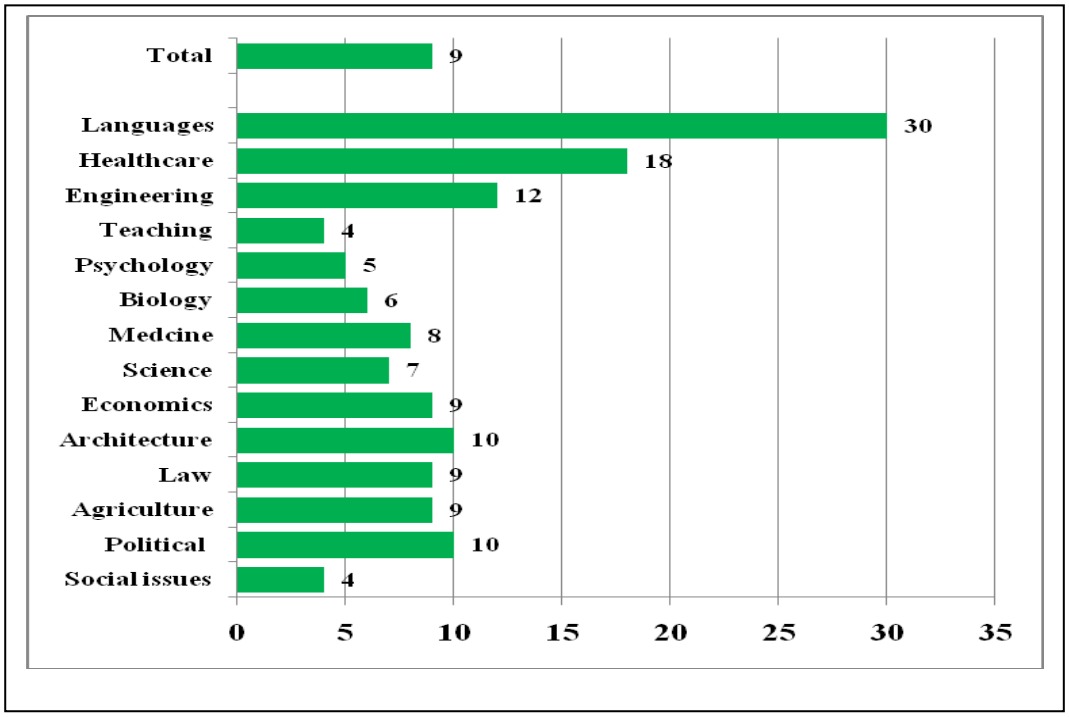
Pie charts are used to provide an overview of the situation (Fig. 1).

Figure 1. Graduates grouping by type of study programs.



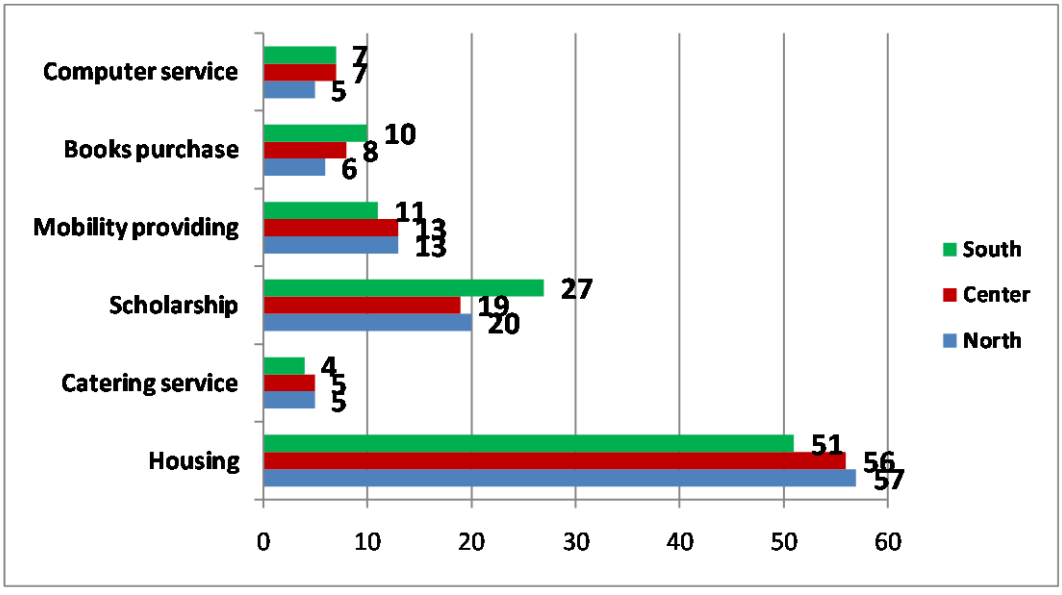
Simple bar charts are used to represent frequency distributions in absolute values or percentages (Fig. 2).

Figure 2. Percentage of graduates who gained study experiences abroad through EU programs, by degree subject area



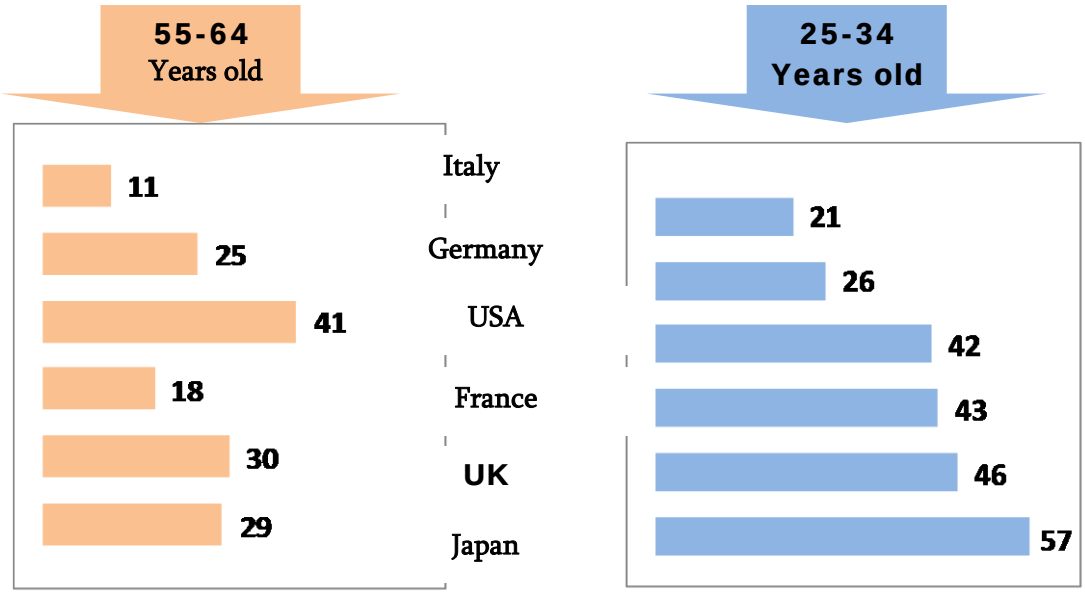
Grouped or two-sided bar charts are often used to compare how the same variable is distributed in different populations (Fig.3).

Figure 3. Percentage of graduates who benefited from student support services, by university's geographical location



Two-sided bar charts (Fig.4) can display, for example, the different distribution of the population with tertiary education among age groups, in different countries.

Figure 4. Population with tertiary education, by age group (percentage values)



Broken line graphs are used to display the development or change of a phenomenon or a subject over time (Fig.5).

Figure 5. Age of graduates and graduation delay (years).