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ANALYZING THE RESULTS OF STUDY IN HIGHER EDUCATION AND THE REQUIREMENTS OF THE WORLD OF WORK

INTRODUCTION

Since the 1990s, interest in obtaining more precise information about the results of study and their relation to the requirements of the world of work has increased in many countries across the world, including Germany. Three reasons for this growing interest can be identified.

First, *evaluation* activities in higher education have increased dramatically in recent decades, and in this context, the focus has increasingly shifted to “output awareness”: the measurement of the core activities of higher education – teaching and learning as well as research – and the factors which contribute to success in these domains as part of an information and monitoring system. Measurements should serve more regularly, more comprehensively and more systematically the purposes of both reflection and efforts for improvement on the part of the actors and control in terms of providing the basis for rewards and sanctions. Both mechanisms are expected to contribute to the enhancement of the quality, relevance and efficiency of higher education. In the arena of teaching and learning, scholars are encouraged not only to focus on the transmission and assessment of knowledge acquisition, but also to reflect on the abilities acquired up to the point of graduation. Terms such as “learning outcomes” (a completely misleading term, because “learning outputs” are referred to as a rule!), “competences” and “skills” signal a paradigm shift from the acquisition of knowledge – i.e., the essence of the academic system – to knowledge-enriched abilities which help to cope with practical problem-solving (see the overview in Cavalli, 2007).

Second, *quantitative-structural changes in higher education* have led to greater interest in more detailed information about the results of study. For example, experts agree that the dramatic expansion of student enrolment (which has increased more than tenfold over five decades worldwide) has been accompanied not only by an increase in the variety of students’ motives, talents and career perspectives, but also – as a response – by increasing diversity within higher education. In addition, as higher education has become more diverse, simple indicators of competences, such as the field of study of a graduate or the grade on his or her final certificate, are less likely to be viewed as sufficient for assessing graduates’ competences and the relationships between demand and supply on the graduate labor market. Similarly, reforms of study programs, such as the introduction of a convergent cycle system and degrees across Europe in the framework of the Bologna Process, raise the question of how

the competences encompassed in a bachelor's degree or a master's degree differ from those acquired on completion of the preceding or persisting single-cycle programs. Qualifications Frameworks have been established at the European level since approximately 2005 in order to set standards for these competences (see Gehmlich, 2009).

Third, the pressure is increasing on higher education to ensure that the results of teaching/learning and research are useful for technology, the economy, social well-being and cultural enhancement. The spread of the terms "knowledge society" and "knowledge economy" and the increasing popularity of the term "employability" indicate rising *expectations that higher education ought to deliver more relevant results*, and so scholars feel exposed to instrumental pressures. As a consequence, interest is growing in the actual relevance of study for employment and work.

It is possible to name a fourth trend, although it is mentioned less frequently by experts addressing the issues discussed here. For various reasons, *trust is fading in the customary modes and sources* that have traditionally been used in the assessment of competences. New and possibly more elaborate measurements are often called for.

Efforts to improve information about the output and outcomes of study are moving in various directions. We may note a growth in statistics and indicators. We have noted an increasing role of graduate surveys in rating job requirements and competences acquired during the course of study. We have also observed increasing efforts to develop test-like measurements of competences. We believe that the rating of job requirements and competences, as is done in research (in graduate surveys) or in practice (in job interviews), is likely to remain the most widespread method and that efforts should concentrate on improving the quality of such rating activities.

It is not the intention of this article to review the state of the academic literature on the relationship between higher education and the world of work; this has already been done at regular intervals by one of the authors over several decades (Hartung, Nuthmann, & Teichler, 1980; Teichler, 1988, 1999a, 1999b, 2009). Nor is it the intention of this article to review the way in which job requirements and competences are addressed in major international comparative studies on graduate employment and work; sources for this purpose are already available (Schomburg & Teichler, 2006; Teichler, 2007; Allen & van der Velden, 2011; Schomburg & Teichler, 2011). Instead, we aim to sketch the character of these ratings of job requirements and competences upon graduation in comparison with other approaches and to use this framework to illustrate the potential of graduate surveys.

CUSTOMARY MEASURES AND SOURCES

In looking at the spectrum of research on the relationship between higher education and the world of work, we can note that all of the major modes of inquiry which are customary in social science or behavioral science research are used. We can also note, however, that the mode of inquiry has enormous consequences for the "findings" of a study and thus for the substantive debates on these links.

Five types of sources and measures are usually employed in assessing the results of study and the utilization/demand in employment and work:

- Indicators;
- Measurement during the actual processes of the higher education system;
- Actors' ratings (possibly self-ratings);
- Experts' ratings;
- Tests.

The term *indicator* usually encompasses quantitative-structural measures produced for purposes other than research that are viewed as suitable “proxies” (approximate measures for the issues one would ideally like to measure). For example, the most frequently employed indicator, the Gross National Product, measures financial flows over a certain period in a specific country, but owes its popularity to the aim of knowing the wealth of a country. Similarly, the high remuneration of university graduates is often taken as an indicator of the use of graduates' competences and work tasks.

Quantitative-structural measures play an enormous role in the assessment of the results of study and the links between study and the world of work. Drop-out rates can be viewed as partial indicators of inappropriate study provisions and conditions. Graduate unemployment rates are often interpreted as signs of wrong delivery of competences on the part of the higher education system. Low income advantages of graduates are often viewed as indicating “over-education”; similarly, the employment of an engineer as a social worker or a philosopher as a tourist guide is often viewed as indicating a substantive “mismatch” between higher education and graduate employment.

The frequent use of quantitative-structural data to assess the links between the results of study and the world of work can be seen as fairly rational, because the labor market is not an arena for linking individual competences to individual work tasks, but rather for trading competences between individual persons and work tasks in terms of job offers for individual persons. However, analyses of the links between the level of educational attainment and areas of expertise on the one hand and occupational groups, remuneration, etc. on the other have often resulted in researchers being too eager to diagnose “over-education” and “mismatches” and thereby underestimating the diversity of links between competences and work tasks.

Measurement during the actual processes of the higher education system most notably takes place in the *grading of study achievements*. The grades stated on the certificates awarded upon graduation are the most salient in this context. All of the information on such certificates (except for the name of the recipient) can be understood as an aggregate measure or as an indicator of competences: the field of study; the areas of specialization; the higher education institution; the length of study; etc. In many countries, a degree in a certain field of study is understood as entailing an “*effectus civilis*”, i.e., an entry qualification (in the English sense of the word) for a profession. Certificates demand others to trust that those who are awarded them have acquired the necessary competences, at least to a certain

standard level. Employers and customers take certificates as indicators of competences, although they may use additional measures to assess the quality of graduates.

Measurements during the actual process tend to be more elaborate and specific than mere indicators. They rely on the actors' experiences. They are the incarnation of a pragmatic compromise between the desire to undertake sophisticated measurements and the intention to keep efforts within realistic bounds. They are based on the strengths and weaknesses of the practitioners' actions.

Actors' ratings are understood here as ratings assigned by actors outside of their normal work tasks within the system. Students may be asked within the framework of evaluation studies to rate the quality of teaching. Similarly, graduates may be asked within the framework of graduate surveys to rate their own competences upon graduation or the requirements of their job (see, for example, Schaeper & Wolter, 2008; Schaeper, 2009; Schomburg & Teichler, 2006). Employers may be asked in surveys to compare the usual quality of graduates with international experience and those without (see, for example, Janson, Schomburg, & Teichler, 2009). Scholars may be asked to rate the competences which are enhanced by a study program.

As a rule, the respondents to such studies are provided with lists of competences and work tasks (e.g., "leadership") and asked to rate the extent to which a job requires such competences and whether a graduate has acquired such competences. Through such procedures, more refined information can be gathered on the relationships between study and work than with the help of quantitative-structural indicators; however, there is widespread criticism that job requirements and competences may be misjudged by those involved (see, for example, Arum & Roksa, 2011).

Experts' ratings – i.e., ratings by highly knowledgeable persons who are not directly involved in the setting which is being rated – play an enormous role in higher education. In the area of research, proposals and texts to be published are rated by "peers" and publications or citations are indirectly determined by experts' ratings because the experts decide whether or not a text shall be published. In the area of teaching and learning, experts review study programs in formal processes of evaluation or accreditation (see Mittag, 2006) and are expected to state whether or not they believe that the curricula under scrutiny are likely to enhance the competences that they are intended to enhance.

Expert ratings' play such an important role because they cover a broad thematic range and because there is widespread belief within the higher education system that experienced actors who are asked to rate academic quality without being personally involved are knowledgeable and fair assessors. Research on peer reviews and related themes, however, shows that experts' ratings are not without bias (see, for example, Fröhlich, 2006).

Finally, *tests* differ from ratings as they evoke not only communication about competences, but also the emanation of competences in response to an artificial,

standardized stimulus (questions, tasks, etc.). They are generally viewed as the most sophisticated and thorough method of assessing competences.

Tests are not only very time-consuming in both their development and administration, but their role in higher education is also limited because there is widespread scepticism that tests, which must always take for granted a certain generally agreed core of knowledge and competences, do not fit with the diversity of concepts in higher education and could lead to undue pressure to homogenize; moreover, there are widespread doubts about whether tests would be suitable to measure the competences in the area of higher education that contribute to innovation and help to cope with indeterminate work tasks. Moreover, many efforts to measure the competences of students in higher education and graduates have focussed on the assessment of “generic skills”, “general competence” and “key skills”. Hence, many experts are concerned that a spread of testing in higher education would lead to an over-emphasis on general competences and a disregard for subject-specific and professional competences (see the critique voiced by Banta, 2007):

For nearly 50 years of measurement scholars have warned against pursuing the blind alley of value added assessment. Our research has demonstrated yet again that the reliability of gain scores and residual scores – the two chief methods of calculating value added – is negligible (i.e., 0.1). We conclude that standardized tests of generic intellectual skills do not provide valid evidence of institutional differences in the quality of education provided to students. Moreover, we see no virtue in attempting to compare institutions, since by design they are pursuing diverse missions and thus attracting students with different interests, abilities, levels of motivation, and career aspirations.

THE COMMON NEED TO IMPROVE THE UNDERSTANDING OF COMPETENCES

We can observe a multitude of valuable conceptual frameworks as regards the links between job requirements and competences (see the overviews of concepts in Bennet, Dunne, & Carrée, 2000; Knight & Yorke, 2002, 2003). In addition, the recent debates on “employability” have triggered efforts for further improvement in this direction (cf. the overview in Yorke, 2007).

Nevertheless, the public debate among practitioners, experts and researchers in this area has by no means reached a satisfactory conclusion. As previously addressed in the overview of modes of inquiry employed, the discourse on the relationships between higher education and the world of work seems to be distorted endemically by certain fallacies.

The first could be called *subordination fallacy*. Higher education is called upon to gear programs toward the presumed demands of the employment system. The frequently employed term “employability” stirred up controversial debates because it seemed to call for such a subordination (cf. the discussion in Vucasovic, 2007).

We have argued that a term such as “professional relevance” could have avoided such a misunderstanding (see Teichler, 2009), if a misunderstanding exists. Any call for such subordination underestimates the role of higher education in preparing graduates – beyond proficiency in the usual rules and tools of professional work – for indeterminate work tasks, competent handling of unexpected tasks and innovation in general.

Closely related to this is a second issue which could be called the *employers know best fallacy*. Of course, representatives of companies and other employer organizations have the best first-hand experience in this respect. However, this theory has many limitations: views could be shaped by the specific traditions of individual companies and the preoccupations of those in charge rather than by “demands”; the persons responsible for management and personnel matters could have different views from those who are active in other departments of a company; there could be an over-emphasis on short-term demands; and we have often noted an emphasis on current shortages of certain competences or on “personality”, as a result of which higher education is accused of over-emphasizing the cognitive dimension of competences.

Third, we have noted a *mismatch and over-education avoidance fallacy*. Many actors and experts are calling for a close link between fields of study and occupational areas as well as for a close link between levels of educational attainment and related occupational hierarchies. Such an emphasis on a link which is as close as possible does not sufficiently take into consideration that a close link between educational awards and occupational categories is not always the result of a good link between competences and work tasks, but could be due to “credentialism”, e.g., excessive rewards for formal educational attainments, the professional power of “closed” occupations and other not necessarily functional and meritocratic mechanisms. Second, there are imperfections in the planning and market-steering of demand and supply, and higher education is bound to be broader than the job requirements of individual positions; thus, higher education cannot provide the closest possible match, but must also prepare students for flexible adjustment. Third, those emphasizing a close match have underestimated the large proportion of graduates who are employed in areas that are not closely linked to their field of study and their level of educational attainment, but who considered their competences as useful for their work tasks and who become proactive agents of change in the world of work.

Fourth, we can note a *practice fallacy*. For example, internships are often hailed as the *non plus ultra* for linking learning and professional work, or the emphasis is placed predominantly on applied knowledge. Useful as these approaches may be, they are in part a response to the difficulty of understanding the links between abstract knowledge in the world of academia and professional problem-solving.

Fifth, we can observe a *general competence fallacy*. We often hear that specific knowledge rapidly becomes obsolete and that training in clear logical thinking will help to cope with various job tasks and the demand for further knowledge acquisition. Once again, useful as general competences may be, we cannot offset

the need to acquire specific knowledge and related professional competences in order to cope with the challenging tasks of an “expert society”.

These fallacies have been so pervasive not only in the public discourse, but also in research on the relationship between educational output and its subsequent use in the world of work or in other spheres of life, that all efforts to improve our knowledge base in these areas have to start with a demystification of the prevailing misconceptions and with a search for an appropriate balance. Operational improvement of the measurement of competences remains of limited value if it is not embedded within a convincing conceptual framework of desirable links between study and work.

POTENTIAL AND CHALLENGES OF GRADUATE SURVEYS

Currently, substantial efforts are underway to improve the knowledge basis on the relationships between higher education and work with the help of competence testing. The OECD initiative for AHELO as a functional equivalent to PISA is the best-known activity in this domain. We can also note national initiatives such as the promotion of research on competence measurement in Germany. The authors of this contribution share the view that these efforts are unlikely to achieve their ambitious aims and that the risk of generating pressure to conform in higher education is salient. However, irrespective of this sceptical view as regards competence testing, we can assume that graduate surveys will play an important role in the future in establishing the links between job requirements and the tasks of higher education. We argue that substantial research efforts are needed that aim to improve the quality of ratings of job requirements and graduates’ competences within the framework of graduate surveys.

Admittedly, not all graduate surveys aim to measure job requirements and graduates’ competences. In some countries, relatively simple large-scale national graduate surveys have been established. Information is collected on the distribution of graduates according to field of study, type of higher education institution, individual higher education institution, type of degree, gender, (employment) status, possibly economic sector, occupational category and possibly income. First-generation national graduate surveys were established decades ago in the U.K. and Japan which have continued to the present time.

These graduate surveys provide core descriptive information on the employment situation of graduates from higher education institutions. They raise public awareness, primarily of customary over-interpretations, e.g., studying humanities at university x leads to a highly successful career in sectors a, b and possibly c. Many economists believe that such datasets allow us to draw far-reaching conclusions on the utilization of competences (e.g., small income advantages indicating over-supply or under-utilization of competences).

Over the years, however, most graduate surveys have moved toward a more complex model in order to explain the relationship between higher education and the world of work. Some key issues inherent in restricted approaches and some directions for widening these approaches could be cited.

1. The proportion of graduates successfully making use of their competences in their job is underestimated if the typical occupational categories of graduates and traditional income advantages are taken as the sole criteria. *Graduates' ratings of the links between their level of competence and their position and of the extent to which their competences are used* in their job can be included and graduate surveys can show a greater proportion of the productive links between study and work than the seemingly "objective" employment criteria outlined above.
2. The professional success of graduates from certain institutions, study programs or sectors of higher education may not be due to study, but may have to be attributed partly or completely to differences at the point of entry into higher education. The "value added" of less prestigious universities may be higher, as a look at the careers of graduates from prestigious universities suggests. *Data on the socio-biographic background of students and on prior schooling* can be collected in graduate surveys that help to control such effects. In principle, competence measures could be used at the beginning and end of study in order to measure the "value added".
3. The success of study may not be solely the result of the study conditions and provisions, but may also be shaped by the *students' study behavior*. In order to disentangle these effects, questions are useful in graduate surveys which ask respondents, for example, to characterize their major approaches as regards teaching and curricula, their choices and their study behavior, e.g., the time spent on learning and their learning styles.
4. Graduates may be less professionally successful than they could be on the basis of their competences because they handled the process of transition from study to employment less well than usual. Therefore, *questions regarding the search and recruitment process* may be raised in graduate surveys in order to establish the extent to which such "intervening variables" come into play.
5. The extent of the professional success (or failure) of a graduate may be caused by a *misjudgement of her of his actual competences on the part of the employers*. They may have overrated the information stated in the graduate's credentials (e.g., the reputation of institutions, grades, etc.) – so-called "credentialism" – or recruitment interviews may not have sufficiently revealed his or her competences. Graduate surveys which ask graduates to rate their own competences at the point of graduation and their perceived job requirements help to measure such phenomena.
6. Not every graduate is driven in his or her study and work behavior by a set of motivations and values which corresponds to that of a "*homo economicus*" or "status seeker". *Questions regarding graduates' orientation* show that those seeking interesting work, opportunities to contribute to social change or another work-life balance far outnumber those matching the construct of a *homo economicus*.

In sum, readiness has grown to *design questionnaires for graduate surveys* in a way that ensures *sufficiently complex information* in order to exclude basic misunderstandings of the relationships between higher education and the world of

work. This helps to measure “success” in transition, employment and work in various respects, to include a certain breadth of study conditions and provisions as well as study behaviors that could be professionally relevant, and to cover the socio-biographic and schooling variables needed to avoid simplification, in terms of assumed causalities concerning the conditions, processes and impact of study. Thereby, the self-rating of competences and their comparison with perceived job requirements are valuable for examining both the weight of the various competences for subsequent employment and the extent to which other factors explain professional success, e.g., credentialism, misidentification of competences on the part of employers, misfortunes in the transition process and deliberate career choices that do not aim for the maximum professional use of the competences acquired in the course of study.

This thematic area has played a substantial role in the two major international comparative surveys on graduate employment and work. For example, in the CHEERS (Careers after Higher Education: A European Research Survey) survey, comprising around 36,000 persons from 12 countries who graduated in 1994/95 surveyed three to four years after graduation, five dimensions of competences and job requirements in addition to disciplinary and professional specialization were addressed in the questionnaire design with the help of 36 items: the ability to transmit systematic knowledge to work tasks; competences which are relevant for reflection, innovation and creativity; working style; socio-communication skills; motives and values (Teichler, 2007, p. 9). Two further classifications were developed in the course of the analysis: on the one hand, general-cognitive, systematic-operative, professionally knowledgeable, socio-reflexive and physiologically/manually skilled (Kellermann, 2007); on the other, knowledge, methodical skills, intelligence, socio-communication skills and organizational skills (Kiviven & Nurmi, 2007). In the REFLEX (The Flexible Professional in the Knowledge Society) survey which again comprised around 36,000 persons from 15 countries who graduated in 1999/2000 surveyed approximately five years later, many similar items were included, but a distinct classification was presented, between professional expertise, functional flexibility, innovation and knowledge management, the mobilization of human resources and international orientation (Allen & van der Velden, 2011).

The authors of the studies had developed these categories for the rating of competences and job requirements after careful study of the available research literature and obviously considered their approaches to be relatively ambitious. However, both studies state that it has remained difficult to define categories of competences in such a way that they are both theoretically satisfying and match the perceptions and understandings of the respondents.

Therefore, graduate surveys would profit enormously from accompanying research on the concepts and measurement of competences and the related demand for and utilization of competences. Cooperation is helpful with research activities striving for other modes of measurement (e.g., indicator development, test development), but certainly *research would be helpful which aims explicitly for the improvement of graduates' ratings in this domain.*

TRENDS AND FUTURE PROSPECTS

The scenery of assessing the competences of students and graduates and their possible relations to job requirements and tasks in other spheres of life is extremely varied – in terms of narrow vs. broad coverage, in the level of sophistication of the measurement and in the workload involved in the assessment.

This does not mean, however, that a move can be expected away from a gradual abandoning of relatively simple measurements toward predominantly complex measurements of competences. Instead, we can note that there is currently:

- The persistence of the vital role of higher education credentials in employers' recruitment of graduates, whereby the assessment of students' achievements by their teachers is the core of the information provided by the credentials;
 - The persistence of the traditional teacher assessments of student achievement;
- The growing popularity of indicators which rely on readily available, simple aggregate measurements, as the "ranking" discourse shows;
- A spread of graduate surveys in which competences and job requirements are measured with the help of graduates' (self-)ratings;
- The persistence of the dominant final selection of job applicants by employers with the help of open or semi-structured interviews, occasionally accompanied by tests in specific areas (e.g., IT or a foreign language) or by testing behavior in semi-standardized simulations of work situations (e.g. "assessment centers");
 - Increasing efforts to develop competence testing in this domain.

It should not come as a surprise to note the persistence of such a broad range of efforts in assessing competences and their links to work tasks.

First, it is by no means clear that highly complex measurements help to predict future performance. Testing at the point of entry into higher education continues to be viewed as controversial by experts as regards the greater predictive validity of achievement during the course of study in higher education, and there are sound reasons to believe that testing at the time of graduation produces even weaker results for predicting professional performance.

Second, the popularity of simple measures has increased: obviously, the desire and pressure to have easily readable data at hand is greater than the desire to enhance the quality of data.

Third, there is the issue of "value for money" as regards investment in elaborate measurements of competences; those in charge of recruiting graduates often spend less than five minutes assessing the documents provided by the candidates and less than one hour communicating with a candidate invited for final selection – this looks efficient and is also based on the assumption that more time invested would not lead to a substantial increase in predictive validity.

The scholars in charge of teaching and assessment at higher education institutions must assess the competences emphasized in their curricula and need feedback as to whether or not these competences have been enhanced by graduation and whether they are important in the graduates' subsequent work. This

can be realized through ratings, but not through tests in order to meet the specific profiles of individual study programs.

Finally, competence testing must be based on the belief that there is a broad common core of competences that are needed and must be strived for; as previously pointed out, this may be not only an illusion, but unduly homogeneous testing could create undue pressure to conform in higher education at a time when calls for diversity in higher education are increasing.

Therefore, a practice-oriented research program on the measurement of competences enhanced by higher education would be most valuable if it served the various needs for objectives to improve measurement in this domain, notably:

- The need for teachers in higher education to change their mode of measuring achievement in their classes if they want to move from knowledge-oriented teaching and learning toward competence-oriented teaching and learning;
- The needs for those in charge of recruiting graduates to enhance the quality of job interviews;
- The need for graduate surveys to increase the quality of self-rating of competences as well as their links to job requirements;
 - Efforts to enhance the testing of competences in higher education.

Such a broad approach to improving the measurement of competences and enhancing our knowledge of the character, causes and consequences of competences would have three significant advantages over an approach to improve testing of competence. Our knowledge about the strengths and weaknesses of existing measurements of competences could grow substantially. Moreover, the potential of experts could be pooled in order to enhance the conceptual basis for measuring competences. Finally, a broad range of practical and relevant means of measuring competences could benefit and eventually improve.

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