Graduate surveys as an outcome evaluation

Paper published to the 31st Annual EAIR Forum in Vilnius, Lithuania
23 to 26 August 2009

from Dr. René Krempkow and Ulrich Wilke [1]

Key words

Postgraduate study, quality, higher education research design, evaluation, employability

Abstract

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The paper deals with the use and potentials of graduate surveys in evaluating outcomes of higher education. It covers briefly different applications of graduate surveys and aspects that have to be taken into consideration when designing a graduate survey. A special focus is laid on employability and job success as outcomes of higher education. Different dimensions of job success are discussed and determinants are identified. The Dresden Graduate Survey and the Freiburg Graduate Survey serve as examples to show important aspects and design issues of outcome evaluation. Some exemplary results from these surveys and their interpretation are described.

1 Special thanks to Mr. Lukas Bischof and Mrs. Annika Vissering (Freiburg University) and Dr. Mandy Pastohr (Dresden University of Technology) for support in the analysis and the translation.

Graduate surveys as an outcome evaluation

The potential of graduate surveys for quality management

In the context of evaluating higher education, it has been argued, that only graduates are in a position to adequately assess the study quality, since only they have the needed distance to their course of study. The benefits of graduate surveys are mainly in the assessment of outputs and outcomes of higher education (Teichler & Schomburg 1997, p. 246). Professionals in higher education as well see graduate surveys as a valuable tool. In a survey conducted by Nickel (2007, p. 191) about the usefulness of different quality assurance instruments, 89.3% of the respondents rated graduate surveys as at least helpful. 48% of the respondents even rated it as a very helpful instrument. This reflects the importance and usefulness of graduate surveys.

Data that is collected with the help of graduate surveys can not only be used to obtain feedback about the experiences of one cohort of students. The data can also be used to generate indicators for quality monitoring and assurance systems (Ziegele 2002, p.11). This feature is increasingly used by higher education institutes (HEIs) in Germany. Many recent surveys and research projects can be stated as examples (Schmidt & Horstmeyer 2008; Lojewski 2008; Petzoldt, Schorcht & Haaßengier 2008). Within the basic model of quality management (QM) systems, graduate surveys are thus located in the area of measuring effects of the teaching process of HEIs. In a process-based QM model such as the one suggested by Nickel (2007, p. 44) graduate surveys are a tool that is used for measuring output and outcome and thus help to gain feedback and information about further needed measures.

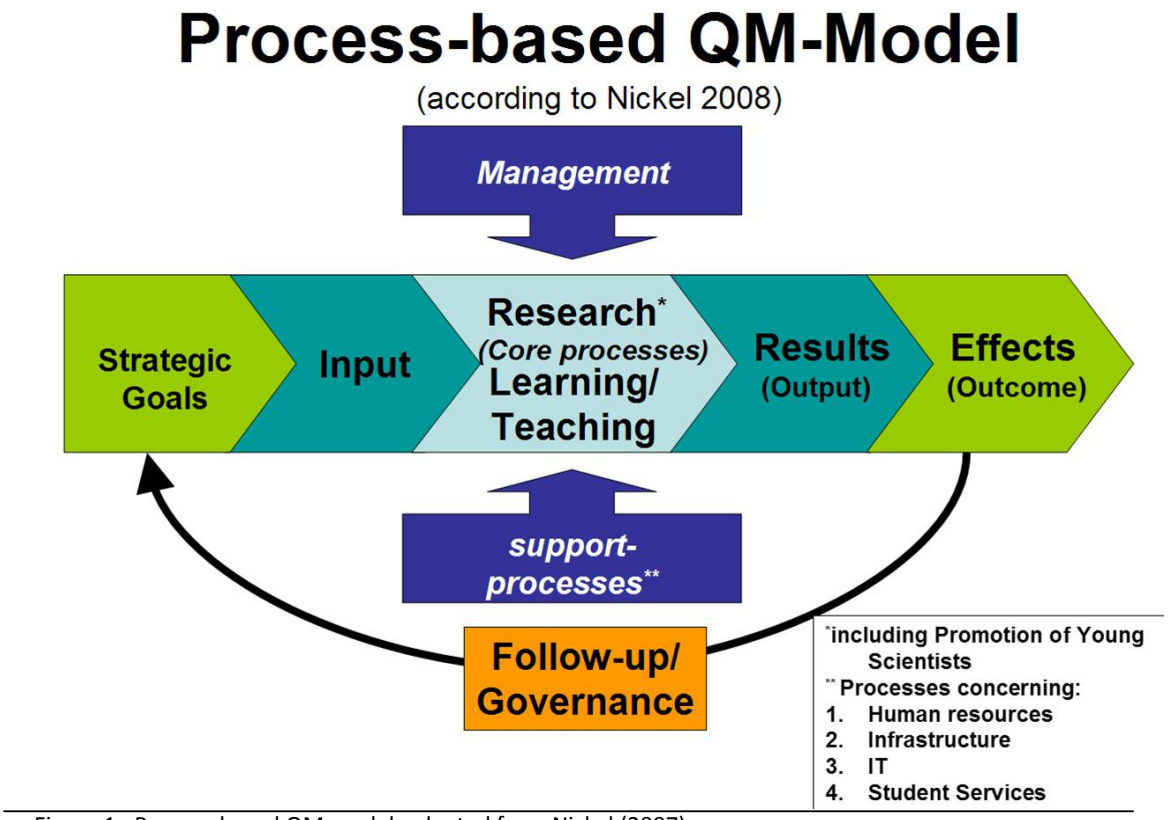

Figure 1: Process-based QM model, adapted from Nickel (2007)

However, the mere measurement of outcomes, like job success for instance, is just the first step of an effective quality assurance system. To be able to reach conclusions that allow the HEIs to further develop and improve programs of study and the supporting infrastructure, additional information is needed. Therefore, graduate surveys also need to cover the relevant processes that shape the effects of teaching within HEIs (Teichler & Schomburg 1997, p. 247). The relevant data must be collected to

ensure a meaningful interpretation of outcomes and an evaluation of the important processes.
Besides providing input to review study programs, graduate surveys also offer valuable data for other purposes. Examples are the provision of valuable information for graduates themselves and the use of the data as a base for a variety of further research topics. Graduates and students can get much interesting information about which competences are really demanded by employers and should therefore be acquired. Other information could be about successful strategies for entering the job market, as well as a better basis to get a feeling of the own abilities in comparison to other graduates and using them for a realistic job search. A graduate survey can be used to collect a wide range of data about the graduates. This data can be used for research in the field of higher education, economics of education and related fields. One possibility is the use of graduate survey data to examine competences and their usefulness as indicators for outcomes of higher education (see Krempkow 2009). This could be carried out in analogy to PISA surveys, like those planned by the OECD and already applied in smaller pilot surveys (see the pilots for the AHELO project, TEDS-M-project). Another research question can be about the recruitment of young academics. Faculties and institutions of HEIs often have further questions about their graduates and can also use the data from these surveys.

Comparability and specific designs

Two important issues arise in the context of graduate surveys as an instrument of quality management. The first is the issue of comparability. The second is the issue of how specific the survey is. These two issues produce some tensions in the design of a graduate survey, because they raise a conflict of objectives. There is some trade-off between a higher comparability and a more specific design of the survey. This conflict of objectives needs to be taken into account and the set up of the survey should try to take both issues into consideration.
Comparability is about the similarity of a graduate survey in comparison to other such surveys. Only in the context of the results of other surveys, findings from one survey can be interpreted meaningfully (Teichler 2002). Data that is collected from one university needs to be compared to data from other universities. Valid conclusions for one HEI or a certain program of study can only be drawn, if the outcome and processes of the HEIs are really comparable (see also Krempkow 2007).
The second issue is about how specific the design of a survey is with regard to a certain HEI. To cover special characteristics of a HEI or certain faculties within this HEI or even certain courses of study, it is necessary to cover any particular feature that has a potentially important correlation with the outcome. Such institution-specific and program-specific surveys have another benefit. They enable the researcher to set an optimal timing for the survey and allow conclusions about changes over time within an institution or a program. Taking into account specific features leads to an optimal use of a graduate survey for improving the quality of higher education.
The Freiburg Graduate Survey tended to incorporate both issues (like the developement of the Dresden Graduate Survey questionnaires before). For that purpose, the questionnaire of the survey consists of two parts. The basis is a core-questionnaire that is used in a study which is carried out nation-wide in Germany in cooperation with the International Centre for Higher Education Research Kassel (INCHER). Additionally, this questionnaire is extended with elements to cover institution- and program-specific features. As a result, in the Freiburg Graduate Survey, six different faculty-specific versions of the questionnaire were used.

Measuring Outcomes of Higher Education

Since greater employability is assumed to have a “first among equals” position among the goals of the Bologna Process, HEIs are either obliged or strongly encouraged to assure the achievement of this goal with a comprehensive system of quality assurance (Akkreditierungsrat 2008). Some German federal states even require their HEIs by law or management by objectives to conduct graduate surveys (Schomburg 2007). The European Standards and Guidelines for Quality Assurance (ENQA 2005) state that “institutional self-knowledge is the starting point for effective quality assurance. It is important that institutions have the means of collecting and analysing information about their own activities [...] The quality-related information system required by individual institutions […] is at least expected to cover: employability of graduates”. The German Accreditation Council

(Akkreditierungsrat) requires HEIs to base their program improvements partly on data on alumni whereabouts (Akkreditierungsrat 2008). Due to their advantages on the one hand and the political requirements on the other, it seems to be natural that graduate surveys are experiencing an unprecedented boom.

Job success is an important indicator to evaluate the outcome of programs of study in Freiburg and to draw conclusions about what could to be done to improve the quality of the programs. The data of the Freiburg Graduate Survey was analysed to identify determinants of job success. Factors that may have a corraltion to the outcome, like a strong or weak regional economy, were taken into consideration to cover the specific context of the outcomes. Other specific initial conditions were taken into account as well. In that context, information about the socioeconomic background of the students is important (Schomburg & Teichler 1998; Krempkow & Pastohr 2006). Generally, the question to what degree differences in outcome can be attributed to differences in the starting conditions needs to be addressed carefully (see Wissenschaftsrat 2008, p. 78, Krempkow 2007).

The examination of determinants of job success was realised with the use of multivariate analyses. This identified the factors influencing job success. In contrast to mere subjective self-assessments of the students, such analyses allow more extensive conclusions about factors that have correlations to job success. For example, one question asked about the graduates' opinion about what aspects they consider to be important for employers hiring them. Many graduates rated fast studying, i. e. a short time needed for completing a program of study, as relatively important. The time students need to finish their program is also in the focus of many public discussions about higher education in Germany. However, the true direction and magnitude of the correlation of a short study duration is rarely investigated (see Krempkow & Pastohr 2006). With the data collected in graduate surveys, detailed conclusions about such questions can be derived.

The findings and conclusions can thus be very useful for the HEIs to introduce measures to improve the perspective of their graduates regarding job success. Furthermore, the findings of the surveys are helpful for the graduates themselves as well as for future and current students. They can use the obtained information to assess the importance of individual actions to correlation the job success, like using personal networks when searching for a job. Graduates who enter the labour market can use this information as well as students who have just started their program of study and are interested in what additional competences are really useful for greater job success.

Job success indicators

Teichler & Schomburg (1997, p. 248) classify four different indicator groups for job success:

1. Objective indicators for job success (e.g. income, hierarchical position)
2. Subjective indicators for job success (e.g. job satisfaction, autonomy)
3. Objective indicators for the transition period between higher education and job (e.g. duration of job search)
4. Subjective indicators for the job adequacy with respect to the higher education (e.g. usefulness of study content, job adequacy)

In the Dresden Graduate Survey (Krempkow & Pastohr 2006), the variables that were used to measure job success are the following: monthly gross income directly after graduation as well as 12 and 24 months after graduation, job satisfaction and adequacy of job with respect to the conducted program of study.

As mentioned above, the use of graduate surveys as an evaluation instrument needs to be well designed. The relevant processes in the HEI must be taken into consideration. These processes can be dimensions like individual prerequisites, study conditions and progress, as well as study results, which all can have significant correlation on job success. In that context, Reinfeld & Frings (2003, p.286) state that, if the goal of the graduate survey is to get conclusions beyond a pure description of the job success, individual characteristics like gender, social background, age, motivation for studying and so on, have to be included. Otherwise, there is a high risk of misinterpreting the results. In particular settings with a wider time horizon need to take personal motivations to pursue a career or family orientation into account as well. Figure 2 shows a diagram of such a basic model of determinants of job success and a frame, presenting the potential panel design of a graduate survey.

During the Dresden Graduate Survey (Krempkow & Pastohr 2006), approximately 4.000 graduates in

total were asked to fill out a questionnaire. The response rate was about 50%, i. e. approximately 2.000 answers that could be used for analyses were returned. The rate of response showed considerable differences among the different faculties which were included in the survey. The response rate ranged from 34% to 69%. The resulting sample of graduates was checked for representativity. A comparison and test of relevant aspects of the sample showed no significant differences between the sample and the population of all graduates of the University of Dresden. According to this close match, the sample was considered to be representative for the basic population in the faculties.
In the Freiburg Graduate Survey, the population of graduates was smaller. Approximately 2.000 graduates were reached via postal mailing or e-mail. The response rate was 51%, also showing considerable differences between the faculties. A test of relevant aspects of the sample in comparison to the population showed slight differences for some subjects in the analysed faculties. In this cases further analyses need to be carried out to examine the source of these differences. Moreover, possible biases that could arise from these differences have to be examined. In the presented analyses the subjects and the faculties were clustered into faculty groups. The sample in the faculty groups were representativ for the basic population.

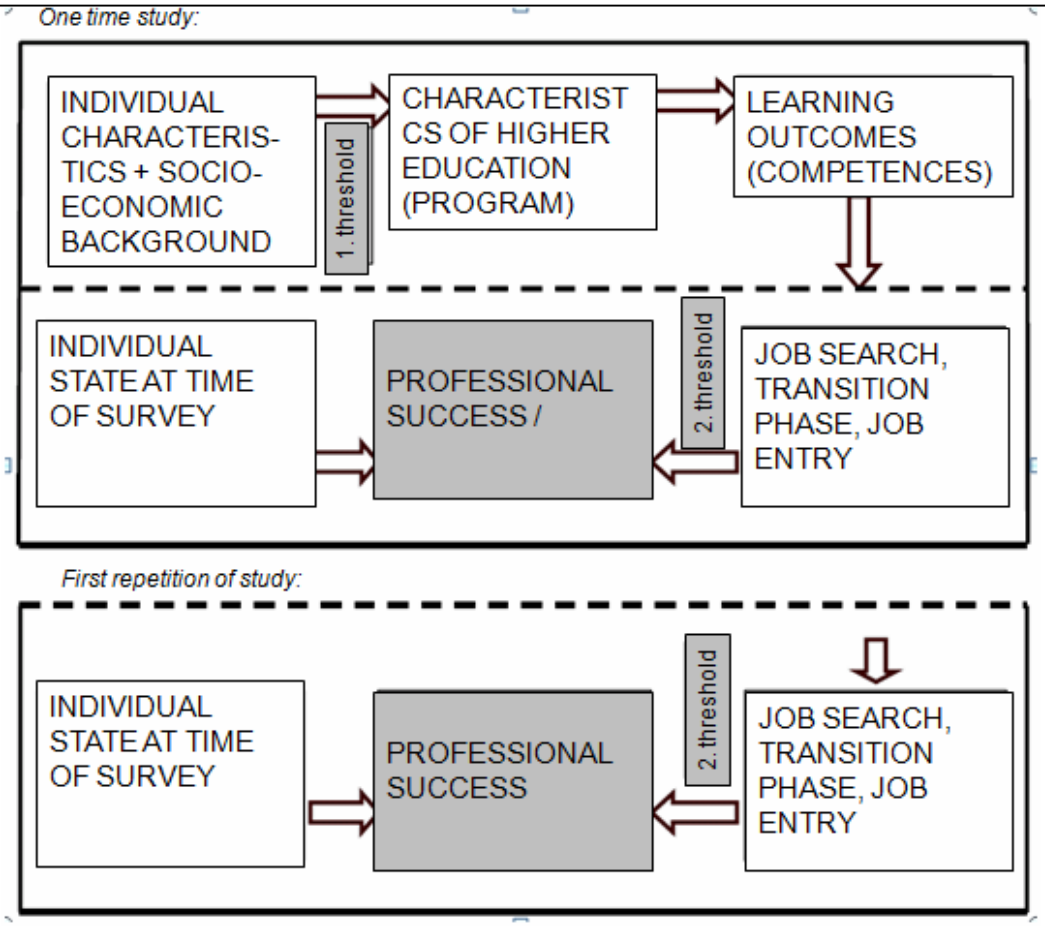

Figure 2: Basic model of determinants of job success (adapted from Krempkow & Pastohr 2006)

Factors correlating to job success: Some exemplary results and their interpretation

Figure 3 shows some results of the Freiburg Graduate Survey. In this table, the standardized regression coefficients are listed for the dependent variable monthly income of the current occupation at the time of the study. Depending on the exact date of finishing their study, the graduates had started to work one to two years ago (mean: 1.5 years). In the left column, there are

the factors which are assumed to have a correlation to the outcome. They consist of individual characteristics, details about the course of study, skills and abilities, motivations as well as specific circumstances. All these factors have been selected carefully. Crucial for the choice were theoretical considerations. For this purpose, the current scientific literature and findings from other empirical studies as well as discussions in seminars and workshops have been used as a foundation to develop a hypothesis for each potential factor of influence. Those hypotheses include the direction of correlation.

The sample of the graduates was divided into three groups according to their program of study.[2] Those groups are the graduates from medical studies, social sciences and technical studies.[3]

Among these three groups, there are considerable differences in the dependent variable, the monthly gross income. The means of the three groups range from 1.600€ to 3.600€.

The explanatory power of the model differs between the three groups[4], suggesting that the model has no explanatory power for the group of graduates from technical studies. Furthermore, the relatively small size of this group raised some methodological problems.[5] Therefore, to derive conclusions for the graduates of technical studies and forestry, a smaller model was calculated. This model incorporates ten potential factors of correlation.[6]

The present results show, that for the graduates of medical studies and social sciences the final grade of the matriculation standard of the graduates shows a significant correlation. However the direction of the results differs between the groups. The ambition to pursue a career has a correlation for all three groups of graduates.[7] The strength of this effect is similar for the three groups.

Regression coefficients for monthly income of current occupation

	Technical studies R^2=.41 adj. R^2=.00 n=105	**Medical studies R^2=.25* adj. R^2=.11* n=270**	**Social sciences R^2=.20* adj. R^2=.08* n=316**
Grade of matriculation standard	,179	,223$^+$	-,203*
Gender (male=1)	-,320$^+$	-,020	-,100
Finished vocational training before studying (yes=1)	,317$^+$	,051	,114
Duration of stay abroad	,182	,116	,031
Part time job during semester break	,093	-,141	,167
Part time job during lecture period	-,063	,104	-,130
Availability of program specific profiles	,053	,111	,057
Social and communication skills	,066	,101	-,146$^+$
Duration of study	-,422*	-,004	-,125
Job entrance age	-	,028	,266$^+$
Final degree of study	-,165	-,012	,052
Foreign language skills	-,025	,080	,106
Proficiency in own subject	,268	,010	,127
Ability to develop new ideas and problem solutions	-,116	-,115	-,110

2 The design of the analysis was similar to the Dresden Graduate Surveys. This leads to a comparability of results of both surveys in selected aspects.

3 Since the number of cases in a fourth group (forestry and related studies) was too small, this group was completely excluded from the first analysis. Later this group was included in further analyses.

4 The explanatory model was checked for heteroscedasticity and collinearity and showed acceptable values for each group.

5 For this reason an interpretation of the results of the group of technical studies should be carried out with caution.

6 This smaller model was also calculated for the other two graduate groups (medical studies and social sciences). The results support the findings of the model with 20 potential factors of correlation. These findings are described in the following.

7 Furthermore, in the small model (with 10 predictors) this factor is significant and relevant for income in the same direction for all groups. The negative correlation states that the stronger the ambition to pursue a career (measured on a scale from 1=very important to 5=not important at all), the higher is the actual monthly income, no matter to which group the graduates belong to.

Ability to work efficiently towards a goal	-,236	,066	-,089
Ability to critically rethink own ideas and ideas of others	,181	-,042	-,058
Use of personal contacts for job search	,063	-,323**	,011
Employers searched for graduates with other study focus	-,043	-	-,076
Importance of family	-,119	-,004	,101
Importance of career	,215	-,209*	-,270**

Figure 3: Regression coefficients for the monthly income of current occupation; +/ */ ** = significant on the 10%-/ 5%-/ 1%-level ("-" = variable was not included in the explanatory model)

But there are also differences. The values of the regression coefficients show that for different groups, there are different significant aspects. For the group of graduates from medical studies, the use of personal contacts is another important correlation that has a relative strong effect. The negative correlation states that graduates who use contacts to family, friends and relatives to find a job have a higher income than graduates who don't use their personal contacts or don't have such. For the graduates from social sciences, social and communication skills and the job entrance age have an impact. However, these two factors could be considered as not being sufficiently significant. For the graduates of technical studies, gender and duration of study are significant factors.[8]

The results of the Freiburg Graduate Survey show some similarities but also some differences to the results of the Dresden Graduate Survey (Krempkow & Pastohr 2006). In the Dresden Graduate Survey, the grade of the matriculation standard before entering a HEI has a significant correlation on the monthly income, too. A finished vocational training also has a strong correlation on the income, while this factor has no impact in the Freiburg Graduate Survey. This difference could arise from the differing focus of the two universities. The University of Freiburg has many graduates from social sciences and medical courses of study while the Dresden University of Technology has many graduates from natural sciences and technical study programs. It is very likely that a finished vocational training is more common and more useful in technical studies like engineering compared to social sciences or medical studies. Another difference is the correlation between gender and income. In the Dresden Graduate Survey, this factor shows a significant correlation. The results of the Freiburg Graduate Survey suggest a correlation between gender and income only in technical studies.

A very interesting finding is about the final grade of study and the duration of study. In contrast to the common point of view that both factors have a strong correlation, the empirical findings do not support this. Neither in the Dresden Graduate Survey nor in the Freiburg Graduate Survey does one of the two show a strong correlation (except for the technical studies in Freiburg). However, the results suggest that other factors are far more important. Which factors actually are the important ones depends on the program of study, but grade and duration of study do not belong to them.

Another dimension of job success is job satisfaction. In the Dresden Graduate Survey (Krempkow & Pastohr 2006), the most influential factors again differ between the different groups of graduates. For the graduates of natural sciences, the socioeconomic background and vocational training before studying are the most important factors. Among the graduates from technical studies, gender has a strong correlation showing that female graduates are less satisfied with their jobs. Important factors influencing the job satisfaction of graduates from social sciences are the family focus and self-assessed expertise. Both factors show a negative impact on the level of satisfaction.

Having a job which is considered to be adequate to the conducted course of study is another aspect of job success. In the Dresden Graduate Survey, the state of the labour market (measured through difficulties in the job search) strongly correlates with the job adequacy, as was expected. For the graduates of technical studies, gender again seems to play a strong role. The tendency is that female graduates report a lower job adequacy.

A detailed discussion of these aspects of job success (job satisfaction and job adequacy) will be carried out as well for the results of the Freiburg Graduate Survey in the future.

8 In the small model the factor use of personal contacts is significant too.

Concluding remarks

Graduate surveys are a useful instrument for evaluating outcomes. They can be used to gather valuable data for a variety of purposes. In the context of improving study programs, graduate surveys need to cover all relevant processes within a HEI and include data about the socioeconomic background and motivations. For a meaningful interpretation of the results, a graduate survey must be comparable to related studies. Furthermore, the survey should cover HEI-specific characteristics to ensure an optimal use and the inclusion of all relevant aspects. When measuring outcomes of higher education, job success can play a crucial role. Graduate surveys are an useful instrument to gain insight into determinants of job success.

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Contact Details

Dr. René Krempkow
Institute for Research Information and Quality Assurance
Godesberger Allee 90
53175 Bonn
Germany
E-mail: krempkow@forschungsinfo.de