Handbook for Graduate Tracer Studies

Harald Schomburg

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1 From the "Standard Instrument" to the Handbook

The diverse experiences gained by scientists of the Centre of Research on Higher Education and Work at the University of Kassel did result in the awareness of many advantages as well as restrictions, weaknesses and misinterpretations of graduate and employer surveys. Especially in the last few years, when the (self-)evaluation of universities has become more and more important, it has been necessary to draw interested persons' attention to the advantages *and* problems associated with such surveys.

In the last few years, members of the Centre for Research on Higher Education and Work, University of Kassel conducted a number of graduate surveys which were designed to help evaluate various programmes and projects in higher education. Included in these are surveys of graduates who previously participated in foreign study programmes in various industrialized countries (Teichler et al, 1990) as well as surveys of natural scientists and engineers who received an EU grant for a research sojourn, and finally - on request of the German Academic Exchange Service - DAAD - a survey of recipients of German scholarships who had completed their course of studies at the Asian Institute of Technology in Bangkok (Schomburg/Teichler/Winkler, 1991).

Since its foundation in 1978, graduate surveys have been one of the main fields of research of the Centre for Research on Higher Education and Work:

- Secondary studies were carried out concerning the consequences of university expansion with respect to the relationship between higher education and work (Teichler, 1981).
- Secondary studies were conducted concerning the status of graduate surveys for the re-structuring of study programmes. These were to identify possible means in order to refer from the professional activities of the graduates to the requirements and potentials of teaching and study programmes (Holtkamp/Teichler, 1983).
- These approaches were supplemented by a survey of personnel managers indicating the (underestimated) variety of criteria and methods of the recruitment of university graduates (Teichler/Buttgereit/Holtkamp, 1984).
- A nearly decade-long graduate survey (at the graduation, 2 years, 5 years, and 10 years after graduation) has been completed which is intended to show more clearly than any graduate survey before the complexity of the options and conditions of a study programme and its importance for the professional development of university graduates (Teichler/Schomburg/Winkler, 1992).
- A survey „Transition from Higher Education to the Labour Market in Japan" was conducted in the early nineties. Its main methods are interviews in large Japanese enterprises investigating criteria and methods for the recruitment of university graduates as well as the connection between the expected qualification at the time of the entrance to the labour market, the initial qualification, and the further professional career of graduates.
- A pilot study on the „Employment Situation and the Demand for Persons with a Higher Education Qualification as seen by Company's Experts" was conducted on behalf of the „Institut für Arbeitsmarkt- und Berufsforschung". Within these framework, contents and methods of a representative questioning of enterprises in Germany were developed.

- A literature study collected and summarized more than 150 graduate surveys conducted in the 90s at German universities (Burkhardt/Schomburg/Teichler, 2000).
- The Kassel centre co-ordinated the CHEERS (Careers after Higher Education - a European Research Study) project which provides the most thorough comparative information on graduate employment and work and the links between higher education and graduate employment and work available (see www.uni-kassel.de/wz1/cheers.htm). From autumn 1998 to spring 2000, about 3,000 graduates each from 9 countries in the European Region (Austria, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden, United Kingdom), one EFTA country (Norway), one of the Central and Eastern European countries in transition (the Czech Republic) and one economically advanced country outside Europe (Japan) answered a written questionnaire on the relationship between higher education and employment four years after graduation (totally more than 40,000 graduates form institutions of higher education).

Besides these substantial research the members of the Kassel centre tried to contribute to the methodology of graduate and employer surveys as well. One result of these methodological developments was the "Standard Instrument" (see Schomburg, 1995), a result of a GTZ initiated project, taken up by the staff of the Centre for Research and Higher Education and Work of the University of Kassel in 1991/92. The development of the "Standard Instrument" can be seen to a great extent as the result of the joint experiences of the researchers in the WZ I. Among them, especially Ulrich Teichler contributed substantially to the instrument. First versions of the "Standard Instrument" have been developed 1991-1993, the first printed version was published 1995 (Schomburg, 1995).

From the beginning the "Standard Instrument" and especially the specimen questionnaires were used in a wide range of projects and studies in many countries in Europe, Latin America, Africa and Asia.

New efforts to improve the "Standard Instrument" were undertaken with the assistance and in co-operation with InWEnt/DSE in the years 2001-2003.

Especially the experiences from workshops on Tracer studies in Costa Rica, Honduras, Indonesia, Panama, the Philippines, Namibia, Nicaragua and South Africa showed a need for an extended Handbook on Tracer Studies.

In the centre of the "Standard Instrument" were the specimen questionnaires. The new "Handbook" does not have this centre any more. It was written with the intention to make the reader more systematically aware of the problems and potentials of tracer studies. Some users of the "Standard Instrument" failed to make a creative use of the given specimen questionnaires. The users of the Handbook are forced to be creative because we do not propose anymore just one specimen or master questionnaire.

2   Overview

This handbook is a practical guide - not a theoretical or methodological one. We tried to put as much as possible our practical knowledge and skills gained in the conduction and involvement in many tracers studies in this handbook. We hope to enable you to avoid most of the pitfalls and cliffs in the process of implementing a survey we faced.

2.1.1 Tracer Study?

What are TRACER Studies?

- Similiar terms
  - Graduate survey
  - Alumni research
  - Follow-up study
- Target population
  - Graduates of an institution of higher education
  - Asked some months/years after graduation

We assume that as a reader of this handbook you have made the decision to carry out a survey of graduates from institutions of higher education - a tracer study (sometimes also called as "alumni survey" or "follow-up survey". We use the terms graduate survey and tracer study in this handbook in the same way.

We further assume that your regular duties do not include implementing such surveys, but that you have a professional background in a technical or scientific field and that you are familiar with the general principles and procedures for implementing projects and empirical surveys.

Therefore, in this handbook we shall attempt to familiarize you with the specific tasks and problems of such surveys, and we wish to provide advice that will enable you to carry out such surveys independently (without an external consultant or agency) or – at least – to manage the implementation of a tracer study.

We are convinced that the objectives and questions usually investigated by graduate surveys are sufficiently similar to permit a standardized methodological procedure. The principal criteria for evaluating and interpreting survey results are, in any case, applicable in all countries.

2.1.2 Objectives of Tracer Studies

Graduate (and employer surveys) constitute *one* form of empirical study which can provide valuable information for evaluating the results of the education and training of a specific institution of higher education. This information may be used for further development of the institution in the context of quality assurance. We propose an advanced approach for tracer studies which should enable the institution of higher education to get information to indicate possible deficits in a given educational programme and to serve as a basis for future planning activities. Therefore information on the professional success (career, status, income) of the graduates are needed as well as information on the relevance of knowledge and skills (relationship between knowledge and skills and work requirements, area of employment, professional position). Graduates might also be asked to asses the study conditions and provisions they experienced retrospectively (evaluation in a narrow sense).

Employer survey typical focus on the methods and criteria of recruitment and on the competencies of graduates and possible future needs.

2.1.3 Three Basic Steps of a Survey

In general, the implementation of graduate and employer surveys involves the following three steps which are described in more detail in this guide:

Concept and Instrument Development	→	Data Collection	→	Data Analysis and Report Writing
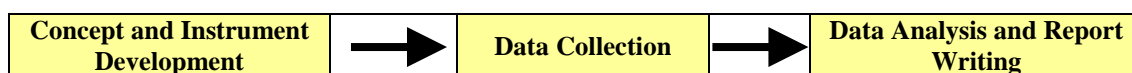
For each step of the survey this guide provides instructions, advice, recommendations, and rules which, to a great extent, will enable you to conduct graduate and employer surveys on your own.

Figure 1:   Phases of a Survey and Major Work Tasks

Phases	Major work tasks	Duration
1. Concept and Instrument Development	• Definition of survey objectives (selection of themes to be investigated) • Survey design (selection of the cohorts of graduates to be included; strategies for tracing the graduates • Technical concept for carrying out the survey • Formulation of questions and of response items • Formatting of questionnaires • Pre-test of questionnaires • Printing of questionnaires and other dispatch material	4 months
2. Data collection	• Training of survey team • Distribution and collection of questionnaires • Assurance of high participation (reminder actions)	4 months
3. Data analysis and report writing	• Definition of coding systems for the responses to open questions • Coding of open responses • Data entry and data editing (quality control) • Data analysis • Preparation of survey report • Workshop with students, graduates and employers	4 months

2.1.4   Specimen or Master Questionnaires

In the appendix of this handbook you can find two master questionnaires following the proposed advanced approach for tracer studies.

Short title	Study	Length
AAU	Association of African Universities (AAU), Study Programme on Higher Education Management - Tracer Studies, 1996-2000	12 pages, 400 variables
CHEERS	European Graduate Survey, 1998-2000	16 pages, 600 variables

In this handbook we will refer extensively to these two studies and the related concepts. The questionnaires can be used as specimen for your own study: you can copy questions which need no adaptations or you can learn from the examples how to develop your own questionnaire. This research instrument can be used by a wide variety of researchers for various projects and in various countries and universities to conduct graduate surveys.

The *questionnaires* in the appendix cannot be used without change or adaptation. To a large extent (60%-80%) the questions and answers can be used as they are. But some questions are only relevant for specific countries or study programmes, and these questions must be adapted to your study.

2.1.5   How to Develop a Questionnaire?

Recommendations are given in this handbook for the development of a questionnaire and the necessary adaptations of questions and answers. Such recommendations obviously do not affect the content, but rather the modification of the structure of the questions (comprehensibility, clarity, relevance, etc.).

For most of the questions/responses in the specimen questionnaires you will find explanations regarding the respective item (or the respective subject/theoretical concept), the method of operationalization, the data analysis (the relations to other variables, the feasibility of aggregating, the measurement level, the methods of data analysis) and the interpretation of results from some surveys. In addition, a recommendation is given as to whether an adaptation is necessary to accommodate specific projects or countries. The manner in which these explanations are given should enable you to select questions which are appropriate for your particular survey, and, if you desire, to prepare additional questions.

2.1.6   QTAFI - Questionnaires, Tables, and Figures

One key element of this handbook is the use of a tool QTAFI, written in Visual Basic for Aplication. QTAFI stands for **Q**uestions, **Ta**bles and **Fi**gures.
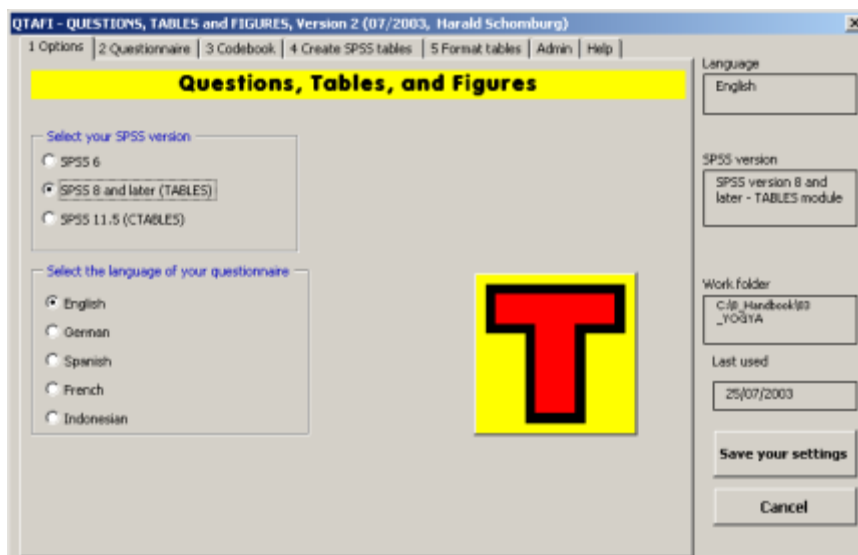
QTAFI helps you in several steps of your work.
- Helps to create a well designed questionnaire
- Provides a proposals for a codebook format
- With the QTAFI codebook you can get automatically
  1.   the SPSS data definition of your questionnaire
  2.   the SPSS tables commands to get ready to print tables
  3.   automatically formatted tables from Microsoft word.

2.1.7   How can I install the QTAFI tool?

Open the file QTAFI.DOC with Microsoft Word and follow the instructions.

IMPORTANT: Please check your security settings. MACRO execution should be allowed!

You will see the following page:

2.1.8   QTAFI Troubleshooting

■   **Disable your virus protection!**
■   **Check your security settings**
■   **If nothing is happening after pressing the QTAFI button:**

Please check your security settings. MACRO execution should be allowed.

Check: **Tools-Macro-Security**
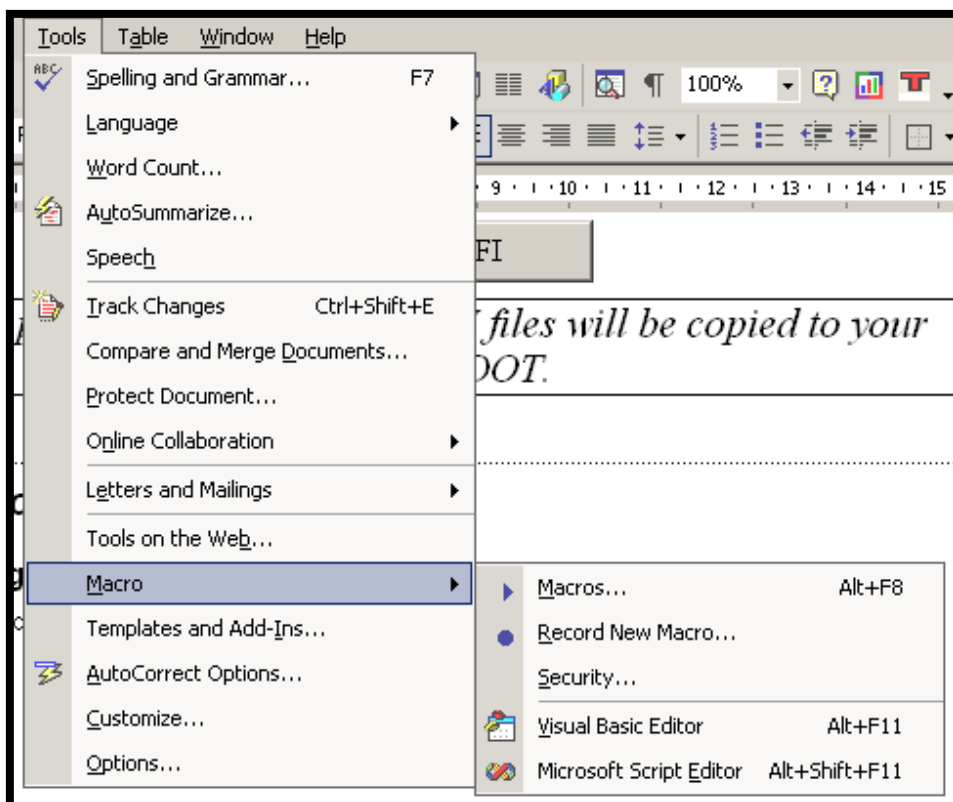
Setting of **Security Level: LOW (Office XP)**
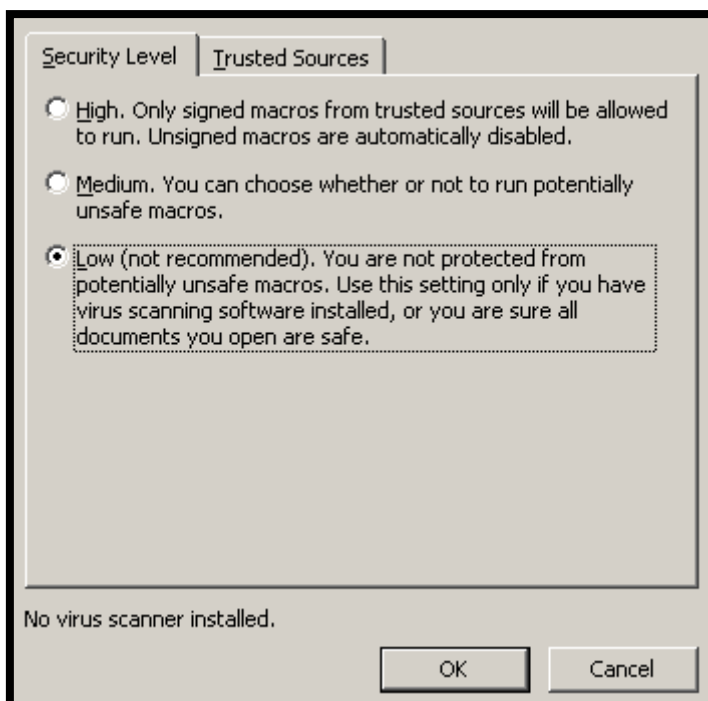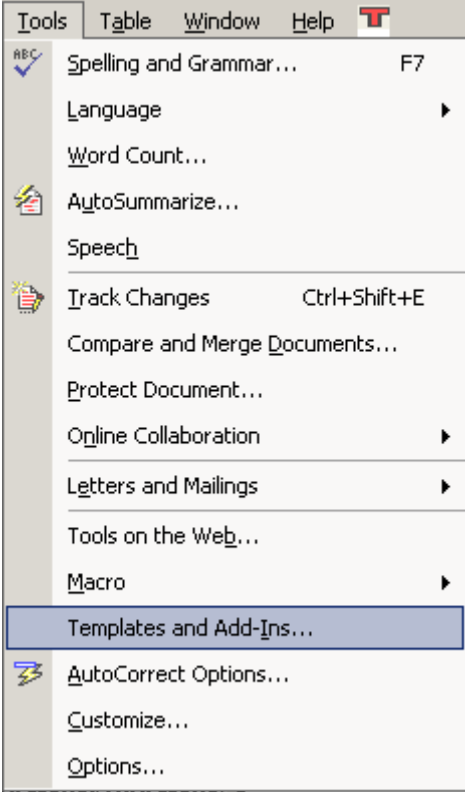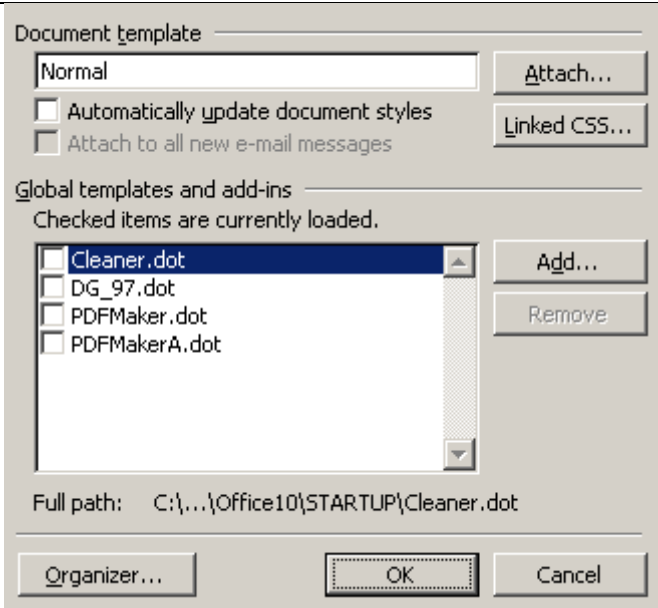
Setting of **Trusted Sources (Office XP):**
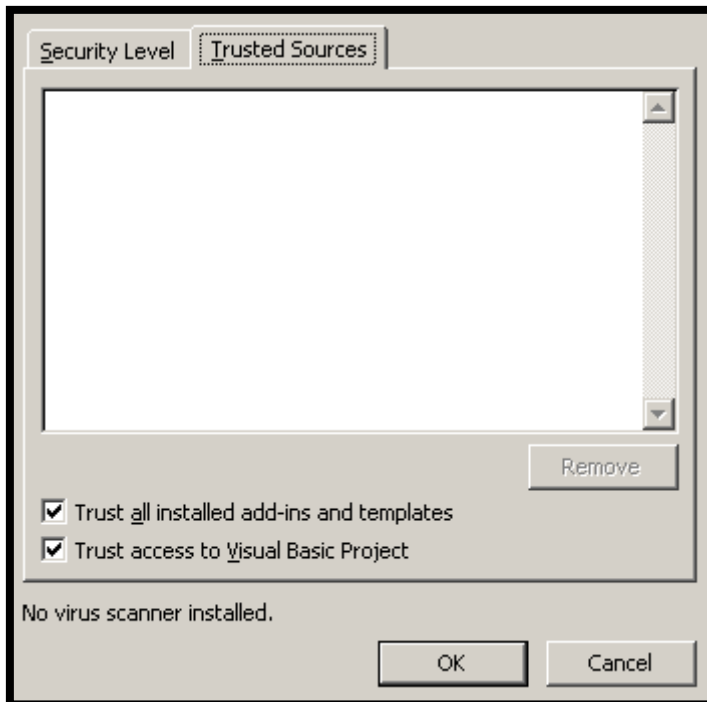
■   **Close Microsoft Word and start again.**

▪ **Manual installation of the QTAFI macro**

1	
	Select **Tools-Templates and Add-Ins**
2	
	Select **ORGANIZER …**
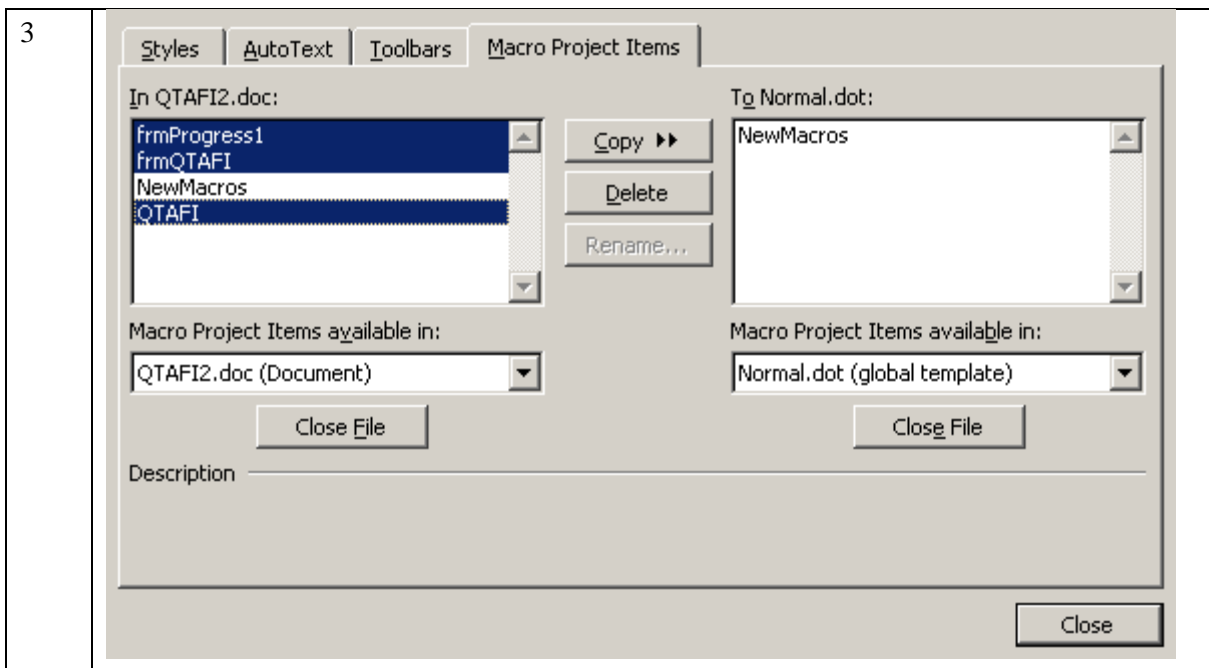
3	
	Select **MacroProjectItem** and mark the elements **frmProgress1, frmQTAFI** and **QTAFI** and press **COPY**
4	
	Now the QTAFI elements are copied to NORMAL.DOT. Press **CLOSE** to finish.
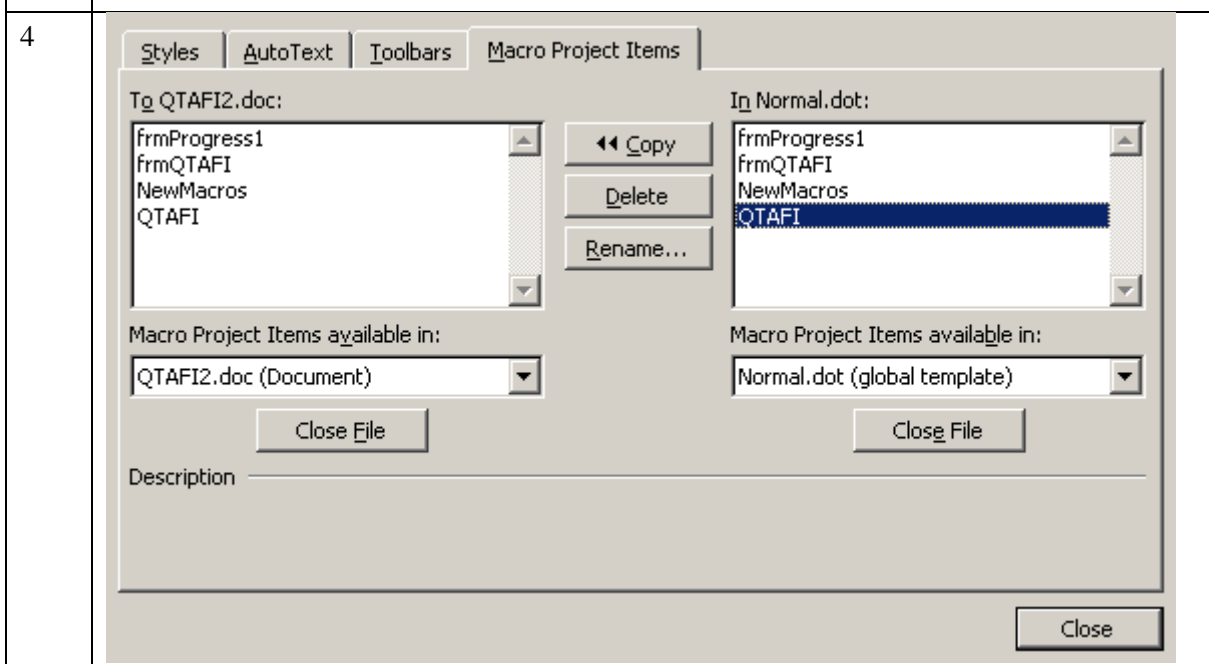
■   **Alternative manual installation of the QTAFI macro**

- Open a new document.

- Press ALT+F11 to open the Visual Basic Window
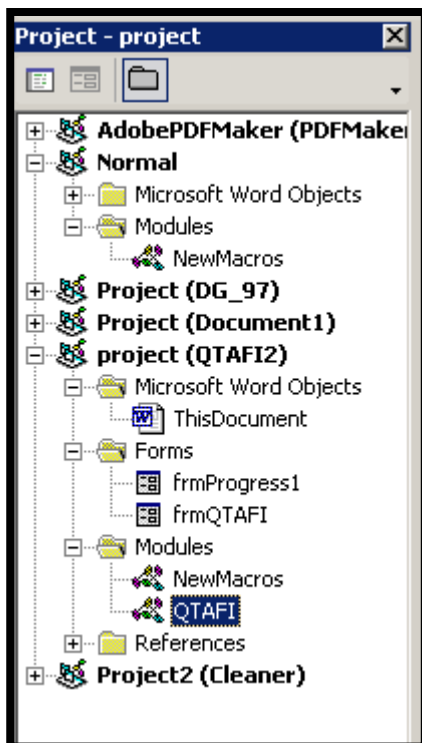
- Copy the Module QTAFI and the Forms frmQTAFI and frmProgress1 to *Normal* . (Drag them with the mouse)

The following screenshot shows the result.
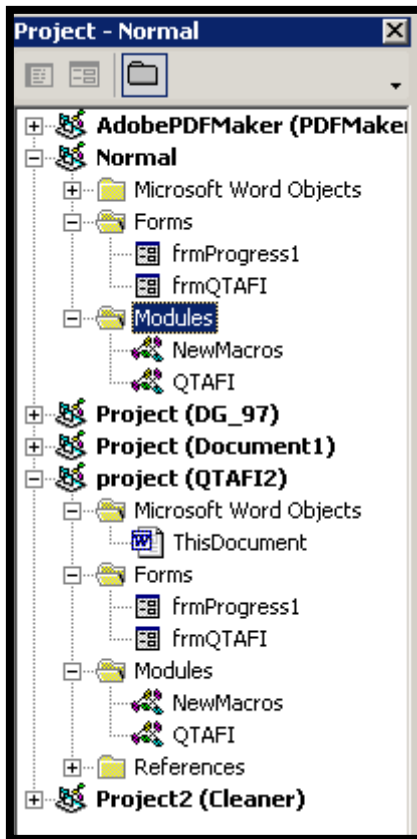
Now the QTAFI is a part of your Normal.dot. Execute: **File-Save Normal**

■ **How to execute the macro?**

The QTAFI can be executed with: **Tools-Macro-Macros-Normal.QTAFI.MAIN**

More convenient is it to have a command buttom which executes the QTAFI macro.

Goto: **View-Toolbars-Customize-Commands-Macros and select Normal.QTAFI.MAIN**

■ **Drag the Normal.QTAFI.MAIN to one command bar.**
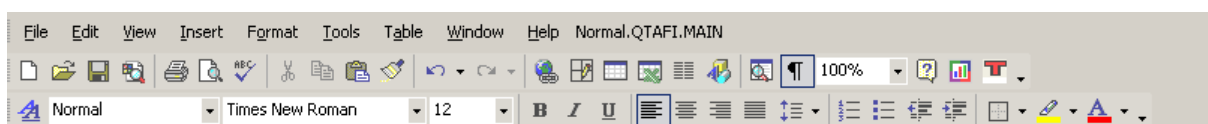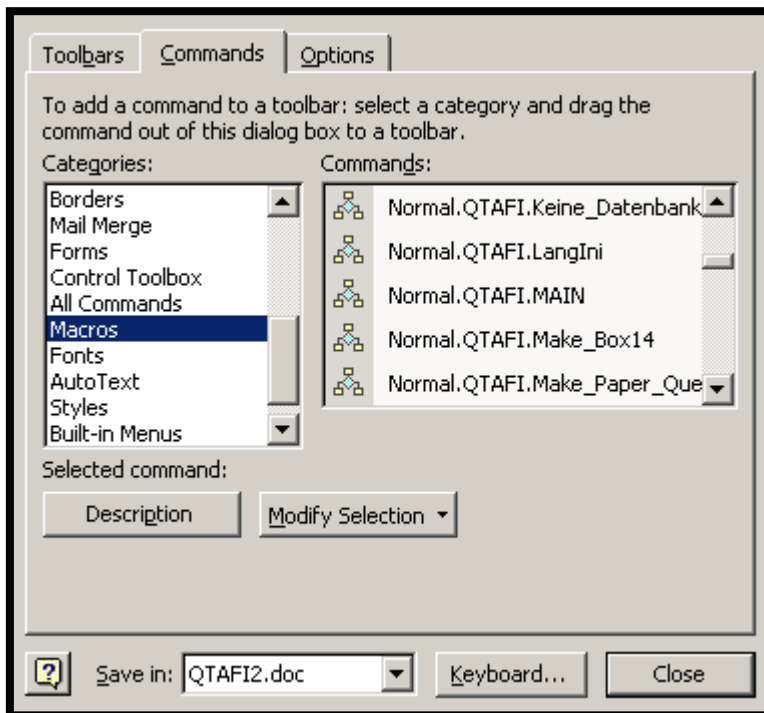
2.1.9   Software Requirements

In order to develop your questionnaire and to produce a well formatted questionnaire a word processor is needed. Taking into account that Microsoft Word as a part of the Microsoft Office package is the most common one we will use it. All examples of questionnaires, codebooks, and reports in this handbook are written with Microsoft Word. We recommend to use the version Microsoft Office XP, because it is more stable than the versions before. Microsoft Office 2000 works also much better than the older versions, which often crashed with large or complicated formatted files like a questionnaire.

See Table 1 for recommendations regarding the different activities.

Table 1   Software Requirements for a Survey

Activity	Required Software	Recommendation
Proposal writing	Word processor	Microsoft Office XP
Questionnaire formatting and codebook writing	Word processor	QTAFI and Microsoft Office XP
Administration of questionnaires, controlling of returns	Data base	Microsoft Access XP or other version
Data entry	Data base	QTAFI & SPSS or Online questionnaire or Microsoft Access XP data base or ASCII file with editor or Readsoft Eyes and Hands FORMS, automatic data capture with a scanner
Data analysis	Statistics package	QTAFI (to produce SPSS data definition and tables programmes) SPSS version 11.5 with the modules BASIC, PROFESSIONAL, ADVANCED and TABLES
Charts	Chart software	Microsoft Excel XP or other version
Presentation	Presentation software	Microsoft Powerpoint XP or other version
Report writing	Word processor	QTAFI (to produce a table report) Microsoft Office XP

2.1.10   Hardware Requirements

Computer: A current standard computer with 128 MB Ram, 20 GB hard disk and a CD Rom drive (or better a CD Rom Writer) is sufficient to run the necessary applications and to store the data of your survey. Important for all word processing is a big and high quality screen (17" or better 19").

Printer: A black and white laser printer is needed because you will produce much paper in your study. An ink jet or bubble jet printer world be too expensive. A colour laser printer is not recommended because the technology is much more complicated than a black and white one which enlarges the maintenance requirements. And the running costs are much higher. For coloured transparencies you should use an ink jet or bubble jet printer.

2.1.11   Competencies Required in the Survey Team

Besides the team leader, who should be an expert in higher education (subject matter related in case of a tracer study for a specific field of study) and who should manage the whole study the following competencies are required in the team:
- advanced knowledge and many experiences with Microsoft word especially with formatting (the concept of "styles" should be well-known);
- advanced knowledge of and experiences with SPSS (the use of SPSS syntax should be well-known);
- knowledge of basic statistical concept like mean, variance, covariance and correlation, analysis o variance and regression analysis.

2.1.12   Data Analysis

The data analysis should be carried out with the help of SPSS ("Statistical Analysis for the Social Sciences"). This well-known computer programme includes all important methods of data analysis and data manipulation. It is probably the most widespread programme of this type, it is user-friendly, very well described (excellent handbooks are available), and relatively easy to use.

The QTAFI tool will produce some SPSS programs automatically for you, based on the codebook. Especially you will get a ready-to-print tables report more or less automatically.

We have also developed an online-questionnaire system, which provides you not only with the automatic generation of a user friendly designed online-questionnaires but also with simple data analysis at your fingertip (frequencies, crosstabs and graphical result presentation).

2.1.13   How to Read the Handbook

We do not assume that you will perform every step of the study yourself, but you should still read all the chapters in order to realize the problems which could occur in various parts of the study and also the consequences of decisions on the overall success of the project.

3   The Relevance of Graduate Surveys

3.1.1   The Evaluation Context

In order to be able to classify the status of graduate surveys it is necessary to give some explanations concerning the theory, methods, and applicability of the evaluation.

It is obvious that many countries expect that universities have to justify the usefulness of their activities and their funding as well as the entire extent of their effectiveness. At the same time, "accountability" and "evaluation", two words of English origin, are the most important terms.

While the expectation of performance in public sector institutions increases at the same time that "government funding" is expected not to grow, pressure is exerted on financing/spending in many public areas - including universities.

Besides, there are clear signs in many industrialized societies that the state's detailed control of the universities' spending is less stringent, e.g. the state permits the legal exchange of expenditures for personnel and equipment but at the same time judges the effectiveness of universities more strictly. Therefore, the control of the processes, to a certain extent, is replaced by an overall budgeting of resources the magnitude of which, to a large degree, will be determined by the results of the outcomes of the evaluations.

Measures, institutions, and programmes but not individuals and markets are being evaluated. Actually, the term "evaluation" is sometimes used in a way that may also refer to individuals and markets; but in principle it is concerned with the valuation of more or less strategic action by organized units.

Only in cases when it is assumed that *this action is actually directed towards an objective but is more or less beyond perfect control* is an evaluation normally performed. An appraisal of the processes and effectiveness of programmes and institutions was customary even at times when evaluation neither was known as a word

nor as an activity. Quite often terms like "supervision" or "inspection" were used. From the point of view of today's discussion about "evaluation", the term "inspection" might have been less systematic and lasting; but it was supported by the assessment that working methods and the effectiveness of programmes and institutions could well be identified by inspection - just because it had been assumed that these institutions or programmes, to a large extent, were controllable. The use of the term "evaluation" therefore concedes that there are limits to the understanding of events in view of a great complexity of conditions, modes of action, and effects.

Finally, the term evaluation is used more often in contexts where *a certain mistrust* in the success of activities seems to be appropriate. By means of friendly words and various trust-building measures on the part of those deciding on the allocation of resources on the basis of evaluation, it is certainly not possible to abolish the sense of uneasiness of participants about the measures, institutions, and programmes being evaluated. This is also true if, in principle, agreement exists about the expediency or about dominant activities of the evaluation, since even the improvement of evaluation procedures does not completely cancel out the power-controlled influence on final decisions.

As will be shown later, we think that acceptable mutual trust is possible between decision makers and people who are evaluated if the two following conditions are fulfilled:

- the evaluation-oriented analysis should not only measure effects but also provide *feedback* for the actors;
- *as a rule, any far reaching decision on resource allocation should not be effected immediately after the evaluation* but measures, programmes, and institutions being evaluated should be given the chance to make use of their own experience.

3.1.2 Prerequisites of Study

A summary of the existing literature about the evaluation of universities in this context reveals that they typically require four kinds of variables to be differentiated and taken into account:

Prerequisites of study need to be controlled in order not to falsely attribute certain output to the university: for example, the individual prerequisites of the students for the evaluation of teaching methods and courses of study. In the most recent research summary in the U.S.A. concerning the subject "How College Affects Students", Pascarella und Terenzini (1991) emphasize that even in the U.S.A. the differences in professional success depending on the university attended are of minor importance if the differences in the pre-university background are taken into account. At the same time, the authors emphasize that on the ground of the current status of conceptions and methods of university research it would be irresponsible to measure the effects of universities on students without "controlling" their pre-university background.

3.1.3 Resources

Resources, study conditions, responsibilities, etc. of the universities: Important prerequisites for teaching and learning processes, for example, are the spatial conditions of the university, the equipment of libraries and laboratories, the number of students per member of teaching staff as well as the scientific reputation of the teachers.

3.1.4 Processes

Processes within the university, e.g. the teaching and learning methods concerns teaching and learning activities in the lectures, the advice given to students, the participation of students in research, etc..

3.1.5 Outputs and Outcomes

In a restricted sense, this is the achievement of the output desired and, in a further sense, the outcomes or impacts. For the results of teaching and study two differentiations are especially meaningful: firstly, the difference between the actual qualifications of the graduate and the overvalued symbolic nature of the diploma, which means not only differentiating the methods of measuring qualifications but also pointing out the momentum acquired by statements concerning qualifications in diplomas; and, secondly, the difference between the actual results of the studies and the later activities and performances in professional life or in other fields of life which are also influenced by study results. This will be dealt with in detail later on.

Figure 2   Key Variables in the Evaluation of Higher Education
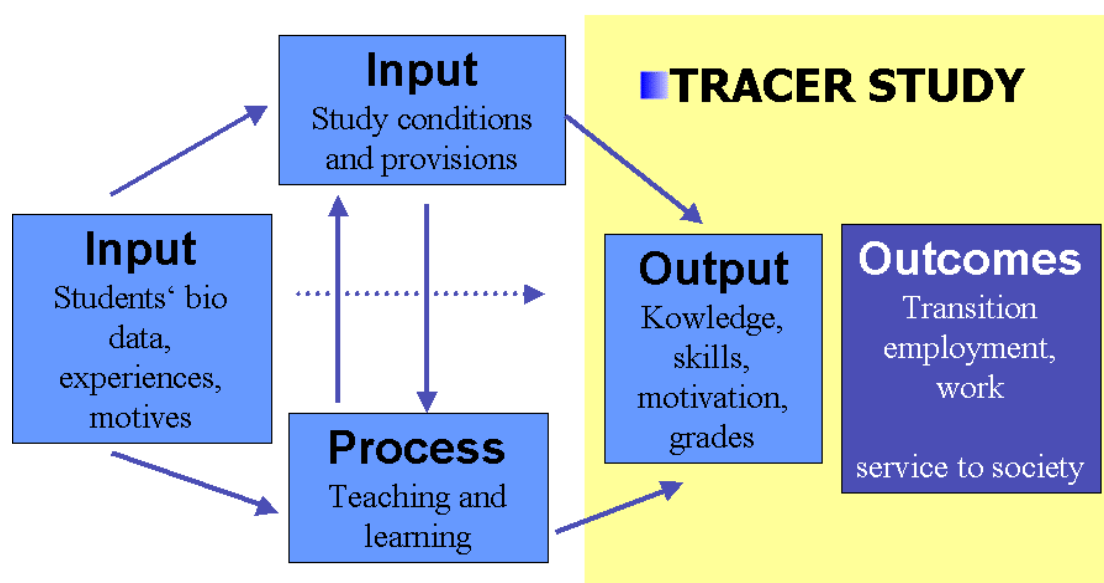
With the term evaluation, a *systematic valuation* is intended that (a) refers to the prerequisites and resources of the unit which is to be evaluated (measures, programmes, or institutions) or to special selected functions of this unit (e.g. the faculty's educational function), (b) refers to the processes (e.g. the conduct of the main actors of these units) and (c) refers to the output either in a restricted sense of the respective objectives or to the outcomes in a broader sense.

It is obvious that graduate and employer surveys, first of all, are important for measuring the output and outcomes of higher education, but they cannot be restricted to

measuring the output only where questions of the effect of higher education and desirable forms of teaching and study are concerned.

In our opinion, restricting these questions to measuring the output only leads to a fruitless research, as with the help of special output criteria universities and individual faculties are merely able to find out their own place in a hierarchy. Thus, they either can accept the results with self-satisfaction or - when publicly embarrassed by the survey - they can seek some kind of improvement. In this case, evaluation studies do not help to respond to the question as to what kind of factors have restricted the output in the past. Supporting and implementing such surveys either assumes that universities know what to do to ameliorate the situation but are usually unwilling to do innovative work. In order to ameliorate the situation it would only be necessary to provide an instrument of public embarrassement - that means surveys which are oriented towards the proof of performance or output only. Or else there is no intention of motivating universities to improve their situation with the help of such evaluation surveys, but instead an instrument is to be provided to those who decide about the allocation of resources for the universities.

Therefore, evaluation surveys which also intend to contribute to innovation in the universities should always include the processes at the universities to the extent that they can help to explain the output.

The indications concerning such weaknesses are not stated here in order to question the quality and the productivity of evaluation surveys in general. The greater the freedom of action of universities or certain programmes, the more evaluation becomes a natural part of the freedom and responsibility of universities. The more efficiency and proof of success is expected for various publicly supported activities, the more important is evaluation. And the more evaluation becomes important, the less the judgement of experts can be trusted; standardized determination of information is necessary.

However, no signs can be detected that the evaluation of universities is developing in such a way that it becomes a science or expert craft in the sense that doctors, for the most part, hope to achieve in their relationship with their patients. In the university system, those people whose performance is an object of evaluation and who will be affected by the results of the evaluation should, to a certain extent, become experts in evaluation . If this is the case, they can provide information for the evaluation, they are better equipped to expertly comment and complete preliminary valuation better, and they also have a better chance to look critically at the results of the evaluation.

3.1.6 Measuring Outcomes of Higher Education

It should be noted that the use of the term evaluation is not standardized. On the one hand, the term evaluation includes all analysis providing information about valuation. On the other hand, the term evaluation describes only the final step of a comprehensive valuation. We will use the term in the more extensive sense of its meaning.

When analysing the output of universities, four methods of gathering information predominate:

Direct measurements, indicators on the basis of existing information, surveys of participants and *expert appraisals*. Naturally, this does not provide a complete list of possible procedures; e.g. observations of teaching and learning processes should be named as well. But the above mentioned four methods of gathering information are the ones mainly used.

3.1.7 Direct Measurements

For example tests of the performance and acquired qualifications, observation of working behaviour, valuation of the results of work. Tests for pupils, for university applicants and also for the admission to certain professions are known from some countries or from some international comparative studies, but hardly any measurements are known for results of university studies.

The best methodological solution, in principle, is the direct measurement of the results of university studies. In view of the variety of expectations that are placed in the university and in view of the difficulty of measuring creativity and the complex field of problem solving ability, attempts to develop methods of measuring results of university studies, in general, have hardly any chance of being accepted by experts and others as being valid. In addition, great effort is necessary to develop such measurements. Finally, the scientific discussion about the value of certificates can be summarized by stating that it is not a perfect measurement of performance that is wanted by the participants, but at best a certain clarity. It is to be expected that interest in developing direct measurements of results of university studies will grow and that this will lead to increased experience in this field.

3.1.8 Indicators

Indicators are relatively easily available measures of phenomena which are connected with the results of the university studies but which, in many cases, do not represent them directly.

If *indicators* are mentioned, one wishes to signal, firstly, that, in general, processes and output are not measured directly but only in indirect ways. Secondly, short and often aggregated information is offered. Thirdly, in many cases but not always "objective" data form the basis. Fourthly, these mainly concern data which are provided anyway and which do not have to be evaluated again but only have to be edited. The advantage of an effortless availability, the "objectivity" and the possibility often connected herewith of comparing different universities is frequently contrasted with the fact that the data remain superficial and indefinite with regard to the construct that is actually being dealt with. It is common practice to provide indicators with some "caveats" concerning the meaningfulness which, however, are forgotten in the analysis. It is possible, though, that the output of graduate and employer surveys provide the basis for building indicators.

3.1.9 Statements on the Part of the Participants

For example: the assessments of the study output on the part of the students and graduates or also by the teaching staff or the employers. Compared to other survey methods, the effectiveness/strength and the ineffectiveness/weaknesses of a survey of the participants can briefly be characterized as middle-costly, middle-systematic, middle-extensive and middle-"profound". As a rule, these surveys can head for the main problems more purposefully than indicators and they are less suggestive/impressionable as regards individual opinions and special experiences than are judgements of experts. It is also important for the conception of such surveys, for the analysis and for the interpretation of the output not to expect too much of the participants, however. As will be shown later in more detail, graduate surveys risk

attributing an unrealistically high level of expertise to the graduates about the correlation between study contents and professional employment.

3.1.10 Statements on the Part of the Experts

For example: evaluation of teaching and its output of "peers". Here, the predominating procedure is to ask respected and independent people or groups of people to analyse the area in question and, besides, provide written information. The strengths of this method are to be seen in the fact that a wide spectrum of characteristics can be noticed and analysed, that the framework of the analysis can be adapted according to the experiences gained in the process of the survey, that the analysis refers to a large spectrum of themes and that, in principle, the judgements can go "deeply" into the subject. The weaknesses, though, are to be seen in the fact that one part of the aspects being dealt with remains superficial, that the subjective elements of the assessment play an important role - as a rule, eminent authorities in certain scientific fields who are intended to lend the evaluation the desired reputation are not necessarily those able to think themselves into the conception of others - and that it is difficult to understand where analysis is well-founded and fair and where it is based on little information and specific outlooks of the experts.

3.1.11 The Content of Graduate Surveys

Some measures of the study output do not necessarily have to be evaluated with the help of the graduates.

However, data and records on study and examinations generated at universities and forming the basis of graduate statistics can also be helpful. Besides, personal files of graduates in employing organizations or interviews of personnel managers or superiors also provide information which are very important for the evaluation of the output of universities.

Conversely, graduate surveys are not exclusively focussed on the output of studies; they may also provide information about all fields of variables which were differentiated before: individual prerequisites for studying, descriptions of the resources/study requirements and the processes of teaching and study. But certainly, these fields can only be evaluated retrospectively; a fact that limits the profundity and reliability of the information.

Questions concerning the satisfaction with studies cannot be assigned clearly to process or result-oriented aspects. Most of the graduate surveys implemented by U.S. universities amongst their alumnis only ask for some biographical data, about satisfaction with the studies from a retrospective point of view and about the professional career in such a way that the professional success generally can be assessed. This *a priori* excludes the possibility of examining whether certain experiences are connected with a certain professional success. It is possible to investigate to what extent the graduates are satisfied with their studies and to what extent they are successful in their job; but the reasons for their satisfaction as well as for their professional success remain a "black box".

Research concerning the employment of university graduates is often accused of subordinating the universities to the requirements of the employment system. It is unimportant whether such research, in a neutral manner, only describes different measurements of professional success according to the field of study, the university attended, the professional main emphasis, etc. or whether it explicitly demands to

support for the professionally promising characteristics of the universities: in both cases, according to such accusations, universities only hold up a mirror reflecting the extent of success or failure.

In our opinion, the autonomy of universities in fixing their targets will not be challenged as long as ignorance survives in universities concerning the destiny of their graduates. The universities should know about the field of tension existing between the results of the studies and their professional reward. This presupposes separate measurements of study results and of professional success within graduate surveys.

Thus, it can be investigated whether certain outputs valued by universities are rewarded by the employment system. Or it can be analysed to what extent professional success actually depends on study results. With the help of such double analysis it can then be investigated whether certain study results are as important as is usually maintained for professional success.

When analysing surveys of university graduates implemented, a large spectrum of subjects will become apparent which may be consulted as measures for the professional success of the study. For methodological reasons, these measures will be classified in four groups:

3.1.12 Objective Measures for the Transitional Period Between Course of Studies and Employment

To these belong, for example, the time of job search respectively the time between graduation and the first regular employment, the number of successful or unsuccessful applications, the period of job search and a longer-lasting unemployment as well as the status and the employment characteristics of the first job.

Interpretations of the significance of such transition-related success diverge. On the one hand, we are convinced that this "delivery" success is of main interest for universities and that data concerning the further professional success are of lower interest as any later decisions, to a high extent, take into account professional experience. Therefore, at the beginning of employment the purest measurements can be obtained about the professional output acquired during studies. On the other hand, the beginning of employment is not always is indicative for using the qualifications acquired during studies: For some graduates working in jobs which do not meet their expectations the first years are atypical; or they may only later correct their career, or other graduates may have to leave their working place even though they managed to find such a job at first. From this point of view, characteristics of the first employment could be taken as indirect measures for professional success, the actual value of which can only be checked by analysing the connection/correlation between the success at the beginning of the employment and the later professional success.

3.1.13 Objective Measures for Professional Success

These include income, the position within the company, etc.

Objective Indicators of Professional Success

- **Transition:** Duration of job search/getting the first regular employment after graduation
- **Quality of the first job**
  - Occupation/job title/position
  - Full-time/part-time
  - Temporary/permanent
- **Quality of the current job (3-4 years after graduation)**
  - Occupation/job title/position
  - Full-time/part-time
  - Temporary/permanent
  - Economic sector
  - Major activity/work tasks
  - Income

3.1.14 Subjective Measures for Professional Success and for the Professional Situation

These include statements concerning the professional satisfaction, the status and reputation and the general characteristics of the profession which are influenced by the ideas of what is desirable for the profession: for instance the chance of utilizing qualifications acquired, the independence of decision-making in work, the possibilities for further professional education, good cooperation with colleagues and the safety of the workplace.

Subjective Indicators of Professional Success

- Overall satisfaction with professional situation

- Satisfaction with different characteristics of employment and work (e.g. work autonomy/content, income and career opportunities)

- Appropriateness of position to level of education

- Extent of use of acquired knowledge and skills

3.1.15 The Assessments of the Relationship Between Study and Profession

As only professional success has been discussed for the above mentioned measures, this part concerns the measures with the help of which the graduates themselves establish the relationship in their statements between studies and employment. In order to give some examples: the extent of the use of qualifications, in general, or the professional utility of particular contents of study.

This type of assessment will be examined in more detail later on. Here, it ought to be emphasized, though, that in some of these assessments the degree of the professional output of academic studies is expressed, e.g.

- in the assessment of the educational validity of professional positions and
- in the general assessment of the extent to which qualifications aquired during the academic studies are used for the profession.

As well as or even better than, for example, income or position, these measures can also be taken as indication of the professional study output. But it is true, too, that they do not include any information about how far academic studies and employment are related to each other - for instance, whether contrary to information, certain knowledge acquired is turning out to be useful for the employment.

3.1.16 Graduate Surveys and Curriculum Development

At the beginning of the eighties, graduate surveys in the Federal Republic of Germany were of considerable interest since in the search for practice-oriented reforms of academic studies, they were expected to allow "derivation" of the requirements of study reform with the help of the analysis of professsional employment. The disappointment of these hopes results in the fact that since then far fewer graduate surveys have been implemented than in the seventies. As typical limitations of the final conclusions of employment analysis for the reform of academic studies we indicated at that time (Holtkamp/Teichler 1983, pp 12):

- vague theoretical and conceptual determination of the term qualification,
- little knowledge about transfer problems,
- different spectrum of understanding of qualification
- inadequate harmony assumption concerning the agreement between education and employment system,
- distorted perception of qualification requirements,
- excessive restriction to the employment market of the statements concerning qualification requirements,
- high status of socio-political decisions when drawing conclusions from the employment about the academic studies.

Therefore, in order to provide interesting and interpretable feedback for the universities, complex approaches of graduate surveys have to be expected in regard to three different aspects:

- in detailed graduates' statements about the relationship between academic studies and employment,
- in the clarification of the affinity between academic studies and employment,
- and in more complex statistical analyses of the relationship of prerequisites, resources, processes and output of teaching and study.

3.1.17 The Graduates' Assessments Concerning the Relationship Between Academic Studies and Profession

In some surveys graduates are asked which of the qualifications acquired in the academic studies they use for their job, which fields of study they consider to be especially useful, for which professional tasks they were appropriately prepared at the university and with regard to which area of responsibility they state a lack of qualifications.

If graduates are asked those questions they are believed to be experts in qualification. As regards precise assignments, this is certainly an overestimation. At the beginning of the seventies, engineers were asked in a survey to estimate in percent to what extent they used in their job their mathematical and natural scientific knowledge, their technical and non-technical knowledge and to compare the percentages with the respective parts of the studies; from the discrepancy between the given percentages it was concluded which parts of the studies had to be reduced and which had to be extended. But this kind of procedure has not been accepted as it certainly did not help to structure the qualifications.

On the whole, it has to be emphasized that the graduates are able to assess the use of the qualification acquired during their academic studies better the greater the correspondence between the knowledge acquired and the professional work. Insofar, we think it justifiable to ask about the professional use of certain subject areas of the academic studies.

3.1.18 Clarification of the Affinity Between Academic Studies and Profession

Analyses of results of academic studies often aim at vertical differences: this mainly concerns ranking lists. The term "differentiation" which is used in educational science to describe the simultaneity of vertical and horizontal variety of education instead of clearly distinguishing the different types vertically, degenerates into a catchword for vertical differences in the relevant university debate. Horizontality, most of the time, is registered only as absence of differences of vertical measures.

Genuine measuring of horizontal differences only occurs when the affinity between the special emphasis of teaching and academic studies in the respective department and the professional fields of employment and corresponding tasks is examined. a university or a department may only be called successful if many of their graduates undertake professionally related duties - even if they are not linked to the highest status.

3.1.19 Complex Data Analysis

Finally, data analysis is necessary in order to indicate the *relationship between requirements and processes of teaching and academic studies* on the one hand and *results of studies and professional success* on the other. It is only now in Germany that multivariate procedures are becoming indispensable as regards research on higher education. Therefore, the question can be asked: Which characteristics of study programmes and study requirements are the most successful in view of the final degree and the professional career.

It is disillusioning, though, to compare this kind of surveys with the predominant discussions about the reasons for the success of academic studies and professional success. It can rarely be proved that individual factors have strong influence on the

success of studies or on professional success. Many popular hypotheses are losing their basis because the actual influence seems to be so marginal that respective efforts for forming teaching and study programmes can be considered to be more or less unnecessary.

The fact, that, firstly, outstanding factors of the results of academic studies cannot be determined and that, secondly, a relatively high number of characteristics of study programmes and requirements shows little influence and differs according to subjects and type of institution of higher education seems to limit the importance of graduate studies, as they do not provide any convincing feed-back for the academic studies. Here, though, the messenger should not to be punished for the news: It should be noted that every effort to structure the study programmes is only effective to a limited extent.

3.1.20 Employer Surveys

As a whole, employer surveys are not conducted as often as graduate surveys but their variety of main themes is hardly any smaller. Examples can be given of such surveys aiming at determining the quantitative need for academic graduates, the recruitment criteria and procedures, the popularity of certain universities among the employing organizations, and the requests concerning the structure of the courses of study.

The term "employer survey" has consciously been chosen vaguely. It concerns people who do not belong to the generations of graduates whose professional situation is to be evaluated, but the persons who participate in the decisions concerning the professional destiny of those generations of graduates. According to the aims of the survey, management representatives, superiors of the graduates or representatives of personnel departments are questioned.

In the context of graduate surveys it must be asked what kind of complementary inputs can be furnished by employer surveys. Five such inputs can be systematically differentiated:

(a) Employers can give information about themes which are hardly available to graduates. This, for example, concerns the quantitative and qualitative need for graduates as well as recruiting procedures.

(b) Some information, in fact, can be given by graduates but better information can be provided by employers. This, for example, concerns the information about personnel and the income structure. However, the information given by the graduates often serves the purpose of the survey sufficiently.

(c) Representatives of the employers and of the graduates may have different experiences concerning the same subjects but can still give the best information from their own point of view. That is why, for example, employers know better how they should treat personnel of whom they are in charge and how they actually treat them. On the other hand, graduates possessing certain qualifications provide the best information about how they themselves are treated by their superiors.

(d) When aiming for a reciprocal review, the same kind of questions can be asked of representatives of the employers and of the graduates. In this case, it is supposed that the perceptions of both groups are only partially valid and that the validity, as a whole, can be assessed to a higher degree if both statements correspond to each

other. This, for example, applies for questions about the kind of qualification that is necessary to manage certain professional tasks.

(e) Finally, statements from either side can be both valid and complementary. Thus, there can be a demand for comparing the evaluation of the representatives of the employers with that of the employees concerning the development-policy goals of the production or the services of the company. This may be founded on the assumption that a high degree of correspondence leads to more performance as well as on the assumption that the responsibility of the graduates is especially high in case no such agreement exists.

According to the formulation of the questions, the selection of the employing organizations which are to be examined will be connected with the selection of the graduates or will be undertaken independently. If, for example, an evaluation is planned of the overall reputation of a university existing amongst employers of the region, a selection of organizations must be made no matter whether they employ graduates of the respective university or not. If the survey covers the employers' opinion concerning the ability of a particular university's graduates to solve problems, only organizations which employ graduates of this particular university should be included.

However, the way that is finally followed for complementary evaluation depends on practical circumstances. If no addresses of graduates are available and if only a small number of possible employers is known, a trade directory may be helpful to get into touch with employers and graduates. More often, though, it is preferable to contact graduates by letter (either by using addresses available at the end of their studies or by later addresses if contact is kept with the former students, e.g. over alumni associations) and to send them the questionnaire including the request to write down the address of the employing organization.

3.1.21 Objectives and Methodology of Tracer Studies

As can be summarized, graduate surveys provide manifold information for universities, for students or for sponsors of universities or of particular programmes in the university area.

During the last years, the *evaluation* of the output of universities may have become the main object of graduate surveys, but a whole spectrum of other goals can be added: from evaluating the need of the university's own graduates for further education to maintaining contacts with and between the former students.

At the same time, graduate surveys have the advantage of securing a systematic information input by standardization and representative determination of the output without having to rely on the construction of a permanent information system. This is a very important advantage in countries on the verge of industrialization and in developing countries.

Graduate surveys can show a considerable variety of content. For example, they by no means have to postulate that study success is proved by professional success only. Discrepancies between study success and professional success and their reasons - e.g. as a result of specific motives of the graduates or of unfavourable regional employment markets - may themselves be the object of the survey and of the analysis.

The studies can include *long periods of the educational and professional biography*, evaluate *assessments and facts*, choose a *mixture of high standardization and open questions*, and they can contribute to explaining instead of measuring the output of

universities in a one-sided manner. The last aspect is of particulary high importance as many evaluation surveys only intend to examine the different measures of success, but without offering help in improving the universities' situation.

> *Graduates surveys are a kind of systematic analysis of the university, the implementation skills for which can be acquired by university staff members of different professional provenance and functions.*

Problems in the acquisition of such skills are not to be underestimated; for many graduate surveys it can be stated, for example, that problems of a systematic formulation of questions are not sufficiently coped with, that the choice of the subjects of the questions does not sufficiently refer to the goals of the survey, that the graduates were not sufficiently motivated to participate, that the used methods of data analysis are far below the potentials and that the interpretation does not take into account the possibilities and limits of the information evaluated. On the other hand, there are also many examples showing that specialists of particular departments and professional areas who are not experts in theory and methods of such surveys have carried out demanding and interesting graduate studies.

In order to exploit this kind of potentials of graduate surveys more easily we have developed this handbook with practical tools and recommendations.

> *This instrument is meant to reduce work in areas where it is not necessary to invent the wheel once again.*

In cases in which your own ways are chosen according to particular goals of the survey and according to particular regional conditions, you will receive detailed indications and advice.

As, on the whole, the debate about chances and problems of the evaluation demands more competence in this area of the staff members of higher education institutions, it is assumed that the interest and the competency for such studies will grow.

Occasionally, the evaluation seems to ossify to become an - unequal - dialogue between sponsors of higher education institutions or selected programmes and people responsible at the universities. At the same time, the criteria of research output are often granted disproportionately large scope. Graduate surveys refer to the status of teaching and study, and with regard to the graduates they concede a qualified voice in the evaluation to those who, in a special fate-determining manner, experienced the advantages and weaknesses of supply and conditions of the higher education institutions. That is why a more frequent implementation of graduate surveys and a higher status of those studies in the framework of evaluation seem to be appropriate despite all limitations indicated above.

4   Objectives of Graduate Surveys

No doubt, preparation of students for future employment is generally conceived as one of the major functions of higher education. With this respect information as regards the relationships between higher education and employment are seen to be important.

But there are some systematic reservations regarding information on higher education and employment as a key theme in information and assessment as well as a key area of concern in higher education management.

Especially three arguments/questions should be considered:

- To what extent are information on the relationships between higher education and employment *relevant for practical improvements* in higher education?
- Do investigations of the relationships between higher education and employment lead to the *subordination* of the higher education system to the employment system?
- Is it possible to conduct graduate and employers survey in all countries (*feasibility*) taken into account the risk of a low return rate of questionnaires.

4.1.1 Practical Relevance of Information From Tracer Studies?

Can information regarding the relationships between higher education and employment really provide guidelines for improvement in higher education? This questions leads to the consideration of nearly all phases of such surveys, but especially to the objectives of the surveys, the content of the survey instruments, the kind of data analysis and the report of the survey results.

Based on the analysis of a few hundreds of graduate surveys, we suggest in this handbook a careful design of graduate surveys both regarding the thematic areas to be included and regarding the methods and procedures of surveying.[1]

In general, graduate surveys are most popular for the analysis of the relationship between higher education and work because they allow to combine five major approaches:

- a look on labour market issues, i.e. quantitative-structural data on employment and career;
- more in-debth view on the character of work and related competencies;
- a direct evaluation of study conditions and provisions bases on the experiences of the graduates;
- an understanding of the values and orientations of the graduates, and finally;
- the collection of information on retrospective views on higher education.

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[1] As examples of complex and sophisticated graduate studies, we like to name L. Solmon et.al. *College as a Training Ground for Jobs*. New York: Praeger 1977; J. Brennan et al. *Students, Courses, and Jobs*. London: J. Kingsley, 1993; H. Schomburg and U. Teichler. "Does the Programme Matter? Approach and Major Findings of the Kassel Graduate Survey", *Higher Education in Europe*, Vol. 18, No. 2, 1993, pp. 37-58.

Table 2   Objectives of a Tracer Study
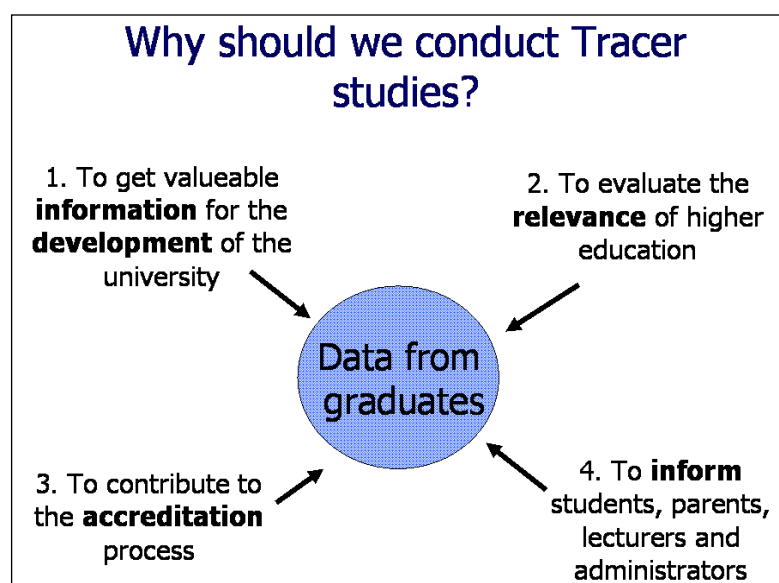
4.1.2   Labour Market Signals: the Employment Situation

Graduate surveys provide rich experience about the *whereabouts of graduates*, which might help to broaden perspectives among administrators, scholars and students. Such information like the income, economic sector, job title, working time, duration of search for the first job, methods of job search are relevant for higher education institutions to note

- the variety of employment and thus the possible range of its preparatory tasks;
- the regional spread of its graduates, the careers successes, etc.;
- key labour market information;
- the transition process from higher education to employment:
  How do students seek for employment?
  How are they informed and supported in the search process?
  How and do employers recruit, and what are the prevailing criteria? What are the timing and duration of these processes?
  What are the conditions for transitional employment and other activities?

4.1.3   Co-operation/Contacts with Alumni

In addition, such a tracing of graduates might help establishing co-operation/contacts between higher education institutions and their alumni.

- Co-operation/contacts with alumni
- Do the institutions of higher education keep in touch with graduates?
- Do alumni play a role regarding graduate employment?
- Do alumni play a role in providing a feedback for curricula, teaching and learning, services, etc.?
- Do alumni are interested in professional training provided by the alma mater (alumni as clients)?

4.1.4 Work Task and Competencies

Graduate surveys should not be restricted to typical labour market measures, such as economic sector and occupation group as well as status and income. They should also inquire about the *kind of work tasks, the relationships between study and work, and professional values and job satisfaction.*

Past surveys have shown that labour market indicators as such provide a narrow and conservative view about the possible impact of higher education on employment and work.

Large proportions of graduates not employed in occupations obviously requiring a degree might report that they are in charge of demanding work, reached an appropriate status, and utilise the knowledge on the job which they acquired during the course of study. We also note that a considerable proportion of graduates opt for task low in status, but important according to their values and/or for the development of a society.

Information on the character of the occupation and the kind of work tasks are a richer source for curricular innovation than mere labour market data. Such kind of information might stimulate thoughts about the strengths and weakness of the training of specific skills, emphasis on broad knowledge, socialisation and personality development, etc.

4.1.5 Issues Regarding Curricula and Preparation for Work

- In which way do students learn a systematic confrontation of academic ways of thinking and professional ways of problem-solving?
- How broad or narrow is knowledge fostered in individual degree programmes in comparison to occupational tasks or major occupations?
- What are the experiences with special implemented measures to implant occupational experiences into the study process (for example phases of work experience, practitioners as part-time teachers, etc.)?
- What are the outcomes of curricula aiming to create new types of learning and qualification and to prepare for newly emerging type of occupation and work tasks?
- What are the retrospective views of the graduates on higher education based on their career experiences?

4.1.6 Higher Education and Atypical Careers:

- In which ways does graduate employment outside the careers typically viewed as "appropriate" might serve innovation in economy and society?
- Do we observe trends towards new ways of division of labour?
- To what extent do graduates active in those areas consider their education and training as a wastage or an opportunity?

4.1.7 Implications for Higher Education Management

- What do the concepts about the institutional mission mean regarding the relationships between higher education and employment?
- In which ways are relationships between higher education and employment considered in key planning and management decisions?
- What role do they play in monitoring and evaluation?

- Are there central mechanisms and services improving links to the employment system?

4.1.8   Subordination of the Higher Education System?

The need for information in the relationships between higher education and employment is sometimes advocated by persons with the policy in mind to subordinate higher education to the presumed demands of the employment system. Admittedly, claims about graduate employment, careers, income and work tasks frequently have served utilitarian and narrow vocational policies.

Such kinds of policies, however, as it can be shown in several cases, have very restricted perceptions and misinterpretations of the relationships between higher education and employment. Strategies and methods to collect more complex information as it is proposed in this handbook is likely to support more appropriate concepts and policies.

On the other side, the misuse of information gathered by graduate surveys doesn't lead to assumption that higher education will be more successful in serving a broad range of functions, if those responsible for administration and teaching are badly informed about impacts of higher education and graduate employment and work.

On the contrary, lack of information in this respect tends to reinforce simplistic views about the relationships between higher education and employment, which, in reality, lead to increased pressures on higher education institutions to serve the employment system in a narrow way.

4.1.9   Feasibility - How to Reach a High Participation Rate?

In general, feasibility is according to our experiences not a real problem. We assume that it is possible to conduct a tracer study successfully in all countries. But of course the conditions might be very different and so the efforts to be undertaken and the related costs.

Looking to conducted studies we see a very broad range of response rates (from 0 to nearly 100 %). It is not meaningful to calculate an average response rate, because the means of the distribution of questionnaires are too different. In some countries the use of the mail system is impossible and all questionnaires must be delivered personally, which increases the costs for such a personal administration dramatically compared to a mailed questionnaire. Usually the reported response rate for such methods of delivery is very high (80-90%). Only very few graduates will really refuse to participate in a graduate survey. On contrary, according to our experiences many graduates are surprised that their university is interested in their experiences, attitudes and proposals and really like to answer the questionnaire.

Sometime no addresses at all are available and the first step of the survey is to ensure that graduates could be traced. For such basic tracing of graduates different methods could be used:

- Newspaper, internet, radio or television advertisement
- Internet search
- Snowball techniques.

For further details see below.

5 Concept of the Study

5.1.1 Overview

The decisions you have to make in the first stage of your project (duration: about four months) are very relevant for the whole project.

For key elements of any study should be considered
1. The objectives of the study?
2. The target population; which graduates should be asked?
3. Which other data will accomplish the graduate survey?
4. Which survey instrument will you use?

In the process of development of the design of your study you might find it necessary to redesign some elements you have designed already. For example, the objectives of the study might lead you to the decision to include graduates from the last 10 years. But taken into account the difficulties to approach the graduates you will find it possible to include last five years of graduates. So you must redefine your objectives.

To make you aware of the wide range of possible graduate surveys read the following descriptions of some studies.

Example 1: Europe and Japan; European Graduate Survey (CHEERS project)

Key design elements of the CHEERS project:

- A representative survey of about 40,000 graduates (about 3,000 each from 12 countries) who had graduated between autumn 1994 and summer 1995.
- Cross-sectional survey
- 1995 cohort of graduates of institutions of higher education
- Graduates were asked three to four years after graduation
- At least 3-years-study programs
- Only first degree (e.g. Bachelor, Diplom, Laurea)
- About 3,000-3,500 graduates in each country
- Interview surveys with graduates and employers: Totally about 400 interviews with graduates and employers, selected topics of higher education and work.
- Duration of the Study: December 1997 to July 2000
- The studies in 9 countries are funded by the EU (TSER) and 3 countries have conducted parallel studies
- Partner: 12 countries, 13 research institutions

Austria Prof. Paul Kellermann, Institut für Soziologie, Universität Klagenfurt

Finland Prof. Osmo Kivinen, Research Unit for the Sociology of Education (RUSE), University of Turku

France Prof. Jean-Jacques Paul, Institut de Recherche sur l'Economie de l'Education (IREDU), Université de Bourgogne

Germany Prof. Ulrich Teichler and Harald Schomburg (Co-ordinators), Wissenschaftliches Zentrum für Berufs- und Hochschulforschung, Universität Gesamthochschule Kassel

Italy Prof. Roberto Moscati, IARD Istituto di Ricerca, Milano

Norway Dr. Per Olaf Aamodt, Norwegian Institute for Studies in Research and Higher Education (NIFU), Oslo

The Netherlands Dr. Egbert de Weert, Centre for Higher Education Policy Studies (CHEPS), University of Twente; Dr. Rolf van der Velden, Research Centre for Education and the Labour Market, Limburg Institute for Business and Economic Research (ROA), Maastricht

Spain Prof. José-Ginés Mora Ruiz, Instituto Valenciasno de Investigaciones Economicas (IVIE), Valencia

United Kingdom John Brennan, Quality Support Centre, The Open University (OU), London

Parallel studies

Japan Keiichi Yoshimoto, Faculty of Education, Kyushu University and Japan Institute of Labour

Czech Republic Dr. Pavel Kuchar, Institute of Sociological Studies, Charles University, Prag

Sweden Dr. Gunilla Bornmalm-Jardeloew, Dept. of Economics, Göteborg University

- Additional graduates included in some countries
- Additional cohort 8-10 years after graduation in two Japan and the Netherlands

Example 2: Germany, The Kassel Panel Study

Field of study	1.Mechanical engineering 2.Social work 3.Economics/business
21 Institutions of higher education	• Fachhochschulen • Gesamthochschulen • Universities
Panel study with four waves	1.1983-1985 during the examination phase (N=2000) 2.1986-1987 2 years after graduation (N=1600) 3.1988-1989 4-5 years after graduation (N=1400) 4. 1995 10 years after graduation (N=1300)

Additional research methods	• Analysis of 21 institutions of higher education
	  Expert interviews with deans, lectures and students; analysis of documents
	• Analyse of regional labour markets
	  Interviews and document analysis

Example 3: Tanzania; Graduate and Employer Survey of the Faculty of Engineering (FoE) at the University of Dar es Salaam (UDSM)

As an example for a relatively comprehensive study can be seen the graduate and employers' surveys of the Faculty of Engineering (FoE) at the University of Dar es Salaam (UDSM). For the first time a survey was carried out 1985. It was aimed at getting an empirically founded feed-back on the appropriateness of the education provided at the FoE, the job and employment situation of the engineering graduates of the FoE, and the qualification requirements of the employment sector. Following one of the recommendations of the 1985 graduates and employers survey, the Faculty decided to carry out further follow-up studies within every three to four years.

The second survey was conducted 1989 with the following main objectives:

- to collect information on placements/misplacements and employment patterns of FoE graduates;
- to get a feedback about the appropriateness of FoE's programme of study as a training for various kinds of employment actually followed by the FoE graduates;
- to obtain the opinions of employers of FoE graduates concerning the capabilities expected when recruiting young graduates;
- to open up possible sources for recruiting teaching staff from amongst FoE graduates having gained professional experience in the country;
- to update a computer based directory of FoE graduates and employers which would facilitate future contacts as well as follow up studies.

Themes of the Graduate and Employers' Survey of the Faculty of Engineering (FoE) at the University of Dar es Salaam (UDSM)

Graduate Survey
1. *Student input*: Age; sex; marital status; home district; entry qualifications; motivation of study;
2. *Assessment of studying at FoE and "output" of the study*: workshop training and practical training; qualification of lecturers; allocation of students to departments at the very beginning of the study; changes in the first year's course content; specialisation in the fourth year; qualifications acquired at FoE; academic division of degree obtained; usefulness of the study;
3. Transition into employment: method applied to get a job; results of manpower allocation;

4. Employment situation: type of organisation; economic sector of employment; designation level; remuneration and fringe benefits; main activity; time spent in present position/with present employer; job satisfaction; adequacy of present employment; job aspirations; problems in adjusting to work; interest in self-employment; interest in lecturer job at FoE;

5. Professional development: previous jobs and reasons for change; experiences with unemployment; membership in professional associations/institutions;

6. Further education: undertaken postgraduate further education and professional training; reasons for further education; preferences in further education also with regard to courses to be offered at the FoE; interest in postgraduate studies at FoE.

Employer survey

1. Characteristics of the covered employers: type of organisation; economic sector; number of employees; qualification structure within the organisation (ratio of artisans : technicians : engineers); number of engineers with membership in professional organisations;

2. Recruitment of engineering graduates: methods of recruitment; results of the manpower allocation procedure; recruitment criteria.

3. Main activities of engineering graduates

4. Qualifications of FoE graduates: professional qualifications; interpersonal and interactional skills; qualifications compared to other engineering graduates; criteria for the judgement of the performance and the promotion of engineers;

5. Practical training (PT) during the study at FoE: assessment of PT as integral part of the curriculum; distinction between PT1 and PT2; provided facilities (kind of provided support; number of PT places offered);

Further education: kind of provided professional training after graduation; awareness/use of IET Note No. 1 and the IET Practical Training Directory; awareness of the Professional Development Courses at the FoE; intended changes in technology; future needs in engineering education.

The graduates questionnaire with its over 70 questions (approximately 330 variables/data) is rather extensive; the employers questionnaire with 30 questions (about 170 data) was designed significantly shorter.

The aim was to reach *all* graduates in civil, mechanical, electrical as well as chemical and process engineering from the founding of the FoE to date (about 1300 graduates who finished their studies between 1977 and 1988) and their respective employers.

Due to the lack of a graduate directory, the only way to reach the FoE graduates was to contact organisations and companies most probably employing them. On the base of lists of organisations (public as well as private ones) the questionnaires were distributed in person by staff members of the FoE to employers and graduates. Altogether, 653 graduates out of the total of 1,300 could be contacted this way and 585 completed questionnaires were given back to the Faculty. This corresponds to 41 percent of the target group; the result is within the range of comparable studies and can be regarded as sufficient considering the difficulties in contacting the graduates. It seems remarkable that nearly all of the graduates who had a questionnaire in hand completed it (89 percent). Of the total number of 1,100 potential employers, 283 were issued the questionnaires which finally resulted in 239 completed ones. This corresponds to 22 percent of the target group.

Example 4: Indonesia; Graduate and employer's survey of the Institute Technology Surabaya (ITS) - Polytechnic Shipbuilding (1992)

This study was carried out 1992 mainly in the region of Surabaya, Java, comprising the graduates (1990-92) from Institute Technology Surabaya (ITS) - Polytechnic Shipbuilding and their employers. The objective of this study was to get more information of the performance of the Polytechnic Shipbuilding graduates in order to improve the education especially regarding curriculum and syllabi development.

Questionnaires both for graduates as well for employers were developed, each with about 20 questions (two pages).

The low participation rate of 23 graduates (out of about 300) and six companies show typical practical difficulties in carrying out such surveys. First the project team from ITS tried to get a feedback from their graduates with a mailed questionnaire - this experience failed totally with the response rate of zero. It was necessary to contact personally the graduates via their respective employers.

Source: Regional Conference with University Teaching Staff in Asia: Quality, Relevance and Efficiency in Higher Education. Bonn: Deutscher Akademischer Austauschdienst, 1995.

5.1.2   Design Elements

From the examples above we can find 10 key design elements of graduate surveys which must be considered in every survey:

1: Regional level
2: Field of study
3: Type of institution
4: Reputation or quality of the institution of higher education
5: Type of degree
6: Number of institutions of higher education
7: Number of cohorts
8: Time after graduation
9: Length of questionnaire
10: Data collection method

Table 3   Design Element 1: Regional Level

Level	Comparison with units on the highest level	Remarks
Individual university or faculty	Not possible	Only within university/faculty comparisons possible
Region with one country	Universities/faculties	High number of graduates from each university/faculty required
Whole country	Universities/faculties	High number of graduates from each university/faculty required
Continent	Countries	Very seldom; high number of cases by country needed

To conduct a tracer study in a country with big differences in the employment conditions and the study conditions and provisions at the institutions of higher education by region a relatively high number of graduates are required to participate in the survey. Suppose we would need a random sample of 1000 graduates to get a representative sample for one country with no differences between regions. Than we would need a sample of 4 X 1000 = 4000 in a country with four different regions to be

able to systematically control for the effect of region taken into account all the other relevant factors.

Table 4   Design Element 2: Field of Study

Unit	Comparison with units on the highest level	Remarks
Single	No comparison between field of study	Even for fields of study with very few graduates possible
Some different	Comparison between fields of study is the focus of the study	High number of graduates from each field of study is needed
All	Some comparisons between big fields of study	Only for fields of study with many graduates possible; but recommended for country studies

For a representative random sample of graduates from one country it is not recommended to delete fields of study with low number of graduates. Although the low numbers will not allow to present meaningful findings on a very disaggregated level (like field of study by institution of higher education), these small field must be integrated in the sample. If not, the sample for the whole country is not any more representative.

Include not only the big fields of study

Table 5   Design Element 3: Type of Institution

Unit	Comparison with units on the highest level	Remarks
University	No comparisons between type of institution	Relevant
Polytechnic	No comparisons between type of institution	Relevant
All	Comparison between type of institution	Recommended for country study

It depends on the system of higher education in a country which types are relevant. For international comparison we recommend to take into account the actual definition of "tertiary education" of the regular OECD study "Education at a Glance" (http://www.oecd.org).

Table 6   Design Element 4: Reputation/Quality of the Institution of Higher Education

The reputation or the quality of the institutions of higher education included might be differentiated between high, medium, and low and measured according the number of lecturers with a higher degree (Master's or PhD). In some countries reputation rankings are available based on different surveys and sometimes published by newspapers.

Table 7   Design Element 5: Type of Degree

Type of Degree	Focus	Remarks
Only one first degree (like B.Sc.)	No comparison between degrees possible	Most relevant for retrospective evaluation
Only a second degree (like M.A.) or higher	No comparison between degrees possible	Not recommended, because comparisons are not possible
Different degrees	Comparison between degrees possible	Aggregated (overall) findings are not very meaningful; different cohorts!

A mixture of degree levels in an individual graduate survey is more difficult to handle.

It gives you the possibility to compare the relevance of a second or higher degree but a lot of questions must be asked twice for the different study experiences. Also the age and the cohorts of the graduates are different which effects the interpretation of the results.

Example: If you want to asses the effect of a Master degree in the year 2005, which cohorts should be included in the survey?

1. Graduates of the year 2000 asked five years later; some of them got a Master's in the meantime. With this design you control the cohort of first degree graduates, but the labour market situation of the time of job search might be different.

2. Graduates with a first degree received in the year 2003 and graduates how received their second degree in the same year. With this design you control the labour market situation, but the age and the year of the first degree are different.

> *In a situation where the labour market changes rapidly the second approach is recommended.*

Table 8   Design Element 6: Number of Institutions of Higher Education

Unit	Focus	Remarks
Single	No comparison between institutions of higher education possible	Typical institutional tracer study
Some different	Comparison between institutions of higher education possible	The comparison of institution (with one field of study) is the focus
All in one country	Some comparison between institutions of higher education possible	The number of graduates from one institution is sometimes too small to compare institutions

A comparison of institutions on the institutional level of aggregation (e.g. the average income of all graduates from one institution) is seldom meaningful if we have labour markets which are different for graduates by field of study and region.

> *At least the field of study should be controlled to compare graduates between institutions of higher education within the same field of study.*

Table 9   Design Element 7: Number of Cohorts

Unit	Focus	Remarks
One	No comparison between cohorts	The survey must be repeated regular to get trend information for different cohorts

Many	Comparison between cohorts are possible and should be done	Aggregated findings for all graduates are sometimes misleading if big differences between the cohorts are existing (e.g. regarding income, duration of job search)

It is feasible to include only one cohort: this will be of advantage as you will have a relatively homogenous group in view of the year of graduation; but you will have to take into account the fact that you do not receive any information about the further professional career. This is very unfavourable when implementing a survey of graduates who finished their studies only recently, for the results of the survey may possibly be influenced to a high extent by the chosen time of the evaluation.

If you include only one cohort the presentation of findings is not much easier than with many cohorts. With many cohorts we have always doubts if the presented findings are true for all the cohorts in the same way. Especially all employment related indicators are influenced by the specific labour market situation at the time of graduation and by the length of employment experiences. The younger cohorts might face a complete different situation than the older cohorts and the therefore the presentation of the overall findings can be misleading.

But with the inclusions of some cohorts you can try to find trends which are very interesting results if you can explain them with background information of changes in higher education or in the labour market. The cross-sectional study including several graduate years permits a far more expressive statement about the integration in the employment system and professional experiences.

In case several graduation years are included in the survey, their answers will be compared and besides being able to make statements about the various years, you will as well be able to ascertain whether there are any differences between them and the extent of those differences. With the help of this kind of comparison, for example, you can try to examine if changes in the curriculum which had consequences for particular years only were actually significant for the career.

If you conduct a graduate survey for the first time you should try to include the last five cohorts.

According to the examination system and study structure, you will have to decide from case to case which graduation years should be included in the survey.

Table 10   Design Element 8: Time After Graduation

Time After Graduation	Focus	Remarks
Six months	Transition	Not recommended because no work experiences of many graduates
One to two years	Transition and first job	Recommended; even the transition process can be asked retrospectively
Three to five years	Early career	Recommended; even the transition process can be asked retrospectively
More than five years	Career paths	Very difficult to get the addresses of the "old" cohorts

We recommend to include only those graduates in a graduate survey who have already some real work experiences.

Fresh graduates in many countries have search period for the first job of half a year. Then they start with specific tasks in which they have to learn to cope with the work requirements. Mainly it is a situation of training on the job, but sometimes formal training programmes are offered to the graduates.

Therefore we recommend to select for the target population of your survey only graduates which have graduated at least one year before. In most of the tracer studies graduates one to five years after graduation are included. Typically the response rate from "older" graduates is much lower than from the younger ones, because it is much more difficult to trace the old graduates.

As the questionnaire aims at the studies as well as at the professional activity of graduates retrospectively, the studies should not have been completed too long ago but nevertheless the graduates should have been able to collect professional experiences meanwhile.

Include graduates who finished their studies at least a year ago.

Table 11   Design Element 9: Length of Questionnaire

Length of questionnaire	Focus	Remarks
Short (1-3 pages)	Very limited, mainly employment	Not recommended
Medium (4-10 pages)	Some topics	Minimum
Long (10-20 pages)	Many different topics	Recommended

Taking into account the amount of difficulties to conduct a tracer study and the amount of necessary variables which should be considered to get meaningful results it is strongly recommended not to use a short questionnaire of one to three pages.

The unit costs of information from the graduates are much higher for such a short questionnaire than for a long one.

But would not a long questionnaire of 10 to 20 pages decrease dramatically the participation rate in our survey? According our experiences this is not the case! The participation rate depends very much on factors from which the length of the questionnaire is only one element. On the opposite it can be argued that a very short questionnaire tells the graduates the story that the university has very limited interests in the feedback from the graduates!

Develop a questionnaire with about 12-16 pages.

Table 12   Design Element 10: Data Collection Method

Method	Remarks
Personal interviews	Very time consuming and costly is many graduates should be included
Personal administration	Only necessary if no reliable mailing system is existing
Mail survey	Effective measure if addresses are available; main method
Telephone survey	Sometimes used
Email survey	No experiences up to now
Online survey	No experiences up to now; most efficient method if the

	graduates have fast internet access and there email addresses are known

Written standardized surveys are easily implemented and generate low costs in case of postal distribution. Also, the data analysis can be carried out easily and takes little time only.

By far the most graduate studies have used written questionnaires for survey instruments.

The second important method is interviews (personal or telephone).

Interviews were mainly used in the following cases:

a) When too little participation was expected from postal distribution (the visit of an interviewer/researcher intensifies the social pressure to respond to a questionnaire);

b) When the completion of the questionnaire by the interviewee would be too difficult or too poor (in this case, the interviewer is looked on as a teacher);

c) When too little knowledge exists about a subject area to be able to develop a standardized questionnaire (the interviewer/researcher enlarges his knowledge).

As graduate surveys are always directed at higher education graduates who are familiar with reading texts and completing forms and as a lot of graduate surveys have been implemented, only (a) remains as a possible reason for the decision to use interviews instead of carrying out written surveys.

> *Use the form of standardized written questionnaires as survey method (distributed by mail, email or as an online questionnaire).*

The questionnaires in the appendix were designed for use in written surveys. It is certainly possible, too, to deliver them by an "interviewer" personally and to either collect the completed questionnaire after a certain time or to be present when it is completed.

In any case, the questionnaires are not meant to be read aloud to the interviewee and to be completed by the interviewer.

If you intend to use interviewers, they have to be trained thoroughly.

The training of the interviewers is absolutely necessary as they have a strong influence on the answers of the examined graduates (see below).

5.1.3 Other design elements

Other relevant design elements related to attributes of the institution of higher education can be:

- The reputation of the institution of higher education (high, medium, low);
- The size of the institution of higher education (big, small);
- The age of the institution of higher education (old, young);
- The ownership of the institution of higher education (public, private);
- The range of fields of study (broad, small);
- The location of the institution of higher education (urban, rural).

5.1.4 Sampling or total population of graduates?

In general the *target group* (or target population) in graduate surveys of individual subject areas of a single institution of higher education is the *total population* of

graduates, in other words the aim is to achieve the participation of nearly all graduates in the survey.

If there is a very high number of graduates, only a partial group should be consulted in order to limit the expected costs (sampling).

As in most of the cases in institutional surveys the number of graduates is relatively low, we shall not go into details of procedures of sampling. In fact, even if you tried to get a response from all graduates of an individual cohort (= year of graduation) you will be confronted with a response rate below 100 %. Very often the response rate is below 50 % and sometimes even below 25 % - regardless you did a sampling before or tried to include all graduates.

Try to include all graduates of an individual cohort – no sampling.

5.1.5 Regular Graduate Survey

The objective should be to understand the evaluation/feed-back as a permanent process, for the conditions/requirements of study courses are permanently changing.

If graduate surveys are implemented regularly, valuable time-oriented reference data are revealed.

When taking the decision concerning the time interval for the implementation of graduate surveys, consideration should be given to the question of which graduation years are to be included.

Graduate surveys should be implemented regular or at least should be repeated.

If you like to conduct a graduate survey every year than you might include only one cohort of graduates (e.g. graduates asked three years after graduation). But if you like to conduct a survey every three years you might decide to include three cohorts of graduation year to cover the whole population of your graduates. In all these cases a graduate is asked only once.

5.1.6 Cross-Sectional or Panel study?

By far the most graduate surveys are cross-sectional studies: a population of graduates is asked at one time point only. Panel or longitudinal studies in which the same persons are asked at different time points are very seldom. Longitudinal studies are necessary to conduct if we are interested to get information on individual change, because we are able to combine the answers of individuals from the different time points. Another reason to conduct a panel study is to get information closely related to experiences of the graduates at the different time points.

In order to combine the answers of an individual graduate asked at two points identification numbers must be assigned to the first questionnaire and the name (and address) as well. When we get the second questionnaire the identification number from the first questionnaire used for the second questionnaire as well. Later we can match the data from the first survey with the second one on an individual level according this identification number.

Longitudinal studies are more complicated to conduct and also the statistical analysis of the data is more demanding.

The typical research questions of tracer studies do not require to conduct a longitudinal study.

Conduct the graduate survey as a cross-sectional survey.

5.1.7   Scope of Work and Schedule

The following schedule for the implementation of a graduate survey is supposed to help you for your own planning. The duration of the various phases can vary substantially:

Figure 3   Tasks and Schedule of a Tracer Study

TASKS	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Phase one: Concept and instruments	██	██	██	██								
1. Specification of goals, determination of design, coordination, planning, organisation	░											
2. Questionnaire development, testing		░	░	░								
3. Procuring addresses and preparation of field phase		░	░	░								
Phase two: Data collection					██	██	██	██				
4. Data collection: Implementation of the survey and checking of the returned questionnaire					░	░	░	░				
5. Development of the codebook												
Phase three: Data analysis and reporting									██	██	██	██
6. Coding of open questions, data entry and data editing (quality control)									░			
7. Data analysis (frequencies, tables)									░	░		
8. Report writing										░	░	
9. Presentation of results, discussion and revision (workshop)											░	
10. Correction and revision of the publication												░

Following only a few hints will be given regarding the different task to make you aware of kind of work to be done. More details are in the following chapters.

Ad 1. Specification of the goals, determination of the design, coordination, planning, organisation (1 month)

You should present to your colleagues, to the representatives of the department/of the university (and perhaps also to the appropriate ministry) the questions in written form and the proposal for the design of the survey including a rough assessment of the expenses. You should above all make sure whether you will get the necessary support (especially from your colleagues and your department).

Ad 2. Adaptation of the questionnaire, development and testing of new questions (3 months)

The scope of work of this phase depends on the amount of new questions you intend to include in your survey. Even if you are using the specimen questionnaires (see appendix) and you added some new questions or changed the sequence of questions you should test your new survey instrument (pre-test).

Ad 3. Procuring addresses, preparation of the field phase (3 months; parallel to 2)

During the first work period you already examined the feasibility of the implementation concept of the survey. Now you start the actual realisation by initiating all necessary activities in order to be able to implement the survey: the procuring of addresses, printing of the questionnaire and of the covering letter, purchase of stamps, procuring of envelopes and preparation of dispatch.

Procuring addresses might be a very difficult and time consuming task in any case you are not able to get the actual addresses out of an updated register.

You should take into consideration several methods:

Use addresses of the parents of the graduates (registration records),

Use the media: announce your survey in the internet, newspaper, radio or TV and ask the graduates to contact you,

Use the help of Alumni associations, if available,

Contact your graduates via employers (like schools and universities and other known employer of graduates),

Use the snowball technique: ask graduates for addresses of other graduates

See the experiences of the AAU Tracer Studies; Kimani 2001.

Ad 4. Implementation of the survey and checking of the questionnaires (3 to 6 months)

Using postal facilities for all three dispatch actions, the duration of implementing the evaluation will at least take two months - independently of the number of graduates being examined. Approximately two weeks after the first dispatch you should send the first reminder and after another three weeks you should start the second one. Now you will have to wait at least three more weeks before you consider the action to be finished.

However, the duration of the checking of the questionnaire depends on its volume and on the number of completed and returned questionnaires.

Your task: Management and checking.

No general recommendation can be given for the duration of interviews, the implementation of which depends very much on local/regional circumstances.

Ad 5. Development of the codebook (1 months)

The codebook is a very important tool for the documentation of the coding, data control and editing, and data entry. In this handbook you will find a proposal for the outline and formatting of your codebook (QTAFI format) which allows you to get quite easy ready-to-print tables.

Take the time and develop a codebook in the QTAFI format.

Ad 6. Data entry/control, coding of open questions (1-2 months)

Before starting the data entry, open questions should be coded. If you used many open questions and many questionnaires, this work step can be very time-consuming.

The data entry depends on the volume of the questionnaire and on the number of completed and returned questionnaires.

Please, implement data quality control procedures.

What is the percentage of errors in data entry in your survey?

Do not except more than 2 % data entry errors.

Ad 7. Data analysis (3 months)

The data analysis starts after the data of the first questionnaires are captured. The work of the data analysis can be done be experts but you should manage and control these procedures.

Crucial in this phase is the assistance by a data analysis expert who has experiences with related research using SPSS.

You should have someone in your research team from the beginning of your project who is an expert in data analysis with SPSS. Your expert should know how to use the SPSS syntax and should be able to handle the SPSS tables module.

Ad 8. Writing the report (3 months)

This is your main task. However, it would be desirable for you to get other colleagues to participate in this process.

During the work on the report you will need further additional data analysis especially results form multivariate analysis.

Be sure to have assistance in this phase by a data analysis expert who has experiences with related research especially multivariate analysis of educational data using SPSS.

Ad 9 Presentation of results, discussion and revision of report (2 months)

The presentation of the results to the university staff will be the first step towards the practical conversion of the findings which you obtained with the help of the survey. At the same time, the discussion with your colleagues will give you additional ideas which will be helpful for the final revision of the report.

Ad 10 Correction and revision of the publication (1 month)

This period of your work deals "only" with the practical realization of the publication. As is the case for all other publications too, you have to make sure that in the course of the revision (correction, formatting) your report is not damaged as regards its content.

The implementation of the survey findings for the improvement of education is not the subject of this project.

5.1.8 Costs of a Survey

To obtain an idea about the calculation of the costs, please see the following fictitious example:

- Altogether, 500 graduates are to be questioned (dispatch of questionnaires by mail).
- The questionnaire contains 16 pages.
- 500 characters per case have to be captured for the numerical data entry.
- A response rate of 50 % is expected with three send outs (2 reminder actions).
- It is not planned to code the text of open responses.

Figure 4   Material Costs of a Tracer Study with a Participation of 250 Graduates (US $)

Task		Unit	Count	Costs per Unit (US$)	Costs (US$)
1. Production of camera-ready questionnaire	low costs only if you do this yourself or with the help of your secretariat	Hours	20	5.00	100

#						
2.	Printing of the questionnaire	depends on the volume of questionnaire and number of graduates	Questionnaires	1000	0.50	500
3.	Dispatch material	Envelops, stamps depends on volume of questionnaire and number of graduates	Envelops	400	0.10	40
4.	Postage 1st dispatch		Stamps	500	1.00	500
5.	Postage 2nd dispatch	Two reminder actions, a second questionnaire should be used with the second reminder	Stamps	500	1.00	500
6.	Postage 3rd dispatch		Stamps	300	1.00	300
7.	Postage for returned questionnaires		Stamps	250	1.00	250
8.	Numerical data entry	depends on volume of questionnaire and on number of graduates responding (manual data entry of five questionnaires per hour = about 10 minutes per questionnaire; if the hourly wage is 5 \$ than one questionnaire costs 1 \$)	Questionnaires	250	1.00	250
Total costs						**2,440**

To get the responses of 250 graduates about 2,500 US\$ are need for the material costs, which is about 10 US\$ for the participating graduates or 5 \$ per graduate of the sample.
Additional costs have to be calculated if no addresses are available.

6 Development of Questionnaires

In the appendix of this handbook you will find specimen questionnaires which you should consider to be used for your own survey. This chapter explains what *formal* attention has been paid to the design of the questionnaires and what regulations have to be taken into consideration for the development of your questionnaire.

6.1.1 Adaptation of the Specimen Questionnaires

The adaptation of the questionnaires is necessary in *each* survey, i.e. the questionnaires in the appendix cannot be used without a reworking step which we call "adaptation". An adaptation is also necessary if you use other questionnaires as a basis for the development of your own questionnaire.

There are three crucial reasons for the necessary adaptation:

Adaptation to individual objectives of your graduate survey

Each survey has its own *objectives* or at least emphasises certain questions.

Depending to the objectives of the survey and the formulation of the questions which you decide to use for your survey, you will complete or shorten some parts of the specimen questionnaires.

Adaptation to national conditions

A specimen questionnaire can only anticipate special *national features* which may exist, for example, in the education and employment system to a certain extent.

Please, check whether the individual questions take into account the special conditions of your country.

Adaptation to special features of a field of study or study programme

Also, a specimen questionnaire can only anticipate *special features of a study programme* which may exist in the structure of the subject area of the graduates to a certain extent.

Please, check whether the individual questions take into account the special conditions of your study programme.

6.1.2 Layout and Volume of a Graduate Questionnaire

The formal basic conditions refer to the volume of the questionnaire, the layout and the data entry.

6.1.3 Volume of the Questionnaire

Compared to other questionnaires, the volume of the specimen questionnaires can certainly not be called small, but neither it is large.

On average, the time needed to fill the European Graduate Questionnaire will take less than one hour - the AAU Questionnaire is clearly shorter.

There are no exact methodical surveys available concerning the question of what volume a questionnaire may have without its length negatively affecting the willingness to complete it.

The number of pages is an inadequate measurement for the length of a questionnaire as the differences of layouts (typeface and size, line spacing, etc.) strongly effect the number of pages.

6.1.4   Layout of the Questionnaire

For the layout, we do not recommend to reduce the number of pages but special emphasis should be put on confronting the interviewee with a well readable and clearly shaped text.

Furthermore, we wanted to ensure that it is possible to change and print the finished copy with the help of the EDP-standard equipment which is available at most of the universities.

Proposal for the layout of the questionnaire:

1. All elements of a questionnaire of the same type (like questions, answer items, remarks) should be formatted in the same way.

Use styles for elements of the same type.

2. All scales should be presented in the same direction.

If, par example, you use 5 point scales with 1 = high and 5 = not at all than all your scales should be oriented like that.

Never change the direction of scales in one questionnaire

6.1.5   Data Entry Requirements

Which information you include in the questionnaire relevant for the technical process of data entry depends on the method of data entry you use.

a) Manual data entry using SPSS or other data base (like MS ACCESS)

Variable names are not required in the questionnaire; but the codes related to the answers (values).

b) Manual data entry using EXCEL

Same as a).

c) Manual data entry of ASCII data (with word processor or editor)

The fact that a questionnaires already contain the codes which have to be captured (= figures which are related to the responses) and the columns (=place/position on which the figures are captured) makes data processing much easier. If the questionnaires do not contain these technical details, the data entry is much more time consuming and incorrect.

6.1.6   Open and Closed Questions

In everyday life, it is natural to ask questions and to receive answers. But it is not easy to write down these questions and the respective answers in such a way that we can assume they will be understood the "right way" by the graduates. You will quickly find out yourself that the formulation of a new question which you might like to include in the questionnaire takes a long time before you can be sure that you formulated a "good" question.

The formulation of a "closed question" requires the formulation of both the question and the possible response. Only the "open question" does not contain any response items.

> *Please avoid the use of an "open question" where a "closed question" could be formulated.*

In everyday life, we formulate open questions *only* because we directly communicate with our interlocutor and because we can ask again and again until we receive a satisfying answer. In a standardized survey, this is not possible. Only after the survey is finished, do we receive the responses of the interviewees and only then do we discover the way our question has been understood. If we want to analyse the answers quantitatively (e.g.: What do you suggest should be improved in your university?) we have to code them. Coding requires the forming of categories of answers under which different individual responses can be subsumed. Thus, for an open question *you* have to do the work that for a closed question is done by the interviewees themselves.

We do not advise doing completely without open questions - in the specimen questionnaires open questions are included as well - but you should ask open questions only where this cannot be avoided.

In the following, we use the expression "question" in the sense of a closed question including response items.

> *The range of proposed responses has to be complete, i.e. all possible answers must be included in the response items.*

6.1.7 Variables, Codes, Values and Other Technical Terms

All members of the survey team should have a basic understanding of these fundamental terms in any survey research: variable, codes and values.

Figure 5   Explanation of Codes, Columns and Variables

Variables	**Coded responses of the interviewees for a certain question**
	Example: Possible responses for the Question 1 (Subject area) are the codes 1, 2, and 3 or: the variable Subject area has the values 1, 2, and 3. .
Codes	**Figures which are assigned to the categories of responses**
	• 1 = Yes ; 2 = No
	• Value of the variable
	For detailed explanations concerning the rules of coding, please, see the chapter Data analysis
Columns	**Place/position on a data carrier (punch card, text file) where the codes are captured**
	• Example: (110) = -card 1 column 10

6.1.8 Answer Scales and the Level of Measurement

Very important in the process of formulation of questions is the knowledge of the consequences for later data analysis. Usually in the methodological literature you find the distinction of four types of questions associated with different level of measurement:
1. Categorical scale
2. Ordinal scale
3. Interval scale

4. Metric scale.

The higher the level of measurement the more statistical data analysis procedures are possible to use.

> *To allow powerful statistical analysis try to use ordinal scale instead of categorical scale where possible.*

6.1.9 Categorical or Nominal Scale Question

In categorical or nominal scale answers the codes or values related to the answers just indicate a difference from each other, but no ranking.

Figure 6   Example for Nominal or Categorical Level of Measurement

We "measure" the *variable* "Gender" with the help of a *nominal scale of responses*. It is to be remembered that in the Social Sciences - as well as in other sciences - measuring is carried out with the help of scales which can have a different level of measurement.

Nominal or categorical level of measurement
• The codes only serve to differentiate the categories of responses.   • Any figures can be used as codes.   • In the preceding example, you could also have used different figures for the categories of responses as codes. The value of the figures is not important for the later data analysis - it is only essential to represent the individual categories by different figures.   • Data analysis: Mainly FREQUENCIES and CROSSTABS.

6.1.10 Categorical Open-Ended Question

Suppose we want to find out whether the graduates started their job search before or after graduation (see Figure 7). However, we have to consider that some graduates did not search for employment because they took up further studies. So the first three responses cannot be applied for this group of graduates. For this group, we have to create an additional category of responses (code 4). Furthermore, we cannot exclude the possibility that some graduates do not exactly remember the start of searching for employment. Thus, to be correct, we should also give the possibility of answering "I do not know". Some graduates may also insist that they started their job search neither before nor after but exactly at the time of graduation; or others may like to date the beginning of their job search more precisely, etc. All those possible responses are included in the category "Other" which enables the interviewees to describe their

"special case" within our categories. Thus, we do not have to create an individual category for every possible response.

Figure 7   Example of a Question with Categorical Responses (Categorical or Nominal Scale)

Now our closed question, however, is only a "semi-closed" one and while checking the questionnaire we have to check whether the response registered in the category "Other" cannot be subsumed to any of the other existing categories.

Please, use the collective category "Other" if further responses are to be expected which you cannot/will not propose in detail.

6.1.11   No answer?

In a questionnaire, it is not common practice to give explicitly the response item "No answer" but actually some interviewees, for various reasons, will not respond (see: Missing Values). In the data set each variable will contain a code for "No answer" (e.g. 9, 99, 999 depending on the number of digits needed).

6.1.12   Only one answer

The chosen example shows some of the problems of formulating questions in cases where we can expect the interviewees to give *one* statement only - in the respective category of responses. The individual categories of answers exclude one another. It is somewhat easier in cases where we can assume all interviewees are able to answer the question and where we can provide the whole range of possible answers.

6.1.13   Multiple Reply Possible

An important type of questions are those which the interviewees can respond to by ticking in a list of given items as many as they think to be applicable.

Figure 8   Example for Multiple Replies

Each response item constitutes one variable!

The scale of answers is not explicitly indicated but we interpret a ticked item to mean "Yes" and the fact that no item has been ticked to mean "No". It will be explained later how to technically realize this in the data analysis.

> *If multiple responses are possible, this has to be indicated in the question*

In the specimen questionnaires all questions allowing multiple responses have included the indication (*Multiply reply possible)*.

This kind of question is always used in cases where a clear-cut scale of responses is meaningful. Someone could have "contacted a public employment agency" or not.

> *In the questionnaires, no codes should be printed for multiple response answers. For data capturing a "1" will be entered for a ticked response.*

But you could also ask "To what extent have been the following means been useful to get the first employment after graduation?" and use a five point scale of answers from 1= Very useful to 5 = Not at all useful".

6.1.14   Ordinal Responses

In some questions, we ask the interviewee to provide a graded assessment of the response with the help of a five point scale. In such cases, the measurement is done with an *ordinal scale level*, i.e. a value in the scale is not only different from the others but also takes a higher or lower position than the others (rank order).

Figure 9   Example of an Ordinal Scale Question

This example differs in various respects from the two preceding ones. The question: "How do you rate the …" only makes sense after adding the items or statements, e.g. "course content of major". Moreover, the categories of responses are not completely verbalized but only the beginning and the end of the scale: 1=very useful and 5=not at all useful.

> *Thus, each item is a "question" and respectively a variable in the data set.*

Although the variables only have an ordinal level of measurement, and therefore all those arithmetical proceedings are improper which suppose that the values have the same distance from one another (e.g. mean, variance), it is common practice and even supplies plausible results in the data analysis not to strictly follow this restriction but to treat these variables as if they were metrical.

Such scales of responses are used in cases where interviewees can be expected to be able to give a graded assessment. In principle, you could also propose the possible responses "Yes" - "No", or "Good" and "Bad" - which are scales of answers, too, but one with two pronounced characteristics only.

6.1.15   How Many Scale Points in an Ordinal Scale?

> *The smaller the number of characteristics in the scale of responses, the "harder" the decision about the correct answer for the interviewees.*

You will more likely give graded responses in cases where it can be assumed that there is no need for the interviewees to give a strict Yes-No-response concerning, for example, their opinion about the usefulness of their studies.

If you follow our advice and use scales with five possible responses, please take care that all scales are polarized the same way, i.e. for example the broadest consent with an item is always registered on the left hand side (value 1).

Varying the degree of grading can hardly ever be justified, i.e. using scales with 3, 4, 5, or 6 grades.

Please do not use different kinds of scales within one survey.

Especially in US surveys, seven-point scales are used more often but on the whole, the use of five-grade scales is predominant.

Our arguments to use five-point scales:

1. A five-point scale is an uneven scale; only uneven scales can fit a normal curve which is statistically advantage over all even scales.

2. A five-point scale fits in many countries to the use of school grades, which constitutes a kind of common metric. It depends on the country whether the scale should go from "1" = high/good/great extent or low to "5" = low/bad/not at all or the reverse order.

3. A five-point scale is more easy to interpret than a seven-point scale. Usually we will count the answers 1 and 2 (if the scale runs from 1="very good" to 5 = "very bad" and present the percentages of "good".

6.1.16   Verbalizing the Scale Points

Only the anchors of the scale should be verbalised because it is very difficult to find balanced verbalisation of the scale points between.

Correct are the examples 1 and 3 in the Figure 10; example 2 is incorrect because it seems to be difficult to understand the difference between "fully agree" and "agree" on the one side and between "not at all agree" and "not agree" on the other side. Addiitional the scale is not well balanced because the "partly agree" sounds more on the "agree" side than the "not agree" side.

Figure 10   Verbalizing of the Scale Points

1	Very good Very bad	Right
	1 2 3 4 5 ☐ ☐ ☐ ☐ ☐	

| 2 | | Wrong |
| 3 | | Right |

Avoid verbalizing of all scale points. It is very difficult to find the "correct" terms.

6.1.17 Metrical Level of Measurement

Only few genuine *interval-scaled variables* are measured in social-sciences surveys of the: e.g. income, age, period of job search, etc.

We recommend asking for these data with the help of an open question and possibly classifying the responses in the data analysis (see: Data analysis).

Figure 11   Example for metrical measurement

6.1.18 Rules for the Formulation of Questions

Figure 12   Rules for the Formulation of Questions

All questions have to fit into the context of the survey	The interviewee has to be able to understand why a certain question has been asked. Each question has to appear to be significant in the framework of the survey. From this rule, a strict criterion arises for all new candidates. Questions may seem to be interesting but when they do not fit into the framework of the survey they cannot be included.
The questions should be related to the object as concretely as possible	Poor: Have you already searched a vacancy for a long time? Better: How long did you search for a vacancy?
Please try to avoid all valuation in the questions	Poor: Don't you think, too, that the workshop training should be abolished? Better: Do you think, too, that ...?
Please check all questions	The violation of the neutrality may already be revealed by only including

for their neutrality	"positive" items in the item lists of the responses.
Each question and each item has to be definite	Therefore, please check whether your questions/items contain any ambiguous enumerations. Poor: Should the department XY abolish the workshop training or the practical training in industry? Yes/No
Please avoid abbreviations	
Please use a simple language and short sentences	You do not mean to test the understanding of the language with the help of this survey.

6.1.19   The Sequence of Questions

The importance of the sequence of the individual questions may at first be less evident than the rules for formulating them.

Please take into consideration that each question has an effect on the following questions.

The first questions of a questionnaire are very significant as they show the interviewee what kind of questionnaire it is, and they also reveal how long it will take to entirely complete it.

The first questions should be of that kind that can be answered quickly and easily.

It is assumed that the degree of attention/seriousness is lower in the beginning than it is in the "middle". This is also a reason for asking easy questions at the beginning. However, towards the end, a certain tiredness might occur or even simply the wish to complete the questionnaire quickly.

Place simple questions at the end.

As far as possible, the questionnaire should be structured in topics which explain their context for the interviewee in addition to the individual questions.

On the whole, the structure of the topics in the graduate questionnaire should follow the biography of the graduates: study - transition - profession - further planning.

Within the different topics, the sequence of the questions also arises from the formal criterion of whether the questions should be answered by all graduates or only by certain groups of graduates.
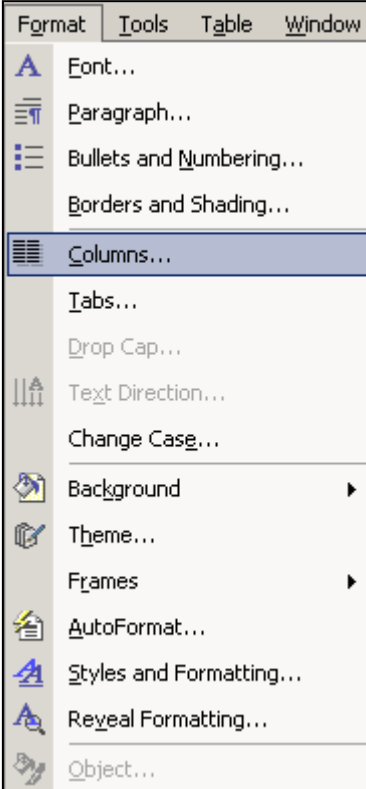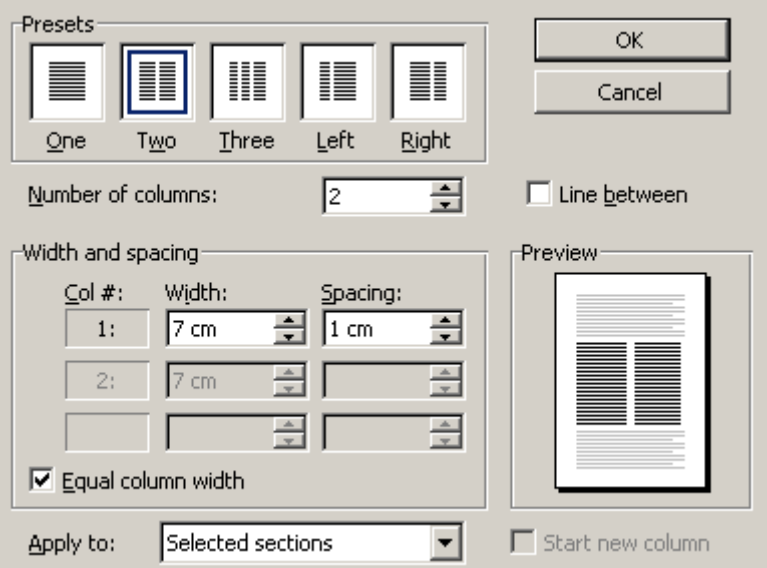
The filter leading should be as easy as possible. Therefore, at the beginning questions should be asked which apply to all.

6.1.20   Technical Layout of the Questionnaire

In designing the layout, we wanted to make sure that it is possible to change the specimen questionnaires with the help of the standard equipment available in the universities and to produce a finished copy ready for printing.

With this aim in view, we have realized the formatting of the questionnaire with the help of only a few style sheets and used Microsoft Word.

The following figures show two different layouts: the two columns layout and the one column layout. The two columns layout is more difficult to handle, but it allows to have a more condensed questionnaire with less pages.

	1. Go to FORMAT- Columns
	2. Select "Two" and change the spacing to "1 cm".

Figure 13   Questionnaire with two column layout

Figure 14   Questionnaire with one column layout

6.1.21   Styles Used for Formatting the Questionnaire

Style name	Font name	Font size
QU_Box	Arial	10
QU_Box10	Arial	10
QU_Box11	Arial	11
QU_Box12	Arial	14
QU_Box13	Times New Roman	12
QU_Box14	Times New Roman	12
QU_CV_Answer	Arial	8
QU_Explanation	Times New Roman	12
QU_Filter	Times New Roman	12
QU_Hidden	Arial	6

QU_MD_Answer	Arial	8
QU_ME_Answer	Times New Roman	12
QU_OR_Answer	Arial	8
QU_QU_Num	Arial	10
QU_QU_Text	Arial	10
QU_Remark	Arial	6
QU_ScaleNumbers	Times New Roman	12
QU_ScaleText	Arial	6
QU_ScaleText_Left	Arial	6
QU_ScaleText_Right	Arial	6
QU_TE_Answer	Times New Roman	12
QU_Value	Arial	6

6.1.22   Covering Letter

It is a pragmatic decision, whether to print the covering letter on the cover of the questionnaire or to use a separate sheet of paper and include this in the questionnaire.

We suggest using two different covering letters: (a) a letter from the department/the university asking for participation in the survey, and (b) the letter from the head of the project that contains the assurance of confidential treatment of the statements of the interviewees.

The covering letter should always contain:

- the description of the purpose of the survey;
- the use of the information/data;
- statements about data protection;
- the offer to inform the participant about the results of the survey;
- information about the implementing institution.

Figure 15   Example for covering letter signed by the dean

Dear Graduates,

We kindly ask you to participate in a survey which is aimed at all graduates of the [ADAPTATION] Faculty Z of the University XY who graduated between 19XX and 19XX.

With the help of this survey we hope to attain a broad overview concerning the study programme, employment situation, occupation, and professional career of graduates from the University XY. For its future planning, the Faculty Z would like to take into account the experience and opinions of the graduates. We therefore ask you kindly to contribute to the success of this survey by your participation.

Signature and function (e.g. Dean)

Figure 16   Example for covering letter signed by the team leader

Dear Graduates,

As head of the research group conducting the graduate survey in 19XX, I also wish to request your participation in the survey. The research group consists of collaborators of the Faculty Z.

As you will notice, your experiences during your studies as well as during your further professional life are being asked for in the questionnaire. We are much interested in your personal perception and experiences in order to obtain an overview of the strengths and weaknesses of the study programme and of the study conditions of the Faculty Z.

We assure you that your answers will only be used for scientific purposes in the framework of this survey. In the description of results of this survey no identification of individual persons will be possible.

YOUR INFORMATION WILL BE TREATED STRICTLY CONFIDENTIALLY.

The results of the survey will be published. If you wish, we will send you an overview of the most important results. Please return the completed questionnaire as soon as possible to the address mentioned below.

Thank your very much for your kind support.

Name and address of the head of the project

6.1.23 Pre-test

Even if you copy most of the questions from other questionnaires you should carry out a pre-test.

Please test your questionnaire

You should implement the pre-test only after finishing the prototype of the questionnaire (finishing format including layout). If possible, you should also copy the questionnaire double-sided to make it look like the printed specimen.

For doing the pre-test, you should try to gain graduates who do not participate in the main survey, i. e. graduates who only graduated recently. It is also useful to ask graduates who graduated quite some time ago to do the pre-test. It is not the objective of the selection of graduates to achieve representativeness for a defined population but to obtain a great variety of professional careers and of other individual characteristics, as you want to find out whether the questionnaire proves worthwhile for "all" graduates.

It cannot be indicated generally how many graduates should do the pre-test. You should decide this yourself in the course of your test.

Please carry out the pre-test in form of a quasi-interview.

In our opinion, it is more important than the number of graduates participating in the pre-test to organize the implementation of the pre-test as a kind of learning process. If you carry out the pre-test in the form of a written interview, you will only find out indirectly which questions caused difficulties; and the reasons for uncompleted questions will not be explained at all. As quasi-interviewer you can watch the graduates completing the questionnaire and if help is needed or is even necessary you will have a concrete indication for the improvement of the questionnaire.

A further indication: you also can invite the graduates to come to your university and to do a classroom-interview.

Doing your pre-test, you should pay special attention to the following questions:

- Are all questions answered? If no, why not?
- Are the filter indications definite and were they followed?
- Which questions are difficult to understand?
- How long does the processing takes?

6.1.24 How to Use QTAFI to Get a Questionnaire Format?

6.1.25 Insert all Styles for a Questionnaire

Open a new document with WORD and select <Insert a new questionnaire> from the QTAFI - Questionnaire Macro.

The following specimen will be automatically created.

1 Question?

1 ☐ Answer1

2 ☐ Answer2

3 ☐ Answer3

4 ☐ Answer4

5 ☐ Answer5

6 ☐ Other: ....
(please specify)

1 Question?

☐ MultipleReplyItem1

☐ MultipleReplyItem2

☐ MultipleReplyItem3

☐ MultipleReplyItem4

☐ MultipleReplyItem5

☐ Other: ....
(please specify)

1 Question?

To a very high extent				Not at all	
1	2	3	4	5	
☐	☐	☐	☐	☐	Item1
☐	☐	☐	☐	☐	Item2
☐	☐	☐	☐	☐	Item3
☐	☐	☐	☐	☐	Other:

(please specify)

1 Question?

Gross income per year

Number of employees

Year of graduation

Number of applications

Number of months looking for a job

1 Question?

....

....

....

....

....

....

....

6.1.26 Insert Only Selected Styles

Open a new document with WORD and select <Insert a questionnaire toolbar> from the QTAFI - Questionnaire Macro.

The following toolbar will be automatically created.

Question Q+cat Cat Q+OR5L OR-item OR-scale Q+Multiple reply MD-item ME-Item Open CV_F OR_F MD_F

Place the toolbar where you want.

Figure 17   QTAFI - the Questionnaire Toolbar

Question	Insert just the number and the text of a question (one row).	**X**
Q+cat	Inserts the questions and answers for categorical answers	**1 Question?** 1 ☐ Answer1 2 ☐ Answer2 3 ☐ Answer3 4 ☐ Other:... (please specify)
Cat	Inserts one categorical answer	1 ☐
Q+OR5L	Inserts questions answer items for ordinal (5) questions.	**1 Question?** To a very high extent ...... Not at all 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ Item1 ☐ ☐ ☐ ☐ ☐ Item2 ☐ ☐ ☐ ☐ ☐ Other: (please specify)
OR-item	Only one ordinal (5) item	☐ ☐ ☐ ☐ ☐
OR-scale	Only the ordinal (5) scale	To a very high extent ...... Not at all 1 2 3 4 5
Q+Multiple repl	Inserts multiple reply question and items.	**1 Question?** ☐ MultipleReplyItem1 ☐ MultipleReplyItem2 ☐ MultipleReplyItem3 ☐ Other:... (please specify)
MD-item	Inserts one multiple reply item	☐
ME-Item	Inserts open metric question	☐☐☐☐☐☐ **text**
Open	Inserts open ended questions	....
CV_F	Format selected categorical answers and do an automatic numbering. A number in the first row is the starting number.	
OR_F	Format selected ordinal answer items.	
MD_F	Format selected multiple reply answer items.	

7   The Content of the Graduate Questionnaire

The content of your questionnaire depends of course on your specific research questions. In this chapter we would like to provide you with some proposals for questions. We like to give examples for the task to transform the objectives of the survey into particular questions and into a range of possible answers. Recommendations are given for the adaptation of the specific questions to the characteristics of your own survey. In addition support and recommendations are given for the data analysis and the interpretation of the results.

For most of the questions the notes are structured in seven sections:

Subject	A shortened form of the question/the subject - which can generally also be used as table heading; explanations concerning the question or the theoretical concept.
Indicator	Kind of indicator; theoretical context
Adaptation	Indications of the necessity to adapt the question or the range of response items to the characteristics of the country and/or the project.
Indications	Additional remarks about the chosen operationalisation and interpretation.
Check	Indications of points to watch out for when Checking the questionnaire.
Data analysis	In most of the cases, you will find the term "Standard" which shows that these questions/variable(s) will be analysed with the help of the Standard Table Programme (QTAFI). The term "Main Break Variable" indicates that this variable also should be included in the Standard Table Programme as "independent variable". All questions will be analysed (cross-tabulated) by the categories of this question/variable. In some cases, we will give advice on how to handle special problems of the analysis or we will recommend further analysis.
Other surveys	References to surveys also including the question occur in a summarized form. Some individual surveys are quoted using an abbreviation. The abbreviations are explained in the appendix.

Let's have a look to the CHEERS questionnaire. The questionnaire is organised in different sections which refers to 10 main topics.
  A. Educational Background Prior to Study
  B. Higher Education Courses Taken
  C. Job Search and Sequence of Professional Activities
  D. Current Activities, Employment and Work
  E. Competencies and Their Application

F. Relationships Between Higher Education and Work
G. Work Orientations and Job Satisfaction
H. Further Education and Training
I. Socio-Biographic data
J Retrospective Assessment of Studies

Table 13   Selected Subjects, Indicator Areas and Text of Questions used in the CHEERS Questionnaire

Sequence number	Number of question	Subject	Indicator area	Text of the question
1	0	Identification	Admin	ID
2	0	Questionnaire return date	Admin	Date of return
3	A1	Type of entry qualification at time of first enrolment	Student input - education before	What were your entry qualifications when you entered higher education (full or part-time) for the first time?
4	A2	Rating of grades in entry qualification	Student input - education before	How would you rate your grades?
5	A3	Date of getting entry qualification	Student input - education before	When did you get your entry qualification?
6	A4	Years of schooling altogether to get entry qualification	Student input - education before	How many years of (primary plus secondary) schooling did you spend altogether up to acquiring the entry qualification to higher education (include years of repeating classes)?
7	A5	Periods of activities between obtaining entry qualification and first enrolment	Student input - education before	How many months did you spend on the following activities between obtaining the entry qualification and your first enrolment in higher education?
8	A5	Kind of other education/training/apprenticeship before first enrolment	Student input - education before	How many months did you spend on the following activities between obtaining the entry qualification and your first enrolment in higher education?
9	A5	Kind of other activity before first enrolment	Student input - education before	How many months did you spend on the following activities between obtaining the entry qualification and your first enrolment in higher education?
10	A6	Employment and education/training/apprenticeship abroad prior to first enrolment	Student input - education before	Prior to your first enrolment in higher education, have you been employed abroad or have you received any education/training/apprenticeship abroad? Multiple reply possible.
11	A6	Period and country of employment abroad prior to first enrolment	Student input - education before	Prior to your first enrolment in higher education, have you been employed abroad or have you received any education/training/apprenticeship abroad? Multiple reply possible.
12	A6	Period and country of education/training/apprenticeship abroad prior to first enrolment	Student input - education before	Prior to your first enrolment in higher education, have you been employed abroad or have you received any education/training/apprenticeship abroad? Multiple reply possible.
13	B1	Period of reference course	Course of study	Please, provide information about all higher education courses you have ever taken (include part-time, post graduate, and courses not completed).
14	B1	Major field of study of reference course	Study behaviour and study output - competence	Please, provide information about all higher education courses you have ever taken (include part-time, post graduate, and courses not completed).
15	B1	Name of institution of higher education concerning reference course	Study provision	Please, provide information about all higher education courses you have ever taken (include part-time, post graduate, and courses not completed).
16	B1	Type of institution of higher education concerning reference course	Study provision	Please, provide information about all higher education courses you have ever taken (include part-time, post graduate, and courses not

				completed).
17	B1	Kind of degree earned in reference course	Study output - competence	Please, provide information about all higher education courses you have ever taken (include part-time, post graduate, and courses not completed).
18	B1	Grade in reference course	Study output - competence	Please, provide information about all higher education courses you have ever taken (include part-time, post graduate, and courses not completed).
19-54		Other courses of study		
55	B2	Time spent abroad during study period	Study behaviour	Did you spend any time abroad during the period of your study (in order to work or to study)?
56	B3	Duration and country of 1st period abroad	Study behaviour	If you stayed abroad: please state (for each period abroad, if you have spent more than one) the countries, the duration and the activities.
57	B3	Major activity of 1st period abroad	Study behaviour	If you stayed abroad: please state (for each period abroad, if you have spent more than one) the countries, the duration and the activities.
58	B3	Duration and country of 2nd period abroad	Study behaviour	If you stayed abroad: please state (for each period abroad, if you have spent more than one) the countries, the duration and the activities.
59	B3	Major activity of 2nd period abroad	Study behaviour	If you stayed abroad: please state (for each period abroad, if you have spent more than one) the countries, the duration and the activities.
60	B4	Duration of activities during period of reference study	Study behaviour	How many months between first enrolment in higher education and graduation 1994 or 1995 did you spend predominantly on:
61	B5	Required and actual period of reference study	Study behaviour	How long did you study in higher education for earning the degree you were awarded in 1994 or 1995 (see Question B1) and what period is normally/by law required (including eventually required lower level diplomas and degrees in higher education and including mandatory periods of work placements/internships; excluding other studies, periods of other activities, etc.)?
62	B6	Activities during lecture period in reference study	Study behaviour	How many hours per week during your study (that you graduated from in 1994 or 1995) did you spend on average on each of the following activities? Please estimate.
63	B6	Activities outside lecture period in reference study	Study behaviour	How many hours per week during your study (that you graduated from in 1994 or 1995) did you spend on average on each of the following activities? Please estimate.
64	B7	Relationship between work experiences and content of reference study	Study behaviour	To what extent did your work experiences (employment, internships etc.) during study tie up with the content of your studies (you graduated from in 1994 or 1995)? (5-point scale of answers.)
65	B8	Emphasis on modes of teaching and learning in reference study	Study conditions and provisions	If you look back to your course of study that you graduated from in 1994 or 1995: to what extent were the following modes of teaching and learning emphasised by your institution of higher education and its teachers? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
66	B9	Rating of provisions and conditions in reference study	Evaluation of study conditions and provisions	How do you rate the study provision and study conditions you experienced in the course of study that you graduated from in 1994 or 1995? (5-point scale of answers from 1 = "Very good" to 5 = "Very bad".)
67	B10	Expertise in selected software areas at time of graduation 1994/1995	Study output - competence	How do you rate your expertise in selected software areas at the time of graduation 1994 or 1995 and now? (5-point scale of answers from 1 = "Very good" to 5 = "No expertise at all".)
68	B10	Expertise in selected software areas now	Work requirements - competence	How do you rate your expertise in selected software areas at the time of graduation 1994 or 1995 and now? (5-point scale of answers from 1 = "Very good" to 5 = "No expertise at all".)
69	B11	Proficiency in English at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.

70	B11	Proficiency in French at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
71	B11	Proficiency in German at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
72	B11	Proficiency in Italian at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
73	B11	Proficiency in Spanish at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
74	B11	Proficiency in a 1st further language at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
75	B11	Proficiency in a 2nd further language at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
76	B11	Proficiency in a 3rd further language at time of graduation 1994/1995	Study output - competence	How do you rate your language proficiency at the time of graduation 1994 or 1995? Please answer with respect of any listed language and tick the kind of proficiency in each row. Multiple reply possible in each row.
77	C1	Job search since graduation 1994/1995	Transition	Did you ever seek a job since graduation 1994 or 1995? Exclude applications for casual and vacation jobs.
78	C2	Begin of job search	Transition	When did you start looking for a job? Exclude search for casual and vacation jobs.
79	C3	Intentions at job search after graduation in 1994/1995	Transition	Did you intend any of the following during your job search period after graduation in 1994 or 1995? Multiple reply possible.
80	C4	Methods of job search	Transition	How did you try to find the first job after graduation? Multiple reply possible.
81	C5	Most important method for getting first job after graduation	Transition	Which method was the most important one for getting your first job after graduation in 1994 or 1995? Please fill in the item number from question C4.
82	C6	Number of employers contacted before first job after graduation in 1994/1995	Transition	How many employers did you contact (by e.g. letter) before you took up your first job after graduation in 1994 or 1995?
83	C7	Duration of job search for first job after graduation in 1994/1995	Transition	How many months have you sought all-together (before or after graduation) for your first job after graduation in 1994 or 1995, which you consider not to be a casual job?
84	C8	Importance of recruitment criteria	Recruitment criteria	How important, according to your perception, were the following aspects for your employer in recruiting you for your initial employment after graduation, if applicable? (5-point scale of answers from 1 = "Very important" to 5 = "Not at all important".)
85	C9	Predominant activities since graduation in 1994/1995	Employment	How would you characterise and summarise your predominant activities since your graduation in 1994 or 1995?
86	C10	Begin of current major activity	Employment	Please inform us on your current major activity.
87	C10	Kind of current major activity	Employment	Please inform us on your current major activity.
88	C10	Type of working hours of current major activity	Employment	Please inform us on your current major activity.
89	C10	Type of contract of current major activity	Employment	Please inform us on your current major activity.

90	C10	Job title of current major activity	Employment and work content	Please inform us on your current major activity.
91	C10	Position of current major activity	Employment	Please inform us on your current major activity.
92	C10	Event status of current major activity	Employment	Please inform us on your current major activity.
93-127		Other events		
128	D1	Current professional situation	Employment	If you are at current employed/self-employed: How would you describe your current professional situation? Multiple reply possible.
129	D2	Effort to obtain paid work in past four weeks	Employment	Have you actively tried to obtain (other) paid work in the past 4 weeks?
130	D3	Number of employers worked for after graduation in 1994/1995	Employment	How many employers (including self-employment) have you worked for in the period after graduation in 1994 or 1995 (including your present employer)?
131	D4	Kind of current employer/institution	Employment	Please state the kind of your current employer/institution (if several, please refer to main employer)? Please mark one single item only.
132	D5	Economic sector of current work	Employment	In which economic sector are you currently working?
133	D6	Current area of work	Work content	What is your current major area of work assignment (e.g. R&D, data processing, sales or teaching) and what are your additional area(s) of activities, if applicable?
134	D7	Working hours per week	Employment	How many hours per week are you working on average? Multiple reply possible.
135	D8	Organisational structure of company	Employment	Do you work in a (big) organisation comprising branches?
136	D9	Size of company	Employment	Please estimate, to the best of your ability, the approximate number of people who are working in ...
137	D10	Kind of self-employment	Employment	If you are self-employed: Which of the following characteristics are applicable to you? Multiple reply possible.
138	D11	Annual gross income	Employment	What is your approximate annual gross income?: (Thousand.)
139	D12	Business/professional journeys abroad within last 12 months	Work content	Did you undertake business/professional journeys abroad within the last 12 months?
140	D13	Communication with foreign clients or partners	Work content	To what extent do you communicate (oral and written communication) with clients/external partners... (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
141	D14	Percentage of work time spent in international context	Work content	What percentage of your work time do you consider to have an international context?
142	D15	Employment abroad since graduation in 1994/1995	Work content	Have you, since graduation (multiple reply possible)
143	D16	Country and period of 1st work abroad since graduation in 1994/1995	Work content	If you have worked abroad: In which country(ies) and how many months (each)?
144	D16	Country and period of 2nd work abroad since graduation in 1994/1995	Work content	If you have worked abroad: In which country(ies) and how many months (each)?
145	D16	Country and period of 3rd work abroad since graduation in 1994/1995	Work content	If you have worked abroad: In which country(ies) and how many months (each)?
146	E1	Competencies at time of graduation in 1994/1995	Study output - competence	Please, state the extent to which you had the following competencies at the time of graduation in 1994 or 1995 and to what extent they are required in your current work. If you are not employed please answer only (A). (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
147	E1	Work requirements	Work content	Please, state the extent to which you had the following competencies at the time of graduation in 1994 or 1995 and to what extent they are required in your current work. If you are not employed please answer only (A). (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
148	E2	Utility of reference study	Evaluation of studies and professional	To what extent has your study (you graduated from 1994 or 1995) been useful for ...? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not

				success	at all".)
149	E3	Importance of competencies for current work	Work content	How important do you consider the following competencies for doing your current work? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
150	F1	Use of knowledge and skills acquired in reference study	Evaluation of studies and professional success	If you take into consideration your current work tasks altogether: To what extent do you use the knowledge and skills acquired in the course of study (you graduated from 1994 or 1995)? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
151	F2	Relationship between field of study and area of work	Evaluation of studies and professional success	How would you characterise the relationship between your field of study and your area of work?
152	F3	Appropriateness of level of education for employment and work	Evaluation of studies and professional success	If you consider all dimensions of your employment and work (status, position, income, work tasks, etc.): a. To what extent is your employment and work appropriate to your level of education? (5-point scale of answers from 1 = "Completely appropriate" to 5 = "Not at all appropriate".)
153	b	Most appropriate level of course of study / degree compared to study graduated from in 1994/1995	Evaluation of studies and professional success	What is the most appropriate level of course of study/degree for your employment and work in comparison to that which you graduated from in 1994 or 1995?
154	F4	Reasons for taking a job hardly linked to study	Evaluation of studies and professional success	If you consider your employment and work as hardly appropriate and not linked to your education: why did you take it up? Multiple reply possible.
155	F5	Current work situation meeting expectations at time of enrolment	Evaluation of studies and professional success	Taking all aspects into account, to what extent does your current work situation meet the expectations you had when you started your study? (5-point scale of answers from 1 = "Much better than expected" to 5 = "Much worse than expected".)
156	G1	General satisfaction with current work	Professional success	Altogether, to what extent are you satisfied with your current work? (5-point scale of answers from 1 = "Very satisfied" to 5 = "Very dissatisfied".)
157	G2	Importance of life goals at time of graduation in 1994/1995	Orientations	Please indicate the importance you placed on each of the following life goals - in the past and now. (5-point scale of answers from 1 = "Very important" to 5 = "Not at all important".)
158	G2	Importance of life goals now	Orientations	Please indicate the importance you placed on each of the following life goals - in the past and now. (5-point scale of answers from 1 = "Very important" to 5 = "Not at all important".)
159	G3	Importance of work aspects	Orientations	How important are the following characteristics of an occupation for you personally (A) and to what extent do they apply to your current professional situation (B)?
160	G3	Application of work aspects to current situation	Work content	How important are the following characteristics of an occupation for you personally (A) and to what extent do they apply to your current professional situation (B)?
161	H1	Further education/training undertaken since graduation in 1994/1995	Further education	Did you undertake further education and training required in order to obtain or keep a professional qualification or another longer professional training period since graduation in 1994 or 1995?
162	H1	Type of further education/training	Further education	Did you undertake further education and training required in order to obtain or keep a professional qualification or another longer professional training period since graduation in 1994 or 1995?
163	H1	Duration of further education/training	Further education	Did you undertake further education and training required in order to obtain or keep a professional qualification or another longer professional training period since graduation in 1994 or 1995?
164	H1	Certification earned in further education/training	Further education	Did you undertake further education and training required in order to obtain or keep a professional qualification or another longer professional training

				period since graduation in 1994 or 1995?
165	H2	Additional/further education/training since graduation in 1994/1995	Further education	After your degree awarded in 1994 or 1995 did you undertake other additional/further education/training (short courses, seminars, workshops, self-study, etc.) related to your career or to a future career that you might pursue? Exclude professional training programmes stated in response to H1 and exclude what you consider to be completely unrelated to work and career.
166	H3	Number and duration of education/training courses	Further education	Please list the most important course(s) and indicate the total duration (in contact hours of teaching/learning).
167	H4	Institution providing education/training courses	Further education	Who is (was) responsible for providing this course/these courses? Multiple reply possible.
168	H5	Sources of funds for education/training course participation	Further education	Who funded the costs for your participation in this course/these courses (fees, transportation etc.)?
169	H6	Education/training course attendance during paid working time	Further education	Did you attend the course(s) during your paid working time?
170	H7	Topics of education/training courses	Further education	Which of the following topics were covered in the course(s)? Multiple reply possible.
171	H8	Purpose of additional/further education/training at start	Further education	What was the most important personal purpose of additional/further education/training when you started it? Please mark only one.
172	H9	Outcomes of additional/further education	Further education	To what extent did your additional/further education or training actually help you afterwards ...? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
173	H10	Need felt to update or develop competencies	Further education	To what extent do you feel at present a need to update or develop your competencies further through additional/further education or training? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
174	H11	Need of additional/further education or training	Further education	To what extent do you agree with the following statements regarding the need of additional/ further education or training? (5-point scale of answers from 1 = "Completely agree" to 5 = "Completely disagree".) Additional/further education or training is necessary ...
175	H12	Reading of subject related professional/scientific journals during last 12 months	Further education	How often did you read subject related professional/scientific journals during the last 12 months?
176	H13	Attendance at professionally relevant meetings/conferences during last 12 months	Further education	How often did you attend professionally relevant meetings/conferences during the last 12 months?
177	H14	Use of internet for professionally relevant information gathering during last 12 months	Further education	How often did you use the internet sources for professionally relevant information gathering during the last 12 months?
178	I1	Gender	Student input - bio data	Gender
179	I2	Year of birth	Student input - bio data	Year of birth
180	I3	Citizenship and country	Student input - bio data	Please, provide some information about your citizenship and your country of schooling, study and work
181	I4	Region of study, residence, and work		In which region have you studied and where do you live today?
182	I5	Parental and partner's highest education	Student input - bio data	Parental and partner's highest education
183	I6	Residence immediately prior to graduation in 1994 or 1995	Student behaviour	Did/do you live ... ? Multiple reply possible.
184	I6	Current residence	Living conditions	Did/do you live ... ? Multiple reply possible.
185	I7	Number and age of children in household	Living conditions	Are there children in your household?
186	I8	Amount of working in household	Living conditions	How many hours per week are you (and eventually your partner) working in your household (cleaning, cooking, child care, etc.)?
187	I9	Partner's major activity	Living conditions	What is the major activity of your partner, if

188	J1	Utility of study viewed retrospectively	Evaluation of studies	To what extent did your studies help you ...? (5-point scale of answers from 1 = "To a very high extent" to 5 = "Not at all".)
189	J2	Study decision viewed retrospectively	Evaluation of studies	Looking back, if you were free to choose again, how likely would you ... (5-point scale of answers from 1 = "Very likely" to 5 = "Not likely at all".)
190	J3	Proposed improvements in higher education	Evaluation of studies	What kind of improvements in higher education would you suggest according to your experiences?

In general the CHEERS questionnaire follows a "biographic" logic. In the beginning easy to answer questions regarding the educational background, then the course of study, the transition to employment, the actual employment situation, work and competencies, relationship between study and work, further education and bio data. But looking to details we see that competence related question are found in different parts, as well as the retrospective evaluation of studies. Of course, all the time we are able to find good reasons to employ different sequences of questions.

If we should develop a new CHEERS questionnaire we would of course change some elements. Especially those which created a lot of problems in the data entry or data analysis process like the question B1, C10, C11, H1. All these questions are open questions. One methodological recommendation from the first CHEERS project was to try to avoid any open question.

7.1.2   Course of Studies

In different parts of the CHEERS questionnaire you will find questions which refer directly to the course of study in question. The first part of B. deals only with objective characteristics of the course of studies. This part B. will be answered quickly and easily and is supposed to induce the interviewees to remember their time as a student. At any rate, it should precede the following part C. The part B, like following part, is to be answered by all interviewees. This is also a reason for putting it at the beginning.

Actually, part H concerning further professional training is not could be integrated in part B, but this might make the terms of reference of this part less clear, and this would apply especially to the terms of reference of the second part of B.

At least the following objective information is required:
1. Period of reference course (year of start and year of end)
2. Major field of study of reference course
3. Name of institution of higher education concerning reference course
4. Type of institution of higher education concerning reference course
5. Kind of degree earned in reference course (like Diploma, Bachelor)
6. Grade in reference course

Subject	**Field of study**

Indicator   Competencies; Central indicator for the professional qualifications acquired as result of the education

Indications   For the comparison with results of other surveys, the subject area should be recorded as accurately as possible and should only be summarized in the analysis. Subject areas which were relevant for the last final degree should be requested, as the graduates could have started a further course of study or could have studied a different subject before. Use the ISCED codes on the lowest level for international comparison.

Check   For this, answers of all interviewees should be available (Main-Break-Variable). Therefore, please check whether cases can be surveyed at all if no statements are given.

Data analysis   Main-Break-Variable
Check whether the Subjects can be summarized, especially if only a few case identification numbers are available.

Other surveys   Similar questions in all surveys.

1   In which field of study were you awarded your Bachelors' degree?

1 ☐ Field 1

2 ☐ Field 1

3 ☐ Field 1

4 ☐ Field 1

5 ☐ Field 1

6 ☐ Other: ....
(please specify)

Subject	Specialisation, Main emphasis of studies

Indicator   Competencies; Central indicator for the professional qualifications acquired as result of the education.

Adaptation   Absolutely necessary as the list is incomplete

Indications   This question assumes that it was possible to select a main emphasis in the course of studies has been possible. If this was not formally possible, the graduates could be asked in which compulsory subject they feel strong.

Data analysis Standard; correlation analysis especially with Question 45 but also with others could be interesting. Therefore it will possibly be used as an additional Break-Variable. For this question multiple replies are possible. The answers can be simplified and hence also the analysis if the possible main emphasis subjects exclude one another. This can also be achieved if the possible combinations are offered as answers.

Other surveys Used in various surveys.

2   Which were the major subjects of your studies? Multiple reply possible

☐ Construction engineering

☐ Rural development

☐ Water resources development

☐ Other

Subject	Cohort and Study Duration

Indicator   Age groups/cohorts of the first year students; duration of course of studies

Adaptation   Check whether the sequence of month/year corresponds to the normal way of writing the date; perhaps it will be necessary to redefine the time of the completion of the course of study if misunderstandings occur amongst the interviewees.

Indications   The calculation of the duration of the course of studies by stating the start and finish presupposes that there was no interruption of the studies. If that is not so the question concerning the duration should be asked additionally.

Data analysis Standard
               Taking Question 3 and 4 it is possible to compute the duration of studies

Other surveys Can be used for all studies

3   When did you start your course of studies?

☐☐☐☐ Year of start of studies (like 1998)

or

☐☐ Month ☐☐ Year

Subject   Cohort and Study DuRation

Indicator	Identification of groups/cohorts who finished in the same year
Adaptation	See Question 3
Indications	None
Check	Please, check figures and enter the leading zeros; no data should be missing here
Data analysis	Main-Break-Variable; perhaps summarize years if more than three were surveyed.
Other surveys	Can be used for all studies.

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4   When did you finish your course of studies?

☐☐☐☐ Year of finish of studies (like 2005)

  Or

☐☐ Month ☐☐ Year

Subject   Type of degree

Indicator	Indicator for the performance level of the graduates. To what extent are graduates who are more successful than others during their studies also more successful in seeking an occupation or in their job? Does the employment system reward performance or are other criteria of importance?
Adaptation	Absolutely necessary; examples from UK
Indications	None
Data analysis	Standard; possibly used as additional Break-Variable
Other surveys	Is often asked for but differs depending on the type of examination system and on assessed performances

---

5   Which university degree did you earn?

1 ☐ BA Hons
2 ☐ BA
3 ☐ BSc Hons
4 ☐ BSC Bachelor of Science
5 ☐ Other Bachelor
11 ☐ Other (please specify)

Subject	Final degree level

Indicator	Indicator for the performance level of the graduates. To what extent are graduates who are more successful than others during their studies also more successful in seeking an occupation or in their job? Does the employment system reward performance or are other criteria of importance?
Adaptation	Absolutely necessary; examples from UK
Indications	None
Data analysis	Standard; possibly used as additional Break-Variable
Other surveys	Is often asked for but differs depending on the type of examination system and on assessed performances

5   Which university degree did you earn?

1 ☐ First

2 ☐ Upper second

3 ☐ Lower second

4 ☐ Third

5 ☐ Unclassified

Subject	Reasons for the Decision to Study at the University

Indicator	University admission; reputation of the university; individual prerequisites for the study.
Adaptation	It is recommended that the special features of the university/of the course of studies be taken into consideration; change of some of the response items or supplements
Indications	The question is directed to the reasons for choosing this special place at the beginning of the studies - a time which for some graduates is a long time ago. Therefore, this question should not be overvalued. It even can be dropped, especially if surveys of first year students or students evaluations are available. It also can be dispensed with if there are no other universities in a country offering comparable courses of studies. Not all conceivable reasons are given in the list of answers.
Data analysis	Standard
Other surveys	Rarely used in graduate surveys

6   To what extent were the following reasons important for your decision to study at the University of XY? Scale of answers from 1=very important to 5=not at all important. Please, specify the importance of the respective reasons with the help of the five-grade scale. If one of the reasons should not apply to you, please tick "not at all important".

☐ ☐ ☐ ☐ ☐   Neighbourhood to home of parents or other relatives

☐ ☐ ☐ ☐ ☐   Grant when studying at this university

☐ ☐ ☐ ☐ ☐   Favourable accommodation possibilities for students on the campus

☐ ☐ ☐ ☐ ☐   Attractiveness of town or region

☐ ☐ ☐ ☐ ☐   Reputation of the university among employers

☐ ☐ ☐ ☐ ☐   Practice-orientated education in my subject

☐ ☐ ☐ ☐ ☐   Chance for specialization in my subject

7.1.3   Retrospective Evaluation of Studies at the University

In a contained form, this part contains the main questions concerning the subjective evaluation of the course of studies by the graduates. In the last part (11) the same subject will be picked up again, but this time in a more open form. This order has been chosen to keep the influence of the self-contained groups of questions on the open ones as low as possible. Besides, it is to be expected that after mentioning the employment situation and especially the utilization of the qualifications acquired, the answers to open questions will be richer in content.

The content of the statements of the assessment based questions exclusively asked for in this part is often misjudged. It is neither legitimate to play down such assessments as "only subjective" statements, nor is it right to call them "objective". Regarding these questions, it is of little interest to interpret the marginal distribution ("How many graduates give a positive opinion concerning the structure of the studies"?) but it is interesting to analyse and interpret the differences in the assessments of the groups (e.g. age groups, groups of subject areas).

Subject	Rating of the study conditions and study provisions

Indicator   Quality of higher education, resources of universities and other study conditions; teaching and learning processes

Adaptation   Necessary as some characteristics do not apply and others which are important are not included in the list

Indications   A Subjective assessment of the studies by the graduates will be achieved. Therefore, from the answers of the graduates you cannot really conclude, for example, that the institute's buildings are bad, but only that the graduates consider them poor. In this question, the Subjective terms of reference of the answers have intentionally not been limited, as they have in Question 8. Therefore, this question also can be put to students. This is the first question asking the interviewees to specify their answer with the help of a five-grade scale. Therefore, this type of question is described in detail and it is made especially clear that an answer is required for each of the listed characteristics.

Data analysis   Standard

Other surveys   Similar questions are asked quite often

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B9   How do you rate the study provision and study conditions you experienced in the course of study that you graduated from in 1994 or 1995?

Very good (1) — Very bad (5)

a. Academic advice offered in general

b. Assistance/advice for your final examination

c. Course content of major

d. Variety of courses offered

e. Design of degree program

f. Testing/grading system

g. Opportunity to choose courses and areas of specialisation

h. Practical emphasis of teaching and learning

i. Teaching quality

j. Chances to participate in research projects

k. Research emphasis of teaching and learning

l. Provision of work placements and other work experience

☐ ☐ ☐ ☐ ☐ m.Opportunity of out-of-class contacts with teaching staff

☐ ☐ ☐ ☐ ☐ n. Contacts with fellow students

☐ ☐ ☐ ☐ ☐ o. Chance for students to have an impact on university policies

☐ ☐ ☐ ☐ ☐ p. Equipment and stocking of libraries

☐ ☐ ☐ ☐ ☐ q. Supply of teaching material

Subject	**Usefulness of study programme**

Indicator   Differentiated valuation of study programmes/study contents/study aims of students; retrospective assessment of results of teaching and learning processes

Adaptation   Is necessary, as some characteristics do not apply and others which are important are not included in the list (see Question 45)

Indications   As in Question 7, a Subjective valuation of the studies by the students will be achieved. The subjective terms of reference of the answers is delimited by the question for the "previous occupation". Using different terms of reference, this question can also be put to students. Question 45 deals in more detail with the use of technical qualifications.

Data analysis Standard; reinforced correlation analysis with characteristics of the professional situation (mainly field of use and position)

Other surveys Similar questions are used quite often.

AAU studies

9	**How would you rate the usefulness of some elements of the study programme for your previous occupation? Scale of answers from 1=very useful to 5=not at all useful.**

☐ ☐ ☐ ☐ ☐ Course contents in your major field of studies

☐ ☐ ☐ ☐ ☐ Variety of courses offered

☐ ☐ ☐ ☐ ☐ Chance for specialization

☐ ☐ ☐ ☐ ☐ Scientific methods

☐ ☐ ☐ ☐ ☐ Research orientation of students'/project work

☐ ☐ ☐ ☐ ☐ Practical orientation of students'/project work

☐ ☐ ☐ ☐ ☐ Practical orientation of teaching

☐ ☐ ☐ ☐ ☐ Practical laboratory training

☐ ☐ ☐ ☐ ☐ Workshop - training

☐ ☐ ☐ ☐ ☐ Practical training in industry

Subject	**General evaluation of the studies**

Indicator	Professional success; results of studies in the comprehensive meaning of the word ("outcomes")
Adaptation	No
Indications	In this question, the terms of reference of the valuation of the studies are broadened to include the aspects listed in the answer. Therefore generalization of the valuation of the usefulness of "the studies" is demanded of the graduates.
Data analysis	Standard
Other surveys	Similar questions are used quite often.

9 Altogether, how do you rate the usefulness of your studies? Scale of answers from 1=very useful to 5=not at all useful.

☐ ☐ ☐ ☐ ☐   for finding an adequate job after finishing your studies

☐ ☐ ☐ ☐ ☐   for fulfilling your present professional tasks

☐ ☐ ☐ ☐ ☐   for your future professional development/career

☐ ☐ ☐ ☐ ☐   for the development of your personality/education

☐ ☐ ☐ ☐ ☐   for the economic development of your country

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J1 To what extent did your studies help you ...?

To a very high extent			Not at all	
1	2	3	4	5

☐ ☐ ☐ ☐ ☐   a. finding a satisfying job after finishing your studies?

☐ ☐ ☐ ☐ ☐   b. for your long-term career prospects?

☐ ☐ ☐ ☐ ☐   c. for the development of your personality?

J2 Looking back, if you were free to choose again, how likely would you ...

Very likely			Not likely at all	
1	2	3	4	5

☐ ☐ ☐ ☐ ☐   a. choose the same course of study?

☐ ☐ ☐ ☐ ☐   b. choose the same institution of higher education?

☐ ☐ ☐ ☐ ☐   c. choose a higher degree level of higher education? [NatCat]

☐ ☐ ☐ ☐ ☐   d. choose a lower degree level of higher education? [NatCat]

☐ ☐ ☐ ☐ ☐   e. decide not to study at all?

7.1.4　　　Job Search and Transition to Employment

The focal point of this subject area concerns the transition from studies to a profession. The first questions relate to the chronological structure of this process, the course of transition. The following questions refer to the strategies of seeking employment and to the experiences of the graduates concerning the recruitment criteria of the employers. These questions only refer to the first search for employment. Since for different reasons some graduates do not seek employment after finishing their studies, considerable attention has to be paid to correct filter guidance.

Subject	**Career**

Indicator Professional success; main question: How many percent of the graduates are employed after how many months?

Adaptation No; but if graduates are surveyed who completed their studies more than three years ago, it is advisable to take a quarter of a year as smallest time unit instead of taking one month. The annex contains an simpler form of this question.

Indications With the help of this question it is possible to survey the further chronological career of the graduates very precisely. As the situations and the conditions (employed, trainee, etc.) of the interviewees are surveyed at different times retrospectively, this method is called a retrospective survey of data progression. This produces far more precise information about the chronological structuring and is more efficient than a panel analysis would be. But therefore it is not possible to record very differentiated information about the individual periods (employment situations). We recommend differentiating the employment situation/occupation for each month into five categories only. However, further differentiation is possible. In some graduate surveys the course of employment is recorded in the form of an open question. We must issue a warning against this as any later coding of such data is very time consuming. In most of the cases, the suggested form of question can be answered quickly by the interviewee, and the data entry is also easy to implement.

Check Please pay attention to double naming within one month. Rule: The priority runs from left to right, this means for 1 and 5 take 1. There will be gaps left in the statements for some months: Code 9 for "No answer".

Data analysis The results for this question can be illustrated best with the help of a diagram: Vertical axis 1 to 100 percent; horizontal axis 1 to 36 "months after being awarded the final degree"; stacked bar or plains. Further time-orientated analysis of data (event history analysis) can easily be realized with data surveyed in this way.

Other surveys In this form it has scarcely been realized yet but in other forms of questions it has been used in nearly all studies.

10   Please indicate your employment situation and your occupation after being awarded your (first) degree at the University of XY. *Please tick only one appropriate category for each month after being awarded your first degree. If the situation of your occupation changed during a month or if you were involved in different activities (e.g. studying and working), please tick the most important category only. If the completion of your first course of studies took place more than 3 years ago, please ignore the remaining months.*

Period after graduation	Employed	Pro-fessional training	Advanced academic study	Not employed, seeking employment	Not employed and not intending to be employed	Other	Job title (e.g. primary school teacher, production manager)
1st year							
1st month	☐	☐	☐	☐	☐	☐	
2nd month	☐	☐	☐	☐	☐	☐	
3rd month	☐	☐	☐	☐	☐	☐	
4th month	☐	☐	☐	☐	☐	☐	
5th month	☐	☐	☐	☐	☐	☐	
6th month	☐	☐	☐	☐	☐	☐	
7th month	☐	☐	☐	☐	☐	☐	
8th month	☐	☐	☐	☐	☐	☐	
9th month	☐	☐	☐	☐	☐	☐	
10th month	☐	☐	☐	☐	☐	☐	
11th month	☐	☐	☐	☐	☐	☐	
12th month	☐	☐	☐	☐	☐	☐	
2nd year							
1st month	☐	☐	☐	☐	☐	☐	
2nd month	☐	☐	☐	☐	☐	☐	
3rd month	☐	☐	☐	☐	☐	☐	
4th month	☐	☐	☐	☐	☐	☐	
5th month	☐	☐	☐	☐	☐	☐	
6th month	☐	☐	☐	☐	☐	☐	
7th month	☐	☐	☐	☐	☐	☐	
8th month	☐	☐	☐	☐	☐	☐	
9th month	☐	☐	☐	☐	☐	☐	
10th month	☐	☐	☐	☐	☐	☐	
11th month	☐	☐	☐	☐	☐	☐	
12th month	☐	☐	☐	☐	☐	☐	
3rd year	☐	☐	☐	☐	☐	☐	
4th year	☐	☐	☐	☐	☐	☐	
5th year	☐	☐	☐	☐	☐	☐	
At present	☐	☐	☐	☐	☐	☐	

Subject	**Job search for employment After Graduation**

Indicator Description of seeking behaviour.

Indications Not all graduates seek a job for the time after graduation. We this question we try to find out their reasons and we can filter them to applicable questions.

Data analysis Standard

CHEERS

C1   Did you ever seek a job since graduation 1994 or 1995? *Exclude applications for casual and vacation jobs.*

1 ☐ Yes ➔ *PLEASE GO TO QUESTION C2*

2 ☐ No, I set up my own business/self-employment

3 ☐ No, I continued the job I have had before graduation

4 ☐ No, I continued to study (or professional traing)

5 ☐ No, I obtained work without actually searching ➔ *PLEASE GO TO QUESTION C8*

6 ☐ Other (please specify):

➔ *IF YOU HAVE NOT SOUGHT A JOB PLEASE GO TO QUESTION C9*

Subject	**Time of start of search for employment**

Indicator Description of seeking behaviour. Is it worthwhile seeking employment at an early stage?

Adaptation No; this question can be dropped if no differences between the graduates are expected.

Indications This question only differentiates whether the search for employment started before or after having been awarded the final degree; you could also ask for the exact time if this seems to be relevant.

Data analysis Standard;   a   reinforced   analysis   is   useful; correlation analysis with individual preconditions of study, performance of study and professional success

Other surveys Is used rarely

C2   When did you start looking for a job? Exclude search for casual and vacation jobs.

1 ☐ Prior to graduation, ☐☐☐☐ months earlier

2 ☐ Around the time of graduation

3 ☐ After graduation, ☐☐☐☐ months later

Subject	**Strategies of seeking employment**

Indicator — Connection between university and employment; in particular, how important are the efforts of the university to make the transition easier?

Adaptation — Is necessary for some items; A11a makes sense only if a manpower allocation system exists in the respective country; A11d and A11g will not exist in all countries.

Indications — With the help of this question only successful strategies will be obtained; in many surveys additional or alternative information is wanted about the employment market and the procedure (Which strategies were used?). In our opinion, these questions can without risking a great loss of information be summarized and even stated more precisely in the question concerning the successful strategies/procedures. This question specifically investigates how the first employment was found after being been awarded the final degree. What kind of different (successful) strategies are used by the students and which quantitative significance they have will at the same time become apparent from the distribution. Cf. Employer Questionnaire Question 9.

Data analysis — Standard; a reinforced analysis is useful; correlation analysis with individual preconditions of study, performance of study and professional success

Other surveys — Used in many studies but with different lists of items

---

C4   How did you try to find the first job after graduation? Multiple reply possible

- [ ] 1. I applied for an advertised vacancy
- [ ] 2. I contacted employers without knowing about a vacancy
- [ ] 3. I launched advertisements by myself
- [ ] 4. I was approached by an employer
- [ ] 5. I contacted a public employment agency [NatCat]
- [ ] 6. I contacted a commercial employment agency
- [ ] 7. I enlisted the help of the careers/placement office [NatCat] of my institution of higher education
- [ ] 8. I enlisted the help of teaching staff of the institution of higher education
- [ ] 9. I established contacts while working during the course of study
- [ ] 10. I used other personal connections/contacts (e.g. parents, relatives, friends)
- [ ] 11. I started my own business/self-employment
- [ ] 12. Other: ....
      (please specify)

C5   Which method was the most important one for getting your first job after graduation in 1994 or 1995? Please fill in the item number from question C4.

[ ][ ] Most important method

[ ] Not applicable, I have not found a job after graduation ➔ *PLEASE GO TO QUESTION C9*

Subject	**Intensity of Job search**

Indicator Indicator for the intensity with which employment is sought.

Adaptation No; this question may be dropped if the graduates find a position only by governmental employment allocation.

Indications The number of applications may be interpreted both as an indication of the objective requirements of the employment market (the more unfavourable the employment market, as higher the average number of applications) and also as an indication of the individual efforts independently of the objective conditions. Independently of the conditions of the employment market there will also be differences between the graduates concerning the intensity with which employment is sought. A measurement for the relative, individual intensity of seeking employment can be formed by referring the number of applications to the duration of seeking employment. (RELINT = A13a / A17a)

Check Please check figures

Data analysis Standard; a more detailed analysis is useful; correlation analysis with individual preconditions of study, performance of study and professional success

Other surveys Is used rarely

CHEERS:

> **C6 How many employers did you contact (by e.g. letter) before you took up your first job after graduation in 1994 or 1995?**

Approx. ⊔⊔⊔⊔ number of employers contacted

13	**How often did you apply for a vacancy?**

☐☐ Number of applications

14	**How often did you participate in tests?**

☐☐ Number of tests

15	**How often were you invited for an interview?**

☐☐ Number of invitations

16	**How many vacancies were you offered?**

☐☐ Number of vacancies

Subject	Duration of seeking employment

Indicator	Indicator for the intensity with which employment is sought; situation of the employment market
Adaptation	No; question may be dropped if graduates find a position only by governmental employment allocation
Indications	See indications for 13
Check	Please check figures
Data analysis	Standard; the questionnaire contains the Variable A17b in an abbreviated form but in the analysis, as mentioned, Code 2 should be completed.
Other surveys	Is used often

17   How long did it take you to find your first employment?

☐☐   Duration of seeking employment (months)

CHEERS

C7   How many months have you sought all-together (before or after graduation) for your first job after graduation in 1994 or 1995, which you consider not to be a casual job?

☐☐   Months of job seeking

Subject	Recruitment criteria of the employers

Indicator   How important are characteristics of the graduates which are influenced by the university?

Adaptation   No

Indications   Graduates, as parties affected by the recruitment procedures can, of course, only provide information about their own experiences which do not necessarily have to correspond with the actual criteria of the employers. On the other hand, each graduate has made his own experiences whereas employer surveys only lead to generalized statements about "the" graduates. Besides, the statements on the employers are not always more valid than those of the graduates. This is a matter of more or less mutually complementary perspectives. The list of the recruitment criteria is not complete. Nor was this intended as this study mainly concerns the importance of study-orientated characteristics. In some countries some aspects may certainly be of high importance but it is not expedient, for example, to ask for any personal qualifications because graduates have probably not received any feedback about these. This also goes for all aspects like gender, age and social, ethnic or regional background. Whether these characteristics of the graduates are of any importance for professional success may be checked in the analysis. Do women state longer periods of seeking than men?
Cf. Employer Questionnaire Question 10

Data analysis   Standard

18   In your opinion, how important were the following aspects for your employment in this occupation? Scale of answers from 1=very important to 5=not at all important

☐ ☐ ☐ ☐ ☐   Field of study

☐ ☐ ☐ ☐ ☐   Main focus of subject area/specialization

☐ ☐ ☐ ☐ ☐   Final examination (subject/form)

☐ ☐ ☐ ☐ ☐   Grades of examination at the university

☐ ☐ ☐ ☐ ☐   Reputation of the university

☐ ☐ ☐ ☐ ☐   Reputation of the department

☐ ☐ ☐ ☐ ☐   Previous work experiences

☐ ☐ ☐ ☐ ☐   Personality

☐ ☐ ☐ ☐ ☐   Foreign experiences

☐ ☐ ☐ ☐ ☐   My own world view/religion

☐ ☐ ☐ ☐ ☐   Other

CHEERS

C8   How important, according to your perception, were the following aspects for your employer in recruiting you for your initial employment after graduation, if applicable?

Very important				Not at all important	
1	2	3	4	5	
☐	☐	☐	☐	☐	a. Field of study
☐	☐	☐	☐	☐	b. Main subject/specialisation
☐	☐	☐	☐	☐	c. Exam results [NatCat]
☐	☐	☐	☐	☐	d. Practical/work experience acquired during course of study
☐	☐	☐	☐	☐	e. Practical/work experience acquired prior to course of study
☐	☐	☐	☐	☐	f. Reputation of the institution of higher education
☐	☐	☐	☐	☐	g. Experience abroad
☐	☐	☐	☐	☐	h. Foreign language proficiency
☐	☐	☐	☐	☐	i. Computer skills
☐	☐	☐	☐	☐	j. Recommendations/references from third persons
☐	☐	☐	☐	☐	k. Personality

Subject   Typology of transition

Indicator	Transition; Labour market
Indications	This question is ery helpful to get an overall impression by the graduates; sometimes it is difficult to get related information from the objective work history information. Problem: multiple reply possible.
Data analysis	Standard

CHEERS

C9   How would you characterise and summarise your predominant activities since your graduation in 1994 or 1995? Multiple reply possible

☐ I have spent most of the time on a regular job

☐ I had mainly various temporary jobs

☐ I had mainly more than one job at the same time

☐ I was most of the time unemployed

☐ I mainly embarked on further study/professional training

☐ I was predominantly engaged in child rearing or family care

☐ Other:

7.1.5   Training Period After Graduation

Like the previous parts, this part also follows the logic of the individual biography by picking out the training period of the professional occupation as the central theme. In particular, it is of high interest to find out to what extent and in what way graduates receive a specific education during their training period. The interpretation of the results of this part depends to a large extent on the aims of education of the individual universities.

Subject	**Kind of initial training**

Indicator	Congruence between qualifications acquired and professional demands Information about the work conditions the graduates find in the institution/the company when starting their job Do they feel as if they are thrown in at the deep end, or are they offered an additional workplace-orientated qualifying period?
Adaptation	Is possible:country- and subject-specific (e.g. internship). There are country-orientated different relationships between the education and the employment system and also between the subject areas.
Indications	With the help of this question which asks for the actual strategies of the employers, you will possibly obtain more information than by asking for the practical orientation of the studies. The internal training period may be necessary to reduce (practical) qualification deficiency, on the one hand, but on the other it may also be used as an internal strategy to qualify young people for management positions. Cf. Employer Questionnaire Question 14
Check	Please pay attention to the multiple replies; rule ascending priority, for example, when 1 and 2 are stated, 2 is recorded; but in any case code 5 takes last place.
Data analysis	Standard; reinforced: Do employers who provide internal training programmes for young graduates attach less importance to technically matched qualifications in their recruitment criteria?
Other surveys	Is rarely used

19   How would you describe the character of the training period of your first occupation after completing your studies?

1 ☐ No training time, immediate start with normal tasks

2 ☐ Advice/help from experienced colleagues

3 ☐ Advice/help also from superiors

4 ☐ Participation in an extensive formal trainee programme/training course, etc.

5 ☐ Other

	Subject	**Duration of the formal training programme**

Indicator   Matching of qualifications acquired and employment demands

Adaptation   No

Indications   See Question 19

Data analysis   Standard; see 19

Other surveys   Is rarely used

20   If you participated in a training programme (course, trainee programme) please indicate its full duration

Duration of the formal training programme (weeks)

	Subject	**Duration of training time**

Indicator   Matching of qualifications acquired and employment demands

Adaptation   No

Indications   See Question 19
                Cf. Employer Questionnaire Question 12

Data analysis   Standard; see Question 19

Other surveys   AAU and CHEERS

21   How long did it take you before you had the impression that you were competent enough to do your job effectively?

Duration of training time (weeks)

	Subject	**Kind of qualifications acquired during the training time**

Indicator   Matching of qualifications acquired and employment demands

Adaptation   Please check whether the items for the Subject

Indications   See 19
                Cf. Employer Questionnaire Question 16

Data analysis   Standard

Other surveys   No, but many studies ask about topics of professional further education

22   In which topics did you gain new knowledge/abilities at the beginning of your employment? Multiple reply possible

☐ Workplace-orientated technical knowledge

☐ EDP application

☐ Personnel management

☐ Financial management

☐ Contact with other persons (sales seminars, courses in group dynamics)

☐   Organizational structure of the institution/the company or of single sections

☐   Other

Subject	Training for management duties

Indicator	Hierarchical level of matching of higher education and employment demands; see also 19
Adaptation	No
Indications	None
	Cf. Employer Questionnaire Question 17
Data analysis	Standard
Other surveys	Is rarely used

23   **Were you trained at the beginning of your job to take over a management position in future?**

1 ☐   Yes

2 ☐   No

See the CHEERS questionnaire, part H, for further questions related to further education.

7.1.6   The Present Employment Situation

In this part the main characteristics concerning the current employment situation of the graduates are investigated. Special importance has been attached to relevant information about the contents of the professional occupation/work in order to connect them with the course of studies. The professional/contextual relation between higher education and employment is also a topic of the following, but there on the basis of the self-perception of the graduates, whereas this part investigates data which when connected with the statements of the graduates concerning their studies (especially the professional main focus of their study) permit statements about the degree of matching between their professional occupation and the knowledge and abilities acquired during their studies.

In many countries, the university graduates have an extra job beside their main occupation. For this extra work they often earn more money than they do with their "official" job. In our opinion, it is not possible to analyse this extra work in more detail in graduate surveys as, in general, it is not officially allowed.

In this part, too, you will have to pay attention to correct filter guidance as some graduates may not have been employed at all since completing their studies, or were perhaps unemployed at the time of the survey but employed before.

Questions concerning their employment situation should only be put to graduates who really are employed at the time of the survey

In some studies, these questions are also asked of graduates who are unemployed at the time of the survey but had been employed before. With this the problem arises that for all statements you have to ensure that you always find the correct reference group.

Example: "From all graduates, who ..., X % are employed in the public sector" instead of simply saying: "From all (employed) graduates, X % are working in the public sector".

Subject   Employment situation

Indicator   Criterion of professional success

Adaptation   No, but possibly further differentiation of the current employment situation/occupation

Indications   The question may seem to be redundant as the categories nearly correspond completely to those of Question 10. But unlike Question 10, multiple reply is possible and therefore the combination of, for example, the course of study and the employment can be captured.

Check   Please, check the correspondence or plausibility with the statements in response to Question 10

Data analysis Standard; additionally you may perhaps form a filter variable in order to ensure that for all questions concerning the employment only those graduates are taken into account who really are employed at the time of the survey.

Other surveys Is used in all studies but with different categories or types of question

---

24   How would you characterize your present employment situation or activity? Multiple reply possible

☐ Employed

☐ Professional training

☐ Further academic studies

☐ Without employment, but seeking employment

☐ Without employment, and I do not wish to/cannot start working at present (e.g. raising children, illness)

☐ Military service/community service, etc.

☐ Other

Subject   Change of employer

Indicator   Career; employment situation

Adaptation   No

Indications   This question contains the main filter for those graduates who have not been employed since completing their studies.

Data analysis Standard

Other surveys Is often used.

---

25   Have you changed your employer/employment since graduation?

---

1 ☐ Yes, I have changed my employer/employment

2 ☐ No

3 ☐ Not applicable, as I am still unemployed since graduation → *Please, go to question XXX*

Subject   Reasons for the change of employer

Indicator   Career

Adaptation   No, possibly complete the items

Indications   This question also has to be answered by graduates who are not employed at the time of the survey but who had been employed before. In some studies this question refers to the last change. In the analysis this reference may to a certain extent also be achieved by analyzing this question only for graduates who have only changed their employer/employment once.

Data analysis Standard

Other surveys Used in some other surveys

---

26   Why did you change your employer/employment? Multiple reply possible

☐ **In order to obtain a higher income**

☐ **In order to get a better position**

☐ **In order to use the qualifications acquired during my studies**

☐ **The change happened compulsorily (I worked in a temporary job, I was sacked, etc.)**

☐ **To live in a certain place**

☐ **To take over desirable professional tasks**

☐ **Other**

Subject   Mobility/Career

---

27   If you have changed your occupation, please indicate for how many employers/in how many occupations you have worked previously (without counting your present post).

☐☐ Number of previous employers

---

28   How long have you been working with the present employer?

☐☐ Number months with present employer

Indicator	Career
Adaptation	No
Indications	The duration of employment is not identical with professional experience. In order to be able to calculate professional experience the times before studying and the times of any further employment after studying (see Question 10) have to be taken into account.
Check	Please check the plausibility of the times given and complete the leading zeros
Data analysis	Standard
Other surveys	Is often asked in similar fashion

Subject	**Job title; relation between studies and profession**

Adaptation	The examples have to be adapted.
Indications	The answers should be captured as text and additionally they should be coded. For this step you can use the ISCO-List. See the WWW
Check	For the data entry the statements should be suitably abbreviated, e.g. Eng. instead of Engineer.
Data analysis	Please evaluate only the list of the text statements; after the coding: standard analysis
Other surveys	Is often used

---

29 What is your job title? Please state the precise term, e.g. construction engineer, production engineer, etc.

....

....

Subject	**Kind of professional tasks; relation between studies and profession**

Adaptation	The examples in the brackets are to be adapted.
Indications	The answers should be captured as text. You may drop the coding as the tasks are ascertained in detail in Question 3. This open question serves as addition.
Check	For the data entry the statements should be suitably abbreviated.
Data analysis	Please evaluate only the list of the text statements
Other surveys	Is used often

30   Please outline your professional tasks (e.g. production management and supervision)

....

....

....

....

CHEERS

D6   What is your current major area of work assignment (e.g. R&D, data processing, sales or teaching) and what are your additional area(s) of activities, if applicable?

Major area of work (please specify)

....

....

Additional area(s) of work (please specify)

....

....

Subject   Economic sector

Indicator   Important conditions of the professional work

Adaptation   Here special attention has to be paid to the customary terms.

Indications   With the help of this question it should be possible, above all, to differentiate between the employees of the public and the private sector. The educational sector has been included additionally because it is an important and very special employment sector. But as the following question also contains the educational sector as being part of the branch of industry, you may decide not to include it in this question as a response item. Cf. Employer Questionnaire Question 5

Data analysis   Main-Break-Variable

Other surveys   A similar question is used in all studies

31   In which economic sector do you work at present? Please tick one item only

1 ☐ Private sector

2 ☐ Parastatal/public enterprise

3 ☐ Public administration/local or central government

4 ☐ Other

Subject	**Economic branch**

Indicator   Kind of economic activities of the company/the organization; technical/professional affinity to the study programme of the university

Adaptation   Please check correspondence with the customary terms and classifications and, if necessary, please differentiate some areas in more detail

Indications   With the help of this question the economic main activities of the company/the organization are to be captured. For this, the system of the official statistics may serve as a basis, but according to the probable employment areas of the engineers it is useful to differentiate in such a way that the employment areas can be captured as precisely as possible. On the other hand, areas in which engineers are hardly employed may be summarized more "roughly". Cf. Employer Questionnaire Question 4

Check   Please pay attention to the multiple replies; if a clear assignment is not possible from the remaining statements of the interviewee, please use the code "77=Cannot be related clearly".

Data analysis   Standard; relation between studies and professional success; possibly used as break-variable; combinations of some categories is useful and with regard to the number of cases probably necessary.

Other surveys   Is used in most of the studies but in all of them with a different degree of differentiation.

---

32   In which of the following branches of industry would you classify your company/organization? Please tick one item only. The answer should only concern your main occupation

1 ☐ Schools

2 ☐ Universities

3 ☐ Research institutions

4 ☐ Agriculture and forestry, fishing

5 ☐ Mining

6 ☐ Power supply and other energy industry

7 ☐ Water supply, water management

8 ☐ Chemistry, mineral oil manufacturing

9 ☐ Plastics/rubber/asbestos manufacturing

10 ☐ Stone, earth, fine ceramics, glass (production and manufacturing)

11 ☐ Iron/metal production and manufacturing

12 ☐ Mechanical engineering, vehicle engineering, steel erection and container construction

13 ☐ Electrical engineering

14 ☐ Precision mechanics, optics, toy industry, and jewellery

15 ☐ Wood/paper and printing industry

16 ☐ Textile/leather and clothing industry

17 ☐ Food and semi-luxury food industry

18 ☐ Building and construction trade (building constructor)

19 ☐ Trade (wholesale trade and retail trade)

20 ☐ Transport (haulage, storage, shipping, railway, etc.)

21 ☐ Communication (post, broadcasting, television, etc.)

22 ☐ Health system

23 ☐ Banking

24 ☐ Insurance companies

25 ☐ Legal and commercial advice (also personnel advice)

26 ☐ Engineering consultants (architect's office)

27 ☐ Other service trades (e.g. journalism, publishing, housing/real estate, tourism)

28 ☐ Trade and commercial associations, parties

29 ☐ Church organizations

30 ☐ International organizations

31 ☐ General public administration (regional administrative bodies, state, county, and local authorities)

32 ☐ Other

Subject	**Main field of activity**

Indicator   Fields of tasks; relation between studies and profession; affinity/adequacy

Adaptation   Necessary; please check the correspondence with the customary terms and classifications; some areas will probably need further differentiation or completion

Indications   see Question 32. This question also shows that for some graduates it is not possible to state their "main occupation". Some categories might not have good selectivity properties which, amongst other things, is a result of a strong differentiation. In our opinion, these problems cannot be solved if you want to capture relatively differentiated data concerning the fields of activity in order to be able to analyse the extent to which a correspondence exists with the study programme of the university. It is possible, though, to aggregate more strongly in the subsequent analysis. Cf. Employer Questionnaire Question 24

Data analysis   Standard; please evaluate in a more detailed manner the relation between studies and professional success, probably used as Break-Variable; combinations of some categories is useful and with regard to the number of cases probably necessary.

Other surveys   Is used in most of the studies but in all of them with a different degree of differentiation.

33   What is your current major occupation?

1 ☐ Settlement/preparation of accounts

2 ☐ Supervision of production facilities/maintenance

3 ☐ Training

4 ☐ Export

5 ☐ Supervision of construction sites

6 ☐ Preparation of construction sites/construction/supervision of construction

7 ☐ Advisory services/consulting

8 ☐ Maintenance and repair of production facilities

9 ☐ Controlling

10 ☐ Data processing

11 ☐ Development/experiments

12 ☐ Production

13 ☐ Preparation of production

14 ☐ Finances

15 ☐ Research and development

16 ☐ Research/science

17 ☐ Estimating/costing

18 ☐ Construction

19 ☐ Construction/design

20 ☐ Management

21 ☐ Marketing

22 ☐ Market research

23 ☐ Material management

24 ☐ Measurement and testing technology

25 ☐ Installation/commissioning

26 ☐ Standardization and licensing

27 ☐ Personnel affairs

28 ☐ Planning of functions/use of buildings/plants

29 ☐ Planning and organization

30 ☐ Project management

31 ☐ Accountancy

32 ☐ Security engineering

33 ☐ Tax affairs

34 ☐ System analysis

35 ☐ Project execution

36 ☐ Environmental engineering

37 ☐ Processing development

38 ☐ Sales management

88 ☐ Other

Subject	**Additional felds of activity**

Indicator   Relation between studies and profession; affinity/adequacy
Adaptation   see 33
Indications   see 33
Data analysis see 33

---

33   What your current major occupation - additional activities?

☐ Settlement/preparation of accounts

☐ Supervision of production facilities/maintenance

- [ ] Training
- [ ] Export
- [ ] Supervision of construction sites
- [ ] Preparation of construction sites/construction/supervision of construction
- [ ] Advisory services/consulting
- [ ] Maintenance and repair of production facilities
- [ ] Controlling
- [ ] Data processing
- [ ] Development/experiments
- [ ] Production
- [ ] Preparation of production
- [ ] Finances
- [ ] Research and development
- [ ] Research/science
- [ ] Estimating/costing
- [ ] Construction
- [ ] Construction/design
- [ ] Management
- [ ] Marketing
- [ ] Market research
- [ ] Material management
- [ ] Measurement and testing technology
- [ ] Installation/commissioning
- [ ] Standardization and licensing
- [ ] Personnel affairs
- [ ] Planning of functions/use of buildings/plants
- [ ] Planning and organization
- [ ] Project management
- [ ] Accountancy
- [ ] Security engineering
- [ ] Tax affairs
- [ ] System analysis
- [ ] Project execution
- [ ] Environmental engineering

☐ Processing development

☐ Sales management

☐ Other

Subject	Size of the company/the organization

Indicator   Information about the companies/the organizations; conditions of the professional work

Adaptation   Please check the terms for the groups of employees

Indications   For companies/organizations owning spatially separated firms/branches it is difficult to define precisely the terms of reference for all cases. Therefore, it is left to the graduates which figures they think to be appropriate. It is possible, too, to think of a solution as shown in the Employer Questionnaire Question 1 to 3.

Check   Please check the plausibility of the figures

Data analysis Standard; please carry out classifications; more detailed correlation analysis between size of company/organization and especially professional success, use of qualifications and requirements.

Other surveys Is often used in similar form.

34 How many employees are working for the company/the organization you work for? If you don't know the exact number, please estimate.

☐☐☐☐☐ Number of employees

☐☐☐☐☐ Number of university graduates employed

☐☐☐☐☐ Number of university graduates in the subject area Z employed

☐☐☐☐☐ Number of university graduates in the subject Z from the University of XY employed

CHEERS

D9 Please estimate, to the best of your ability, the approximate number of people who are working in ...

approx. ☐☐☐☐☐☐☐   a. the location where you currently work.

approx. ☐☐☐☐☐☐☐   b. the <u>entire organisation</u> if there is more than one location.

	Subject	**Working time**

Indicator   Employment situation

Adaptation   No

Indications   Up to now, all questions could also be answered by the independent businessman/woman/self-employed persons, but that is not possible for this question and some following ones. We propose to include for these questions the item "Not applicable, I am an independent businessman/woman/self-employed" instead of "filtering" this group and asking them special questions which could not be answered by the other graduates. However, should you enter any questions in your study which only can be answered by independent businessman/woman/self-employed persons, then probably a filter guidance would be more useful.

Data analysis   Standard; in order to be able to analyse income, it is useful to distinguish between the full-time and the part-time employees

Other surveys   AAU graduate surveys; CHEERS C10/C11 and D7

---

35   Are you employed full-time?

1 ☐   Yes

2 ☐   No, I am employed part-time

3 ☐   Not applicable, I have my own business/I am self-employed

Or (CHEERS)

D7   How many hours per week are you working on average? Multiple reply possible

Working hours

  per week

|␣|␣|␣|␣| Contract hours of my major assignment

|␣|␣|␣|␣| Additional working hours of my major assignment *(paid and unpaid overtime)*

|␣|␣|␣|␣| Working hours on other assignments *(second occupation, side jobs, etc.)*

|␣|␣|␣|␣| **Total working hours** *(incl. self-employment)*

---

36   Are you the superior of other employees?

1 ☐   No

2 ☐   Yes

Subject	**Management duties**

Indicator   Criterion for professional success

Adaptation   No

Indications   The number of persons for whom graduates are responsible or whom they have to supervise ("span of supervision") may also be understood as an indicator for the professional position achieved. See indications for Question 37.

Check   Please check the plausibility of the statements with the "open" statements of the graduates for the Question 38 as well as the figures concerning the size of the company/the organization

Data analysis   Standard; please carry out more detailed correlation analysis with the remaining criteria for professional success, the individual characteristics, the duration of studies, etc.; therefore probably used as additional Break-Variable

Other surveys   AAU studies

37   Which of the following management and leadership levels characterize your professional position?

1 ☐ Top/senior management (board of directors, general manager, etc.)

2 ☐ Average management (head of department, local manager, etc.)

3 ☐ Lower management (group leader, etc.)

4 ☐ No management tasks at all

5 ☐ Other

6 ☐ Not applicable, I have my own business/I am self-employed

Subject	Management level

Indicator   Professional position; criterion for professional success

Adaptation   Please check the examples

Indications   In some studies, the professional position achieved - together with the income - is the main indicator for professional success. In graduates surveys, though, it is only possible to a certain extent to ascertain the professional position achieved clearly in order to be able to use it as an indicator because the terms for the hierarchical positions of companies and organizations are not standardized and, besides, the individual companies/organizations are vertically diversified in a different way. Additional problems occur when making comparisons between different countries. Therefore, we recommend that you do not overvalue the results concerning the professional position and pay at least the same attention to other criteria of professional success.

Check   Please check the plausibility of the classification with the open statements of the graduates in the following Question 38.

Data analysis   Standard; please carry out more detailed correlation analysis with the remaining criteria for professional success, the individual characteristics, the duration of professional experience, the performance during studies, etc.; therefore probably used as additional Break-Variable

Other surveys Is used often

---

38   What is the term for your professional position? Please indicate the most precise term (e.g. management assistant, owner of a business)

....

....

Indicator	Professional position; criterion of professional success
Adaptation	Please check examples
Indications	First of all, the open statements of the graduates are supposed to enable a check of the plausibility of the classification in Question 37.
Check	Please shorten/correct the text statements where necessary (e.g. Ass. instead of Assistant)
Data analysis	Only list of text answers; possibly coding
Other surveys	Is used often

Subject   Duration of employment in the present position

Indicator	Criterion of professional success; professional career
Adaptation	No
Indications	With the help of this Question it can be ascertained after what length of employment promotion can be achieved.
Check	Please check plausibility of times
Data analysis	Standard
Other surveys	Is used occasionally

39   For how long have you been working in your present position?

☐☐☐☐☐ Duration of work in the present position (months)

Subject   Income

Indicator	Criterion of professional success
Adaptation	Please check if it is possible to ask frankly about the income in the country; possibly propose income classification
Indications	Giving the currency is only necessary to enable conversion of the figures in case graduates are employed abroad.
Check	Please pay attention to the statement regarding currency and, if necessary, convert it into the state currency
Data analysis	Standard; please evaluate connections with the other criteria of professional success
Other surveys	There are similar questions in all studies

40   How much is your monthly gross income? Please take into account only the income from your main occupation and, if necessary, take the average value

☐☐☐☐☐ Monthly gross income

CHEERS

D11 What is your approximate annual gross income?[NatCat local currency]:

Thousand [NatCat]

⌊_⌊_⌊_⌊_⌊_⌊_⌋   a. from your current major job *(excluding overtime and extra payments)?*

⌊_⌊_⌊_⌊_⌊_⌊_⌋   b. from overtime and extra payments in your major job?

⌊_⌊_⌊_⌊_⌊_⌊_⌋   c. from other jobs?

Subject	**Additional grants of the employer**

Indicator   Criterion of professional success
Adaptation   Probably complete further grants
Indications   None
Data analysis   Standard
Other surveys   Is used occasionally

41 Do you receive any fringe benefits from your employer? Multiple reply possible

☐ Car, car allowance, or other grants for using public transport

☐ Housing or grant towards the rent

☐ Health service or something similar

☐ (Additional) provision for old age

☐ Other

☐ No additional grants

Subject	**Further occupations**

Indicator   Professional situation
Adaptation   No
Indications   As mentioned before, we don't think it useful to ask any more questions about the further occupation.
Data analysis   Standard
Other surveys   Is used occasionally

42 Do you have any further professional occupations?

1 ☐ Yes

2 ☐ No

3 ☐ Not applicable, I have my own business/I am self-employed

---

Subject	**Region of employment**

Indicator   Basic conditions of the occupation; regional mobility

Adaptation   Is necessary, as only the officially named regions of the respective country are useful

Indications   Some studies also ask for the size of the town or they propose types of regions (e.g. capital, city, industrial centre, etc.). We recommend that you include a list of the regions of your country; with the help of this list you are able to ascertain the mobility quite precisely as well and you will get to know the economic characteristics of the individual regions.

Data analysis Standard

Other surveys A similar question is used in many studies

---

43   In which region are you working?

1 ☐ (text)

2 ☐ (text)

99 ☐ No answer

Subject	**Assessment of the self-employed person**

Indicator   Information

Adaptation   Probably complete further aspects

Indications   In graduates surveys, independent businessmen/women/self-employed persons are often underrepresented or are represented only in such few numbers of cases that reliable statements concerning their professional situation can hardly be made. This question provides indirect information about the professional situation of the independent businessman/woman/self-employed person, as all graduates are asked for their assessment of this Subject.

Data analysis Standard

Other surveys Is used occasionally; most of the time a similar question about the reasons for taking up an independent occupation are only asked of self-employed people. AAU studies.

---

44   How far do you agree with the following statements concerning work in one's own business/being self-employed? Scale of answers from 1=completely applicable to 5=not at all applicable.

☐ ☐ ☐ ☐ ☐ Persons having their own business/being self-employed achieve a relatively high income

☐ ☐ ☐ ☐ ☐ Persons having their own business/being self-employed have long working hours

☐ ☐ ☐ ☐ ☐ Graduates establish their own business/are self-employed mainly because they have not found any other employment

☐ ☐ ☐ ☐ ☐ Higher education does not really prepare graduates sufficiently for an occupation with regard to setting up their own business/to be self-employed

☐ ☐ ☐ ☐ ☐ Favourable long-term job prospects exist for persons having their own business/being self-employed

7.1.7 Work, Professional Requirements and Use of Qualifications

This topic includes the two questions 45 and 46. The first question concerns the professional/contextual relation of higher education and employment on the basis of the self-perception of the graduates and the second question deals with the non-professional qualification requirements. It is advisable, though, to differentiate the first question more strongly than has been done in this Specimen Questionnaire, as the results are a main focus of this study for the purpose of taking into account the educational programme of the university appropriately. You will have to propose longer lists of course contents, particularly if engineers are educated in different subject areas.

Subject	**Use of professional qualifications**

Indicator	Relation between studies and profession; use of professional qualifications acquired; affinity of the professional tasks
Adaptation	Is necessary; please carry out further differentiation of proposed answers, corresponding to the respective study contents.
Indications	The proposed answers are relatively highly aggregated and are equally suitable for mechanical engineers, electrical engineers and civil engineers. We recommend that you use a stronger differentiation of the proposed answers for your study corresponding to the course of studies of your university. Cf. Employer Questionnaire Question 30
Data analysis	Standard; reinforced factor analysis, probably clusters should be built
Other surveys	Is used in individual studies only; AAU studies

45 To what extent do you use qualifications acquired during your studies for your present job? Scale of answers from 1=to a very high extent to 5=not at all. If you have not acquired any of the following knowledge or skills, please don't tick any item in the corresponding line

☐ ☐ ☐ ☐ ☐ Mathematics

☐ ☐ ☐ ☐ ☐ Natural sciences (physics, chemistry), material technology

☐ ☐ ☐ ☐ ☐ Ecology and conservation

☐ ☐ ☐ ☐ ☐ Theoretical basics of engineering sciences (technical mechanics, thermodynamics, structural engineering, electrical engineering, etc.)

☐ ☐ ☐ ☐ ☐ Operation, measurement, and control technology

☐ ☐ ☐ ☐ ☐ Applied technical fields (technical sets, machine systems, installations, connections)

☐ ☐ ☐ ☐ ☐ System analysis and optimization

☐ ☐ ☐ ☐ ☐ Planning, design, calculation, and construction (product- and process-orientated)

☐ ☐ ☐ ☐ ☐ Experimental and practical working

☐ ☐ ☐ ☐ ☐ EDP application (CAD, CIM, etc.)

☐ ☐ ☐ ☐ ☐ Social sciences (psychology, sociology, politics)

☐ ☐ ☐ ☐ ☐ Economics (finances, costing, etc.)

☐ ☐ ☐ ☐ ☐ Law (elements relevant to discipline/subject)

☐ ☐ ☐ ☐ ☐ Knowledge of the English language

Subject	Non-professional qualification requirements

Indicator | Relation between studies and profession

Adaptation | No

Indications | For the execution of professional tasks not only the knowledge and abilities which are obviously the aim of higher education are necessary but graduates also have to possess "non-professional" qualifications and orientations. To what extent the universities teach these "non-professional" qualifications and orientations will differ highly between the individual cases. Besides, it is not known how these qualification contents can be produced or how they were produced. Many of them might have existed at the time the course of studies was commenced (e.g. persistence, determination) On the other hand, others might have been specially supported during the course of studies (e.g. economically effective thinking, ability to solve problems, innovativeness, self-confidence).
Cf. Employer Questionnaire Question 31

Data analysis | Standard; reinforced factor analysis

Other surveys | Is used in some studies but with different lists. AAU studies

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46 **To what extent are you confronted with the following requirements in your present occupation? Scale of answers from 1=to a very high extent to 5=not at all.**

☐ ☐ ☐ ☐ ☐ Willingness to learn

☐ ☐ ☐ ☐ ☐ Ability to solve problems

☐ ☐ ☐ ☐ ☐ Ability to reflect upon your own actions/activities

☐ ☐ ☐ ☐ ☐ Ability to express yourself in writing

☐ ☐ ☐ ☐ ☐ Unconventional thinking

☐ ☐ ☐ ☐ ☐ Willingness to perform/commitment

☐ ☐ ☐ ☐ ☐ Ability to coordinate

☐ ☐ ☐ ☐ ☐ Ability to improvise

☐ ☐ ☐ ☐ ☐ Reliability

☐ ☐ ☐ ☐ ☐ Ability to work under pressure

☐ ☐ ☐ ☐ ☐ Independence

☐ ☐ ☐ ☐ ☐ Sense of responsibility

☐ ☐ ☐ ☐ ☐ Innovativeness

☐ ☐ ☐ ☐ ☐ Creativity

☐ ☐ ☐ ☐ ☐ Economically efficient thinking

☐ ☐ ☐ ☐ ☐ Determination

☐ ☐ ☐ ☐ ☐ Loyalty to the institution and its objectives

☐ ☐ ☐ ☐ ☐ Persistence

☐ ☐ ☐ ☐ ☐ Ability to cooperate

☐ ☐ ☐ ☐ ☐ Ability to assert oneself

☐ ☐ ☐ ☐ ☐ Self-confidence

☐ ☐ ☐ ☐ ☐ Adaptability

☐ ☐ ☐ ☐ ☐ Empathy

☐ ☐ ☐ ☐ ☐ Leadership qualities

☐ ☐ ☐ ☐ ☐ Initiative and drive

Or in the CHEERS project:

E1   Please, state the extent to which you had the following competencies at the time of graduation in 1994 or 1995 and to what extent they are required in your current work. If you are not employed please answer only (A).

A. Possessed at time of graduation 1994 or 1995					**Knowledge, skills and competencies**	**B. Work requirements**				
To a very high extent				Not at all		To a very high extent				Not at all
1	2	3	4	5		1	2	3	4	5
☐	☐	☐	☐	☐	Broad general knowledge	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Cross-disciplinary thinking/knowledge	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Field-specific theoretical knowledge	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Field-specific knowledge of methods	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Foreign language proficiency	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Computer skills	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Understanding complex social, organisational and technical systems	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Planning, co-ordinating and organising	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Applying rules and regulations	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Economic reasoning	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Documenting ideas and information	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Problem-solving ability	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Analytical competencies	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Learning abilities	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Reflective thinking, assessing one's own work	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Creativity	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Working under pressure	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Accuracy, attention to detail	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Time management	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Negotiating	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Fitness for work	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Manual skills	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Working independently	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	Working in a team	☐	☐	☐	☐	☐

☐ ☐ ☐ ☐ ☐					Initiative	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Adaptability	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Assertiveness, decisiveness, persistence	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Power of concentration	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Getting personally involved	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Loyalty, integrity	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Critical thinking	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Oral communication skills	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Written communication skills	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Tolerance, appreciating of different points of view	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Leadership	☐ ☐ ☐ ☐ ☐				
☐ ☐ ☐ ☐ ☐					Taking responsibilities, decisions	☐ ☐ ☐ ☐ ☐				

7.1.8   Assessment of the Professional Situation

The term of this subject area is not very precise as in this part different subject areas are summarized. First of all you will find questions concerning the relation between studies and employment, the results of which provide information about important aspects of professional success. The questions concerning the professional satisfaction also provide details about professional success with regard to important characteristics of the professional situation as well as in general. In the question about the professional motivation the orientations which are important for individual actions are of considerable importance for the explanation of the professional development of the graduates. The final question provides information about the further perspectives of the graduates.

Subject   Realization of the professional ideas

Indicator   Criterion of professional success

Adaptation   No

Indications   The question aims at the degree of matching between the job outline at the end of the studies and subsequent experiences. The match may only be slight, but nevertheless the professional satisfaction may be high. Therefore, with the help of this question we do not ascertain professional satisfaction.

Data analysis   Standard; connections with the other criteria of professional success

Other surveys   Is used occasionally

---

47   To what extent were you able to realize the professional ideas you had at the end of your studies? Scale of answers from 1=to a very high extent to 5=not at all.

☐ ☐ ☐ ☐ ☐   Realization of the professional ideas

Subject   use of Knowledge and skills

Indicator   Relation between studies and profession; criterion of professional success

Adaptation   No

Indications   The extent of the use of qualifications has been already ascertained in detail in part 6. Here, a summarizing characterization by the graduates is wanted.

Data analysis   Standard; correlation analysis with the other criteria of professional success

Other surveys   Similar questions are used often

---

48   When you look at your current professional tasks as a whole: to what extent do you use the qualifications acquired during your course of studies? Scale of answers from 1=to a very high extent to 5=not at all.

☐ ☐ ☐ ☐ ☐   Extent of the use of qualifications

Cheers:

E2   To what extent has your study (you graduated from 1994 or 1995) been useful for ...?

To a very high extent				Not at all	
1	2	3	4	5	
☐	☐	☐	☐	☐	a. preparing you for your present work tasks?
☐	☐	☐	☐	☐	b. preparing you for tasks in other spheres of life?

Subject	**Appropriateness of the professional position**

Indicator   Relation between studies and profession; criterion of professional success. A central question in the discussions concerning the consequences of university expansion in the industrialized countries is if and to what extent graduates have positions which are below the level looked upon as being the standard level for graduates.

Adaptation   No

Indications   None

Data analysis   Standard; correlation analysis with the other criteria of professional success

Other surveys   Is used in similar form in some studies

49   How would you characterize your current professional position? To what extent is your professional position adequate to your education? Scale of answers from 1=completely to 5=not at all.

☐ ☐ ☐ ☐ ☐   Appropriateness of the professional position

Cheers

F3   If you consider all dimensions of your employment and work (status, position, income, work tasks, etc.):

a.   To what extent is your employment and work appropriate to your level of education?

Completely appropriate 1   2   3   4   Not at all appropriate 5

☐ ☐ ☐ ☐ ☐

b.   What is the most appropriate level of course of study/degree for your employment and work in comparison to that which you graduated from in 1994 or 1995?

1 ☐ A higher level than the one I graduated from

2 ☐ The same level

3 ☐ A lower level of higher/tertiary education

4 ☐ No higher/tertiary education at all

5 ☐ Others (please specify): ....

Subject	**General appropriateness of the professional situation**

Indicator   Relation between studies and profession; criterion of professional success

Adaptation   No

Indications   The comprehensive assessment of the professional situation is supposed to give graduates the chance to take into account further aspects of their professional situation - beside the above mentioned aspects "use of qualification" and "appropriateness" - and to weight the individual characteristics for their opinion.

Data analysis   Standard; correlation analysis with the other criteria of professional success

Other surveys   Is used in similar form in some studies

50   Assessed as a whole, to what extent does your occupation correspond to your education? Please take into account all aspects which you think are important, for example the admission requirements for a profession, the chance of using qualifications, the professional and social position, the further professional perspectives, etc. Scale of answers from 1=completely to 5=not at all.

☐ ☐ ☐ ☐ ☐   General appropriateness of the professional situation

Subject	**Reasons for inadequate employment**

Indicator   Relation between studies and profession

Adaptation   No

Indications   In some studies, a filter question is placed before the question for the reasons for an inadequate employment so that this question only can be answered by those who - at least partly - don't think their profession is adequate . A "soft" filter has been installed here and, additionally, the category "Not at all applicable" has been included for the reasons.

Data analysis   Standard

Other surveys   Is used in a few studies only

51   If, at least partially, you don't think your occupation is adequate: why do you work in a job like this? Multiple reply possible

☐ I earn more money doing this work than doing a study-orientated job

☐ I prefer an occupation which is not closely connected to my studies

☐ This job promises better career prospects than a study-orientated occupation

☐ I am very interested in this work, it is very important for me

☐ Because of promotion I am no longer working in an occupation closely related to my studies any longer

☐ I preferred a part-time job or a flexible occupation

☐ I wanted to work in a certain local area but I could not find any adequate occupation

☐ Even though I would prefer a study-orientated occupation, I could not find any

☐ My family situation reduced the possibility of choice

☐ My current occupation is a prerequisite for my desired future profession

☐ Other

☐ Not applicable because I think my job is fully adequate

Subject	Relevance of the professional occupation for the development of the country

52 **To what extent does your occupation contribute to the economic development of your country? Scale of answers from 1=to a very high extent to 5=not at all.**

☐ ☐ ☐ ☐ ☐ Relevance of the professional occupation for the development of the country

Adaptation   No

Indications   The question aims at the contribution towards economic development. In this way problems concerning the differences in the understanding of "development" are to be avoided.

Data analysis   Standard

Other surveys   Is used in some studies

53 **To what extent are you satisfied with the following characteristics of your professional situation? Scale of answers from 1=to a very high extent to 5=not at all.**

☐ ☐ ☐ ☐ ☐   Contents of work/the professional tasks

☐ ☐ ☐ ☐ ☐   Working atmosphere

☐ ☐ ☐ ☐ ☐   Safety of the workplace

☐ ☐ ☐ ☐ ☐   Possibility to use qualifications acquired during my studies

☐ ☐ ☐ ☐ ☐   Possibility to work in a demanding job

☐ ☐ ☐ ☐ ☐   Professional position achieved

☐ ☐ ☐ ☐ ☐   Amount of income

☐ ☐ ☐ ☐ ☐   Prospects for promotion

☐ ☐ ☐ ☐ ☐   Opportunity to benefit society

☐ ☐ ☐ ☐ ☐   Chance to realize my own ideas

☐ ☐ ☐ ☐ ☐   Fringe benefits granted by the employer

☐ ☐ ☐ ☐ ☐   Chances to obtain further professional qualifications

☐ ☐ ☐ ☐ ☐   Equipment of the workplace as regards necessary working material

☐ ☐ ☐ ☐ ☐   Workplace surroundings (noise, space, climat, etc.)

Subject	**Satisfaction with the individual characteristics of the professional situation**

Adaptation	No
Indications	None
Data analysis	Standard; correlation analysis with the other criteria of professional success; factor analysis
Other surveys	Is used in many studies

54   Altogether, to what extent are you satisfied with your professional situation? Please also take into account in your statement any professional sidelines. Scale of answers from 1=to a very high extent to 5=not at all.

☐ ☐ ☐ ☐ ☐   General professional satisfaction

Subject	General satisfaction with professional situation

Indicator	Criterion of professional success
Adaptation	No
Indications	None
Data analysis	Standard; correlation analysis with the other criteria of professional success; factor analysis
Other surveys	Is used in many studies

55 **How important are the different characteristics of an occupation for you personally? Please start out from your own objectives for a professional occupation regardless of whether you have achieved them yet. Please indicate the importance for you personally of each of the following characteristics. Scale of answers from 1=very important to 5=not at all important.**

☐ ☐ ☐ ☐ ☐ Largely independent planning of my own work

☐ ☐ ☐ ☐ ☐ Chance for scientific work

☐ ☐ ☐ ☐ ☐ Clear and well-ordered tasks

☐ ☐ ☐ ☐ ☐ Possibilities of using acquired qualifications

☐ ☐ ☐ ☐ ☐ High safety of the workplace

☐ ☐ ☐ ☐ ☐ Social respect and acceptance

☐ ☐ ☐ ☐ ☐ Possibility to develop and realize own ideas

☐ ☐ ☐ ☐ ☐ Good working atmosphere

☐ ☐ ☐ ☐ ☐ Chance to obtain further professional qualifications

☐ ☐ ☐ ☐ ☐ High income

☐ ☐ ☐ ☐ ☐ Chances of political influence

☐ ☐ ☐ ☐ ☐ To work in a demanding job

☐ ☐ ☐ ☐ ☐ Good promotion prospects

☐ ☐ ☐ ☐ ☐ Lot of free time

☐ ☐ ☐ ☐ ☐ Assumption of coordinating and management tasks

☐ ☐ ☐ ☐ ☐ Possibility of team-work

☐ ☐ ☐ ☐ ☐ Chance to do something useful for society

Subject	**Professional motivation**

Indicator   Orientation for one's own actions which is important for understanding individual professional development

Adaptation   No

Indications   This question again is to be answered by all graduates including those who are unemployed. If you include additional questions into the questionnaire, please pay attention to the filter guidance

Data analysis Standard; factor analysis; to be included in regression analyses; correlation analysis with the criteria of professional success

Other surveys Is used in many studies

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56   Are you a member of an organization/a committee with development-related tasks?

1 ☐ Yes

2 ☐ No

Subject	**Membership in a development organization**

Indicator   Commitment for the development of the country

Adaptation   possibly include list of organizations/committees or ask for them in an "open" question

Indications   None

Data analysis Standard

Other surveys Is used in individual studies

---

57   Are you a member of any professional associations?

1 ☐ No

2 ☐ Yes

Subject	Membership in professional associations

Indicator	Professionalism; criterion for professional success if membership in professional associations is connected with a certain standard of professional performance
Adaptation	Probably propose list of home associations instead of the "open" question
Indications	The interpretation of the names of the professional organizations presupposes knowledge concerning these organizations, therefore the coding and following analysis of this item is only useful if this knowledge exists.
Data analysis	Standard
Other surveys	Is used in individual studies only

7.1.9   8. Further/Other Formal Higher Education

This part, like the following ones does not pursue the individual biography. Other higher education could have been completed before the course of studies this questionnaire refers to.

This chapter is about the main objective characteristics of a further higher education and additionally it asks for the reasons for it. When interpreting the results and the educational concept of the university, the basic conditions for the professional occupation of university graduates of the respective country and the individual orientation of the graduates have to be taken into account.

In various aspects those graduates who completed other higher education are an interesting group: if they have completed a further course of study at a different university than the University of XY they are equipped to make a basic comparison with their studies at the University of XY. In any case, they also ascribe professional success less directly to being an "effect" of the course of studies at the University of XY than do the graduates who do not have any other higher education. It has to be taken into account that this group has clearly less professional experience than other graduates and therefore their professional success, as far as it depends on the duration of the professional experience (e.g. promotion by merits), may initially be lower even though they have more education.

Subject	Further course of studies

Indicator	Professional development
Adaptation	No
Data analysis	Standard analysis
Other surveys	A similar question is used in many studies.

59   Have your started a further/another course of studies?

1 ☐ Yes, I have completed it successfully

2 ☐ Yes, I am still studying

3 ☐ Yes, I have stopped my further course of studies

4 ☐ No, I have not started a further course of studies

| **Subject** | **Subject area of further course of studies** |

Indicator   Professional development

Adaptation   No

Indications   Here, an open question has been used as, in advance, it is hardly possible to create exhaustive lists of the departments, the institutions, etc. According to the status the question about further higher education has in the framework of this study, it must be decided whether the statements of the graduates will be coded and in what way this will be done. In the statements concerning the Subject area you could only differentiate whether this subject area shows great coincidence with the subject area at the University of XY (= affinitive subject area) or whether it does not show any at all.

Data analysis   A quantitative standard analysis is possible after coding

Other surveys   A similar question is used in many studies.

60   (Major) Subject area(s)

....

....

61   Name of the university/institution

....

....

62   Kind of degree

1 ☐ Bachelor

2 ☐ Master

3 ☐ PhD

4 ☐ Other

63   When did you start your course of studies? And when was the end?

Month ☐☐ Year ☐☐☐☐   Start of course of studies

Month ☐☐ Year ☐☐☐☐   Endt of course of studies

1 ☐   Not finished yet

7.1.10   Further Professional Training

As was the case for the questions concerning further higher education, the objective characteristics of the further professional education will mainly be ascertained. For the interpretation of the results not only the educational concept of the university has to be taken into account but also the national basic conditions for graduate employment as well as individual orientations.

The statements in this part also serve to provide important information about the need for further professional education which may also be addressed to the University of XY.

Subject   Further professional education

Indicator   It is also a gauge for the individual professional orientation
Adaptation   No
Indications   See the Employer Questionnaire
Data analysis   Standard, possibly used as Break-Variable
Other surveys   Is used in many studies

65   Have you continued professional education after completing your studies?

1 ☐   Yes

2 ☐   No

Subject   Consequences of further professional education

Indicator   It is also a gauge for the individual professional orientation
Adaptation   No
Indications   See the Employer Questionnaire Questions 18 to 22
Data analysis   Standard
Other surveys   No

66   Which consequences did your further education have for your employment situation so far? Multiple reply possible

☐   Helped changing the profession

☐   Helped changing the employer

☐   Helped towards economic independence (establishment of firm, etc.)

☐   Prevented worsening of my professional situation

☐   Belonged to my field of activity

☐   Helped me to earn more money

☐   Helped me to get a better position

☐   Has been important to get a job at all

☐ Has not shown any results yet

☐ Did not lead to any changes in my occupation even though I expected it

☐ Other

Subject	Kind of need for further professional education

Adaptation	Is necessary; please pay attention to the exceptional features of the departments
Indications	Cf. Employers Questionnaire Question 19
Data analysis	Standard
Other surveys	Is used in individual studies

67	In which topic would you like to receive further professional training if you had the opportunity to participate? Multiple reply possible

☐ Reinforcement of technical basic knowledge/skills

☐ Workplace-orientated technical knowledge

☐ EDP-application

☐ Personnel management

☐ Finance management

☐ Contact with other persons (sales seminar/courses on group dynamics)

☐ Preparation for management functions

☐ Other

7.1.11   Bio-Data: Personal Background

This part is about the evaluation of the main individual characteristics of the graduates, e.g. year of birth, gender, etc. which were already facts before studies were started. Some far-reaching assumptions about differences between graduate groups are connected with these biographical characteristics and are investigated in many graduate studies.

In some studies, this subject is much more differentiated than is proposed here. In the appendix we have included further questions which allow greater depth.

We recommend that these questions be placed at the end of the questionnaire as it may then be more comprehensible for the graduates why these questions are asked. Besides, they are easy to answer and this caters for any tiredness which may have developed in the course of the interview.

Subject   Year of birth

Indicator   Individual characteristics; information about the sample

Adaptation   No

Indications   None

Data analysis   Standard (mean and classification). The actual age (including a certain mistake) can be found from the difference age = actual year - year of birth.

Other surveys   Is used in all studies

---

68   Year of birth

☐☐☐☐ Year of birth

Subject   Country of Birth

Indicator   Origin; individual characteristic; information about the sample

Adaptation   No

Indications   None

Data analysis   After coding standard analysis

Other surveys   Is used in most studies

---

69   Country of birth

1 ☐ (text)

2 ☐ (text)

3 ☐ (text)

88 ☐ Other

99 ☐ No answer

70   Country of present residence

1 ☐ (text)

2 ☐ (text)

3 ☐ (text)

88 ☐ Other

99 ☐ No answer

Subject	Reasons for staying in another country

Indicator	Brain drain
Adaptation	No
Indications	As a basis for the calculation of a Brain-Drain-Quota only those graduates should be chosen who give the reason "Better working conditions in the present country of residence".
Data analysis	Standard
Other surveys	Is used in individual studies

71 If you do not live in your country of birth at present, please indicate the reasons for this: Multiple reply possible

☐ Further higher education

☐ Further professional education

☐ Better employment conditions in the present country of residence

☐ Political circumstances in my home country

☐ Other

Subject	Professional education before studying

Indicator	Individual characteristics; information about the sample
Adaptation	May be dropped if this only applies to a few graduates
Indications	With the help of an open question, you may additionally ask for the kind of professional education (see appendix)
Data analysis	Standard
Other surveys	Is used in some studies

72 Did you complete a professional education prior to your studies at the University of XY?

1 ☐ Yes

2 ☐ No

Subject	Employment before starting to study

Indicator	Individual characteristics; information about the sample
Adaptation	May be dropped if this only applies to a few graduates.
Indications	None
Data analysis	Standard
Other surveys	Is used in some studies only

74 Were you unemployed for a long time before you started your studies at the University of XY?

1 ☐ No

2 ☐ Yes

---

74   How many years did you work before you started your studies at the university of XY?

Indicator	Individual characteristics; information about the sample
Adaptation	May be dropped if this only applies to a few graduates.
Indications	None
Check	Please check the plausibility of the given time and the given age
Data analysis	Standard; to be taken into account for the whole duration of the employment
Other surveys	Is used in some studies only

Subject   Social origin

Indicator	Individual characteristics; information about the sample. The inequality of the social levels participating in higher education has been a main interest of the education research in the industrialized countries, and also has a certain importance in developing countries in the debate about the justification of public financing of higher education costs.
Adaptation	Is necessary, corresponding to the national education system
Indications	In many studies, the social origin is captured with further variables the income of the parents, the profession/position etc. Our proposal, to ascertain only the "education origin" is, on the one hand, justified by the empirically backed knowledge that the individual "characteristics of the social level" are more or less strongly connected with each other. But it is always easier and more reliable to ascertain the origin of education than the other characteristics of social origin.
Data analysis	Standard; possibly used as Break-Variable
Other surveys	Is used in most of the studies

---

75   What is the highest level of education attained by your parents?

1 ☐ No formal education

2 ☐ Completion of compulsory education

3 ☐ Completion of secondary education and/or higher vocational school

5 ☐ Attended college of higher education for up to two years

6 ☐ First degree awarded at a university (three or more years of study; e.g. Bachelor)

7 ☐ Higher degree awarded at a university (e.g. Master, PhD)

8 ☐ I don't know

1 ☐ No formal education

Subject	**Gender**

Indicator	Individual characteristics; information about the sample During the last years, a growing awareness of sex-related differentiation has been noted (headword: discrimination against women, promotion of women). Therefore, a main question for graduate surveys is connected with the "gender".
Adaptation	No
Indications	Usually, you use the short word "gender" instead of formulating "What is your gender?"
Data analysis	Standard - Break-Variable; the share of women in the engineering sciences is only very small, therefore, the analysis may fail due to the excessively small numbers of cases.
Other surveys	Is used in all studies

---

76   Gender

1 ☐ Male

2 ☐ Female

7.1.12   Comments Concerning the Studies

Subject	**Strengths and weaknesses of the studies**

Indicator	Evaluation of studies
Check	Code the answers, use the same list for Question 77, 78, and 79.
Data analysis	Standard
Other surveys	Sometimes

---

77   In your opinion, what are the strengths of the studies at the University of XY?

....

....

....

....

78   In your opinion, what are the weaknesses of the study programme at the University of XY?

---

79   Looking at your present professional experiences, which changes would you suggest (technical emphasis, ways of education, etc.) in the study programme?

100 ☐ Facilities

101 ☐ Laboratory facilities

102 ☐ University library

103 ☐ Faculty library

104 ☐ Classroom space

105 ☐ Computer facilities (hardware)

106 ☐ Computer facilities (software)

107 ☐ Other facilities

108 ☐ Study programme

109 ☐ Curriculum

110 ☐ Workshop training

111 ☐ Practical work

112 ☐ Research

113 ☐ Councelling

114 ☐ Other study programme

115 ☐ Teaching and learning

116 ☐ Methods of teaching

117 ☐ Availability of lecturers

118 ☐ (text)

119 ☐ (text)

120 ☐ Other teaching and learning

121 ☐ Other

122 ☐ No answer

Subject	**Contacts or cooperation between university and its graduates**

Adaptation	Possibly
Indications	None
Data analysis	Standard
Other surveys	Is used in some studies

80   What kind of connections/contacts do you have to the Faculty Z of the University XY and how should connections/contacts be organized between the Faculty Z of the University XY and its graduates? Multiple reply possible

☐ Newsletter

☐ Graduate meetings

☐ Foundation/support of a graduate' union

☐ Professional cooperation in projects

☐ Help with current problems

☐ Other

Subject	**Request of report**

Adaptation   Possibly

Indications   None

Data analysis No

Other surveys Is used in some studies

81   Request of report

1 ☐ Yes

2 ☐ No

Subject	**Addresses**

Indicator   Important information for matching the data from the employer and the graduate questionnaire; incentive for participation in the survey (see also text of the enclosed letter)

Adaptation   Country-orientated

Indications   If this statement represents sensitive data in the respective country, please point out that answering is optional.

Check   In order to guarantee anonymity, this slip should be cut off immediately after receipt. The addresses should not be integrated in the data record later either. If you intend to connect the data from the Graduates Questionnaire (case-orientated) with the data from the Employers Questionnaire, the questionnaire and address-slip should be given the same number.

Data analysis No

Other surveys Is asked for in many studies in developing countries

82   Addresses

1 ☐ Yes

2 ☐ No

8 Employer Survey

<table>
<tr><td colspan="2" align="center">SUBJECT   ADMINISTRATIVE INFORMATION</td></tr>
</table>

01 Case number

02 Card number

Adaptation   A card number is not necessary if a data bank programm like DATA ENTRY or DBASE is used

Check   Sequence of the cards

03 Date of returned questionnaire

Adaptation   no

Data analysis   Special: Relevant only for the chapter on methods

8.1.1 Characteristics of the Employing Organization

<table>
<tr><td align="center">Subject   Structure of company/organization</td></tr>
</table>

Indicator   Description of the sample; effects of the organization structure on the conditions of use of the qualifications and the professional further education of the graduates;

Adaptation   Possibly; the question should refer to the relevant structures of organization of the main employers of the Subject areas surveyed.

Indications   As the structures of organization of private and public enterprises follow different logics they are hardly to be captured with the same question. Our proposal more or less follows the structures of the private enterprises.

Data analysis   Standard; correlation analysis with the size of the company/organization; when interpreting the findings please take the results into account appropiately.

Reinforced   To what extent do differences exist regarding the recruitment strategies and the recruitment criteria? For example, is the professional affinity of study and profession less decisive in central enterprises because of more training time or additional introductory or further professional education offered?

Other surveys   Is used rarely

1 Is the company/organization you are working for part of a (bigger)

company/organization?

1 ☐ No

2 ☐ Yes, it is the head office/central unit of a company/organization

3 ☐ Yes, it is a branch of the company/organization

Subject	Size of Company/Institution

Indicator Description of the samples; consequences of the organization structure for the demand for qualifications, professional tasks and internal possibilities for professional further education. Could it be that in smaller enterprises more generally educated graduates are wanted and that in bigger firms an increasing demand exists for graduates who specialized more strongly in certain Subjects.

Adaptation No

Indications Alternatively a classification regarding the size of the company/organization could be proposed. The classification into these categories would be quite easy for the interviewees as only general details are expected. Of course, this includes a lack of data. You would not receive any information about the variation of statements within the categories.

Check Please check the plausibility of the given figures.

Data analysis Main-Break-Variable; it is interesting to investigate the influence of the size of the company/organization on the qualifications required, the area of responsibility and the supply of internal/external qualifying measures. If the company/organization is part of a bigger enterprise (see Question 1) we propose to use as Main-Break-Variable the number of employees at the respective plant because the following questions refer only to this and not to the whole enterprise. This, however, does not exclude using the total number of employees for certain questions/cases. The formation of classifications regarding the size of the company/organization (small business, middle-sized business, large concern) can either be done by following the classifications of official statistics if these classifications are appropriate for the respective investigation area. Or else you can use standardized statistical measures for forming classifications (forming quartiles or percentiles of the investigated data).

Other surveys Is used often.

2 How many employees work for the branch of the company/organization you are working for?

3 How many people are employed by the whole company/organization?

| **Subject** | **Economic branch of the company/organization** |

Adaptation   Subject-specific

Indicator   Kind of work

Indications   Compare   Graduates   Questionnaire   Question   32
As far as possible and appropriate for the investigation, official statistics can be used for the classifications. In most of the cases changes will be necessary which could be made as follows
1. Selecting relevant upper categories (non-relevant upper categories will be investigated by "Other");
2. amongst the upper categories selecting relevant sub-categories or possibly introducing further differentiations (non-relevant sub-categories will be investigated by "Other" specified by the name of the respective upper   category)
Following the procedure described in the explanatory chapter a very sensitive system of the branches of industry for mechanical engineering has been developed (see A1.4). However, within the framework of the necessary adaptation of the classifications of the branches of industry we recommend developing a category of average differentiation. Starting from the strongly differentiated version, for example, you may focus the differentiations or drop them or capture them under "Other" if you think they are too clearly defined. In case of doubt a more differentiated version of the categories of answers is recommended which can be aggregated more strongly for the analysis.

Data analysis   Standard; in order to classify the findings, please use the comparison with the respective data of the official statistics as far as possible.

Other surveys   Is used in a different form in nearly all studies

---

4   Please specify the field in which the company/organization best can be best classified. Please tick one item only.

1 ☐ School

2 ☐ University

3 ☐ Research institution

4 ☐ Agriculture and forestry/fishing

5 ☐ Mining

6 ☐ Electricity supply and other energy industry

7 ☐ Water supply and water industry

Subject	Economic sector

Indicator   Important work conditions

Adaptation   Please pay special attention to the terms used in the respective country.

Indications   This question serves mainly to differentiate between the employees in the public and private sectors. The educational field has additionally been included because it is an important sector with very special characteristics. Since the next question also contains the educational field as an employment sector you may well decide not to include it in this question as part of the proposed answers. See Graduates Questionnaire Question 31

Data analysis Main-Break-Variable

Other surveys A similar question is used in all studies.

---

5   To which of the following sectors does the company/organization belong? Please tick one item only

1 ☐ Private sector

2 ☐ Parastatal/public enterprise

3 ☐ Public sector/local or central government

4 ☐ Other

Subject	Number of engineers working for the company/organization

Indicator   Effect of the organization structure on the demand for qualifications, professional tasks and internal professional further education. The answers to the questions concerning the qualification assessments of the graduates of the University of XY will inform you about the experience level of the interviewee. The number of female graduates provides indications about the employment chances of women in the company/organization.

Adaptation   Subject-specific; if any further related subject areas of a university are included in this study, the information should also be ascertained for each of them (cf. example in the appendix).

Indications   The number of graduates of a specific Subject area can be regarded as specific indicator for the size of the enterprise.

Check   Please, check the plausibility of the given figures.

Data analysis Standard; classifications; correlation analysis with the size of the enterprise; after forming classifications the variables can be used as break-variables.

Other surveys Is used rarely.

---

6   How many engineers are employed in the company/organization?

Number of all engineers
Number of female engineers
Number of engineers of the university of XY

Subject	Reasons for not employing graduates of the University of XY

Indicator   Implicit assessment of the educational concept at the University of XY (with this, though, effects of the self-selection of the graduates are not captured).
For example, do anticipated or really experienced qualification shortfalls or unwanted qualification conditions of the graduates lead to poor chances on the employment market?

Adaptation   It depends on the design; if you want to include employers of the questioned graduate groups only, this question must be dropped in this study.

Indications   None

Data analysis Standard after coding

Other surveys No

7   If you do not employ any engineers from the University of XY: what are the decisive reasons for this?

....

....

Subject	Number of technicians and skilled workers

Indicator	Effects of the organization structure in the company/organization on the duties of the engineers. Studies concerning the developing countries often represent the thesis that because of a country-wide lack of technicians and skilled workers, engineers are working in jobs which are done by technicians and skilled workers in industrialized countries. Question 14 deals with these facts more precisely. This question only surveys objective quantities.
Adaptation	Subject-specific and possibly country-specific
Indications	None
Data analysis	Standard; relation between the number of engineers and the number of technicians respectively skilled workers; it would be useful to take comparative figures from countries which do not have a shortage of qualified engineers. For example, a German electrical concern employs nearly as many graduates educated in natural or engineering sciences as skilled workers or technicians/technical employees.
Other surveys	Is used rarely.

8   How many technicians and skilled workers are employed in the company/organization?

Number of technicians (FTC-Diploma)
Number of skilled workers

8.1.2   Recruitment Procedures and Criteria

Subject	Recruitment procedures

Indicator	Mediation mechanism between study and profession. What kind of role do the different institutions play in the recruitment process (especially the University of XY)? How important is the internal employment market?
Adaptation	Necessary; please check the list with regard to the country-specific items
Indications	Cf. Graduates Questionnaire Question 11
Data analysis	Standard
Other surveys	Is used in many studies

9   What kind of procedures does the company/organization use to recruit engineers? Multiple reply possible

☐ Advertisements of vacancies in newspapers (daily papers, special periodicals, etc.)

☐ Advertisements in the Internet

☐ Internal advertisements of vacancies

☐ Direct application by graduates

☐ Career advisory agency at the University of XY

☐ Other contacts to the University of XY

☐ Personal contacts to graduates

☐ Manpower allocation

☐ Public work administration (public placement services, manpower allocation system, etc.)

☐ Private employment agencies

☐ Binding students by scholarships

☐ Other

Subject	Women-supporting

Indicator	To what extent do companies/organizations help towards implementing equality of men and women which in many cases is not yet achieved?
Adaptation	No
Indications	None
Data analysis	ReinforcedWhat kind of characteristics distinguish companies/organizations which use measures to support women? In this context you may think of the size, the branch or of the special main emphasis of the company/organization.
Other surveys	No

10   Does the company/organization support the recruitment of female engineers?

....

....

Subject	**Recruitment criterias**

Indicator
Mediation mechanism between study and profession How important are especially those characteristics of the graduates which are influenced by the university? To what extent are further qualification certificates obtained additionally to the university certificates important? What kind of role does the factual coherence between the contents of the study and of the profession (professional affinity) play in the recruitment of engineers; indication for a possible mismatch between the qualifications of the graduates and the qualification demand of the workplace)?

Adaptation
Country-specific (addition or specification of items)

Indications
Cf. Graduates Questionnaire Question 18. The list of the recruitment criteria is incomplete. However, completeness is not intended since, above all, this study concerns the importance of study-orientated characteristics. The items of some points, therefore, are intentionally formulated globally (e.g. personality). As in the Graduates Questionnaire, the importance of social background, ethnic origin or sex (so-called ascribing characteristics) when filling the post are not asked about here. It may be supposed that you will receive socially desirable, but not necessarily valid answers from the employers. In order to be able to capture the phenomenon of social inequality when filling the post it is advisable to ask for facts (e.g. question concerning the share of a certain social/ethnic group amongst the company/organization staff).

Data analysis
Standard; reinforced factor analysis

Other surveys
Is used often, but with very different lists

11   How important in general are the following aspects for the recruitment of engineers? Scale of answers from 1=very important to 5=not at all important.

☐ ☐ ☐ ☐ ☐   Field of study

☐ ☐ ☐ ☐ ☐   Main focus of subject area/specialization

☐ ☐ ☐ ☐ ☐   Final examination (subject/form)

☐ ☐ ☐ ☐ ☐   Grades of examinations at the university

☐ ☐ ☐ ☐ ☐   Practical experience acquired during course of study

☐ ☐ ☐ ☐ ☐   Practical experience acquired prior to course of study

☐ ☐ ☐ ☐ ☐   Reputation of university

☐ ☐ ☐ ☐ ☐   Reputation of the department

☐ ☐ ☐ ☐ ☐   Experience abroad

☐ ☐ ☐ ☐ ☐   Recommendations/references from third persons

☐ ☐ ☐ ☐ ☐   Results of recruitments tests

☐ ☐ ☐ ☐ ☐   Behaviour during interview

☐ ☐ ☐ ☐ ☐   Personality

☐ ☐ ☐ ☐ ☐   Candidate's own world view/religion

☐ ☐ ☐ ☐ ☐   Other

8.1.3   Initial Training for Graduates

12   In your opinion, how long does it take before newly employed engineers who have just finished their university studies are able to carry out professional tasks properly?

Duration of the training period for engineers in general (months)

Duration of the training period for engineers of the University of XY (months)

Subject	**Duration of the training period**

Indicator — Structure of the transition from studies to profession; in connection with Question 13, these statements can also be interpreted as the match between the qualifications acquired at the University of XY and the professional requirements

Adaptation — No

Indications — If graduates who completed their studies more than five years ago are surveyed, the questions concerning the training period should be dropped.
The differentiation between both groups of graduates is also useful if the course of study or the courses of study are offered only at a home university. Graduates who received their final degree at a university abroad may then serve as a comparative group. Cf. Graduates Questionnaire Question 20

Data analysis — Standard

Other surveys — No

Subject	**Reasons for the differences in the duration of the training period**

Indicator — Comparing assessments of the universities concerning the matching of the qualifications acquired and the professional demand - this presupposes, though, that the workplace demands of both graduate groups can be compared with each other. The reasons for the different duration of the training period may on the one hand result from the work demands which are objectively ascertainable (qualification demands of the respective areas of work, training for future management duties) and on the other hand may result from the professional and additional qualifications of the graduates. If for comparable workplaces various companies/organizations emphasize professional qualification shortfalls of the graduates of the University of XY, this can be taken as proof of a comparably low match betweeen acquired qualifications and professional demand.

Adaptation — No

Indications — None

Data analysis — Standard; please check, to what extent the workplaces of both graduate groups are comparable (Question 24 and 25)

Other surveys — No

13 If the times required by the two groups of graduates are different, what - in your

opinion - are the decisive reasons for this?

....

....

| **Subject** | **Kind of initial training period** |

Indicator   Information about the work conditions the graduates find in the company/organization when starting their job Do they feel as if they were thrown into the deep end, or are they offered an additional workplace-orientated qualifying period?

Adaptation   Possibly country- and Subject-specific (e.g. internship)

Indications   With the help of this question which asks for the actual strategies of the employers you will possibly obtain more information than by asking about the practical orientation of the studies. The internal training period may be necessary to reduce (practical) qualification deficiencies, but it may equally be used as an internal strategy to qualify young people for management positions. Cf. Graduates Questionnaire Question 19

Data analysis Standard; reinforced Do employers who provide internal training programmes for young graduates attach less importance to practical matching of qualifications and demands in their recruitment criteria?

Other surveys Can't be used in employers surveys

---

14   As a rule, how would you describe the training period of engineers in the company/organization Please tick one item only

1 ☐ Immediate assumption of normal tasks without any support

2 ☐ Advice/help from experienced colleagues

3 ☐ Advice/help from superiors also

4 ☐ Participation in an extensive formal trainee programme/training course

5 ☐ Other

| **Subject** | **Components of the training period** |

Indicator   Formalized learning processes; structure of transition from the studies to the profession

Adaptation   No

Indications   None

Data analysis Standard

Other surveys No

---

15   What are the different essentials of the training period? Multiple reply possible

☐ Getting to know different departments

☐ Training periods inside the company/organization

☐ Training periods in external education institutions

☐ Other

Subject	**Kind of qualifications acquired during the training period**

Indicator	Matching of qualifications acquired and professional demands
Adaptation	Single Subject-specifically formulated items
Indications	None
	Cf. Graduates Questionnaire Question 21
Data analysis	Standard
Other surveys	Not used in employers surveys

16   What kind of knowledge and abilities are usually acquired during the training period? Multiple reply possible

☐ Knowledge of the organizational structure of the enterprise or of single sections

☐ Workplace-orientated technical knowledge

☐ Application-orientated EDP-knowledge

☐ Knowledge/capability in the field of personnel management

☐ Knowledge/capability in the field of financial management

☐ Skills in dealing with other persons (sales seminars, courses for group dynamics)

☐ Other

Subject	**Training for management duties**

Indicator	Hierarchical level of matching of higher education and professional demands
Adaptation	No
Indications	None
Data analysis	Standard
Other surveys	No

17   Are engineers prepared for assumption of future management posts when they start to work in the company/organization

1 ☐ Yes

2 ☐ No

Subject	Further Professional Training

Indicator   Post-graduate qualification possibilities

Adaptation   No

Indications   If job starters are mainly surveyed with the help of the graduate study, the chapter about further education and further professional training may be considerably shortened or possibly dropped. The first question also takes over a filter leading function as with the help of the following questions you ask for the kind of internal further education possibilities.

Data analysis   Standard

Other surveys   Is used in a different form for many studies

---

18   Does the company/organization offer any internal or external possibilities for further professional training for engineers?

Subject	Kind and content of the further education courses

Indicator — Post-graduate qualification possibilities. Information about the main emphasis of the internal and external courses which may also seen as indication for the need of the respective further education. In order to distinguish it from further professional training, further education is often defined as the educational area which does not aim at acquiring any appreciated final examination/result.

Adaptation — Individual items formulated in a Subject-orientated manner have to be adapted.

Indications — If detailed information about internal courses of further education is available from different sources this question may be dropped. In the chapter about the training period as well as in the chapter concerning further education, detailed information is wanted about the qualifications acquired respectively about the kind of qualifications offered. Thus, information will be obtained about whether, and to what extent different emphasis is put on the qualification of engineers during their professional training period and during their further education. Therefore, it is advisable to use comparable categories of answers for both questions.

As an indicator for the quantitative size of the offers of further education, statements were consulted about the number of courses and the average duration of the course units. These statements may possibly provide important comparable information if for example the matter under review is the right timing for further education courses planned shortly at the University of XY. If you are not interested in such detailed information you can ask for the main emphasis of the internal and external further education with the help of a categorized question.

Data analysis — Standard

Other surveys — Is often used as an open question

19 Which topics/subject areas are concerned? Please indicate also whether (a) the courses of futher professsional training were offered by the company/organization itself or by another organization (employers' federation, trade organizations, universities, etc.); (b) on average, how many courses are offered annually and (c) how long do they last?

☐ Topics of training supplied by the company/organization itself

☐ Workplace-orientated technical knowledge

☐ EDP-application

☐ Personnel management

☐ Preparation for management tasks

☐ Financial management

☐ Dealing with customers/clients (sales seminars, courses in group dynamics, etc.)

☐ Other courses in the field of personality development (creativity training, resolution of conflicts, etc.)

☐ Other

| **Subject** | **Further training possibilities abroad** |

Adaptation   This question is relevant mainly for engineering and natural sciences as in developing countries foreign technology know-how is often imported or adapted.

Indications   None

Other surveys   Is used in a similar form in many studies

20   Are possibilities for further professional training abroad offered to engineers by the company/organization (courses, training on the job, etc.)?

1 ☐   Yes

2 ☐   No

| **Subject** | **Support of further training by release from company-specific tasks** |

Adaptation   No

Indications   None

Data analysis   Standard

Other surveys   No

21   To what extent does the company/organization support the participation of engineers in further professional training by releasing them from company-specific tasks? Scale of answers from 1=to a very high extent to 5=not at all.

☐ ☐ ☐ ☐ ☐   Release from company-specific tasks

| **Subject** | **Financial support of external further education measures** |

Adaptation   No

Indications   Differing from the previous question this is about a "harder" indicator for the support of further education activities of the graduates as it does not concern self-financing decisions.

Data analysis   Standard

Other surveys   No

22   If further professional training for engineers is offered by external (education)institutions, to what extent are costs paid by the company/organization (attendance fees, accommodation, travelling costs)? Scale of answers from 1=completely to 5=not at all.

☐ ☐ ☐ ☐ ☐   Financial support for external further professional training

---

Subject	**Internal support of further training**

Adaptation   No

Indications   Information about awarding scholarships is also included in Question 12 concerning the procedures of recruitment.

Data analysis   Standard

Other surveys   Is used more often in a different form

23   Does the company/organization offer grants to engineers for courses of further study ending with an academic degree (secondary studies, research studies, PhD)?

8.1.4   Tasks of Engineers and Qualification Requirements

Subject   Main field of activity of engineers

Indicator   Frame of interpretation, especially for the questions about the qualification demands and qualification assessments; relation between studies and profession (content-specific level)

Adaptation   Subject-specific, possibly also country-specific

Indications   Cf.   Graduates   Questionnaire   Question   33
In some cases, the function areas and fields of activity can follow the categories of professional qualifications relatively closely or they can be used in such a way that there is only a weak connection between them. The decision regarding adequate categorization also depends on a concrete formulation of the questions. To analyse the affinity of studies and profession - as far as possible - you may, for instance, fall back upon a system of categorie, which establishes a fairly close relation between those   two   dimensions.
If you include several related professional groups in the survey, you have to consider to what extent different Subject-specific lists of activities have to be given in order to investigate the questions of the affinity of studies   and   profession.
First the function areas/fields of activity should be captured in a relatively differentiated fashion and should only be combined to form larger units in the analysis phase. In many analyses you actually will work with a more aggregated form, for certain questions, though, you may   again   carry   out   important   differentiations.
Additionally or alternatively to this you will find in some empirical surveys a list including different job characteristics (e.g. to sell/to distribute, to develop/to project, to set up/to monitor/to adjust a machine) with the help of which the specific work tasks are to be described in more detail. However, for several reasons this procedure has not been chosen here:
The statements concerning the job characteristics provide an atomistic picture of the professional work which can only be replaced by a more complex picture (pragmatic argument) with the help of further analysis procedures (e.g. factor analysis and/or cluster analysis) .
Besides, it is hardly possible to depict all relevant job characteristics. As far as job characteristics of different occupational groups are involved in the survey, the problem of the ambiguity of various job characteristics may   emerge.
Finally, the categories do not show any relation to the (professional) aims of education of the university (research-strategic argument).

Data analysis Main-Break-Variable; in order to classify the findings, please compare - as far as possible - with the respective data of the public statistics.

Other surveys Is used in most of the studies but with very different degrees of differentiation of the areas of responsibility.

24   What is the main occupation and the main field of activity of engineers in the company/organization?

....

....

Subject	**Additional felds of activity of engineers**

Adaptation   see 24

Indications   see 24

Data analysis see 24

24   What are the additional fields of activity of engineers in the company/organization?

☐ Settlement/preparation of accounts

☐ Supervision of production facilities/maintenance

☐ Training

☐ Export

☐ Supervision of construction sites

☐ Preparation of construction sites/construction/supervision of construction

☐ Advisory services/consulting

☐ Maintenance and repair of production facilities

☐ Controlling

☐ Data processing

☐ Development/experiments

☐ Production

☐ Preparation of production

☐ Finances

☐ Research and development

☐ Research/science

☐ Estimating/costing

☐ Construction

☐ Construction/design

☐ Management

☐ Marketing

☐ Market research

☐ Material management

☐ Measurement and testing technology

- [ ] Installation/commissioning
- [ ] Standardization and licensing
- [ ] Personnel affairs
- [ ] Planning of functions/use of buildings/plants
- [ ] Planning and organization
- [ ] Project management
- [ ] Accountancy
- [ ] Security engineering
- [ ] Tax affairs
- [ ] System analysis
- [ ] Project execution
- [ ] Environmental engineering
- [ ] Processing development
- [ ] Sales management
- [ ] Other

Subject	Main field of activity of engineers from the University of XY

Indicator — Frame of interpretation for the questions concerning the assessment of qualifications of the graduates of the University of XY These statements are of some relevance especially for the interpretation of comparisons of assessments of the qualifications of engineers of the University of XY and of other engineers. On the one hand, differences may be explained by real differences in the qualifications of the graduates and on the other hand by differences in the job situation. Do the statements of the employers reveal a typical job and task profile of the engineers from the University of XY in the company/organization and, with this, do they possibly show the strengths and weaknesses of higher education? Do relatively poor qualification assessments of the graduates have to be referred to the fact that they are working in areas of responsibility for which they were hardly or not at all prepared - purposely or involuntarily - by the university? If the answer is no, you will have to look for other explanations - e.g. in the sphere of quality of the higher education (relation between theory and experience; qualifications of the university teachers, etc.)

Adaptation — See 24

Indications — The differentiation between the two groups is useful even when the course(s) of studies are offered at a home university only. In this case, graduates who received their final degree at a foreign university may serve as a comparative group.

Data analysis — Standard; correlation analysis with the qualification assessments

Other surveys — No

25   What is the main occupation and the main field of activity of engineers from the University of XY in the company/organization?

....

....

Subject	Further fields of activity of engineers from the University of XY

Adaptation — See 25 above

Indications — See 25 above

Data analysis — Standard; correlation analysis with the qualification assessments

Other surveys — No

25   What is the main occupation and the main field of activity of engineers from the University of XY in the company/organization?

....

....

Subject	Professionally untypical taks

Indicator   Adequacy of the professional work; relation between studies and profession

Adaptation   No

Indications   These data can only partly be obtained from the statements concerning the areas of responsibility.

Data analysis   Standard

Other surveys   No

---

26   Do engineers in the company/organization take on tasks which could be performed by technicians or skilled workers?

1 ☐   Yes

2 ☐   No

Subject	Reasons for taking over professionally untypical tasks

Indicator   Adaequacy of the professional work; relation between studies and profession
Studies concerning the developing countries often represent the thesis that because of a country-wide lack of technicians and skilled workers, engineers are working in jobs which in industrialized countries are done by technicians and skilled workers.

Adaptation   Subject-specific and possibly country-specific

Indications   None

Data analysis   Standard

Other surveys   No

---

27   If engineers in the company/organization have to take on professionally untypical tasks, what are the decisive reasons for this? Multiple reply possible

☐   There is a lack of technicians/skilled workers

☐   Engineers are working in jobs which are usually occupied by people without a university degree.

☐   Engineers are given these tasks only during their training period in order to enlarge their practical experience.

☐   Engineers are given these tasks outside their training period also in order to train other persons in these fields.

☐   Other

Subject	**Professional qualification demands**

Indicator   Relation between studies and profession. How are the graduates assessed concerning the main professional qualifications for their job?

Adaptation   Subject-specific and country-specific; B28n should be referred to the most important (foreign) language in the respective country or to general linguistic proficiency in case several (foreign) languages are relevant.

Indications   The proposed answers are relatively highly aggregated and are equally suitable for mechanical engineers, electrical engineers, and civil engineers. For your study we recommend using a stronger differentiation of the proposed answers corresponding to the courses of study of your university.
Cf. Graduates Questionnaire Question 45

Data analysis   Standard; factor analysis. What kind of qualification clusters arise in the professional work?

Other surveys   Is rarely used.

---

28   To what extent are engineers required to have knowledge and skills in the following fields?

☐ ☐ ☐ ☐ ☐   Mathematics

☐ ☐ ☐ ☐ ☐   Natural sciences (physics, chemistry), material technology

☐ ☐ ☐ ☐ ☐   Ecology and conservation

☐ ☐ ☐ ☐ ☐   Theoretical basics of engineering sciences (technical mechanics, thermodynamics, structural engineering, electrical engineering, etc.)

☐ ☐ ☐ ☐ ☐   Operation, measurement, and control technology

☐ ☐ ☐ ☐ ☐   Applied technical fields (technical sets, machine systems, installations, connections)

☐ ☐ ☐ ☐ ☐   System analysis and optimization

☐ ☐ ☐ ☐ ☐   Planning, design, calculation, and construction (product and process-orientated)

☐ ☐ ☐ ☐ ☐   Experimental and practical work

☐ ☐ ☐ ☐ ☐   EDP application (CAD, CIM, etc.)

☐ ☐ ☐ ☐ ☐   Social sciences (psychology, sociology, politics)

☐ ☐ ☐ ☐ ☐   Economics (finances, costing, etc.)

☐ ☐ ☐ ☐ ☐   Law (elements relevant to discipline/subject)

☐ ☐ ☐ ☐ ☐   Knowledge of the English language

Subject	**Non-professional/Key qualification demands**

Indicator
Relation between studies and profession. For completing professional tasks graduates not only need professional knowledge and skills which are obviously offered by the higher education, but they also need non-professional qualifications and orientations.

Adaptation
No

Indications
Cf. Graduates Questionnaire Question 46

Data analysis
Standard; factor analysis. What kind of qualification clusters arise in the professional work?

Other surveys
Is used rarely and, in addition, in less detailed form. See the list in the CHEERS survey (E1).

29   **To what extent are engineers confronted with the following requirements in the company/organization?**

☐ ☐ ☐ ☐ ☐   Willingness to learn

☐ ☐ ☐ ☐ ☐   Ability to solve problems

☐ ☐ ☐ ☐ ☐   Ability to reflect upon one's own conduct

☐ ☐ ☐ ☐ ☐   Ability to express oneself in writing

☐ ☐ ☐ ☐ ☐   Unconventional thinking

☐ ☐ ☐ ☐ ☐   Willingness to perform/commitment

☐ ☐ ☐ ☐ ☐   Ability to coordinate

☐ ☐ ☐ ☐ ☐   Ability to improvise

☐ ☐ ☐ ☐ ☐   Reliability

☐ ☐ ☐ ☐ ☐   Ability to work under pressure

☐ ☐ ☐ ☐ ☐   Independence

☐ ☐ ☐ ☐ ☐   Sense of responsibility

☐ ☐ ☐ ☐ ☐   Innovativeness

☐ ☐ ☐ ☐ ☐   Creativity

☐ ☐ ☐ ☐ ☐   Economically efficient thinking

☐ ☐ ☐ ☐ ☐   Determination

☐ ☐ ☐ ☐ ☐   Loyalty to the institution and its objectives

☐ ☐ ☐ ☐ ☐   Persistence

☐ ☐ ☐ ☐ ☐   Ability to cooperate

☐ ☐ ☐ ☐ ☐   Ability to assert oneself

☐ ☐ ☐ ☐ ☐   Self-confidence

☐ ☐ ☐ ☐ ☐   Adaptability

☐ ☐ ☐ ☐ ☐   Empathy

☐ ☐ ☐ ☐ ☐   Leadership qualities

☐ ☐ ☐ ☐ ☐   Initiative

Subject	Assessment of the professional qualifications of engineers from the University of XY

Indicators   Assessment of the education in the department of Z

Adaptation   See Question 28

Indications   See Question 28

Data analysis Standard

Other surveys Is used rarely

30   How do you assess the knowlegde and ability of engineers from the University of XY in the following fields? Scale of answers from 1=very good to 5=very bad.

☐ ☐ ☐ ☐ ☐   Mathematics

☐ ☐ ☐ ☐ ☐   Natural sciences (physics, chemistry), material technology

☐ ☐ ☐ ☐ ☐   Ecology and conservation

☐ ☐ ☐ ☐ ☐   Theoretical basics of engineering sciences (technical mechanics, thermodynamics, structural engineering, electrical engineering, etc.)

☐ ☐ ☐ ☐ ☐   Operation, measurement, and control technology

☐ ☐ ☐ ☐ ☐   Applied technical fields (technical sets, machine systems, installations, connections)

☐ ☐ ☐ ☐ ☐   System analysis and optimization

☐ ☐ ☐ ☐ ☐   Planning, design, calculation, and construction (product and process-orientated)

☐ ☐ ☐ ☐ ☐   Experimental and practical work

☐ ☐ ☐ ☐ ☐   EDP application (CAD, CIM, etc.)

☐ ☐ ☐ ☐ ☐   Social sciences (psychology, sociology, politics)

☐ ☐ ☐ ☐ ☐   Economics (finances, costing, etc.)

☐ ☐ ☐ ☐ ☐   Law (elements relevant to discipline/subject)

☐ ☐ ☐ ☐ ☐   Knowledge of the English language

Subject	Assessment of the non-professional qualifications of engineers from the University of XY

Adaptation   No

Indications   See Question 29

Data analysis Standard

Other surveys Sometimes, but very different item lists . AAU + CHEERS

31   How do you assess the non professional orientated qualifications of engineers from the University of XY in the following fields?

☐ ☐ ☐ ☐ ☐ Willingness to learn

☐ ☐ ☐ ☐ ☐ Ability to solve problems

☐ ☐ ☐ ☐ ☐ Ability to reflect upon one's own conduct

☐ ☐ ☐ ☐ ☐ Ability to express oneself in writing

☐ ☐ ☐ ☐ ☐ Unconventional thinking

☐ ☐ ☐ ☐ ☐ Willingness to perform/commitment

☐ ☐ ☐ ☐ ☐ Ability to coordinate

☐ ☐ ☐ ☐ ☐ Ability to improvise

☐ ☐ ☐ ☐ ☐ Reliability

☐ ☐ ☐ ☐ ☐ Ability to work under pressure

☐ ☐ ☐ ☐ ☐ Independence

☐ ☐ ☐ ☐ ☐ Sense of responsibility

☐ ☐ ☐ ☐ ☐ Innovativeness

☐ ☐ ☐ ☐ ☐ Creativity

☐ ☐ ☐ ☐ ☐ Economically efficient thinking

☐ ☐ ☐ ☐ ☐ Determination

☐ ☐ ☐ ☐ ☐ Loyalty to the institution and its objectives

☐ ☐ ☐ ☐ ☐ Persistence

☐ ☐ ☐ ☐ ☐ Ability to cooperate

☐ ☐ ☐ ☐ ☐ Ability to assert oneself

☐ ☐ ☐ ☐ ☐ Self-confidence

☐ ☐ ☐ ☐ ☐ Adaptability

☐ ☐ ☐ ☐ ☐ Empathy

☐ ☐ ☐ ☐ ☐ Leadership qualities

☐ ☐ ☐ ☐ ☐ Initiative

Subject	Comparing qualification assessment

Adaptation   Subject-specific
Indications   None
Data analysis Standard
Other surveys Not used in a differentiated manner

32   How do you assess knowledge and abilities of engineers from the University of XY compared to engineers from other universities with regard to the following aspects? Scale of answers from 1=much better to 5=much worse.

☐ ☐ ☐ ☐ ☐   Technical basic knowledge

☐ ☐ ☐ ☐ ☐   Special technical knowledge

☐ ☐ ☐ ☐ ☐   Knowledge in non-technical fields

☐ ☐ ☐ ☐ ☐   Non professionally-orientated qualifications

8.1.5   Prospects

Subject	Expectation of changes in the company/organization

Indicator   Potential changes in the qualification requirements The structural, organizational or technological changes enquired about in this question can induce differently accentuated demands relating to the professional and non-professional qualifications of the graduates. Thus, for example, it is supposed that according to the dropping off of hierarchies more emphasis is put on certain non-professional qualifications like independence or sense of responsibility, or that according to a diversification of products increased consultancy strategies have to be developed depending on the individual needs of the customers.

Adaptation   A more Subject-orientated differentiation is possible but this should always take place with regard to the effects of qualification demands.

Indications   For any relevant curricular decisions this question hardly provides more than background information or certain ideas.

Data analysis Standard; do the changes more or less concentrate on certain types of organizations or is a more general trend to be noticed with regard to certain aspects?

33   Do you expect extensive changes in the company/organization within the next five years? Multiple reply possible

☐ Implementation of new domestic production and manufacturing technologies

☐ Implementation of new foreign production and manufacturing technologies

☐ Development/marketing of new products/diversification of products

☐ Implementation/expansion of computer technology

☐ Internal organizational restructuring

☐ Building up/expanding of international business connections

☐ No, extensive changes are not expected

☐ Other

Subject	**Need of graduates**
Indicator	Feedback to the employment agency of the University of XY or to other agencies with similar tasks
Adaptation	No
Indications	This question relates initially to the kind of changes and only then to the quantitative statements. As in many enterprises hardly any detailed plans for personnel staff are or can be elaborated due to the instability of the market, the graded form of the question does at least provide statements about the expected trends.
Data analysis	Standard
Other surveys	No

34 In your opinion, will the number of employed engineers change within the next five years?

1 ☐ No, the number of employed engineers will remain nearly constant.

2 ☐ Yes, the number of employed engineers will increase.

3 ☐ Yes, the number of employed engineers will decrease.

4 ☐ I don't know

8.1.6 Personal Background of the Interviewee

Subject	**Position in the company/organization**
Indicator	Documentation of the implementation of the employers survey which may be helpful in case it is repeated some years later; and at the same time check to the extent to which the group of persons addressed has answered the questions; assessment basis of the interviewee in questions relating to the qualification demands and assessments
Indications	None
Adaptation	No
Data analysis	Standard
Other surveys	Is used often

35 Your position in the establishment

....

Subject Documentation of the implementation of the employer survey

Indicator   Assessment basis of the interviewee in questions relating to the qualification demands and assessments

Adaptation   No

Indications   None

Data analysis Standard; reinforced: Break-Variable for all questions about qualifications as in big firms the statements about the tasks and fields of activity do not provide sufficiently detailed information about the concrete experience background of the interviewees. In order to achieve clear results the departments should be reduced to a smaller number of relatively homogenous departments.

Other surveys Is used often

36   Exact name of the technical department you work for

....

....

Subject	**Number of engineers in the sectoral department**

Indicator   Assessment basis of the interviewees in questions relating to qualification demands and assessments

Adaptation   No

Indications   None

Data analysis Standard

Other surveys No

37   Number of engineers in your technical department

Number of engineers in the technical department

Subject	Knowledge of the educational programme of the University of XY

Indicator   Information about the extent to which the training programme is known, as well as about the kind of contacts which exist between the education and employment system; assessment basis of the interviewees.

Adaptation   This question will above all be included if there is a need for the respective information, e.g. when establishing new departments or when examining the effectiveness of public relation actions.

Indications   None

Data analysis Standard; reinforced Do interviewees who know the study programme of the University of XY possibly assess the (professional) qualifications of the graduates very critically because they compare the qualifications with the curricular aims?

Other surveys No

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38   How did you come to know about the degree course for engineers at the University of XY? Multiple reply possible

☐ Through contacts with students who did a period of practical training/graduates of the University of XY

☐ Through contacts with university staff

☐ Through my own studies or through attending courses at the University of XY

☐ Through working as a lecturer at the University of XY

☐ Through information material/information courses of the University of XY

☐ Through information from others (e.g. other establishments)

☐ Other

Subject	Request of report

Adaptation   Possibly

Indications   None

Data analysis No

Other surveys Is used in some studies

---

39   Request of report

1 ☐ Yes

2 ☐ No

Subject	Address of employer

Indicator	Important information for matching the data from the employer and the graduate questionnaire; incentive for participation in the survey (see also text of the enclosed letter)
Adaptation	Country-orientated
Indications	If this statement represents sensitive data in the respective country, please point out that answering is optional.
Check	In order to guarantee anonymity, this slip should be cut off immediately after receipt. The addresses should not be integrated in the data record later either. If you intend to connect the data from the Graduates Questionnaire (case-orientated) with the data from the Employers Questionnaire, the questionnaire and address-slip should be given the same number.
Data analysis	No
Other surveys	Is asked for in many studies in developing countries

40 Addresses

1 ☐ Yes

2 ☐ No

9 Data Collection - Implementation of the Survey

As in all other empirical studies, the implementation of the survey is of high importance. The outcome of your survey, on the whole, depends substantially on the fact of actually reaching the target group and motivating it to participate in the study.

Check list of the most important activities for a postal survey:

- Procuring the addresses of the graduates/employers
- Production of a ready for printing copy of the questionnaire
- Printing of the questionnaire
- Printing of the covering letter(s)
- Purchase of stamps for the return letter
- Procuring of envelopes (three different types)
- Preparation of the dispatch material
- Checking of the questionnaires

Implementation of the survey in three dispatch actions
- 1st dispatch action (questionnaire + envelope)
- 2nd dispatch action (= 1st reminder; lettre)
- 3rd dispatch action (= 2nd reminder; lettre + questionnaire + envelope)

9.1.1   Measures for Obtaining a High Participation

The success of the implementation of a survey is mainly measured by the number of returns. The smaller the number of graduates who refused to complete the questionnaire, the higher the proportion of returns. A high proportion of returns then is very important when the actual number of graduates questioned is low, as this reduces the possibility of data analysis very much.

Please try to obtain a high participation

For written graduate surveys, the proportion of returns is for the most part between 30 and 60 percent, for employer surveys it is nearly always clearly lower.

Please carry out two reminder actions in order to obtain a high proportion of returns

In a written survey, the proportion of returns can clearly be increased through sending reminders.
We recommend that you proceed as follows:

1ST DISPATCH

Questionnaire, stamped return envelope containing your address, possibly a supplementary covering letter (in addition to the covering letter on the cover page of the questionnaire).

2ND DISPATCH

Please send a first reminder about two weeks after the first dispatch to those graduates who have not responded by then.

3RD DISPATCH

Please send a second reminder, another questionnaire and a stamped return envelope about four to five weeks after the first dispatch to those graduates who have not responded by then.

Therefore, the implementation of a postal survey including three dispatch actions takes at least two months - independently of the number of persons who are to be questioned.
Doing interviews, the duration of the implementation depends very much on the local/regional conditions so that no general indications can be given.
Guiding and checking are your main tasks during this period of the survey; you will easily be able to delegate the implementation.

9.1.2   Checking of the Questionnaires and First Corrections

The checking of the returned questionnaires is one step of the proceedings which can partly be understood as a preparatory step for the data entry.

Please check the returned questionnaires

We recommend not only collecting the returned questionnaires, but checking them with regard to the four following criteria:

Figure 18   Rules for the Check of Questionnaires

1. Target Group	Has the questionnaire been completed by a member of the target group? This check is especially important as it is easily possible that the addresses you received are not the ones you actually wanted. During this period of the implementation of the survey you have the opportunity to correct these mistakes. Questionnaires which were not completed by members of the target group are left out of the survey (no data entry) but they are counted for the proportion of returns.
2. Completeness	In some cases, you will receive questionnaires which were not completed properly without being given a good reason for this (e.g. unemployment). These questionnaires are generally left out of the survey, too, but are counted for the proportion of returns.
3. Seriousness	It is not easy to describe how to check whether the completion of the questionnaire has been done seriously. If, for example, you take the responses/the long list of items for the question with a five point scale you may suppose a lack of seriousness if a plausible pattern for the ticked responses cannot be seen. This check can be very time-consuming if it is done systematically. Besides, it is not very plausible why many interviewees should bother to purposely give foolish answers. Therefore, we recommend that you only casually look for signs of lack of seriousness while doing the general check. However, only during the process of data analysis is it possible to do this kind of check more systematically.
4. Clearness and Consistency of Answers	It is the most costly workstep within the check of the questionnaires to check the clearness and consistency of the answers. It will happen more often that the interviewees do not keep to the formulated rules given in the questionnaire: • even though they are asked to tick one item only, you will find two items being marked; • some interviewees may tick "Other" without ticking the corresponding box; • for a five point scale, you may find two ticks in one line or a tick between two boxes. In all these cases you have to correct the statements of the interviewees in order to enable the data entry. In the "Explanation of the Specimen Questionnaires" you will find many indications showing in what way the correction can be done.

All multi-figure numbers being filled in by the interviewees (e.g. number of applications) have to be captured flash right.

Leading zeros do not necessarily have to be filled in, but during the check attention has to be paid to the fact that all statements can be captured correctly.

Especially all more than two-figure numbers (e.g. income or number of employees) have to be checked to see whether they are captured flash right.

If this is not so, you will have to correct the figures.

9.1.3   Training of Survey Staff

In case other people are involved in the implementation of the survey, you have to organize a training course for them.

Form and content of the training course depend on the kind of participation of these people.

For a *postal dispatch* of the questionnaires you will only have to give technical indications concerning the dispatch action.

For a personal delivery of the questionnaire ("interviews"), though, it is necessary that all staff members are very well informed about the study and that they know the questionnaire perfectly. The interviewer will certainly be asked often to explain the

objectives of the study and to give explanations and help for responding the individual questions. Thus, interviewers more or less influence the results of the study. Generally, this kind of influence cannot be avoided but it has to be an objective of the training course to control the influence insofar that all staff members have the same knowledge about the study and that all of them orientate towards the same rules when doing the interview.

Possible proceedings: You offer a one-day training course. Each person interested in participating in the implementation of the survey *has* to attend the training course. Previously, they have to read your paper concerning the objectives of the study, the questionnaire, and the "Explanation of the Questionnaire".

If other people take part in implementing the survey, please make sure they are well trained.

An important aid for controlling the implementation is the *record of the interviewer* which, for instance, could be designed as follows:

Figure 19   Form of a Interview Protocol

Name of interviewee:	Date of interview □□□□□□□
Name of graduate:	Duration of interview □□□ Minutes
Location:	

Which problems occurred for some of the questions? Please, state number and column of the question and give a brief description of the problems.

Question	Item/Variable	Kind of Problem
Comments:		

10 The QTAFI Codebook

When the data collection is in progress you can start to prepare the data entry and coding. For this task you need a instruction manual called "codebook". Even if you enter your data directly with SPSS (in a kind of spreadsheet) or if someone is doing the job for you must prepare a codebook. There are no formal requirements for a codebook besides the point that anybody who reads the codebook should be able to understand how the information given in the questionnaire are treated as data.

The QTAFI macro provides you with a specific format of a codebook which has the following main advantages:

1.   From the codebook you can get automatically an online questionnaire
2.   From the codebook you get automatically a full SPSS data definition (SYNTAX) with
     DATA LIST for ASCII data (optional)
     Dummy data file for data entry in SPSS (no manual data definition necessary)
     Variable labels for all items
     Value labels for all answers
     Missing values for all variables.
3.   Form the codebook you can get automatically an SPSS tables job, which allows you to get ready-to-print tables of all questions in your questionnaire with little efforts.

Codebook	Main part of the documentation of a survey
	• contains the rules of the coding (assignment of figures to responses) • contains a description of the data being captured is mostly used by persons who are directly involved in data capturing and/or data analysis

Below you find the content of the master codebook, which contains all necessary formal elements of a codebook. To create you own codebook you can load the file CB_MASTER.DOC and modify it according your questionnaire.

Graduate Tracer Study

Year: 2003

Codebook

Version:

Prepared by

Date:

Adress: University XY

Explanations

All relevant information for data entry and data analysis should are stated in the codebook.

The codebook is organised in tables with three columns. The content of each row is explained in column one.

Table 14: Explanation of the Format of the QTAFI Codebook

Col 1	Col 2	Col2	Explanation	Status
H1	Number of the section	Text of the section title	Section heading used in the questionnaire	optional
QU	Number of the question	Text of the question		required
VN or VV or OT			Explanations of the columns below	optional
CV MD MC OR ME TE	Name of the variable (max 8 characters)	Label of the variable	Indication of the type of variable. With this information the macro can generate the SPSS data definition and meaningful tables. CV - Categorical variable MD - multiple reply (yes/no) MC - multiple reply categorical OR - Ordinal scale ME - Metric (like Income) TE - Open text answer	Required One the list must be stated as a row indicator
RE			RE - Remark - is used for the introduction of the questionnaire and the closing remarks (only relevant for ONLINE questionnaire)	
SCR			SCR indicates no specific type of variable. The type SCR is only needed, if HTML code is stated below with different types of variables. A SCR variable will not be analysed in the tables, but is included in the data file.	
SU	Subject	Text.	Should summarize the key concept of the question. Will be used as the title for tables	required
IN	Indications	Text	Explanations of the question	optional
CH	Check	Text	Rule how to check the plausibility of the answers	optional
MV	Missing value	Code/value	Indicates the values which should not be treated as valid answers like (9 = no answer)	required
QF	Questionnaire	Text	Formatting information for a questionnaire layout: *Newpage*; - new page *after* this question. *Continue*, - this question should be connected with the next one. *Filter*(from_variable, value, to_question _number); - if value of from_variable is ticked, a filter to the to_question _number will be activated; *Items=6*; arrange the items/codes in two columns, start the break *after* item 6; *Columns=2*; use 2 columns; *Sourcemode*; use the HTML code from the row *CODE;* *Stop*; jump to the end of the questionnaire, no further questions.	optional
DA	Data analysis	Text	Indicates the use for data analysis: *BREAK* - use this variable as a break	optional

			variable; *FACTOR* - perform a factor analysis; *CLUSTER* - perform a cluster analysis (WARD); *ANOVA* - perform a analysis of variance with the BREAK variables; *REGDEP1*(V1) - use this variable as a dependent variable in the regression analysis (1); *REGINDEP1*(V3, V5, V9) - use this variables as independent variables in the regression analysis (1);	
CODE	HTML code	HTML code like \<table\> \<\table\>	\<table class="qubody" \>\<tr\>\<td\> \<input name="V1" size="20" value="[value:V1]" [value:V1:1:checked] \>\</td\>\</tr\> \<\table\>	

Table 15   Kind of Variables used in the Codebook and Related Analysis

Kind of variable	Explanation of Variable	Kind of Typical Tables
CV	**C**ategorical **V**ariable (one answer)	Tables with percentages
MD	**M**ultiple Categorical (multiple responses **D**ichotomous – the particular coded value is "1")	Tables with percentages
MC	**M**ultiple **C**ategorical (multiple **r**esponses with no limits of distinct values)	Tables with percentages
OR	**OR**dinal scale	Tables with means; additional tables with percentages for the dichotomised answers
ME	**ME**ans - Interval scale	Tables with arithmetic means, and median
TE	**TE**xt - alphanumeric characters	Listing of answers
General paragraph for values and value labels		
CC	Values (codes) and value labels	

10.1.2   Recommendations and rules for coding and data cleaning

10.1.3   Code lists

A general rule: Code as detailed as possible and useful. Later the data can be aggregated on a higher level. Ask your national statistics agency or the relevant institution for rules to transform the national codes into international codes e.g. for job titles, economic branch, field of study.

For example, if it is said here that the code for "Field of study" has two digits, then two digits are the *highest* possible aggregation; it is strongly recommended that the national codes are more differentiated.

The code lists should be included in the codebook, or a reference has to been stated.

10.1.4   Missing values

Code "8", "88", "888" and so on should be used for "Not applicable".
Code "9", "99", "999" and so on should be used for "No answer".
Blanks should never be coded with "0".

10.1.5 Scales

When more than one box is ticked, and the ticked ones are neighbours, then take the more extreme one, e.g. if "1" and "2" had been ticked, take "1". In all other cases, enter the mean value, e.g. if "4" and "2" are ticked, enter "3".

10.1.6 Imputations

Blanks and missings should be imputed as far as possible. The imputations should be documented well. But do not impute blanks with "0", as mentioned above.

10.1.7 Multiple response

Only ticks should be coded, actually with a "1". After data entry, if at least one item of a list of items was ticked, the ones not ticked will be recoded into "2" ("No"). If no item at all is ticked, the blanks will be recoded into "9" ("Missing").

Table 16   General Rules for Checking the Questionnaire

.	Rule	Example
1.	All corrections and remarks are to be done with a **red pencil** (or with a pencil in another contrasting colour, if the questionnaire is filled in with a red one).	
2.	Deletions are to be done by two parallel slashes.	
3.	On the front page of the questionnaire an abbreviation of the name of the person having checked the questionnaire has to be stated	
4.	In case of scales: if two values are ticked, one has to be deleted. As a rule, the more extreme value counts	e.g. on a scale of 5 the **1** and **2** are ticked = **1** is the valid value
5.	Entries have to be done on the check sheet.	Like: "Answer to question 5 is unclear"
6.	Replies under the category "other" have to be classified under the given categories, if possible.	
7.	Unclear figures/numbers have to approximated. All figures have to be controlled (e.g. question 25) and, if necessary, must be corrected.	e.g. 2-3 persons becomes 3 persons - figures are to be approximated

10.1.8   ID Number and Return Date

Basic information required in each survey

ID: **Identification number**

Date: **Return date**

QU	X1	Identification number
VN	Variable name	Variable label
CV4	**ID**	**Identification number**
VV	Value/codes	Value label
CC	1	Questionnaire 1
CC	2	Questionnaire 2
OT	Other information	Text
SU	Subject	Identification number
IN	Indications	The ID number should be just a sequence number of incoming questionnaires. The ID number must be written on the first page of the questionnaire.
CH	Check	Check for double IDs. No missing values allowed.
MV	Missing value	99999
QF	Questionnaire	
DA	Data analysis	

QU	X2	Date of return
VN	Variable name	Variable label
TE8	**RETURND**	**Date of return**
VV	Value/codes	Value label
CC	02.03.05	02.03.05
CC	03.03.05	03.03.05
OT	Other information	Text
SU	Subject	Date of Return of Questionnaire
IN	Indications	The date of return must be written also on the first page of the questionnaire - together with ID number.
CH	Check	No missing value, this is basic information.
MV	Missing value	9999999
QF	Questionnaire	
DA	Data analysis	

H1	1	Categorical (nominal) variable - CV

QU	1	When did you start seeking a job?
VN	Variable name	Variable label
CV	**V1**	Time of start of search for employment
VV	Value/codes	Value label
CC	1	More than one month before graduation
CC	2	At the time of graduation (one month before or after)
CC	3	More than one month after graduation
CC	4	Other
CC	8	Not applicable, no job search
CC	9	No answer
OT	Other information	Text
SU	Subject	Time of Start of Search for Employment
IN	Indications	
CH	Check	
MV	Missing value	8,9
QF	Questionnaire	
DA	Data analysis	

H1	2	Ordinal scale variables - OR

QU	2	How do you rate the study provision and study conditions you experienced in the course of study that you graduated from in 1994 or 1995?
VN	Variable name	Variable label
OR	**V2_1**	Assistance/advice for your final examination
OR	**V2_2**	Opportunity of out of class contacts with teaching staff
OR	**V2_3**	Academic advice offered
VV	Value/codes	Value label
CC	1	1 very good
CC	2	2
CC	3	3
CC	4	4
CC	5	5 very bad
CC	9	No answer
OT	Other information	Text
SU	Subject	Assessment of Study Provisions and Study Conditions
IN	Indications	
CH	Check	
MV	Missing value	9
QF	Questionnaire	
DA	Data analysis	

H1	**3**	**Multiple reply - dichotomy - variables - MD**

QU	3	How did you get for your first employment after graduation? Multiple reply possible
VN	Variable name	Variable label
MD	**V3_1**	Application to vacant position
MD	**V3_2**	My own advertisement
MD	**V3_3**	Public employment agency
MD	**V3_4**	Private employment agency
VV	Value/codes	Value label
CC	1	Yes
CC	2	No
CC	8	Not applicable, no job search
CC	9	No answer
OT	Other information	Text
SU	Subject	Strategies for Seeking Employment
IN	Indications	
CH	Check	
MV	Missing value	8,9
QF	Questionnaire	
DA	Data analysis	

H1	4	Multiple reply - categorical - variables - MC

QU	4	How did you get for your first employment after graduation? Multiple reply possible, please select the tree most important methods.
VN	Variable name	Variable label
MC	**V4_1**	Strategies for Seeking Employment - 1
MC	**V4_2**	Strategies for Seeking Employment - 2
MC	**V4_3**	Strategies for Seeking Employment - 3
VV	Value/codes	Value label
CC	1	My own advertisement
CC	2	Public employment agency
CC	3	Private employment agency
CC	4	Answer 4
CC	5	Answer 5
CC	6	Answer 6
CC	7	Answer 7
CC	8	Answer 8
CC	9	Answer 9
CC	10	Answer 10
CC	11	Answer 11
CC	98	Not applicable, no job search
CC	99	No answer
OT	Other information	Text
SU	Subject	Strategies for Seeking Employment
IN	Indications	
CH	Check	
MV	Missing value	98,99
QF	Questionnaire	
DA	Data analysis	

H1	5	Metric variables (open question) - ME

QU	5	How long did it take you to find your first job after graduation?
VN	Variable name	Variable label
ME2	**V5**	Duration of seeking employment (months)
VV	Values/codes	Value labels
CC	97	Not applicable, no job found up to now
CC	98	Not applicable, no job search
CC	99	No answer
OT	Other information	Text
SU	Subject	Duration of Seeking Employment
IN	Indications	
CH	Check	
MV	Missing value	97,98,99
QF	Questionnaire	
DA	Data analysis	

H1	6	Text variables (open question) - TE

QU	6	What is your job title?
VN	Variable name	Variable label
TE35	V6	Job title
VV	Values/codes	Value labels
OT	Other information	Text
SU	Subject	Job Title
IN	Indications	
CH	Check	
MV	Missing value	99999
QF	Questionnaire	
DA	Data analysis	

11 Data analysis

11.1   Overview

This chapter deals with the different types of problems which are connected with the quantitative data analysis of the data ascertained.

The data entry and the data control are the prerequisites of the statistical data analysis (in the narrow sense of meaning: the data analysis).

Even if you do not intend to do this work yourself, you should still read the following chapters in order to be able to appraise the results of the processes.

Before beginning the data entry, you should decide the form you want to choose to handle the open questions, which requires text answers like job title, suggestions for improvements, etc.

The following procedures are possible:

- First, all responses to open questions ("text file") are captured and code them and then all numerical data (for the open and the closed questions) ("raw data").
- First, please capture all responses to closed questions ("raw data1") and then all responses to open questions ("text file"). After having coded the open responses, please capture the new numerical data ("raw data2").
- As in the previous paragraph, please capture all responses to closed questions ("raw data") and then the responses to open questions ("text file") without coding them.

You can/should assign the data entry *to professionals but you can contribute substantially to the quality of the data: That is why you should take part in data control.*

The *data analysis* could also be done by professionals but it is imperative to have fundamental knowledge in order to be able to understand and to interpret the results of the statistical analysis.

For this chapter, too, we have developed some tools which will make work substantially easier for you (see enclosed CD-Rom).

We especially recommend drawing up an extensive *table volume*. This will serve as a fundamental basis because you will be able to insert selected tables directly into the final report.

In this manual, we do not intend to give a detailed introduction into the procedures and problems of the data analysis. Depending on the extent to which you expect to do the data analysis yourself, it may be necessary to additionally consult the SPSS manual.

11.1.1　Codebook

Nearly all questions of the graduate and the employer questionnaire contain response items which already are coded, i.e. codes (figures) are assigned to each of them. For the later data analysis they can be directly entered.

ASCII/ TEXT DATA ENTRY

For this data entry type, columns are indicated additionally to each question respectively to each response item that give the position on the card where the codes have to be entered. Up to a few years ago, punch cards (containing exactly 80 columns) were mainly used as data carrier, whereas nowadays magnetic tapes or diskettes are used for data entry which do not involve a limitation of the number of columns.

But there are still many reasons why data entry, even on modern data carriers, should be done according to the principle used for punch cards:

- for the most part, even on screens, a maximum of 80 characters can be shown side by side (columns),
- code sheets get unwieldy if they contain more than 80 columns.

CODING OF OPEN QUESTIONS

However, for some questions response items are not given, for others, supplements additionally to response items are possible (e.g. "Other").

This chapter shows the procedures which will enable you to quantitatively analyse these "open responses", too.

The quantitative analysis presupposes that figures have to be assigned to the responses by established rules (which have to be included/have to be recognisable in the *codebook*). The assignment of figures to answers is called *coding*.

The codes (figures which have to be captured) may either be entered in the questionnaire (on the margin) or on a separate sheet (the so-called code leaf or code sheet). However, for data entry it has to be indicated, additionally, in which column (and on which card) data entry is carried out or in which "field" of a data bank the information have to be entered.

On the other hand, we would like to achieve a situation in which the results of the data analysis - for example the tables which we produce - not only contain the "bare figures" but also contain a description of the figures. The codebook enables this kind of "re-translation" and is therefore a main aid during the period of the data analysis.

In the data analysis we regard the responses of the interviewees as values of variables. By using the name of the variable which is included in the codebook we refer to individual questions or response items. As the name of the variable is of central importance for the data analysis, in the codebook it is printed in bold, e.g. **A2a**.

We recommend to create the names of the variables by a simple scheme which will have considerable advantages for the data control and the further data management.

Two alternative procedures have to be distinguished:
1. raw data in a fixed table format (data entry in columns)
2. raw data in a database format (e.g. as dBase file)

11.1.2   Table Format (Data entry in Columns)

All names of the variables of a survey should start with the same letter and should include the information of the column, i.e. the variable "subject" is called A110 (card 1, column 10). The first letter (e.g. A) could serve for identification of the survey. In case that two surveys are conducted at the same time (e.g. a graduate survey and an employer survey) all variables of the graduate survey could be named A. By doing so all variables of the graduate survey can be easily identified.

For the distribution of the name of the variables, the advantage of this scheme results from its simplicity: the naming of the columns in the questionnaire which is absolutely necessary already contains the name of the variables - if, your actual codebook is not to hand, each questionnaire serves as aid-codebook, too. Furthermore, during the period of data control, this scheme facilitates checking where a mistake may exist in the data record as the name of the variable indicates the place in the data record where the values of the variable have been captured.

11.1.3   Format of the data base (e.g. dBase or DATA ENTRY)

All variable names of the same survey should begin with a letter and contain an indication on the question and the item, e.g. the variable "subject" may have the name A1a (question 1, item a). In our case the capital A stands for "graduate survey".

Moreover, the statistical programme SPSS (as well as others) only allows the name of variables to contain eight characters at the most, so, the description of the content of a variable by its name is hardly possible at all. Therefore, further description of the content of the variables (so-called VARIABLE LABELS in SPSS) is always necessary in order to receive readable prints of the statistical data analysis.

Furthermore, we especially emphasize the function of the explanations of the questionnaires as a codebook by giving each variable a brief description concerning its content. In cases of multiple replies and responses of five point scales, the description of the content of variables is given "automatically" for each individual response item forms a variable itself and the introductory question can mostly be left out of consideration. The description of the variable (VARIABLE LABEL) is identical with the item.

On the other hand, however, for the nominal scaled variables (e.g. field of study), the open questions and the questions consisting of figures that have to be entered (e.g. time of graduation) the description, as a rule, can be taken from the formulation of the question. In these cases, the description of the variables is a concise formulation of the questions.

For the description of the results in the final report you will need such abbreviations in order to formulate precisely the questions in the questionnaire.

If, in the codebook, you already provide the variables with brief descriptions, it is possible to establish the standard table programme with little effort only.

11.1.4   Coding of Open Responses

Text Entry of all Open Responses

The answers of the interviewees concerning a *particular question* (in the following called "texts") are copied out in such a way that it is possible to separate and sort the texts of the individual interviewees given on different questions. Therefore, the *number of the question* as well as the *case number* have to be noted additionally to the actual text of the answer.

For this reason the *sorting* is very important as for the next step - the forming of categories of responses - it is necessary to obtain a complete overview of all answers concerning *one particular question*; while all other answers of the individual interviewees, as a rule, are not important.

- It is useful to determine abbreviations before starting to enter the text (e.g. "eng." instead of "engineer").
- Spelling mistakes, etc. may be corrected as only the meaning is important.

Before the EDP age, the classical way was to do the text entry on a typewriter, to cut the texts apart and to do the sorting by hand.

The advantage of this kind of procedure is that all necessary aids (typewriter and scissors) are available everywhere.

It is more elegant - but also more complicated - to use the possibilities of word processors and/or data bases for managing (sorting) the texts.

We recommend using a word-processing programme like Microsoft WINWORD; in the following we will explain the procedures which can easily be converted for other word-processing programmes.

> *In order to be able to sort the answers, a column for the case number and the question number should be captured together with the text.*

Figure 20   Example for the Data Entry of Text

ID	Question number	Code	Text
001	12		Response
001	15		Response
001	16		Response
002	15		Response
002	16		Response
003	15		Response
003	16		Response

11.1.5   Should all Responses be Coded?

If only a few interviewees answered open questions it is not worthwhile to plan a quantitative data analysis but the responses should still be captured as texts and for the formulation of the examination report they should be taken into consideration.

> *Rough rule: If you received responses from more than 5 percent of the interviewees, they should be coded.*

11.1.6   Development of Response Categories

Please look for so-called head-categories under which *several* individual responses can be subsumed.

We presume that the meaning of the statements in question is the same even when different expressions are used. However, for the coding process criteria for the similarity should be given in the codebook. This is mostly done by indicating examples.

In this connection, all reflections should be taken into account that are described in part 6 for the development of questions and response categories (the operationalization), especially about the level of measuring questions/responses.

According to the emphasis of the examination, you will look for different aggregations and you will differentiate the response categories respectively.

11.1.7   Example: Coding of semi-open questions

1   Did you have financial problems during your studies?

1 ☐   No

2 ☐   Yes

(please specify)

If "yes", please specify the kind of problems:

For the first 50 cases, the following text responses were entered in the data record:

ID	Q	Code	Answers
001	1.8		simply bursary was not enough to maintain
005	1.8		When I had to return home with my family I had a shortage of money
006	1.8		I was permitted "Extraordinary Leave without Pay" so for the support of my parents financial problems exist
008	1.8		We have to sacrifice so many demands of wife and son such as pleasure trips, cinemashow and so many.
009	1.8		not sufficient
010	1.8		To pay the childs school fees so most faculty was getting it from AIT & students were not getting any money from AIT and school teachers started feeling that students are over-subsidized.
013	1.8		in thesis works (transformation for field works)
022	1.8		not sufficient - had to cut down legitimate expenses
023	1.8		when studying, when my family member was serious ill I had a problem in arranging the money to go back home suddenly.
031	1.8		first term, not sufficient for study material
034	1.8		For data collection back in country
037	1.8		travel allowance for surveying during thesis-work
040	1.8		study materials, books
043	1.8		to support my family
050	1.8		Food, clothing & beverage

On the whole, 15 interviewees have given statements concerning the kind of financial problems.

All the statements show that the graduates only gave one detail about the kind of financial problems; this means, there is only **one** variable necessary in the data record.

It is useful to note down the name of the variable, the description of the variable (VARIABLE LABELS) and the value of the variable including its comments (VALUE LABELS) in the way that has been proposed.

Name of variable: **Fincprob**
Variable Label: **Kind of financial problems during study**

After checking all 15 cases, the following proposal for coding the open responses could result from this:

QU	1.8	Do you remember any financial problems during your studies?
VN	Variable name	Variable label
CV2	**Fincprob**	Kind of financial problems during studies
VV	Value/codes	Value label
CC	1	Study material (not explicitly in connection with the studies/final work)
CC	2	In connection with the studies/final work
CC	3	Living costs (own ones and for the family)
CC	4	For return to the home country
CC	5	Financial problems for the family
CC	7	Travel expenses for unforeseen return flight
CC	8	No further comments
CC	9	Other
CC	88	Not applicable, no financial problems stated
CC	99	No answer
OT	Other information	Text
SU	Subject	Kind of financial problems during study
IN	Indications	
CH	Check	
MV	Missing value	88,99
QF	Questionnaire	
DA	Data analysis	

As it is possible that further response categories have to be formed because new aspects occur while coding the remaining cases, it is useful to reserve two columns for the codes even though at first one column may seem to be sufficient. It then is easy to supplement new codes.

Moreover, for response categories which generally occur in all questions the same codes should possibly be used. In the previous example these are the codes 77, 88, and 99.

The coding itself can be done, for example, into the text file directly.

The advantage of this kind of procedure is that we can quickly check the coherence of coding by sorting the cases by codes.

11.1.8   Numerical Data Entry

The "data entry" contains the act of copying the codes from the questionnaire onto a suitable data carrier (which nowadays will probably be the diskette).

As happens in every other writing process, data capturing is also afflicted with mistakes. But contrary to other "normal" texts, mistakes done in data capturing are not

easily found (see data control) as the sequence of the figures entered is different in each questionnaire. Therefore, precautions should be taken to carry out data capturing perfectly. That is why for data capturing professionals do not use a normal word-processing programme but a special capturing programme which, for example, checks the plausibility of the acceptable numerical values while entering the numerical values.

DATA ENTRY of SPSS/PC is such a data capturing programme enabling the user to draw up masks for the data capturing and also to carry out plausibility checks. With DATA ENTRY you can capture your data perfectly. Because of the great number of variables in your study, the programming of the plausibility ckecks and the drawing up of the masks, is quite costly though and not at all easy. That is why we recommend having the data capturing done by professionals.

One more tip: the error rate can be reduced extremely by **capturing the data twice**; first, all questionnaires are captured normally and afterwards all questionnaires are captured again (in the same sequence), but in the second stage only the correspondence with the first entry has to be detected and, if necessary, data have to be corrected.

It definitely increases the costs to do data capturing this way but in the following phase of data correction costs will be saved.

11.1.9   Data Control

The control of the captured data (raw data and text of responses) is a process that has to be continued until the data reach a quality which is accepted as sufficient. However, it is neither meaningful nor feasible to strive for completely perfect data: in any case, the costs of removing even the last mistakes too are far to high.

The data control has the function of excluding all systematic errors and of determining the degree of errors made accidentally.

11.1.10   Quality control - check of entered data

If the data capturing is done by professionals, first a random selection of about 10-30 questionnaires should be captured and then this capturing should be checked very carefully by yourself or by others.

In pratice, the captured data should be compared with the entry in the questionnaire in that way that one person reads the captured codes (including "blanks") and a second person checks these codes with the ones entered in the questionnaire.

All differences should be noted down, the different kinds of errors should be analysed and the proportion of errors should be calculated.

You should then report back the results of the data control to the professionals.

In general, a proportion of errors of 2-3 percent is still acceptable (excluding systematic errors).

11.1.11   Second phase of data control

As a result of the data capturing you will receive different data files.

DATA FILES	
Raw Data (numerical data)	Graduate Questionnaire: GRAD.DAT
	Employer Questionnaire: EMP.DAT
Text files (response on open	Graduate Questionnaire: GRADTXT.DAT

questions)	Employer Questionnaire: EM5TXT.DAT

If the data capturing has been effected without any mistakes, you could do the data analysis. Experience shows, though, that the data still contain errors which have to be resolved. For this phase of the data control it is advisable to use the possibilities of EDP (and SPSS/PC).

First, you have to **define the data** both for the later statistical analysis and also for the second phase of the data control.

11.2   Data Definition

11.2.1   Data Definition for the Statistical Analysis with SPSS

For the analysis of the data with the help of SPSS, only a few instructions are necessary which will inform the programme about the structure of the data (similar to the CREATE-instruction in DBASE).

Here, the main instruction is the DATA LIST-instruction. With the help of this instruction we regulate the reading of the data with the help of SPSS by describing a "example case".

> *Errors in the DATA LIST-instruction have serious consequences.*
> *Structure errors of the raw data, i.e. missing or interchanged cards, are serious errors, too.*

Therefore, the DATA-LIST-instruction and the structure of the raw data have to be ckecked very carefully. It is advisable to know the number of cases and the number of lines (=cards) of the raw data file before processing the data by SPSS. A basic examination of the raw data will then easily be done:

> *The number of lines in the raw data file has to correspond to the product of the number of cases and the number of cards per case.*

It is very easy to understand the rules for the DATA LIST-instruction:

Figure 21   Example of Data Definition with SPSS

SPSS Instruction	Explanation of the Instructions
DATA LIST	Name of the SPSS command
FILE='GRAD95.DAT'	The data should be read from the file GRAD95.DAT.
/	Read the first card. Reading any further cards belonging to a case is also steered by an oblique.
A101 1-4	The 1st variable should be named A101. It contains the columns 1 to 4 and it is numeric.
A105 5-6	The second variable should be named A105. It contains the columns 5 to 6 and it is numeric.
A110 to A129 10-29	Read 19 single-columned numeric variables and name them A111, A112,...A119 (inclusively list of variables).
A130 30-32 (1)	Read a three-columned numeric variable with one decimal with the name A130.
... further instructions	
SAVE OUT	Save the data (together with the data definition) in a SPSS system file.

='G95-A.SYC'	Name of the system file
/COMPRESSED.	The file should be recorded in a compressed form.

SPSS-System File SAVE FILE/GET FILE	In general, the raw data (together with the data definition) are read once only and then they are recorded in a "system file" - a file in SPSS format which you cannot read or change with other programmes. All other data analysis should be done by system files which you can easily load with the help of GET FILE (e.g. GET FILE='GRAD95-A.SAV'). Changes in the data and the labels can be done in this first system file and it can be recorded in a new (corrected) system file. GET FILE='GRAD-A.SAV'. ... Data modifications ... SAVE FILE='GRAD-B.SAV'.

The further instructions concerning the data definition (VARIABLE LABELS, VALUE LABELS) are optional. But you should not do without them because they improve the reading of the prints of the analysis.

11.2.2 Short explanations of the most important SPSS-syntax

Style of instructions
- Nearly all instructions can be abbreviated. Mostly, the first three characters of an instruction are sufficient to enable SPSS to interpret them correctly; e.g. it is sufficient to write VAR LAB instead of writing VARIABLE LABELS. It is not necessary to write the abbreviations in capital letters, "Var Lab" is correct, too.

End of instruction
- SPSS, recognizes a point (.) as the end of an instruction. Instructions may extend over many lines (see Var Lab instructions).

Table 17   SPSS Syntax: Labels and Missing Values

VARIABLE LABELS	**Description of a variable** 120 characters at the most (most of the SPSS procedures only print the first 40 characters) With regard to the text, the variable labels correspond to the response items of the questionnaire; only if those are too long do they have to be shortened correspondingly.	`VAR LAB A1a 'Field of study'`

VALUE LABELS	**Description of the values of the variables**
	60 characters at the most (most of the SPSS procedures only print the first 20 characters).
		`VALUE LABELS A1a`
		`1 'Mechanical engineering'`
		`2 'Electrical engineering'`
		`3 'Civil engineering'`
		`9 'No answer'`

MISSING	Some values of a variable receive the	`MISSING VALUE A1a (9)`

VALUES	status "missing". On average, those interviewees who give a so defined "missing" value are not taken into consideration for the data analysis of this variable.	

11.2.3   Missing values

By using the MISSING VALUES-instruction, the data are not changed but the data analysis programme receives notice for the data analysis not to take into account those cases showing values which are defined as missing.

The term "MISSING VALUES" is not very appropriate, for these values are not really missing in the data record - this is not allowed to happen as SPSS only processes files of a rectangular form.

The following counting of the frequency of the variable A157 from the fictitious data record shows the action of the MISSING VALUES-instruction:

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


A157     Organization of practical training


                                          Valid    Cum
 Value Label              Value  Frequency  Percent  Percent  Percent


1 very good                  1         1    10.0    12.5    12.5
                             2         2    20.0    25.0    37.5
                             3         2    20.0    25.0    62.5
                             4         3    30.0    37.5   100.0
No statement                 9         2    20.0   MISSING
                                     -------  -------  -------
                          TOTAL       10   100.0   100.0


Valid Cases      8    Missing Cases    2


- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

For the variable A157, the value 9 has been defined as MISSING VALUE.

This can be seen from the column "Valid Percent", as for the value "9" no percentage is entered but the term "missing".

The percentages in this column are based on the number of valid cases (Valid Cases = 8) while all cases are included in the column "Percent". If you only take into account the valid cases, one finding shows that 38 % of the interviewees value the organization of the professional training done by the university as "good".

When should the values be defined as MISSING VALUES?

- It will often happen that **individual** questions are not answered by the interviewees without any cause being noticeable for this ("missing at random"). For **data capturing**, in cases like this, you can explicitly establish a code for "no response", e.g. the Code 9 (or 0).
- In case of some of the questions it will happen that certain groups of the interviewees are excluded from reply (the item "not applicable"). A **systematical reason** make it impossible for these persons to answer the question. E.g.: questions asking for motives for having changed employers can only be answered by those who actually had done this. For data capturing you can explicitely provide a code for "not applicable" (e.g. code 7).

If in data capturing (actually) missing responses were explicitly coded it is necessary to inform the data analysis programme by the MISSING VALUES-instruction that for example the value "9" has to be understood as a missing value (MISSING = user-defined missing values).

If in data capturing (actually) missing responses have *not been explicitly* coded (BLANKS in data record) at first it is useful to change (with the help of RECODE varname (SYSMIS=9)) the coding of the missing values (SYSMIS = system-defined missing values; represented as point in print-outs), done by the SPSS-Programme as standard and then to inform the data analysis programme by the

MISSING VALUES-instruction that, for example, the value "9" has to be understood as missing value.

It is very important for the analysis of the data to deal carefully with the MISSING VALUES and it is necessary to decide for each individual question in what way missing responses are to be interpreted.

Please, define a missing value for each variable and avoid SYSMIS

11.2.4 SPSS syntax for data modification: RECOCE and COMPUTE

In data analysis it often is necessary to change the values of existing variables (e.g. to combine values - with the help of RECODE) or to create new variables (with the help of COMPUTE, COUNT or IF).

Table 18   SPSS Syntax: RECODE and COMPUTE

SPSS syntax	Explanation	Example
RECODE	Recode of values of existing variables	`RECODE A157 (SYSMIS=9)`
COMPUTE	Create a new variable e.g. the content of an existing variable will be copied into a new variable:	`COMPUTE Field = A1a.`

The instructions RECODE and COMPUTE are often used together if new variables have to be formed. One typical use is the forming of age-groups (similar to the proceedings of classifying other variables).

The creation of a new variable should include the use of the instructions of the data definition VARIABLE LABELS, VALUE LABELS and MISSING VALUES.

```
* ---------------------------------------------.
COMPUTE   YEARG = A4b.
RECODE    YEARG (89 THRU 91 = 1) (92 THRU 94 = 3)   (MISSING = 0) .
VAR LAB   YEARG 'Year of graduation'.
VAL LAB   YEARG
 1 '1989-1991'
 2 '1992-1994'.
MISSING VALUES YEARG (0).
* ---------------------------------------------.
```

Table 19   SPSS Syntax: COUNT

SPSS	Explanation	Example

syntax		
COUNT	Frequency counting of values within a group of variables	`COUNT A11=A11a TO A11r (1)`

In the following example, with the help of the COUNT-instruction, a new variable A11 will be formed, the value of which contains the number of responses for the question 11 per case. The frequency counting of this variable shows that the majority of the (fictitious) interviewees state more than one subject and the absence of the value "0" shows that all cases at least stated one subject.

Therefore it is permissible to recode all missing values of the individual variables of question 11 into code 2 (RECODE A11a to A11r (MISSING=2)).

```
* ------------------------------------------------------------.
count A11=A11a to A11r (1).
freq A11.

A11

                                       Valid     Cum
  Value Label              Value  Frequency  Percent  Percent  Percent

                            1.00          1     10.0     10.0     10.0
                            2.00          1     10.0     10.0     20.0
                            3.00          5     50.0     50.0     70.0
                            4.00          2     20.0     20.0     90.0
                            6.00          1     10.0     10.0    100.0
                                    -------  -------  -------
                           TOTAL         10    100.0    100.0

Valid Cases     10    Missing Cases     0
--------------------------------------------------------------------------
```

11.2.5　Simple data analysis: frequencies

The first step of the actual data analysis is to carry out simple frequency countings and aggregate statistics (statistical values) of all variables. This is also very important for the unfinished data control.

Table 20　SPSS Syntax: FREQUENCIES and DESCRIPTIVES

SPSS syntax	Explanation	Example
FREQUENCIES	Counting of frequency of values of variables	`FREQUENCIES  A1a` `Or FREQ ALL.`
DESCRIPTIVES	Calculation of statistical measurements	`DESCRIPTIVES All.`

The advantage of the DESCRIPTIVES procedure lies in the compact form of the print-outs as the statistical descriptives together with the name of the variable and the label are shown in one line.

Further statistical descriptives for analysing the distribution of a variable (e.g. the median) can be produced by the STATISTICS-instruction of the FREQUENCIES procedure (see also SPSS Manual).

During the phase of data control, though, the statistical descriptives are not interesting but the print-out of the FREQUENCIES-procedure is merely needed for checking each individual variable to ascertain whether its values seem to be plausible. For the fault location, two cases have to be distinguished:

- Are the values within a permissible field of values?
- If, for example, the possible responses lie only between 1 and 5 in the field of values, the value 6 is inadmissable - which means this is a "wild code" that proves that errors have been made in data capturing.
- Are the values plausible when taking into account further statements of the same interviewee?
- If an interviewee indicates, for example, that he has not found any employment yet he should not give any further statements concerning the methods of finding employment.

Frequency countings inform about whether any errors exist at all within the data. In order to determinate the error and to possibly correct it, it is necessary to find out the case in which the error occurs.

The procedure LIST enables you to look at the values of variables of individual cases.

Table 21   SPSS Syntax: LIST and SELECT IF

SPSS syntax	Explanation	Example
LIST	Lists the value of variables for all cases In many cases the results of such lists are very confused. With the help of an instruction concerning the selection of cases, only those of which the values are to be looked at can be listed specifically.	`LIST   A1a to A9e.`
SELECT IF	The following procedure is carried out for selected cases only	`SELECT IF  (A1a EQ 1)`

11.2.6   Data correction with SPSS syntax

In order to be able to correct the data, it is necessary to take the questionnaires to hand again.

The correction of data

- can be effected directly in the raw data (please be careful not to produce other errors);
- can be implemented in the system file with the help of DATA ENTRY (the raw data remain faulty, but here, too, you have to work very carefully in order not to produce any other errors);
- can also be effected by using IF-instructions in the system file (the raw data remain faulty but the correction of the errors stays transparent and can be checked any time).

Use SPSS syntax for data corrections. This is the only way to check this important change of your data.

The last version is the most reliable way of data correction but it may lead to quite an extensive data correction file. If we assume the checking of the questionnaires of the interviewees with the case numbers 7 and 9 revealed that they actually "have not found any employment yet", this means we have to correct all remaining variables which belong to the Question 3.2 and which were ticked. This kind of data correction including "IF"-instructions could be done as follows:

```
* ----------------------------------------.
IF   (A101 EQ  007) A347 = 0.
IF   (A101 EQ  007) A351 = 0.
IF   (A101 EQ  007) A357 = 0.
IF   (A101 EQ  007) A360 = 0.
IF   (A101 EQ  007) A361 = 0.
IF   (A101 EQ  007) A363 = 0.
* ----------------------------------------.
IF   (A101 EQ  009) A347 = 0.
IF   (A101 EQ  009) A351 = 0.
IF   (A101 EQ  009) A357 = 0.
IF   (A101 EQ  009) A360 = 0.
IF   (A101 EQ  009) A361 = 0.
IF   (A101 EQ  009) A363 = 0.
* ----------------------------------------.
```

Table 22   SPSS Syntax: IF

SPSS syntax	Explanation	Example
IF	Change of the values of variables	`IF   (A101 EQ 007) A347 = 0`

In order to be able to understand the corrections effected later, it is advisable to collect all corrections of the raw data that change system files in **one** correction file (name, for example, GCORR.DEF'). The changes in the Var Labels, Value Labels and the building of new variables should be collected in *one* file, too. Starting from the original system file (G-A.SYC), you can easily form a new system file any time you like. But if you carry out and record any changes in the system file (e.g. recoding of values) without explicitly documenting the changes you may have difficulties when writing the survey report in reconstructing the way of interpreting the results. Also, the necessity may occur later to revise any former recodings.

11.3   Tables: Standard Breaks

11.3.1   Standard-Table Programme

The previous chapter concerning frequency counting and statistical descriptives forms an important basis for more detailed analysis. With the help of these instruments, many survey questions can be answered already - in as far as they refer to the totality of graduates.

The representation of results which only contain statements of the totality of graduates (e.g. "the average income of graduates is ..."; "x % of the graduates are employed") is not really false but often the meaning is of doubtful value. Differentiated analysis is necessary, especially if efforts are based on results of graduates and employers surveys for the amelioration of education. If, for example, you have interviewed five age groups, for many questions it seems reasonable to check whether the responses of the individual age groups are different.

Standard tables: **As second strategy of the main analysis we recommend that you make out a table volume that differentiates all results by the central aggregation characteristics of the interviewees.**

The following variables are to be considered (for this see also the comments of Chapter 5):

Standard Breaks for Graduate Survey:

- Field of study
- Year of graduation
- Sector of employment
- Main field of work

Standard Breaks for Employer Survey :

- Main field of work of engineers
- Size of company/organization
- Field of employment

The following table programme was (nearly) performed automatically.

If you have designed your codebook as described, you can produce SPSS instructions for the SPSS Tables Programme with the Winword macro "QTAFI".

The following Codebook (see also CB_Handbook.doc) contains examples of the most important variable types and was used to produce the SPSS tables programme.

CHEERS
Careers after Higher Education
An European Research Study

Survey of Graduates in 12 Countries

Selected variables from the CHEERS codebook, rev. 2, version 02.06.1999

H1	**1.**	**Categorical answers**

QU	I1	Gender
VN	Variable name	Variable label
CV	**GENDER**	Gender
VV	Value/codes	Value label
CC	1	Male
CC	2	Female
CC	9	No answer
OT	Other information	Text
SU	Subject	Gender
IN	Indications	
CH	Check	
MV	Missing value	9
QF	Questionnaire	
DA	Data analysis	BREAK;REGINDEP1; REGINDEP2;

QU	B2	Did you spend any time abroad during the period of your study (in order to work or to study)?
VN	Variable name	Variable label
CV	**TIMEABST**	Time spent abroad during study period
VV	Value/codes	Value label
CC	1	Yes
CC	2	No
CC	9	No answer
OT	Other information	Text
SU	Subject	Time Spent Abroad During Study Period
IN	Indications	
CH	Check	
MV	Missing value	9
QF	Questionnaire	
DA	Data analysis	REGINDEP1; REGINDEP2;

H1	2.	Ordinal treated as categorical answers + arithmetic means

QU	B7	To what extent did your work experiences (employment, internships tc.) during study tie up with the content of your studies (you graduated from in 1994 or 1995)? (5-point scale of answers.)
VN	Variable name	Variable label
OR	**WEXPSTUD**	Relationship between work experiences and studies
VV	Value/codes	Value label
CC	1	1 To a very high extent
CC	2	2
CC	3	3
CC	4	4
CC	5	5 Not at all
CC	6	6 Not applicable, no work experiences
CC	9	No answer
OT	Other information	Text
SU	Subject	Relationship Between Work Experiences and Content of Study
IN	Indications	
CH	Check	
MV	Missing value	6, 9
QF	Questionnaire	
DA	Data analysis	REGINDEP1; REGINDEP2

H1	**3.**	**Ordinal answers**

QU	**B9**	**How do you rate the study provision and study conditions you experienced in the course of study that you graduated from in 1994 or 1995? (5-point scale of answers from 1 = "Very good" to 5 = "Very bad".)**
VN	Variable name	Variable label
OR	**B9ADVICE**	Academic advice offered in general
OR	**B9ADEXAM**	Assistance/advice for your final examination
OR	**B9CONTNT**	Course content of major
OR	**B9VARIET**	Variety of courses offered
OR	**B9DESIGN**	Design of degree program
OR	**B9TESTSY**	Testing/grading system
OR	**B9CHOOSE**	Opportunity to choose courses and areas of specialisation
OR	**B9PRACTI**	Practical emphasis of teaching and learning
OR	**B9TEQUAL**	Teaching quality
OR	**B9RESPRO**	Chances to participate in research projects
OR	**B9RESEAR**	Research emphasis of teaching and learning
OR	**B9WORKEX**	Provision of work placements and other work experience
OR	**B9CONTTE**	Opportunity of out-of-class contacts with teaching staff
OR	**B9CONTST**	Contacts with fellow students
OR	**B9UNIPOL**	Chance for students to have an impact on university policies
OR	**B9LIBRAR**	Equipment and stocking of libraries
OR	**B9TEAMAT**	Supply of teaching material
OR	**B9TEQUIP**	Quality of technical equipment (e.g. PC, measuring instruments, etc.)
VV	Value/codes	Value label
CC	1	1 Very good
CC	2	2
CC	3	3
CC	4	4
CC	5	5 Very bad
CC	9	No answer
OT	Other information	Text
SU	Subject	Rating of Study Provisions and Conditions
IN	Indications	
CH	Check	
MV	Missing value	9
QF	Questionnaire	
DA	Data analysis	FACTOR

H1	4.	Multiple reply answers

QU	C4	How did you try to find the first job after graduation? Multiple reply possible.
VN	Variable name	Variable label
MD	**C4APPLYV**	I applied for an advertised vacancy
MD	**C4WITHOV**	I contacted employers without knowing about a vacancy
MD	**C4LAUNCH**	I launched advertisements by myself
MD	**C4APPROA**	I was approached by an employer
MD	**C4PAGNCY**	I contacted a public employment agency
MD	**C4CAGNCY**	I contacted a commercial employment agency
MD	**C4OFFINS**	I enlisted the help of the careers/placement office of my institution of higher education
MD	**C4STAINS**	I enlisted the help of teaching staff of the institution of higher education
MD	**C4DURSTU**	I established contacts while working during the course of study
MD	**C4OTHPER**	I used other personal connections/contacts (e.g. parents, relatives, friends)
MD	**C4OWNBUS**	I started my own business/self-employment
MD	**C4OT**	Other
VV	Value/codes	Value label
CC	1	Yes
CC	2	No
CC	8	Not applicable, no job search
CC	9	No answer to C4
OT	Other information	Text
SU	Subject	Methods of Job Search
IN	Indications	
CH	Check	
MV	Missing value	8,9
QF	Questionnaire	
DA	Data analysis	

H1	5.	Metric answers

QU	C7	How many months have you sought all-together (before or after graduation) for your first job after graduation in 1994 or 1995, which you consider not to be a casual job?
VN	Variable name	Variable label
ME2	**JSMO**	Duration of job search
VV	Value/codes	Value label
CC	1	1 month
CC	2	2 months
CC	59	59 months
CC	60	60 months
CC	88	Not applicable, no job search
CC	99	No answer
OT	Other information	Text
SU	Subject	Duration of Job Search for First Job After Graduation in 1994/1995
IN	Indications	
CH	Check	
MV	Missing value	88, 99
QF	Questionnaire	
DA	Data analysis	REGDEP1

QU	G1	Altogether, to what extent are you satisfied with your current work? (5-point scale of answers from 1 = "Very satisfied" to 5 = "Very dissatisfied".)
VN	Variable name	Variable label
OR	**SATISFAC**	General satisfaction with current work
VV	Value/codes	Value label
CC	1	1 Very satisfied
CC	2	2
CC	3	3
CC	4	4
CC	5	5 Very dissatisfied
CC	9	No answer
OT	Other information	Text
SU	Subject	General Satisfaction with Current Work
IN	Indications	
CH	Check	
MV	Missing value	8, 9
QF	Questionnaire	
DA	Data analysis	REGDEP2

Figure 22   QTAFI - Generate SPSS Data Definition

Press "**Generate SPSS data definition**"

The following SPSS data definition was produced by the macro QTAFI

```
* ****************************************.
* ************* VARIABLE LABELS *********.
* ****************************************.

VARIABLE LABELS
   GENDER   "Gender"
  /TIMEABST "Time spent abroad during study period"
  /WEXPSTUD "Relationship between work experiences and studies"
  /B9ADVICE "Academic advice offered in general"
  /B9ADEXAM "Assistance/advice for your final examination"
  /B9CONTNT "Course content of major"
  /B9VARIET "Variety of courses offered"
  /B9DESIGN "Design of degree program"
  /B9TESTSY "Testing/grading system"
  /B9CHOOSE "Opportunity to choose courses and areas of specialisation"
  /B9PRACTI "Practical emphasis of teaching and learning"
  /B9TEQUAL "Teaching quality"
  /B9RESPRO "Chances to participate in research projects"
  /B9RESEAR "Research emphasis of teaching and learning"
  /B9WORKEX "Provision of work placements and other work experience"
  /B9CONTTE "Opportunity of out-of-class contacts with teaching staff"
  /B9CONTST "Contacts with fellow students"
  /B9UNIPOL "Chance for students to have an impact on university policies"
  /B9LIBRAR "Equipment and stocking of libraries"
  /B9TEAMAT "Supply of teaching material"
  /B9TEQUIP "Quality of technical equipment (e.g. PC, measuring instruments, etc.)"
  /C4APPLYV "I applied for an advertised vacancy"
  /C4WITHOV "I contacted employers without knowing about a vacancy"
  /C4LAUNCH "I launched advertisements by myself"
  /C4APPROA "I was approached by an employer"
  /C4PAGNCY "I contacted a public employment agency"
  /C4CAGNCY "I contacted a commercial employment agency"
```

```
  /C4OFFINS "I enlisted the help of the careers/placement office of my institution of
higher education"
  /C4STAINS "I enlisted the help of teaching staff of the institution of higher
education"
  /C4DURSTU "I established contacts while working during the course of study"
  /C4OTHPER "I used other personal connections/contacts (e.g. parents, relatives,
friends)"
  /C4OWNBUS "I started my own business/self-employment"
  /C4OT     "Other"
  /JSMO     "Duration of job search"
  /SATISFAC "General satisfaction with current work"
.
```

```
* ****************************************.
* ************* Value labels ************.
* ****************************************.

VALUE LABELS
   GENDER
    1 "Male"
    2 "Female"
    9 "No answer"
  /TIMEABST
    1 "Yes"
    2 "No"
    9 "No answer"
  /WEXPSTUD
    1 "1 To a very high extent"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Not at all"
    6 "6 Not applicable, no work experiences"
    9 "No answer"
   -9 "Not asked"
  /B9ADVICE
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
  /B9ADEXAM
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
  /B9CONTNT
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
  /B9VARIET
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
  /B9DESIGN
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
  /B9TESTSY
    1 "1 Very good"
    2 "2"
```

```
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9CHOOSE
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9PRACTI
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9TEQUAL
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9RESPRO
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9RESEAR
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9WORKEX
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9CONTTE
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9CONTST
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9UNIPOL
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
    9 "No answer"
 /B9LIBRAR
    1 "1 Very good"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very bad"
```

```
      9 "No answer"
 /B9TEAMAT
   1 "1 Very good"
   2 "2"
   3 "3"
   4 "4"
   5 "5 Very bad"
   9 "No answer"
 /B9TEQUIP
   1 "1 Very good"
   2 "2"
   3 "3"
   4 "4"
   5 "5 Very bad"
   9 "No answer"
 /C4APPLYV
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4WITHOV
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4LAUNCH
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4APPROA
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4PAGNCY
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4CAGNCY
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4OFFINS
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4STAINS
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4DURSTU
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
   9 "No answer to C4"
  -9 "Not asked"
 /C4OTHPER
   1 "Yes"
   2 "No"
   8 "Not applicable, no job search"
```

```
     9 "No answer to C4"
    -9 "Not asked"
  /C4OWNBUS
    1 "Yes"
    2 "No"
    8 "Not applicable, no job search"
    9 "No answer to C4"
   -9 "Not asked"
  /C4OT
    1 "Yes"
    2 "No"
    8 "Not applicable, no job search"
    9 "No answer to C4"
   -9 "Not asked"
  /JSMO
    1 "1 month"
    2 "2 months"
   59 "59 months"
   60 "60 months"
   88 "Not applicable, no job search"
   99 "No answer"
  /SATISFAC
    1 "1 Very satisfied"
    2 "2"
    3 "3"
    4 "4"
    5 "5 Very dissatisfied"
    9 "No answer"
.
```

```
* ****************************************.
* ************ MISSING VALUES **********.
* ****************************************.
MISSING VALUES
   GENDER   (9 )
  /TIMEABST (9 )
  /WEXPSTUD (6  9, -9)
  /B9ADVICE (9 )
  /B9ADEXAM (9 )
  /B9CONTNT (9 )
  /B9VARIET (9 )
  /B9DESIGN (9 )
  /B9TESTSY (9 )
  /B9CHOOSE (9 )
  /B9PRACTI (9 )
  /B9TEQUAL (9 )
  /B9RESPRO (9 )
  /B9RESEAR (9 )
  /B9WORKEX (9 )
  /B9CONTTE (9 )
  /B9CONTST (9 )
  /B9UNIPOL (9 )
  /B9LIBRAR (9 )
  /B9TEAMAT (9 )
  /B9TEQUIP (9 )
  /C4APPLYV (8 9, -9)
  /C4WITHOV (8 9, -9)
  /C4LAUNCH (8 9, -9)
  /C4APPROA (8 9, -9)
  /C4PAGNCY (8 9, -9)
  /C4CAGNCY (8 9, -9)
  /C4OFFINS (8 9, -9)
  /C4STAINS (8 9, -9)
  /C4DURSTU (8 9, -9)
  /C4OTHPER (8 9, -9)
  /C4OWNBUS (8 9, -9)
  /C4OT     (8 9, -9)
  /JSMO     (88  99)
  /SATISFAC (8  9)
.
```

See also the files

1. DEF01.SPS (to use with SPSS)

2. INF_QU.txt (for database of questions)

3. INF_VAR.txt (for database of variables)

4. VARLIST.DAT (only variable names)

which contains the data definition information.

Figure 23   Example of Data Definition with ASCII Data File

```
TITLE "cb-test.sps +++++".
.
*----------------------------------------.
*.
*Number of questions:   5
*Number of variables:  20
.
*----------------------------------------.
*.
DATA LIST   RECORDS =  1 /
  A1a  10
  A2a  11
  A2b  12
  A2c  13
  A2d  14
  A9a  15
  A9b  16
  A9c  17
  A9d  18
  A9e  19
  A9f  20
  A9g  21
  A9h  22
  A9i  23
  A9j  24
  A14a  25- 26
  A30a  27- 28
  A30b  29- 30
  A30c  31- 32
  A30d  33- 34
.
Begin data.
00011
.
End data.
.
*----------------------------------------.
*.
```

```
save out="c:\grad95\test1.sav".
execute.


* ----------------------------------------
* INPUT PROGRAM to generate data.
* ----------------------------------------
INPUT PROGRAM.
+ LOOP #I= 1 to 500.
+   COMPUTE A1a= rnd(RV.Uniform(1,3)).

+   DO REPEAT v1= a2a a2b a2c a2d.
+     COMPUTE v1= rnd(RV.Uniform(1,5)).
+   END REPEAT.


+   DO REPEAT v2= a9a a9b a9c a9d a9e a9f a9g a9h a9i a9j.
+     COMPUTE v2= rnd(RV.Normal(3,1)).
+   END REPEAT.


+   COMPUTE A14a= rnd(RV.Normal(4,1)).
+   COMPUTE A17a= rnd(RV.Normal(9,2)).


+   DO REPEAT v3= a30a a30b a30c a30d.
+     COMPUTE v3= rnd(RV.Uniform(1,15)).
+   END REPEAT.


+   END CASE.
+ END LOOP.
+ END FILE.
END INPUT PROGRAM.
execute.
*.
VAR LABELS
   A1a   "Subject"
  /A2a   "Construction engineering"
  /A2b   "Rural development"
  /A2c   "Water resources development"
  /A2d   "Other"
  /A9a   "Course contents in your major field of studies"
  /A9b   "Variety of courses offered"
  /A9c   "Chance for specialization"
  /A9d   "Scientific methods"
  /A9e   "Research orientation of students'/project work"
  /A9f   "Practical orientation of students'/project work"
  /A9g   "Practical orientation of teaching"
  /A9h   "Practical laboratory training"
  /A9i   "Workshop - training"
  /A9j   "Practical training in industry"
  /A14a   "Number of tests"
  /A17a   "Duration of seeking employment (months)"
  /A30a   "Kind of professional tasks (1)"
  /A30b   "Kind of professional tasks (2)"
  /A30c   "Kind of professional tasks (3)"
  /A30d   "Kind of professional tasks (4)"
.
```

```
*----------------------------------------.
*.
VALUE LABELS
 /A1a  1 'Mechanical engineering'
  2 'Electrical engineering'
  3 'Civil engineering'
 /A2a   1 'Yes'   2 'No'   9 'No answer'
 /A2b   1 'Yes'   2 'No'   9 'No answer'
 /A2c   1 'Yes'   2 'No'   9 'No answer'
 /A2d   1 'Yes'   2 'No'   9 'No answer'
 /A9a   1 '1 very useful'   5 '5 not at all useful'
 /A9b   1 '1 very useful'   5 '5 not at all useful'
 /A9c   1 '1 very useful'   5 '5 not at all useful'
 /A9d   1 '1 very useful'   5 '5 not at all useful'
 /A9e   1 '1 very useful'   5 '5 not at all useful'
 /A9f   1 '1 very useful'   5 '5 not at all useful'
 /A9g   1 '1 very useful'   5 '5 not at all useful'
 /A9h   1 '1 very useful'   5 '5 not at all useful'
 /A9i   1 '1 very useful'   5 '5 not at all useful'
 /A9j   1 '1 very useful'   5 '5 not at all useful'
 /A30a to A30d
  01 'Item 1'
  02 'Item 2'
  03 'Item 3'
  88 'Other'
  99 'No answer'
.
if (a30b ge a30a) a30b=0.
if (a30c ge a30a) a30c=0.
if (a30d ge a30a) a30d=0.
if (a30c ge a30b) a30c=0.
if (a30d ge a30b) a30d=0.
Recode a2a to a2d (3 thru hi=0).
Recode a1a to a30d (lo thru 0=0) /a9a to a9j (6=0).
Missing values a1a to a30d (0).
SAVE OUTFILE='C:\GRAD95\TEST2.SAV'
    /COMPRESSED.
desc all.
```

Figure 24   Examples of a SPSS Tables Programme Generated by QTAFI

1. Insert the information of your break variable, at least the **name** of the variable (like FIELD)

2. Insert the number of categories of the break variable and press **Check table wirth**

3. Check the table options

4. Press **Create SPSS tables**

The following SPSS Tables syntax was created by the QTAFI macro.

```
Set WorkSpace = 512.
Set Journal=ON.
Set FORMAT=F8.2.
Set ERRORS=ON.
Set MESSAGES=ON.
Set BOX = X '2D7C2B2B2B2B2B2B2B2B2B2B'.
Set HISTOGRAM = X '9F'.
Set BLOCK = X '9E'.
Set Length = None.
Set WIDTH = 132.
Set PRINTBACK=ON.
* ---------------------.
Get File='C:\03_YOGYA\TEST10b.SAV'.
* ---------------------.
COMPUTE   X = 1 .
VAR LABEL X '' .
VAL LAB   X 1 ''.
* ---------------------.
```

```
* ------------------------------------------------.
*REM <H1>1. Categorical answers
* ------------------------------------------------.


*----------------------------------------------------------------------.
* Question: I1  SPSS6_TB_CROSSTABS   (07/08/2003)                    *.
* Table:   1  Title:  Gender                                        *.
*----------------------------------------------------------------------.
TEMPORARY.
VARIABLE LABELS GENDER  '' .
TABLES
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES=   GENDER   + TOTAL
     BY FIELD + TOTAL
  /STATISTICS=CPCT     (''              (F3.0): FIELD)
             COUNT    (TOTAL 'Count (n)'  (PAREN4.0))
  /TTITLE LEFT 'Table #:'
    "Gender"
  'by Field of Study Area'
  '(percent)'
  /TFOOT LEFT
 "Question I1: Gender"
.


*----------------------------------------------------------------------.
* Question: B2  SPSS6_TB_CROSSTABS   (07/08/2003)                    *.
* Table:   2  Title:  Time Spent Abroad During Study Period         *.
*----------------------------------------------------------------------.
TEMPORARY.
VARIABLE LABELS TIMEABST  '' .
TABLES
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES=   TIMEABST   + TOTAL
     BY FIELD + TOTAL
  /STATISTICS=CPCT     (''              (F3.0): FIELD)
             COUNT    (TOTAL 'Count (n)'  (PAREN4.0))
  /TTITLE LEFT 'Table #:'
    "Time Spent Abroad During Study Period"
  'by Field of Study Area'
  '(percent)'
  /TFOOT LEFT
 "Question B2: Did you spend any time abroad during the period of your study"
 " (in order to work or to study)?"
.


* ------------------------------------------------.
*REM <H1>2. Ordinal treated as categorical answers + arithmetic means
* ------------------------------------------------.


*----------------------------------------------------------------------.
```

```
* Question: B7  SPSS6_TB_CROSSTABS   (07/08/2003)                    *.
* Table:   3  Title:  Relationship Between Work Experiences and Con  *.
*--------------------------------------------------------------------.
COMPUTE      X1=WEXPSTUD.
VAR LABEL    X1 'Arithmetic mean'.
COMPUTE              NUM=0.
IF (NOT (MISSING (X1))) NUM=1.
VALUE LABELS         NUM 1 ''.
MISSING VALUES       NUM (0).
VAR   LABELS         NUM ''.
COMPUTE  X1RECODE= WEXPSTUD.
RECODE  X1RECODE (1,2=1) (3=2) (4,5=3).
VAR LAB  X1RECODE 'Recoded values'.
VAL LAB  X1RECODE 1 '1,2' 2 '3' 3 '4,5'.
* -------------------------------------------------.
TABLES
  /OBSERVATION= X1
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES =
  WEXPSTUD + NUM + X1RECODE + X1
           BY FIELD  + TOTAL
  /STATISTICS = MEAN    (X1 '' (F3.1) )
                CPCT    (WEXPSTUD '' (F4.0): FIELD)
                CPCT    ( X1RECODE  '' (F4.0): FIELD)
                CPCT    ( NUM  'Total' (F4.0): FIELD)
               COUNT    (NUM '' (PAREN5.0) )
  /TTITLE LEFT 'Table #:'
    "Relationship Between Work Experiences and Content of Study"
  'by Field of Study Area'
  '(percent; arithmetic mean)'
  /TFOOT LEFT
 "Question B7: To what extent did your work experiences (employment,"
 " internships tc.) during study tie up with the content of your"
 " studies (you graduated from in 1994 or 1995)? (5-point scale of"
 " answers.)"
.

* -------------------------------------------------.
*REM <H1>3. Ordinal answers
* -------------------------------------------------.

*--------------------------------------------------------------------.
* Question: B9  OM   (07/08/2003)                                    *.
* Table:   4  Title:  Rating of Study Provisions and Conditions      *.
*--------------------------------------------------------------------.
COUNT         n2  =
    B9ADVICE B9ADEXAM B9CONTNT B9VARIET B9DESIGN B9TESTSY B9CHOOSE
    B9PRACTI B9TEQUAL B9RESPRO B9RESEAR B9WORKEX B9CONTTE
    B9CONTST B9UNIPOL B9LIBRAR B9TEAMAT B9TEQUIP
            (1 THRU 5) .
RECODE        n2 (1 THRU HI = 1) (ELSE = 2).
VALUE LABELS  n2 1 '' 2 'DELETEME'.
VAR   LABELS  n2 'DELETETOTAL'.
```

```
MISSING VALUES  n2 (2).
TABLES /OBSERVATION =
    B9ADVICE B9ADEXAM B9CONTNT B9VARIET B9DESIGN B9TESTSY B9CHOOSE
    B9PRACTI B9TEQUAL B9RESPRO B9RESEAR B9WORKEX B9CONTTE
    B9CONTST B9UNIPOL B9LIBRAR B9TEAMAT B9TEQUIP
  n2
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES =
  B9ADVICE+B9ADEXAM+B9CONTNT+B9VARIET+B9DESIGN+B9TESTSY+B9CHOOSE
  +B9PRACTI+B9TEQUAL+B9RESPRO+B9RESEAR+B9WORKEX+B9CONTTE
  +B9CONTST+B9UNIPOL+B9LIBRAR+B9TEAMAT+B9TEQUIP
 +  n2
            BY FIELD  + TOTAL
  /STATISTICS = MEAN    (  (F3.1) '')
              VALIDN    ( n2   'Count (n)' (PAREN4.0) )
  /TTITLE LEFT 'Table #:'
    "Rating of Study Provisions and Conditions"
  'by Field of Study Area'
 '(arithmetic mean)'
  /TFOOT LEFT
 "Question B9: How do you rate the study provision and study conditions you"
 " experienced in the course of study that you graduated from in"
 " 1994 or 1995? (5-point scale of answers from 1 = 'Very good' to"
 " 5 = 'Very bad'.)"
.
*------------------------------------------------------------------.
* Question: B9  Scale - Percentages   (07/08/2003)                *.
* Table:   4  Title:  Rating of Study Provisions and Conditions    *.
*------------------------------------------------------------------.
TEMPORARY.
RECODE
    B9ADVICE B9ADEXAM B9CONTNT B9VARIET B9DESIGN B9TESTSY B9CHOOSE
    B9PRACTI B9TEQUAL B9RESPRO B9RESEAR B9WORKEX B9CONTTE
    B9CONTST B9UNIPOL B9LIBRAR B9TEAMAT B9TEQUIP
   (1, 2  = 1) (3, 4, 5 = 2) (Else = sysmis) .
VALUE LABELS
    B9ADVICE B9ADEXAM B9CONTNT B9VARIET B9DESIGN B9TESTSY B9CHOOSE
    B9PRACTI B9TEQUAL B9RESPRO B9RESEAR B9WORKEX B9CONTTE
    B9CONTST B9UNIPOL B9LIBRAR B9TEAMAT B9TEQUIP
    1'' 2 'DELETEME'.
TABLES
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES=
  B9ADVICE+B9ADEXAM+B9CONTNT+B9VARIET+B9DESIGN+B9TESTSY+B9CHOOSE
  +B9PRACTI+B9TEQUAL+B9RESPRO+B9RESEAR+B9WORKEX+B9CONTTE
  +B9CONTST+B9UNIPOL+B9LIBRAR+B9TEAMAT+B9TEQUIP
    + n2  BY FIELD + TOTAL
  /STATISTICS = CPCT  (''  (F3.0): FIELD )
              COUNT    ( n2  'Count (n)'  (PAREN4.0))
  /TTITLE LEFT 'Table #:'
    "Rating of Study Provisions and Conditions"
```

```
  'by Field of Study Area'
  '(percent; responses 1 and 2)'
  /TFOOT LEFT
 "Question B9: How do you rate the study provision and study conditions you"
 " experienced in the course of study that you graduated from in"
 " 1994 or 1995? (5-point scale of answers from 1 = 'Very good' to"
 " 5 = 'Very bad'.)"
.


* ------------------------------------------------.
*REM <H1>4. Multiple reply answers
* ------------------------------------------------.


*----------------------------------------------------------------------.
* Question: C4  MD   (07/08/2003)                                     *.
* Table:   5  Title:  Methods of Job Search                          *.
*----------------------------------------------------------------------.
TABLES
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /MDGROUP = GRU1, ''
    C4APPLYV C4WITHOV C4LAUNCH C4APPROA C4PAGNCY C4CAGNCY C4OFFINS
    C4STAINS C4DURSTU C4OTHPER C4OWNBUS C4OT (1)
  /TABLES = GRU1 + TOTAL BY  FIELD  + TOTAL
  /STATISTICS = RPCT          (''                (F3.0): FIELD )
              CASES        (TOTAL'Count (n)' (PAREN4.0))
  /TTITLE LEFT 'Table #:'
    "Methods of Job Search"
  'by Field of Study Area'
 '(percent; multiple responses)'
  /TFOOT LEFT
 "Question C4: How did you try to find the first job after graduation? Multiple"
 " reply possible."
.


* ------------------------------------------------.
*REM <H1>5. Metric answers
* ------------------------------------------------.


*----------------------------------------------------------------------.
* Question: C7  SPSS_TB_Means   (07/08/2003)                          *.
* Table:   6  Title:  Duration of Job Search for First Job After Gr  *.
*----------------------------------------------------------------------.
TABLES /OBSERVATION =
    JSMO
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES=   JSMO
                BY FIELD + TOTAL
  /STATISTICS =
              MEAN   ('Arithm. mean' (F5.1) )
              MEDIAN ('Median' (F5.1) )
              MIN    ('Minimum' (F5.1) )
```

```
              MAX    ('Maximum' (F5.1) )
              VALIDN ('Count' (paren5.0) )
 /TTITLE LEFT 'Table #:'
   "Duration of Job Search for First Job After Graduation in 1994/1995"
 'by Field of Study Area'
'(means)'
 /TFOOT LEFT
"Question C7: How many months have you sought all-together (before or after"
" graduation) for your first job after graduation in 1994 or"
" 1995, which you consider not to be a casual job?"
.


*-------------------------------------------------------------------.
* Question: G1  SPSS_TB_Means   (07/08/2003)                      *.
* Table:   7  Title:  General Satisfaction with Current Work      *.
*-------------------------------------------------------------------.
COMPUTE       X1=SATISFAC.
VAR LABEL     X1 'Arithmetic mean'.
COMPUTE            NUM=0.
IF (NOT (MISSING (X1))) NUM=1.
VALUE LABELS       NUM 1 ''.
MISSING VALUES     NUM (0).
VAR   LABELS       NUM ''.
COMPUTE  X1RECODE= SATISFAC.
RECODE  X1RECODE (1,2=1) (3=2) (4,5=3).
VAR LAB  X1RECODE 'Recoded values'.
VAL LAB  X1RECODE 1 '1,2' 2 '3' 3 '4,5'.
* -------------------------------------------------.
TABLES
  /OBSERVATION= X1
  /BOXCHAR=SYSTEM /FTOT=TOTAL 'Total'
  /FORMAT=CWIDTH(45,10) OFFSET(CENTER) INDENT(0) TFSPACE(0) TTSPACE(0)
   MARGINS(1,145) ZERO BOX FRAME
  /TABLES =
  SATISFAC + NUM + X1RECODE + X1
          BY FIELD  + TOTAL
  /STATISTICS = MEAN    (X1 '' (F3.1) )
              CPCT    (SATISFAC '' (F4.0): FIELD)
              CPCT    ( X1RECODE  '' (F4.0): FIELD)
              CPCT    ( NUM  'Total' (F4.0): FIELD)
             COUNT    (NUM '' (PAREN5.0) )
 /TTITLE LEFT 'Table #:'
   "General Satisfaction with Current Work"
 'by Field of Study Area'
 '(percent; arithmetic mean)'
 /TFOOT LEFT
"Question G1: Altogether, to what extent are you satisfied with your current"
" work? (5-point scale of answers from 1 = 'Very satisfied' to 5"
" = 'Very dissatisfied'.)"
.
```

Run the tables with SPSS and paste the output (SPSS listing) in a new WINWORD document. Then perform the next QTAFI step: Clean and format SPSS listing.

Figure 25   QTAFI - Clean and Format Tables

1. Load the SPSS listing or paste in a new document

2. Set or adjust the page layout

3. Press **Clean and format ...**

You will then get the following cleaned and formatted tables:

Figure 26   QTAFI - Ready to Print Tables

1. Categorical answers

Table 1   Gender by Field of Study Area (percent)

	Edu	Hum	SocSci	Bus	Sci	Eng	Law	Total
			Field of Study Area					Total
Male	24	27	45	57	61	73	53	51
Female	76	73	55	43	39	27	47	49
Total	100	100	100	100	100	100	100	100
Count (n)	(1049)	(1558)	(1097)	(1549)	(1130)	(2195)	(935)	(9513)

Question I1: Gender

Table 2   Time Spent Abroad During Study Period by Field of Study Area (percent)

| | Field of Study Area | | | | | | | Total |
	Edu	Hum	SocSci	Bus	Sci	Eng	Law	
Yes	14	35	19	23	17	20	15	22
No	86	65	81	77	83	80	85	78
Total	100	100	100	100	100	100	100	100
Count (n)	(1043)	(1535)	(1075)	(1526)	(1112)	(2177)	(906)	(9374)

Question B2: Did you spend any time abroad during the period of your study (in order to work or to study)?

2. Ordinal treated as categorical answers + arithmetic means

Table 3   Relationship Between Work Experiences and Content of Study by Field of Study Area (percent; arithmetic mean)

| | Field of Study Area | | | | | | | Total |
	Edu	Hum	SocSci	Bus	Sci	Eng	Law	
1 To a very high extent	18	11	7	9	13	15	7	12
2	27	17	15	20	18	23	10	19
3	15	15	16	23	16	17	16	17
4	15	20	24	22	19	16	20	19
5 Not at all	25	37	38	25	33	29	47	33
Total	100	100	100	100	100	100	100	100
Count	(784)	(1310)	(956)	(1166)	(852)	(1678)	(673)	(7419)
Recoded values								
1, 2	45	28	22	29	31	38	17	31
3	15	15	16	23	16	17	16	17
4, 5	40	57	62	48	52	46	67	52
Arithmetic mean	3.0	3.6	3.7	3.4	3.4	3.2	3.9	3.4

Question B7: To what extent did your work experiences (employment internships etc.) during study tie up with the content of you studies (you graduated from in 1994 or 1995)? (5-point scale o answers.)

3. Ordinal answers

Table 4a   Rating of Study Provisions and Conditions by Field of Study Area (arithmetic mean)

	Field of Study Area							Total
	Edu	Hum	SocSci	Bus	Sci	Eng	Law	
Academic advice offered in general	3.1	3.1	3.1	3.2	3.1	3.0	3.4	3.1
Assistance/advice for your final examination	2.8	2.8	2.8	3.0	2.8	2.7	3.3	2.8
Course content of major	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.5
Variety of courses offered	2.9	2.8	2.6	2.6	2.7	2.6	2.8	2.7
Design of degree program	3.0	3.1	2.9	2.8	3.0	2.8	3.0	2.9
Testing/grading system	3.0	3.0	3.0	2.9	3.0	2.9	3.2	3.0
Opportunity to choose courses and areas of specialisation	3.1	2.8	2.6	2.8	2.8	2.7	3.0	2.8
Practical emphasis of teaching and learning	3.1	3.5	3.6	3.4	3.5	3.2	3.8	3.4
Teaching quality	2.9	2.9	3.1	2.9	2.9	2.9	3.0	2.9
Chances to participate in research projects	3.9	3.9	3.7	3.9	3.4	3.6	4.1	3.8
Research emphasis of teaching and learning	3.5	3.4	3.2	3.7	3.1	3.4	3.8	3.4
Provision of work placements and other work experience	3.2	4.0	3.8	3.6	3.8	3.5	4.1	3.7
Opportunity of out-of-class contacts with teaching staff	3.3	3.3	3.5	3.5	3.2	3.3	3.8	3.4
Contacts with fellow students	2.0	2.3	2.3	2.1	2.1	2.1	2.4	2.2
Chance for students to have an impact on university policies	3.4	3.6	3.5	3.4	3.5	3.4	3.6	3.5
Equipment and stocking of libraries	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.5
Supply of teaching material	2.7	2.9	2.9	2.7	2.8	2.7	2.9	2.8
Quality of technical equipment (e.g. PC, measuring instruments, etc.)	3.1	3.3	3.2	3.0	2.8	2.8	3.6	3.1
Count (n)	(1048)	(1551)	(1092)	(1545)	(1126)	(2187)	(924)	(9473)

Question B9: How do you rate the study provision and study conditions you experienced in the course of study that you graduated from i 1994 or 1995? (5-point scale of answers from 1 = 'Very good' to 5 = 'Very bad'.)

Table 4b   Rating of Study Provisions and Conditions by Field of Study Area (percent; responses 1 and 2)

	Edu	Hum	SocSci	Bus	Sci	Eng	Law	Total
				Field of Study Area				Total
Academic advice offered in general	28	30	31	23	28	31	20	28
Assistance/advice for your final examination	43	46	45	37	43	48	25	42
Course content of major	51	53	51	54	55	54	43	52
Variety of courses offered	38	41	52	50	44	49	41	46
Design of degree program	28	26	32	36	28	36	28	32
Testing/grading system	30	25	25	33	30	35	21	29
Opportunity to choose courses and areas of specialisation	31	43	53	44	43	45	37	43
Practical emphasis of teaching and learning	32	19	16	21	19	27	13	22
Teaching quality	34	34	25	34	34	33	26	32
Chances to participate in research projects	11	13	16	10	25	19	4	15
Research emphasis of teaching and learning	17	24	30	13	35	22	12	22
Provision of work placements and other work experience	35	13	14	22	17	24	11	20
Opportunity of out-of-class contacts with teaching staff	27	27	21	18	29	24	13	23
Contacts with fellow students	72	61	61	69	70	72	57	67
Chance for students to have an impact on university policies	15	13	15	16	14	17	14	15
Equipment and stocking of libraries	57	55	57	53	55	54	58	55
Supply of teaching material	43	39	36	44	42	46	37	42
Quality of technical equipment (e.g. PC, measuring instruments, etc.)	33	25	30	36	43	44	15	34
Count (n)	(1048)	(1551)	(1092)	(1545)	(1126)	(2187)	(924)	(9473)

Question B9: How do you rate the study provision and study conditions you experienced in the course of study that you graduated from i 1994 or 1995? (5-point scale of answers from 1 = 'Very good' to 5 = 'Very bad'.)

4. Multiple reply answers

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Table 5   Methods of Job Search by Field of Study Area (percent; multiple responses)

	Field of Study Area							Total
	Edu	Hum	SocSci	Bus	Sci	Eng	Law	
I applied for an advertised vacancy	64	69	78	80	74	73	65	73
I contacted employers without knowing about a vacancy	40	41	38	52	51	52	41	46
I launched advertisements by myself	6	6	4	6	7	7	4	6
I was approached by an employer	15	12	17	16	12	14	13	14
I contacted a public employment agency	30	35	35	34	43	35	31	35
I contacted a commercial employment agency	10	16	18	21	13	15	14	16
I enlisted the help of the careers/placement office of my institution of higher education	15	33	41	29	22	28	30	29
I enlisted the help of teaching staff of the institution of higher education	7	13	11	8	20	21	7	13
I established contacts while working during the course of study	18	13	14	13	14	19	7	15
I used other personal connections/contacts (e.g. parents, relatives, friends)	22	33	29	35	30	29	36	31
I started my own business/self-employment	2	5	2	3	4	4	5	4
Other	20	13	10	7	12	6	13	11
Total	248	291	298	304	304	302	268	291
Count (n)	(790)	(1158)	(858)	(1170)	(752)	(1567)	(654)	(6949)

Question C4: How did you try to find the first job after graduation? Multiple reply possible.

5. Metric answers

Table 6   Duration of Job Search for First Job After Graduation in 1994/1995 by Field of Study Area (means)

	Field of Study Area							Total
	Edu	Hum	SocSci	Bus	Sci	Eng	Law	
Arithm. mean	6.3	8.0	7.2	6.4	6.9	5.7	6.8	6.7
Median	3.0	6.0	5.0	4.0	4.0	4.0	5.0	4.0
Minimum	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Maximum	68.0	60.0	68.0	64.0	60.0	54.0	96.0	96.0
Count	(542)	(901)	(718)	(982)	(583)	(1269)	(520)	(5515)

Question C7: How many months have you sought all-together (before or after graduation) for your first job after graduation in 1994 o 1995, which you consider not to be a casual job

Table 7   General Satisfaction with Current Work by Field of Study Area (percent; arithmetic mean)

	Edu	Hum	SocSci	Bus	Sci	Eng	Law	Total
								Field of Study Area / Total
General satisfaction with current work								
1 Very satisfied	24	18	17	15	20	18	18	18
2	46	39	38	46	46	45	39	43
3	20	23	26	25	21	24	25	24
4	7	15	15	12	11	11	14	12
5 Very dissatisfied	2	5	4	3	3	3	5	3
Total	100	100	100	100	100	100	100	100
Count	(878)	(1292)	(945)	(1421)	(984)	(2029)	(773)	(8322)
Recoded values								
1, 2	70	57	54	61	66	63	57	61
3	20	23	26	25	21	24	25	24
4, 5	10	20	19	14	13	13	18	15
Arithmetic mean	2.2	2.5	2.5	2.4	2.3	2.3	2.5	2.4

Question G1: Altogether, to what extent are you satisfied with your current work? (5-point scale of answers from 1 = 'Very satisfied' to = 'Very dissatisfied'.)

11.3.2   Specific Individual Statistical Analysis

The simple frequency countings (FREQUENCIES), statistical descriptives (DESCRIPTIVES) and the table volume containing a breakdown of the results for important survey groups (like gender, year of grdaution) will enable you to answer most of the questions of your survey.

But for some of the questions the survey strategies shown are not really satisfactory.

- For individual questions, for example, it is interesting to analyse the responses of the graduates by further differentiating characteristics (gender, study performances, origin, professional education, etc.).
- It may be interesting, for example, to look at the responses of some questions the characteristics of which were not actually asked for but resulted from the combination of individual characteristics.
- If in the survey differences were noticed in main questions, e.g. subject area, year of graduation and field of employment, it is obviously important to enquire about those differences that are more crucial. This is not possible by only comparing percentage values or means, but needs special procedures. As also connections may exist between the subject area and the field of employment, multivariate analysis strategies are advisable (e.g. SPSS procedures ANOVA or REGRESSION).
- It is not an analysis of effectiveness to simply describe the differences between groups or the relations between variables. In order to find out to what extent the further professional career of graduates is influenced by their studies and by the study conditions, more in-depth analysis is necessary the description of which would be beyond the scope of this manual.

12 Report of Results

For the effectiveness of a survey not only its results are decisive but also the way they are presented. Many of those graduate surveys which were implemented at great cost did not achieve great effectiveness because too little attention was paid to the final report.

Please publish your survey report

It certainly is more costly to produce a survey report with the aim of publishing it for a wider readership than is planned for an internal report. But this extra work/money/time is worthwhile.

12.1.1 Structure of the Survey Report

The following structure of the survey report of the Graduate and Employer Survey 1989 of the Faculty of Engineering (Dar es Salaam, Tanzania) can be regarded as a kind of specimen structure for survey reports.

Comments concerning the individual parts:

- Part 2 (The Socio-economic Situation in ...) is intended to give background information to those readers of the study who do not know the country.
- Part 3 (Objectives and Curriculum of the Faculty of ....) is intended to give background information to those readers of the study who do not know the university and the educational programme.
- In Part 4 (Design), the procedure should be described as precisely as possible (kind and time of the implementation, return rate, etc.).
- Part 5 (Background Information about the ... Graduates) could contain those data about the graduates which do not fit into the following systematical chapters, like distribution by gender, social and regional origin, educational prerequisites, etc.
- The summary, generally, is an important chapter for the hasty reader. Therefore, it is advisable not to conceive it too sparsely but to appropriately summarize all individual chapters for it. A summary like this, extended by graphics and tables, may also serve for the information of graduates/employers.

University Education and Engineering Profession in Tanzania

0. Preface
1. Cause and Objectives of the Study
2. The Socio-economic Situation in Tanzania
3. Objectives and Curriculum of the Faculty of Engineering (FoE)
4. Design of the Study
5. Background Information about the FoE-Graduates
6. Studies at the FoE
7. Transition to Employment
8 Employment Situation of Engineers
9. Main Activities and Qualifications of Engineers
10. Professional Career
11. Further Education and Professional Development

12. Future Needs for Engineering Education
13. Summary
14. Appendix

Presentation of Results and Interpretation

It is hardly possible to standardize the drafting of the survey report. As you will certainly have sufficient experience in writing reports with other contents, we shall only give you a few special recommendations.

If you intend to publish the report, please take into account that most of the readers have little or no knowledge concerning the educational programme of the university. Therefore, please avoid using abbreviations which may not be familiar to everybody.

For the presention of the results, you may like to adapt the following formal scheme:

- Short *introduction to the subject/the questions investigated* (What do you want to know? Why do you want to know it - please, explain the practical purpose). For this you can use the "Explanation of the Specimen Questionnaires".

- *Presentation of the findings* (What are the results?) If, for example, you state that X percent of the graduates indicate that their professional position is appropriate to their studies, please take the results from the SPSS-jobs - mainly the table volume. Most of the time, the "result" is a statistical descriptive; we especially recommend to giving percentages, for they can best be understood by the readers. Means only are comprehensible when the scale is explained additionally.

- Please try to avoid indefinite terms like "many", "several", "few", "some" (graduates, etc.) if you do not present the exact information in form of the statistical descriptives at the same time.

- Main findings should also be presented in the form of a table or a graphic (next to the information in the text). For the most part, tables and graphics contain much more information than can be given in the text and by studying them the reader is able to check the presentation of the results as well as to infer additional details about the study.

- For the reader it is much easier to understand your presentation if first you give the results for the total population interviewed and - if it seems to be interesting - then differentiate the findings.

- Interpretation of the results: The presentation of the outcomes which is the result of a data selection is already a form of their interpretation.

- Further-reaching interpretations aim at explaning of findings or at least classifying them within an explanation frame. Often these interpretations begin with the following sentence: "It has to be taken into consideration that ...". In scientific surveys which are used to test specific hypotheses the theory that is to be examined already represents the explanation and interpretation frame. On the other hand, graduate surveys seldomly are implemented in order to test comparable individual hypotheses; instead they supply a multitude of information which is useful for all kinds of objectives.

- Therefore, while presenting the results and their interpretation it is important to develop an interpretation frame which classifies individual findings. This, for example, is possible by choosing relative comparison standards for the interpretation of the findings: it is interesting, for example, to compare the

results of Question 2.1 (Valuation of the study) (a) by subject area, (b) by study performance, (c) by the year of graduation, or to also compare the individual elements of the studies, whereas the absolute value of, for example, the assessment of the "Offer for advice in professional questions" can hardly be interpreted ("how much is much"). If after a few years you implement the graduate survey again, the comparison with the results of the first survey will lead to an interesting perspective for the interpretation.

- Conclusions/recommendations: We recommend that you separate the presentation and the interpretation of the results from the practical conclusions and recommendations concerning measurements for ameliorating education and to planning a separate part for this that need not necessarily be a component of the published report.

13 Literature

13.1.1 Higher Education - Labour Market - Performance Indicators - Evaluation

ALTBACH, Philip. G. and KELLY, D.H.: Higher Education in International Perspective. A Survey and Bibliography. London: Mansell 1985.

ALTBACH, Philip. G.: Perspectives on Comparative Higher Education: A Survey of Research and Literature. New York: International Council for Educational Development 1985.

ALTBACH, Philip G.: International Higher Education. An Encyclopedia, vol. 2, New York: Garland 1991.

ASTIN, A. W.: Assessment for Excellence. The Philosophy and Practice of Assessment and Evaluation in Higher Education. New York: Macmillan 1991.

BLOMQVIST, Ake: Higher Education and the Markets for Educated Labour in LDCS: Theoretical Approaches and Implications. Washington D.C.: World Bank 1987.

BRENNAN, John; KOGAN, Maurice and TEICHLER, Ulrich (ed.): Higher Education and Work. London: Jessica Kingsley 1995.

BRENNAN, John; KOGAN, Maurice and TEICHLER, Ulrich (ed.): "Higher Education and Work: A Conceptual Framework". In: BRENNAN, John; KOGAN, Maurice and TEICHLER, Ulrich (ed.): Higher Education and Work. London: Jessica Kingsley 1995, pp. 1-24.

CAVE, Martin et al.: The Use of Performance Indicators in Higher Education: A Critical Analysis of Developing Practice. London: Jessica Kingsley 1988.

CONRAD, C.F. and WILSON, R.F.: Academic Program Reviews. Washington, D.C.: ERIC Clearinghouse on Higher Education und Association for the Study of Higher Education 1985.

COPPLE, Carol E.: Education and Employment Research and Policy Studies: Annotated Bibliography, 1987-1990. Washington D.C.: World Bank 1990 (Background Paper Series; 26).

DOCHY, F.J.R.C., SEGERS, M.S.R. and WIJNEN, W.H.F.W. (ed.): Management Information and Performance Indicators in Higher Education: An International Issue. Assen: Van Gorcum 1990.

DORE, R.: The Diploma Disease. London: Allen & Unwin 1976.

EWELL, P.T. (ed.): Assessing Educational Outcomes. San Francisco, Cal.: Jossey-Bass, 1985 (New Directions for Institutional Research; 43).

EWELL, P.T.: "Outcomes, Assessment, and Academic Improvement: In Search of Usable Knowledge." In: SMART, J.C. (ed.): Higher Education: Handbook of Theory and Research. Vol. IV. New York: Agathon 1988, pp. 53-105.

FULTON, O., GORDON, A. and WILLIAMS, G.: Higher Education and Manpower Planning. Geneva: International Labour Office 1982.

GOEDEGEBUURE, L.C.J., MAASSEN, P.A.M. and WESTERHEIJDEN, D.F. (ed.): Peer Review and Performance Indicators: Quality Assessment in British and Dutch Higher Education. Culemborg: Lemma 1990.

HINCHLIFFE, Keith: Higher Education in Sub-Saharan Africa. Washington: The World Bank 1985 (Discussion Paper. Education and Training Series. Report No. 3).

HOEPER, Bernhard (ed.): Quality, Relevance and Efficiency in Higher education in Africa. Report on the International Seminar in Harare, Zimbabwe, 13.-18. September 1992. Bonn: Deutsche Stiftung für Internationale Entwicklung 1993.

HOLTKAMP, R. and TEICHLER, Ulrich (ed.): Berufstätigkeit von Hochschulabsolventen. Forschungsergebnisse und Folgerungen für das Studium. Frankfurt a.M. and New York: Campus 1983.

HUSÉN, T.: Higher Education and Social Stratification: An International Comparative Study. Paris: UNESCO, International Institute for Educational Planning 1987.

JACOBI, M., ASTIN, A. and AYALA, Jr., F.: College Student Outcomes Assessment. Washington, D.C.: ERIC Clearinghouse on Higher Education and ASHE 1987.

KOGAN, Maurice and BRENNAN, John: "Higher Education and the World of Work: An Overview." In: Higher Education in Europe, Vol. 18, No. 2, 1993, S. 2-24.

OXENHAM, John (ed.): Education versus Qualification. A Study of Relationships Between Education, Selection for Employment and the Productivity of Labour. London 1984.

PASCARELLA, E.T. and TERENZINI, P.T.: How College Affects Students. San Francisco, Cal.: Jossey-Bass 1991.

PSACHAROPOULOS, George: "Returns to Education: An updated international comparison". In: Comparative Education Review 17, 1981, pp. 321-341.

PSACHAROPOULOS, George: "Returns to Education: A further international update and implications". In: Journal of Human Resources 1985, pp. 583-604.

PSACHAROPOULOS, George (ed.): Economics of Education: Research and Studies. Oxford: Pergamon Press 1987.

PSACHAROPOULOS, Georg: Critical Issues in Education: A World Agenda. Washington D.C.: World Bank 1987.

SANYAL, B. C.: Higher Education and Employment - An International Comparative Analysis. London: UNESCO/Falmer Press 1987.

SANYAL , B.C.: "Higher Education and the Labor Market". In: Altbach, P.G. (Hg.): International Higher Education: An Encyclopedia. New York and London: Garland, 1991, S. 147-168.

SOBEL, I.: "The Human Capital Revolution in Economic Development". In: ALTBACH, P.G.; ARNOVE, R.F. and KELLY, G.P. (ed.): Comparative Education. New York: Macmillan 1982, pp. 54-77.

TEICHLER, Ulrich: "Higher Education and Work in Europe". In: SMART, John (Hg.): Higher Education: Handbook of Theory and Research. Band IV. New York: Agathon 1988, S. 109-182.

TEICHLER, Ulrich: "Occupational Structures and Higher Education". In: Clark, B.R. and Neave, G.R. (Hg.): The Encyclopedia of Higher Education, Vol. 2. Oxford: Pergamon Press, 1992, pp. 975-992.

TEICHLER, Ulrich: "Research on Higher Education and Employment and its Implication for Higher Education Management". In: Higher Education Policy, Vol. 8, No.1, 1995, pp. 11-15.

WORLD BANK (ed.): Education in Sub-Saharan Africa: Policies for Adjustment, Revitalization, and Expansion. Washington D.C.: World Bank 1988.

YOUDI, R. V. and HINCHLIFFE, K. (ed.): Forecasting Skilled Manpower Needs: The Experience of Eleven Countries. Paris: Unesco, International Institute for Educational Planning 1985.

13.1.2   Methods of Empirical Social Research

BLALOCK, H.M.: Social Statistics. New York: McGraw-Hill 1979.

BOLLEN, Kenneth A.: Structural Equations with Latent Variables. New York: Wiley 1989.

DENZIN, Norman K.: The Research Act: A Theoretical Introduction to Sociological Methods. Englewood Cliffs 1989.

DILLMAN, Don. A.: Mail and telephone surveys: The Total Design Method. New York 1978.

DILLMAN, Don. Mail and Internet Surveys. The Tailored Design Method. 2nd Edition. Hoboken, New Jersey: Wiley, 2007.

DUNN, W.; HOLZNER, B. and ZALTMAN, G.: "Knowledge Utilization." In: WALLBERG, Herbert and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

ERAUT, Michael R.: "Educational Objectives." In: WALLBERG, Herbert and HAERTEL, Geneva (ed.): International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

FINK, Arlene and KOSECOFF, Jaqueline: How to conduct surveys. A step-by-step Guide. Beverly Hills, London and New Delhi: Sage Publications 1985.

FOLSTER, Floyd J.: Survey Research Methods. Beverly Hills, London and New Delhi: Sage Publications 1987.

HAYDUK, Leslie A.: Structural Equation Models with LISREL. Baltimore: Johns Hopkins University 1987.

JACOBS, T. O.: Developing Questionnaire Items: How to do it well. Alexandria, Virginia 1974.

JÖRESKOG, K.G., and SÖRBOM, D.: LISREL 7: A Guide to the Program and Applications.

MORRIS, Lynn Lyons and FITZ-GIBBON, Carol Taylor: Evaluater's Handbook. Los Angeles and London: Sage Publications 1978 (Program Evaluation; 3).

MORRIS, Lynn Lyons and FITZ-GIBBON, Carol Taylor: How to Design a Program Evaluation. Los Angeles and London: Sage Publications 1978 (Program Evaluation; 1).

MORRIS, Lynn Lyons and FITZ-GIBBON, Carol Taylor: How to Measure Achievement. Los Angeles and London: Sage Publications 1978 (Program Evaluation; 6).

MORRIS, Lynn Lyons and FITZ-GIBBON, Carol Taylor: How to Present an Evaluation Report. Los Angeles and London: Sage Publications 1978 (Program Evaluation; 8).

NORUSIS, Marija J.: The SPSS Guide to Data Analysis for Release 4. Chicago: SPSS Inc. 1990.

NORUSIS, Marija J. and SPSS Inc.: SPSS-X Introductory Statistics Guide for SPSS-X Release 3. Chicago: SPSS Inc. 1988.

NORUSIS, Marija J. and SPSS Inc.: SPSS-X Advanced Statistics Guide. 2nd edition. Chicago: SPSS Inc. 1988.

NORUSIS, Marija J. and SPSS Inc.: SPSS-X Advanced Statistics Student Guide. Chicago: SPSS Inc. 1990.

NORUSIS, Marija J. and SPSS Inc.: SPSS-X Introductory Statistics Student Guide. Chicago: SPSS Inc. 1990.

NORUSIS, Marija J. and SPSS Inc.: SPSS Command Reference. Chicago: SPSS Inc. 1990.

RAIZEN, Senta A. and ROSSI, Peter (ed): Program Evaluation in Education: When? How? To what ends? Washington, DC: National Academy Press 1981.

ROSSI, Peter H. : "Critical Decisions in Evaluation Studies." In: New Directions for Testing and Measurement, 1/1979, pp. 79-88.

ROSSI, Peter H. (ed.): Questions and Answers in Attitude Surveys. Experiments on Question Form, Wording, and Context. New York, London, Toronto, Sydney and San Francisco: Academic Press 1981.

ROSSI, Peter H. (ed.): "Standards for Evaluation Practice." In: New Directions for Program Evaluation, 9/1982,.

ROSSI, Peter H. and FREEMAN, Howard E.: Evaluation. A Systematic Approach. 5th edition, Newbury Park: Sage Publications 1993.

ROTHMAN, Jack: Using Research in Organizations: A Guide to Successful Application. Beverly Hills: Sage Publications 1980.

SCHUMAN, Howard and PRESSER, Stanley: Questions and Answers in Attitude Surveys. New York: Academic Press 1981.

SIEGEL, S.: Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill 1956.

SUDMAN, Seymour and BRADBURN, Norman M.: Asking Questions. San Francisco: Jossey-Bass 1982.

TAMIR, P.: "Long-term Curriculum Evaluation." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

TATSOUKA, Maurice M.: "Regression Analysis." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

THORNDIKE, Robert L.: "Reliability." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

TOWNSEND, Christina: "School and Work." In: BURGESS, Tyrrell and ADAMS, Elizabeth: Outcomes in Education. London: Macmillan Press 1980.

TYLER, Ralph W.: "Changing Concepts of Educational Evaluation." In: International Journal of Educational Research, 10/1986, pp. 1-113.

TYLER, Ralph W.: "Reporting Evaluations of Learning Outcomes." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

UNESCO: Evaluation Procedures used to Measure the Efficiency of Higher Education Systems and Institutions. A Study conducted by: The International Association for Educational Assessment. Paris: UNESCO 1990 (New Papers on Higher Education. Studies and Research; 1).

WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation: . Oxford and New York: Pergamon Press 1990.

WILLETT, John B.: "Measuring Change: The Difference Score and Beyond." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

WILLETT, John B.: "Two Types of Question about Time: Methodological issues in the analysis of teacher career path data." In: International Journal of Educational Research, 4/1989, pp. 421-437.

WILLIAMS, B.: A Sampler on Sampling. New York: John Wily and Sons 1978.

WILLMS, Douglas J.: Monitoring School Performance: A Guide to Educators. Washington, D.C.: Falmer Press 1992.

WINER, B.J.: Statistical Principles in Experimental Design. New York: McGraw-Hill 1971.

WOLF, Richard M.: "Questionnaires." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

ZELLER, R. A.: "Validity." In: WALLBERG, Herbert J. and HAERTEL, Geneva (ed.): The International Encyclopedia of Educational Evaluation. Oxford and New York: Pergamon Press 1990.

13.1.3　　Tracer Study Guidelines

HINCHLIFFE, Keith and PSACHAROPOULOS, George: Tracer Study Guidelines. Washington D.C.: World Bank, Education Dep. June 1983.

LAMOUR, Jean: Follow-Up and Tracer Studies. A series of training modules and related exercises for educational planners and administrators. Paris: UNESCO 1996 (IIEP Teaching Materials).

MELCHIORI, Gerlinda S. (ed.): Alumni Research: Methods and Applications. San Francisco: Jossey-Bass 1988 (New Directions for Educational Research Series; 60).

SCHOMBURG, Harald: Standard Instrument for Graduate and Employer Surveys. Eschborn and Kassel, 1995.

WEBER, Karl E. and TIWARI, Indra Prasad: Tracer Study Design. A Concept Paper. Bangkok: Asian Institute of Technology 1992 (AIT Research Report, 247).

13.1.4   Selected Graduate and Employer Surveys

ARCELO, Adriano A. and SANYAL, Bikas C.: Employment and Career Opportunities after Graduation: A Study on the Transition from College to Work in the Philippines. Paris: International Institute for Educational Planning 1987 (Research Report; 61).

Asian Institute of Technology (AIT) ed. (prepared by W.P.J. BRANDON): Alumni Tracer Study and Employer Survey. Bangkok: AIT 1978.

Asian Institute of Technology (AIT) ed. (prepared by Karl E. WEBER and Indra Prasad TIWARI with Jagannath ADHIKARI): AIT Alumni 1961-1987 Tracer Study. Bangkok: AIT 1990.

AZIZ, Ungku A. and SANYAL, Bikas C. et al.: University Education and Employment in Malaysia. Paris: International Institute for Educational Planning 1987 (Research Report; 66).

BALDAUF, Beate und LWAMBUKA, Ladislaus: Findings of the Graduates' and Employers' Surveys 1989. In: University of Dar es Salaam, Faculty of Engineering (Hg.): University Education and Engineering Profession in Tanzania. Dar es Salaam, 1993, S. 9-100.

BIERVLIET, Wim and RICHARDSON, John: International Education of Surveyors for Development. In-Build Evaluation. The ITC Postal Follow-up Survey. Results. Outwikkelingslanden, Netherlands 1978.

BOSE, P.K.; SANYAL, Bikas C. and MUKHERJEE, S.P.: Graduate Employment and Higher Education in West Bengal. Paris: UNESCO et al. 1983.

BRACHT, Oliver; ENGEL, Constanze; JANSON, Kerstin; OVER, Albert; SCHOMBURG, Harald und TEICHLER, Ulrich: "Der berufliche Ertrag temporärer Mobilität im Studium". In: Teichler, Ulrich: Die Internationalisierung der Hochschulen. Neue Herausforderungen und Strategien. Campus Verlag, Frankfurt/New York 2007, S. 171-188.

BRACHT, Oliver; ENGEL, Constanze; JANSON, Kerstin; OVER, Albert; SCHOMBURG, Harald und TEICHLER, Ulrich: The Professional Value of ERASMUS Mobility. Final Report. International Centre for Higher Education Research (INCHER-Kassel) (http://ec.europa.eu/education/programmes/socrates/erasmus/evalcareer.pdf).

BRENNAN, John et al.: Students, Courses and Jobs. The Relationship Between Higher Education and the Labour Market. London: Jessica Kingsley 1990 (Higher Education Policy Series; 21).

BRENNAN, John and McGEEVOR, Philip: Graduates at Work. Degree Courses and the Labour Market. Jessica Kingsley 1988 (Higher Education Policy Series; 1).

BRAIG, Marianne: Absolventenverbleibsuntersuchung am Instituto Técnico de Capacitación y Productividad (INTECAP) Guatemala. O.O (Berlin; Eschborn: GTZ) 1988 (mimeo).

CARNOY, Martin: Higher Education and Graduate Employment in India: A Summary of Three Case Studies. Paris: International Institute for Educational Planning 1987 (Research Report; 64).

CAVE, Martin et al.: The Use of Performance Indicators in Higher Education: A Critical Analysis of Developing Practice. Jessica Kingsley 1988 (Higher Education Policy Series; 2).

CZICHOWSKI, F.: Hospitationsbericht über die vom 23.9.83 bis 20.12.83 durchgeführte Hospitation am Pak.-German Staff Training Institute in Lahore, Pakistan. Eschborn 1983.

DUBBEY, J.M. et al.: University of Malawi Tracer Study. Malawi: University of Malawi 1990. .

Formacion Universitaria y Profesion. Carrera de la Lizenciatura en Química de la Universidad Austral de Chile. Buenes Aires: Universidad de Buenos Aires, Facultad de Ciencias Exactas y Naturales Proyecto UBA-GTZ and Deutsche Gesellschaft für Technische Zusammenarbeit 1994.

GRÜHN, Dieter; LENECKE, Kerstin und Harald SCHOMBURG: Absolventenstudien an deutschen, europäischen und lateinamerikanischen Hochschulen. Ergebnisbericht des GRADUA2-Projekts. Kassel, INCHER-Kassel (mimeo), 2006.

HARTMANN, K.: Graduate and Employer Survey 1985. Summary, Conclusions and Recommendations. Dar Es Salaam: University of Dar Es Salaam, Faculty of Engineering 1986.

HARTMANN, K.: Graduate and Employer Survey 1985. Summary, Conclusions and Recommendations. Dar Es Salaam: University of Dar Es Salaam, Faculty of Engineering 1986.

HELLING, Vera: Absolventenverbleibsuntersuchung am Southern Institute for Skill Development (SISD) Songkhla/Thailand. O.O (Eschborn: GTZ) 1984 (mimeo).

HESS, Peter: Tracer Study for the Promotion of Higher education in the Indonesian-German Forestry Project "Advisory Assistance in the Development of Samarinda Forestry Faculty". Part I, Main Part. Feldkirchen: Deutsche Forstservice GmbH and Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit 1995 (mimeo).

HUGHES, Rees and MWIRIA, Kilemi: "Kenyan Women, Higher Education and the Labor Market." In: Comparative Education, vol. 25, no. 2, 1989, pp. 179-195.

HUGHES, Rees: "Revisiting the Fortunate Few: University Graduates in the Kenyan Labor Market." In: Comparative Education Review, vol. 31, no. 4, November 1987, pp. 583-601.

HUQ, Shamsul M. and SANYAL, Bikas C et al.: Higher Education and Employment in Bangladesh. Dhaka: University Press and Paris: UNESCO 1983.

HUSAIN, Tahir and SANYAL, Bikas C. et al.: Higher Education and Employment Opportunities in Pakistan. Paris: International Institute for Educational Planning 1987 (Research Report; 60).

INDIRESAN, Pavagada: "Engineering Education at IIT Madras". In: Winkler, Helmut (ed.) 1984, pp. 67-75.

Institut für Arbeitsmarkt- und Berufsforschung: "Zum Verbleib der Absolventen wissenschaftlicher Hochschulen 1971-1978". In: Beiträge zur Arbeitsmarkt- und Berufsforschung 1979, 42, pp.163-165.

IVETE TIYOMI Ida: Evaluationsstudie von Meisterkursabgängern. N.p (Eschborn: GTZ and DPEA - Abteilung für Umfragen, Studien und Evaluation) Dezember 1985 (mimeo).

JAHR, Volker; SCHOMBURG, Harald und TEICHLER, Ulrich: "Mobilität von Hochschulabsolventinnen und -absolventen in Europa". In: Teichler, Ulrich: Die Internationalisierung der Hochschulen. Neue Herausforderungen und Strategien. Campus Verlag, Frankfurt/New York 2007, S. 89-102.

JANSON, Kerstin; SCHOMBURG, Harald and TEICHLER, Ulrich: Wege zur Professur. Qualifizierung und Beschäftigung an Hochschulen in Deutschland und den USA. Waxmann: Münster u.a. 2007.

KOGAN, Maurice (ed.): Evaluating Higher Education. Jessica Kingsley 1988 (Higher Education Policy Series; 6).

KRAUSE, D.: Die Beschäftigungs- und Berufssituation von Wirtschaftswissenschaftlern in der Bundesrepublik Deutschland. Eine Literaturstudie im Auftrag der Studienreformkommission Wirtschaftswissenschaften. Bremen: Universität 1979 (mimeo).

MAIWORM, Friedhelm, STEUBE, Wolfgang and TEICHLER, Ulrich: Learning in Europe. The ERASMUS Experience. A Survey of the 1988-89 ERASMUS Students. London: Jessica Kingsley 1991 (Higher Education Policy Series, 14; ERASMUS Monographs, 14).

MAIWORM, Friedhelm and TEICHLER, Ulrich: Transition to Work. London: Jessica Kingsley 1994.

MALIYAMKONO, T.L.; ISHUMI, A.G.M. and WELLS, S.J.: Higher Education and Development in Eastern Africa. A Report of the Eastern African Universities Research Project (EAURP) on the Impact of Overseas Training and Development. London, Nairobi et al.: Heinemann Educational Books Ltd. 1982.

MEYER, Ingo (unter Mitarbeit von Jürgen Henke): Absolventen der Technischen Universität Berlin in Entwicklungsländern. Ergebnisse einer schriftlichen Befragung. Berlin: Techn. Universität, ZTZ o.J (mimeo).

MKWANANZI, T.N.: Graduate Destinations Preliminary Report - 1990. N.p (Harare): University of Zimbabwe, Student Affairs Department 1990.

MUGABUSHAKA, Alexis-Michel, SCHOMBURG, Harald und TEICHLER, Ulrich (eds.): Higher Education and Work in Africa. A Comparative Empirical Study in Selected Countries. Kassel, University of Kassel, International Centre for Higher Education Research, Werkstattberichte 69. (http://www.uni-kassel.de/incher/v_pub/wb69.pdf)

MUGISHA, Rujagaata X. and MWAMWENDA, Tuntufye S.: "Vocational Training, Inservice Courses and Higher Education for Graduates in Botswana". In: Studies in Higher Education, vol.16, no. 3, 1991, pp. 343-354.

MUGISHA, Rujagaata X.; MHOZYA, Xavier M. and MWAMWENDA, Tuntufye S.: "Higher Education and Employment in Botswana: a tracer study". In: South African Journal of Higher Education, vol. 5, no. 1, 1991, pp. 15-24.

NICHOLS, James O.: Institutional Effectiveness and Outcomes Assesment Implementation on Campus: A Practitioners´s Handbook. New York: Agathon 1989.

NIVEN, Alastair: Commonwealth Scholarship and Fellowship Plan Tracer Study. Final Report. London: Commonwealth Secretariat 1989.

NOTODIHARDJO, Hardjono and SANYAL, Bikas C.: Higher Education and the Labour Market in the Java Region, Indonesia. A contribution to the IIEP research project on 'Higher Education and Employment', directed by Bikas C. SANYAL. Paris 1983 (International Institute for Educational Planning Research Report. No. 49).

OPPER, Susan; TEICHLER, Ulrich and CARLSON, Jerrry: The Impact of Study Abroad Programmes on Students and Graduates. London: Jessica Kingsley Publishers 1990.

PANCHAMUKHI, P.R.: Graduates and Job Markets. A Quantitative Study of Two Universities in India. Paris: International Institute for Educational Planning 1987 (Occasional Papers no. 74).

PFEIFFER, Dietmar K.: Formacion Universitaria y Profesion. Carrera de Ingeniera Comercial de la Universidad Austral de Chile. Valdivia: Universidad Austral de Chile, Facultad de Ciencias Economicas y Administrativas Proyecto UACH-GTZ and Deutsche Gesellschaft für Technische Zusammenarbeit 1993.

SANYAL, Bikas C. and Kinunda, Michael J.: Higher education for self-reliance: the Tanzanian experience. Paris: Unesco 1977.

SANYAL, Bikas C. and NOTODIHARDJO, Hardjono: Higher Education and the Labour Market in the Java Region, Indonesia. Paris: International Institute for Educational Planning 1983 (Research Report; 49).

SANYAL, Bikas C. and Psacharopoulos, George: Higher Education and employment: the IIEP experience in five less developed countries. Paris 1981.

SANYAL, Bikas C. and YACOUB, El Sammani A.: Higher Education and Employment in the Sudan. Paris: Unesco 1975.

SANYAL, Bikas C. et al.: University Education and Graduate Employment in Sri Lanka. Paris: UNESCO and Colombo: Marga Institute 1983.

SANYAL, Bikas C. et al.: Higher education and employment in Bangladesh. Dhaka; Paris: Unesco 1983.

SANYAL, Bikas C. et al.: Higher education and employment opportunities in Pakistan. Paris: International Institute for Educational Planning 1987 (Research Report; 60).

SANYAL, Bikas C. et al.: University education and employment in Malaysia. Paris: 1987 (Research Report; 66).

SANYAL, Bikas C. et al.: University Education and Graduate Employment in Sri Lanka. Paris: UNESCO; Colombo: Marga Institute 1983.

SANYAL, Bikas C.: Higher Education and Employment. An International Comparative Analysis (an IIEP Research Project). London: The Falmer Press 1987.

SANYAL, Bikas C.: University Education and the Labour Market in the Arab Republic of Egypt. Oxford: Pergamon 1982.

SANYAL, Bikas C.; CASE, John H.; DOW, Philip S. and JACKMAN, Mary E.: Higher Education and the Labour Market in Zambia: Expectations and Performance. Paris: Unesco 1976.

SANYAL, Bikas C.; PERFECTO, Waldo S. and ARCELO, Adriano A.: Higher Education and the Labour Market in the Philippines. Paris: UNESCO; New Delhi: Wiley Eastern 1981.

SCHLEGEL, Wolfgang and SCHUMACHER, Jürgen: Empirische Untersuchung zum Verbleib der Absolventen des College of Business Education und des Technical College Arusha Tansania. Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit 1985.

SCHLEICH, Bernd (OEKOTOP GmbH, Berlin): Qualitative Absolventenverbleibsstudie am Servicio Ecuatoriano de Capacitación SECAP. Berlin: OEKOTOP; Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit 1987 (mimeo).

SCHOMBURG, Harald: "Work Orientation, Job Satisfaction and Professional Success of Graduates from African Universities". In: Mugabushaka, Schomburg and Teichler (eds.): Higher Education and Work in Africa. A Comparative Empirical Study in Selected Countries. Kassel, University of Kassel, International Centre for Higher Education Research, Werkstattberichte 69, 111-126. (http://www.uni-kassel.de/incher/v_pub/wb69.pdf)

SCHOMBURG, Harald: "Young Higher Education Graduates - the Winners of Globalisation". Proceedings of the Fifteenth Annual Workshop of the European Research Network on Transitions in Youth (TIY) in Ghent, 5-8 September 2007.

SCHOMBURG, Harald: "The Professional Work of Graduates". Contribution to final report of the REFLEX project (mimeo).

SCHOMBURG, Harald: "Die Europäische Absolventenstudien CHEERS und REFLEX. Erfahrungen und konzeptioneller Rahmen der Forschung zu Hochschule und Beruf des Internationalen Zentrums für Hochschulforschung der Universität Kassel. In: HRK (Hg.): Potentiale von Absolventenstudien für die Hochschulentwicklung, Dokumentation einer Veranstaltung der HRK in Kooperation mit dem INCHER-Kassel und dem Arbeitsbereich Absolventenforschung der FU Berlin am 18. und 19. Mai 2006 an der Universität Kassel, Bonn, HRK März 2007 (Reihe Beiträge zur Hochschulpolitik 4/2007).

SCHOMBURG, Harald: "Work Orientation and Job Satisfaction". In: Teichler, Ulrich (Hrsg.): Careers of University Graduates. Views and Experiences in Comparative Perspective. Dordrecht: Springer, Higher Education Dynamics, 2007.

SCHOMBURG, Harald und TEICHLER, Ulrich: "Potentiale der professionellen Relevanz des universitären Bachelor - einige Überlegungen auf der Basis des internationalen Vergleichs". In: Das Hochschulwesen, 55.Jg., Nr.1, 2007, S. 25-32.

SCHOMBURG, Harald: "Kein schwerer Start: Die ersten Berufsjahre von Hochschulabsolventen in Europa". In: Beiträge zur Hochschulforschung (Bayrisches Staatsinstitut für Hochschulforschung und Hochschulplanung, München), Nr.1, 2007, S. 130-155.

SCHOMBURG, Harald: "The Professional Success of Higher Education Graduates". In: European Journal of Education, Vol. 42, No. 1, 2007, S. 35-57.

SCHOMBURG, Harald und TEICHLER, Ulrich: Higher Education and Graduate Employment in Europe. Results of Graduates Surveys from 12 Countries. Dordrecht: Springer, Higher Education Dynamics, 2006.

SCHOMBURG, Harald: Manual para estudios de seguimiento de graduados universitarios. CSUCA-InWEnt-Universidad de Kassel-Universidad Pedagogica Nacional Francisco Morazan. Guatemala: Editorial Serviprensa 2004.

SCHOMBURG, Harald und TEICHLER, Ulrich: "Creciente potencialidad de la investigación sobre alumni para la reforma curricular: experiencias de un instituto de investigación alemán". In: Teichler, Ulrich: Graduados y empleo. Investigación, metodología y resultados. Madrid und Buenos Aires: Mino y Dáliva 2005, S. 161-182.

SCHOMBURG, Harald, TEICHLER, Ulrich und WINKLER, Helmut: "Steigende Erwartungen, aber keine einfache Auskunft. Potentiale der Absolventenforschung nach den Erfahrungen des Wissenschaftlichen Zentrums für Berufs- und Hochschulforschung Kassel". In: Craanen, Michael und Huber, Ludwig (Hg.): Notwendige Verbindungen. Zur Verankerung von Hochschuldidaktik in Hochschulforschung. Bielefeld: UniversitätsVerlagWebler 2005, S. 29-41.

SCHOMBURG, Harald und TEICHLER, Ulrich: "Increasing Potentials of Alumni Research for Curriculum Reforms : Some Experiences from a German Research Institute". In Weerts, David, J. und Vidal, Javier (Hg.): Enhancing Alumni Research. European and American Perspectives. San Francisco: Jossey Bass 2005 (New Directions for Institutional Research, Nr. 126), S. 31-48.

SCHOMBURG, Harald: "Doitsu ni okeru kôtôkyôiku to gakusotsu koyô" (Higher Education and Graduate Employment in Germany). In: Yoshimoto, Keiichi, Inenaga, Yuki and Nakajima, Hirokazu (Hg.): Ôshu no kôtôkôiku to rôdôshijo (Country Reports on Higher Education and Labor Market in Europe and Japan). Hiroshima: Research Institute for Higher Education, Hiroshima University 2004 (Reviews in Higher Education, Nr. 77), S. 67-80.

SCHOMBURG, Harald: "La transizione dall'università al mondo lavoro in Germania". In: Cammelli, Andrea: La transizione dall'università al lavoro in Europa e in Italia. Bologna: il Mulino, 2004, S. 167-189.

SCHOMBURG, Harald: "Zum Stellenwert der besuchten Hochschule für den Berufsstart." In: KAISER, Manfred and GÖRLITZ, Herbert (ed.): Bildung und Beruf im Umbruch. Zur Diskussion der Übergänge in die Hochschule und Beschäftigung im geeinten Deutschland. Nürnberg: Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit 1992 (Beiträge zur Arbeitsmarkt- und Berufsforschung, 153.3).

SCHOMBURG, Harald and TEICHLER, Ulrich: "Does the Programme Matter? Approach and Major Findings of the Kassel Graduate Survey". In: *Higher Education in Europe*, Band 18, Nr. 2, 1993, S. 37-58.

SCHOMBURG, Harald, WINKLER, Helmut and TEICHLER, Ulrich: Studium und Beruf von Empfängern deutscher Stipendien am Asian Institute of Technology. Kassel: Wissenschaftliches Zentrum für Berufs- und Hochschulforschung der Gesamthochschule Kassel 1991 (Werkstattberichte; 30).

SETIDISHO, N.O.H. and SANYAL, Bikas C.: Higher Education and Employment in Botswana. Paris: International Institute for Educational Planning 1988 (Research Report; 65).

TEICHLER, Ulrich et al.: Experiences and Careers of Science and Engineering Fellows supported by the European Community. Luxembourg: Office for Official Publications of the Commission of the European Communities, 1990.

TEICHLER, Ulrich; BUTTGEREIT, Michael und HOLTKAMP, Rolf: Hochschulzertifikate in der betrieblichen Einstellungspraxis. Bad Honnef: Bock 1984 (Bundesminister für Bildung und Wissenschaft: Studien zu Bildung und Wissenschaft, 6).

TEICHLER, Ulrich and BUTTGEREIT, Michael (ed.): Hochschulabsolventen im Beruf. Ergebnisse der dritten Befragung bei Absolventen der Kasseler Verlaufsstudie. Bad Honnef: Bock 1992 (Schriftenreihe Studien zu Bildung und Wissenschaft; 102).

TEICHLER, Ulrich; SCHOMBURG, Harald und WINKLER, Helmut: Studium und Berufsweg von Hochschulabsolventen. Ergebnisse einer Langzeitstudie. Bonn: Bundesminister für Bildung und Wissenschaft 1992 (Bildung - Wissenschaft - Aktuell 18/92).

TEICHLER, Ulrich and WINKLER, Helmut (ed.): Der Berufsstart von Hochschulabsolventen. Bad Honnef: Bock 1990 (Bundesministerium für Bildung und Wissenschaft: Schriftenreihe Studien zu Bildung und Wissenschaft; 87).

TEICHLER, Ulrich et al.: Hochschule-Studium-Berufsvorstellungen. Eine empirische Untersuchung zur Vielfalt von Hochschulen und deren Auswirkungen. Bad Honnef: Bock 1987 (Bundesministerium für Bildung und Wissenschaft: Schriftenreihe Studien zu Bildung und Wissenschaft; 50).

WEBER, Karl E. et al.: AIT Alumni 1961 - 1990 Employer Study. Interim Report on Preliminary Findings. Bangkok: Asian Institute of Technology 1992.

WINKLER, Helmut; HARTMANN, Klaus und SCHOMBURG, Harald: Engineers in Tanzania. A secondary Analysis - Graduate and Employer Survey 1985 - Faculty of Dar es Salaam. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. Eschborn 1992.