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Assessment of Competencies among University Students and Graduates

- Analyzing the State of Research and Perspectives

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Contents

1 Introduction

Until today, higher education has been underrepresented in national and international empirical research (see Lenzen, Krüger & Wulf, 2008). The many actions taken nationally in response to the PISA debacle in school education gave cause to hope for similar empiric research in higher education that would be the foundation for the implementation of customized reforms. However, the Bologna declaration has rather led to an education policy reform instead of a theoretical and empirical one.

Although complex multidimensional research on the "Assessment of Domain-specific and Generic Competencies among University Students and Graduates" (i.e. because of an international and intra-national diversity of study programs, structures and teaching efficiency) asks for the highest evaluation techniques, the challenge has to be met with regard to progressing international competition in order to create a competitive education system. The international context offers evidence of approaches to structural stabilizations in university research (i.e. the OECD's feasibility study titled the "Assessment of Higher Education Learning Outcomes" (AHELO)), which can be carried out at a national scale as well (cf. Lenzen et al., 2008; Weiler, 2008).

It is therefore necessary to bring together national and international experts from different fields to cooperate on a common multi-interdisciplinary method-integrating research project. Many tasks have to be carried out. These not only include the complex assessments of competencies such as psychological, didactical and statistical demands (cf. Hartig, Klieme & Leutner, 2008), but also intensive analyses of processes and structures in the ramified area of higher education and the state of research on other relevant topics (institutional variants, manifold scientific disciplines, diverse course structures, different societal and economic backgrounds etc.) and topical national and international research.

Documents and potentials have been analyzed, while experts have already been interviewed in order to finally reprocess and structure the field of research (cf. chapter 2). On this basis, central research activities and research deficits can be identified (cf. chapter 3), and preferences and opportunities for a successful research program can be developed (cf. chapter 4).

2 Analyzed Database

In order to compose an assessment report of the (multi- and interdisciplinary) field of research, a comprehensive and intensive *documentary analysis consisting of literature and database research (incl. secondary data analysis)* had to be conducted as a first step. To ensure a systematic approach, a selection of national and international educational-specific and cross-disciplinary literature databases was chosen and a selection of relevant English and German keywords was gathered (see below).

The main databases in the field of education are at a national level the "FIS Bildung" literature database (educational information system) of the German Institute for International Educational Research (DIPF), and the "ERIC" literature database (Education Resources Information Center) of the U.S. Institute of Educational Sciences (IES) at an international level. Additional information at an international level was gathered through the comprehensive interdisciplinary "Academic Search Premier" literature database from EBSCO Information Services. The enlisted literature databases integrate the information of cooperating documentation institutes and evaluate comprehensive magazine databases, thereby including a broad field of research. Nonetheless, further databases enhanced the research directly (including CEDEFOP to find European Romance literature), as did central journals (i.e. "Assessment & Evaluation in Higher Education" or "Higher Education in Europe") and pertinent institutions (i.e. test institutes such as the American Educational Testing Service (ETS) institute).

The following keywords were emphasized: (academic) achievement, college & university, comparison, competence, competencies, (educational/ large-scale) assessment, (educational) test/ measurement, graduates, higher education, learning outcome and performance.

Many hits were found by inserting different keyword combinations into the databases. First, the abstracts of these hits were analyzed. Depending on their relevance and quality, the whole source was then used to specifically analyze the contents. The sources were collected and structured in a user-defined category scheme of the literature administration software CITAVI, which was the basis for a tabular data presentation in Excel (cf. Tables 1–3).

In addition to the documentary analysis, *interviews with national and international experts in the relevant areas* were conducted. National and international trends and innovative research areas were revealed and (more) closely monitored by searching the databases. Seven experts were interviewed on the phone on the overall situation and on their respective fields of expertise. These interviews allowed us to trace current trends and innovative research areas

both nationally and internationally and to target them by means of database research. These seven experts were questioned on the general state of research and their particular areas of expertise. A higher education researcher, a psychologist, a psychometrics expert, a statistician, a didactic expert and two empiric educational researchers – all of them experienced in national and international large-scale assessment studies – contributed with their expertise.

A comprehensive database was created that built the foundation for the conducted *potential analyses*. The research area was first structured with the help of a chart, including the main and subcategories. The categories were carefully selected according to the diverse and related research units, taking into account the complex and multidimensional character of the research object. This course of action was chosen because there are currently few approaches to large-scale assessment in higher education (cf. chapter 3).

The evaluation focused on the concept of competence, which exceeds the mere consideration of "knowledge and skills". This includes in particular motivational, volitional and social tendencies and abilities according to Weinert (2001)[1]. The integration of competence modeling (as a precondition for the valid assessments of competencies), surveys among graduate students and university rankings into the evaluation prove how important it is to broaden the perspective. The high potential of expertise in these fields should be used for systematic research initiatives.

The categories were first classified geographically into "Germany", "Europe" and "International" (outside Europe)[2], and then subcategorized into "assessment of competencies," "competence models," "graduate student surveys" and "university rankings" (cf. Tables 1–3). A chart was developed for each subcategory, giving detailed information on the research conducted (i.e. the subcategory "assessment of competencies" provides information on the used tool, object, sample, design, initiator, local scope and source). This systematic approach allows us to recognize potentials and deficits in subfields (i.e. for certain countries, subject groups, methods, approaches etc.), present them in a structured report and recommend them as a starting point for future research.

[1] According to Weinert (2001, p. 62) the concept of competence "should be used when the necessary prerequisites for successfully meeting a demand are comprised of cognitive *and* (in many cases) motivational, ethical, volitional, and/or social components."

[2] If a study covers more than one country and therefore more than one category, it is classified into the highest geographical range (i.e. the PISA study that refers to Germany, European and non-European countries was classified as "International").

All data were collected and analyzed in spring and summer 2009. The results were updated in autumn 2010[3].

3 Report on the Results

3.1 State of Research at the National Level

Although the category *"assessment of competencies"* refers to numerous national studies (cf. Table 1a: 35 listings), the results have to be interpreted regarding the tool, object, target group, design and scope. Germany is lagging behind when it comes to research on the *large-scale assessment of the (domain-specific and generic) competencies of students and graduates from different fields of study* (as a reference criterion). At the moment, there are no national higher education approaches that meet the criteria of national and international comparative studies from the school sector (i.e. VERA or PISA).

Direct Assessment of Competencies

Two useful studies can be tagged for the small area of *teacher training* (cf. Blömeke et al., 2011; Brunner et al., 2006; Kunter et al., 2011). While the projects COACTIV and COACTIV-R (see List of Abbreviations) by Brunner et al. (2006) and Kunter et al. (2011) concentrate on experienced maths teachers and teacher trainees, TEDS-LT by Blömeke et al. (2011) focuses on students and trainees for mathematics, German and English. Both studies share the goal to evaluate *objectively*, horizontally as well as at a regional and national scale, the content knowledge, pedagogical content knowledge and pedagogical knowledge of the target group, based on a theoretic expert competency model.

The precondition for the valid assessment of competencies is to consult *models* in which the structure and levels of domain-specific competencies are theoretically substantiated (cf. Hartig, Klieme & Leutner, 2008). The first evidence has been provided of the possibility to transfer educational competence models to individual disciplines (in this case for diplomas and BA/MA courses in mathematics, German and English).

If the scope of the reference criteria is narrowed, *single university projects* can be found that deal with objective competence assessment (see the column "scope" in chart 1a). However, they only play a small role in national research (see Clermont and Höfer (n.d.), who focus on the

[3] The results of the relevant international conference on the "Modeling and Measurement of Competencies in Higher Education" are not included here because they will be published separately (cf. Blömeke, Zlatkin-Troitschanskaia, Kuhn & Fege, in press).

teaching performance of university lecturers[4] in economics; Eilerts and Rinkens (2008) and Riese and Reinhold (2008), who concentrate on the development of competencies among students of mathematics and physics; Buske, Förster, Klinke, Kuhn, Preuße & Zlatkin-Troitschanskaia (2011) on the assessment of content knowledge and pedagogical content knowledge of diploma and BA students of business and economics; and Beck, Krumm and Dubs (1998) on the "Wirtschaftskundlicher Bildungstest" (WBT; as an adaption of the Test of Economic Literacy)). These projects have great potential as inter-university research alliances that can boost the synergies, scope and domain reference of expertise dramatically.

At the German level, a form of assessment has evolved that concentrates less on "academically acquired skills and knowledge" and more on "*prediction of scholastic aptitude*" (see Gold and Souvignier (2005) for the central disciplines of medicine, law, engineering and economics; Henn and Polaczek (2007), who focused on engineering; ITB Consulting GmbH (2008) on the (aptitude) test for medical university courses (TMS), which is obligatory for all prospective students at all medical faculties within the German federal state of Baden-Württemberg as well as in the higher education institutions in Lübeck and Bochum; Trost et al. (1998) on the evaluation of TMS; and Kammerl (2006) on the prediction of competencies relevant to teaching).

Indirect Assessment of Competencies

German research can be further differentiated according to the used survey instrument. A substantial number of studies exist that develop indirect methods of assessing competencies or are based on them (cf. chart 1a, column "instrument"). One example is the Berlin evaluation instrument for self-evaluated student competencies (BEvaKomp) (Braun & Hannover, 2008). This competence- and outcome-oriented instrument represents a further development in concept and assessment methods, taking into account the latest Bologna conditions and test theoretical requirements. The instrument claims to capture expertise with regard to the concept of "situational competence". However, as a *universally applicable instrument* peculiarities of different fields can only be taken into account at a very limited scale. Although applicable for the assessment of methods, presentation, communication, social and inter-personal skills, the instrument can only briefly be used for a valid assessment of expertise.

The PaLea study of Bauer (2009) offers a large-scale design. It strives to assess the subjective professional development of *prospective teachers* (BA, MA, state examination) during their

[4] The study focuses on university lecturers, but as they have followed a university education, they are included in the group "graduates."

university studies at 12 German universities. However, the focus is not on a subjective *competence* assessment. Another problem is: Only a small number of students (prospective teachers) can be represented in this study (see Rauin and Meier (2007) on the development of competencies among prospective teachers in the German state of Baden-Württemberg).

The National Educational Panel Study (NEPS) tries to solve this problem by accompanying a number of first-year students with selected fields of study during the course of their educational and professional careers. However, the NEPS is *no original competence assessment in higher education,* as students and graduates only make up a small part of the overall sample needed to complete the samples taken of a certain (in this case formal) context (cf. Blossfeld, 2008). Detailed analyses on to what extent the measured competencies can be traced back to the study period are limited. These studies represent a first approach to focus on students regarding their individual competence developments *in the long run*.

When it comes to *national research*, the higher education information system (HIS) should be emphasized. This increasingly focuses on the indirect assessment of competencies after having concentrated on the analysis of indicators of the higher education system for a long time (see Schaeper and Briedis (2004) and Schaeper and Spangenberg (2008) on the acquired and required competencies of graduates; Peschel, Senger and Willige (2006) on the self-evaluation of foreign language competence in comparison to the DIALANG test of the European Reference Frame). There are also *university research associations* that do not act at a national scale, but rather concentrate on students from different disciplines (cf. Dickhäuser, Schöne, Spinath and Stiensmeier-Pelster (2002) on the assessment of an academic self-concept of prospective teachers and students of computer sciences and psychology). Furthermore, there are a number of *individual university projects* dealing with indirect competence assessment (Abel (2008), Bodensohn (2004) and Gehrmann (2007) for academic teacher education; Meyer, Frank and Janas (2007) on professional and interdisciplinary competencies in the field of "navigation and global economy"; Eggert, Gausmann, Hasselhorn, Watermann and Bögeholz (2008) on diagnostic competencies in biology; Koch (2005), Kohl-Frey (2007) and Schiefele and Moschner (n.d.) on generic competencies).

Indirect methods are based on the self-perceptions and self-evaluations of respondents. Only unreliable predictions about acquired competencies can be made because of the problem of the over- and underestimation of own competencies, which is inherent to indirect assessment, and "social desirability," which makes the candidate answer according to what he/she thinks is expected from him/her by the interrogator or a peer group instead of telling the truth. By contrast, indirect methods are suitable for assessing the equally important *non*-cognitive

competencies (e.g. social, volitional and motivational dispositions). However, they can only be used for assessing academically imparted skills and knowledge to a limited extent (i.e. in comparison with the results of direct assessments). In particular, cognitive competencies are crucial in order to assess (especially domain-specific) knowledge and skills intentionally taught at higher education institutions. Nevertheless, research initiatives that use direct assessment should make use of the high expertise in the field of indirect assessment through self-evaluation. Content-specific basics have been created that should be used.

Graduate Student Surveys

Another important area of the national research landscape is graduate student surveys (cf. chart 1c). In most cases, these meet the reference criteria only because of their large scale, but their partial relevance should also be mentioned here. There are numerous (specific and interdisciplinary) studies of problem situations in retrospect (difficulties, career opportunities etc.) and career starts (see the national and interdisciplinary graduate study of the HIS by Briedis (2007); the Bavarian graduate panel by Falk, Reimer and Hartwig (2007); and the survey among graduates of economics by the Centre for Higher Education Development (CHE) by Federkeil (2002)). Although they do not include assessments, these studies can be of great interest as they deliver relevant information on specific needs in a global knowledge-based society. Therefore, they (indirectly) contribute to assessing which competencies (regarding the outcome criterion) should be taught at universities and therefore measured as well.

University Ranking

The same applies to the popular university rankings (cf. chart 1d) that analyze quantitative indicators of the higher education system (number of first-year students, drop-out rate, research activities etc.) and thus are supplementary to competence assessment (e.g. Federkeil (2002) on the methodology of the nationwide CHE university rankings). The quality of the higher education system is not measured by the output of students (and therefore by acquired competencies) but by factors of input. However, student surveys have been established that take the output quality of universities into account and thereby add to traditional university rankings. The student survey of the University of Constance, for example, focuses explicitly on "efficiency, qualification, socialization, screening and placement" (see Simeaner, Dippelhofer, Bargel, Ramm and Bargel (2007) and Heine, Kerst and Sommer (2007) on the HIS student survey). Statements on conditions and the university curriculum are also relevant to national assessments. They offer important information on the conditions of academic studies and

therefore allow statements on the comparability of student competencies from different courses and universities.

Competence Models

As mentioned before, a valid assessment of competencies requires appropriate competence models (cf. Hartig, Klieme & Leutner, 2008). These are characterized by their structure, levels and reference to domain. The qualification frame for German university degrees (Qualifikationsrahmen für Deutsche Hochschulabschlüsse) offers a first approach that combines competencies that should be required ("knowledge and comprehension" and "skills") and formal aspects (e.g. entry requirements, duration classified by degrees) (HRK, KMK & BMBF, 2005). They represent a first step towards comparative competence assessment, but they lack an empiric foundation and reference to the domain. With regard to domain-specific references, the field of "social work" takes on a leading role. For this discipline, a respective qualification frame was adopted by the Faculty Conference (cf. Bartosch, Maile & Speth, 2008).

Evidence-based competence models in higher education still are an exception, as for example demonstrated by the abovementioned conceptualizations of Blömeke et al. (2011) and Kunter et al. (2011). This also applies to further approaches from the field of teaching, i.e. for the subjects electrical engineering and mechanical engineering (Könekamp & Glindemann, 2008), physics (Riese & Reinhold, 2008), biology (Eggert et al., 2008) and from the linguistics field German language and literature and physics (Sennewald, n.d.). Based on domain-specific and empirically evaluated concepts *from the pupil level* (cf. Table 1b), there is huge potential for development in this area, which should act as a cornerstone for valid competence assessment. Early models have already been developed and tested for both pupils and students (cf. Eggert et al., 2008).

3.2 State of Research at the European Level

After concentrating on the situation at the German level, the focus is now on European research. It is especially interesting to see in what areas (1) Germany can benefit from research in other European countries and where (2) research has been conducted within Europe.

There is a huge research deficit in Europe when it comes to large-scale direct assessments of (domain-specific and generic) competencies among students and graduates of different fields (as a reference criterion). At the current state of research, no European country meets the criterion of the current state of research (cf. Table 2a). If only certain sub-criteria are taken into

account, relevant preliminary studies can be found on certain aspects that will be presented in order to give an overview.

Direct Assessment of Competencies

Carrillo de la Pena et al. (2009) analyzes the academic achievement of students from three disciplines (medicine, psychology and biology) at four *Spanish* higher education institutions using a longitudinal approach. The pivotal question of the study was to what extent does the participation of students in *formative evaluations* (e.g. by the implementation of feedback instruments) affect the summative outcome (here the achieved grades) at the end of a term. It was proven that participation (regardless of the success) leads to better final grades. Another meaningful example from Anglo-Saxon countries for competence assessment is a study by Rigney (2002). This study assesses and compares the skills and knowledge of *Irish* students of economics at the beginning and during their courses of studies. These two studies are relevant research initiatives in the field of competence assessment. However, they do not offer any more sophisticated designs or divergent results than do German studies in this subfield.

Just as in Germany, there are further forms of competence assessment in order to *diagnose the qualification* of prospective students and to *predict their success* (cf. the column "object of study"in Table 2a). One example is the "*Swedish* Scholastic Aptitude Test". As a quality assurance program, it is part of the university system and it influences the allocation of university places (Swedish National Agency for Higher Education, n.d.). Another example is the "aptitude test for medical training in *Austria* (EMS)", which is based on the German "test for medical university courses (TMS)" (cf. Mallinger, 2008). In particular, the EMS points out a problem that is connected with the composition of aptitude tests and with achievement tests in general. The EMS was controlled for regarding its fairness as women generally performed worse than did men, although more women graduated than did men (cf. Spiel, Schober & Litzenberger, 2008). Not only insufficient definition and reliability values, but above all the closed-ended format (multiple choice) caused gender-related disadvantages for prospective female students. For the state of research, this means that the *methodical aspect of competence assessment* should be more focused on by systematically initiating special methodical research projects.

Indirect Assessment of Competencies

A lot of research on objective assessment methods is being conducted in the *UK* (cf. Table 2a under "instrument"). In particular, the "Teaching and Learning Research Program (TLRP)" by the British Economic and Social Research Council (ESRC), which includes projects in the higher

education area, should be mentioned. For this analysis of the state of research, the SOMUL project in particular (The Social and Organizational Mediation of University Learning) should be named (cf. Brennan & Jary, 2005). Students and graduates of the three disciplines of biology, economics and sociology (from five different universities) were interviewed about their study habits and individual and professional characteristics. The results show very interesting differences between the subjects.

Thus, the *comparison of students and graduates from various disciplines and universities* helps gain evidence-based conclusions on (social and organizational) parameters and the output of a still highly heterogeneous higher education landscape despite all educational policy efforts (for conclusions on students of music and prospective teachers in two further TLRP projects, see Creech et al. (2008) and Smith, McCully, Moran and Clarke (2008)). Such information is vital (for Germany) to the state of research. It provides important clues on (1) to what extent a large-scale assessment of students and graduates of different disciplines and universities can be compared and (2) what concepts and methods should be paid attention to in terms of implementation (cf. chapter 4). Apart from these TLRP projects, other single university projects have been conducted in the UK (by Sheard (2003) or Pokorny and Pokorny (2005)) within the discipline "economy and quantitative methods."

Further European studies on indirect competence assessment in *teacher training* exist, for example studies from *Sweden* and the *Netherlands* on the professional development of the subject-didactical competencies of prospective science teachers that are based on domain-specific competence modeling (cf. Henze & van Driel, 2006; Nilsson, 2006). Further country-specific studies focus on the formative evaluation of the common educational teaching competencies of students, trainee teachers and experienced teaching staff (e.g. for England, see Boyle, Lamprianou & Boyle, 2005; for Switzerland, see Beck et al., 2008). This also applies to cross-national studies with a comparative perspective (for Germany and Switzerland, see Baer, Dörr & Fraefel, 2006; for Germany, Switzerland, Austria, Italy and Poland, see Frey, 2008). All studies emphasize the *crucial importance of formative evaluation processes* (cf. Carrillo de la Pena et al., 2009; Rigney, 2002). A design directed towards such a process is also crucial to assess the skills and knowledge of students and graduates on a large scale. This is necessary in order to introduce (educational policy, organizational and individual) measures and to control and further optimize them regarding their effects.

Further studies focus on the outcome as a central quality criterion of higher education in a constantly advancing globalized knowledge society. One very broad-ranging comparative interview study pursues the assessment of the acquired and required competencies of higher

education graduates (cf. Joumady & Ris, 2005). Graduates of 209 higher education institutions in *eight European countries* were interviewed three years after having graduated. Evidence-based statements were required on how much university really prepares students for working life. The research results showed that competence assessment in higher education should include interpersonal and professional individual development to prove the assumed "trade-off" of comprehensive democratic-societal and situation-specific requirements. Owing to the multidimensionality and complexity of the object of study, it seems justifiable to first narrow it down to the original job-related cognitive competencies of skills and knowledge as a reference criterion.

Graduate Student Surveys

Graduate student surveys will only briefly be mentioned here for the reasons mentioned above (cf. Table 2c). The institutionalized and annual DLHE survey (Destinations of Leavers from Higher Education) in the *United Kingdom* and the standardized graduate student survey initiated by the *Swiss* Federal Statistical Office act as examples. Since 2002, the latter has gained differentiated and systematic statements about the professional careers of university graduates over the course of time. As mentioned before regarding the national scale, these studies provide important information on the occupational requirements of global employers. In the context of large-scale assessments, these can be of interest regarding their (global) use (cf. chapter 3.1).

University Rankings

University rankings now play an important role in the European higher education landscape (cf. Table 2d). National rankings have been conducted based on input-oriented university indicators for example in *Great Britain*, *Russia* and *Poland*. These are usually initiated by renowned newspapers (e.g. The Times Higher Education Supplement in the UK), well-known publishers (e.g. Perspektywy in Poland) or independent ratings agencies (e.g. RatER in Russia). In today's research landscape, university rankings are mainly critically discussed because of their low transparency of data and methods used (cf. Eccles, 2002; Artushina & Troyan, 2007; Filinov & Ruchkina, 2002; Swinski, 2002). Their significance regarding the quality of universities is low. However, as in Germany, solutions to overcome the deficits of these rankings are being sought. One current example is the feasibility study into a multidimensional globally designed university ranking under the initiative of the "Consortium for Higher Education and Research Performance Assessment" (CHEPRA) (Center for Higher Education (CHEPS), 2009). On one hand, the study draws on an explicit *consideration of the linguistics, cultural, economic and historic contexts of the respective educational systems* based on a classification scheme of *European countries*. On

the other hand, the *domain reference* is being considered, as economics and engineering (rather than the whole higher education institution) are being evaluated under the aspect of academic "teaching and learning."

The mentioned "mapping" could be relevant for a conceptualization of a cross-country large-scale assessment. However, the high heterogeneity of federal states raises doubts as to whether a country-specific "mapping" can actually allow for more than just general conclusions. In the course of the Bologna process, it was attempted to create a common European higher education area, a unification of heterogeneous higher education structures (above all in regard to degrees). However, numerous studies show that at present there is no homogeneous logic of the system at those various system levels (on the width and swiftness of the implementation of BA and MA degree courses, see Alesi, Bürger, Kehm & Teichler, 2005; on the structure of courses and student bodies, see Andren, 2005; Brennan, Patel & Tang, 2009; HIS, 2005; and on the quality management of higher education institutions, see Contreras, 2008). These studies show that European large-scale projects cannot yet compare output- or outcome-related data easily. They rather show that the numerous and diverging state-specific and higher education structures need to be taken into consideration for such projects. Without these provisions regarding the outputs or outcomes of students and graduates, profound conclusions about university quality cannot be made.

3.3 State of Research at the International Level

Development potential for new research projects can be found based on current German and European research activities. However, they do not take the "large-scale direct assessment of the (domain-specific and generic) competencies of students and graduates of various disciplines" directly into account. The field of research into direct assessment can only be classified as *insufficient* at the German and European level. Therefore, one has to look at the international research landscape, which promises to close the research gap at least to some extent.

Direct Assessment of Competencies – National Projects

Focusing on the *USA,* one can find research initiatives that largely fulfill the reference criterion (see above) (cf. Table 3a). These initiatives are mainly undertaken by non-state testing bodies. They offer a variety of different tests of higher education institutions (as well) and therefore allow for a standardized assessment among students that meets the quality criteria of direct

assessment. The mostly national use of these services enables the comparison of degree courses and higher education institutions.

The available range includes tests for assessing generic and domain-specific skills and knowledge, mainly used for cross-sectional, but also partly used for longitudinal comparisons among students. Although the "Collegiate Assessment of Academic Proficiency" (CAAP) is suitable for measuring generic skills such as writing, reading and calculating (cf. ACT, n.d.), the "Major Field Tests" (MFT) (Educational Testing Service (ETS), n.d.b) are suitable for sampling domain-specific skills and knowledge such as factual knowledge, analytical skills and problem-solving abilities in certain domains. A subject-specific elaboration is available for several disciplines[5]. Further tests exist that assess generic (e.g. writing ability) and context-related abilities (e.g. critical thinking in a humanistic context) (see ETS and the College Board (n.d.) for the "Measure of Academic Proficiency and Progress"(MAPP); Borden and Owens (2001) for "Tasks in Critical Thinking"; and Council for Aid to Education (CAE) (n.d.) for "Collegiate Learning Assessment" (CLA)[6]). The underlying test form varies, namely multiple choice tests (MFT), open-ended formats (Tasks in Critical Thinking, CLA) and combinations of the two (CAAP) were used.

American assessment instruments are also available that were designed for specific deployment in *particular areas*. At a teacher level, there is, for example, the "Test of Teaching Knowledge" (TTK). This analyzes the characteristics of the content knowledge and pedagogical content knowledge among teachers of different subjects such as mathematics, natural sciences and others (cf. Council of Chief State School Officers, n.d.). This assessment is criterion-oriented and based on core values established by the INTASC states (Interstate New Teacher Assessment and Support Consortium). The study by Hill, Rowan and Ball (2005) strives to gain empiric results on the use of teaching quality by measuring the mathematic content knowledge of teaching staff and its effects on students' mathematical achievements. A further area specific test is the "Test of Understanding of College Economics"(TUCE). This analyzes the micro- and macro-economic knowledge of economics students in a cross-sectional and longitudinal comparison (cf. Walstad & Rebeck, 2008).

The use of standardized assessment projects is also found in *Central and South America* (cf. Table 3a regarding "local scope"). *Brazil* should especially be mentioned in this context. At the moment, it is the only country on the continent that has institutionalized a nationwide large-

[5] For the application of the MFT in economics, see the study conducted by Mirchandani, Lynch and Hamilton (2001), when 241 BA and MA students of business and economics were tested. There are also specific results for the fields of biology, chemistry, computer sciences, criminal law, history, literature, mathematics, music, physics, politics, psychology and sociology.

[6] On content as well as on measuring the methodology of CLA, see Klein, Benjamin, Shavelson & Bolus (2007) and Roger and Hersh (2003).

scale assessment of the academically imparted skills and knowledge of students. The test is compulsory for students of all higher education institutions. The deployment of the "*Exame Nacional de Cursos* (ENC)" provides data on the domain-specific competencies of all students from 26 different disciplines. The "*Exame Nacional de Desempenho dos Estudantes* (ENADE)" furthermore collects information on general content knowledge (on social diversity and biodiversity, law and order etc.) as well as the generic skills (e.g. logical thinking) of students at entry and graduation level (cf. Fundação Cesgranrio, n.d.; Fundação Cesgranrio & Cespe, n.d.). Similar forms of assessment can be found in *Mexico*. Higher education institutions there can decide whether they take part in the national assessment. Three multiple choice test methods are mainly used at Mexican higher education institutions: (1) the "*Examen General para el Egreso de la Licenciatura* (EGEL)" surveys the domain-specific competencies of students from 33 different (non-technical) disciplines in the form of a BA final examination, (2) the "*Examen Nacional de Ingreso al Posgrado* (EXANI-III)" assesses the generic competencies of students who apply for postgraduate courses and (3) the "*Exámenes General espara el Egreso del Técnico Superior Universitario* (EGETSU)" measures the domain-specific and generic competencies as well as general content knowledge of students from 19 technical disciplines (cf. Centro Nacional de Evaluación para la Educación Superior (CENEVAL), n.d.a–c).

In *Australia,* higher education institutions are free to decide to take part in a nationwide organized survey. The "Graduate Skills Assessment" (GSA) test is conducted twice a year. The instrument consists of closed-ended and open-ended items and measures the generic skills "writing and problem-solving ability, critical thinking and social skills" of students at entry and graduation level (cf. Graduate Careers Australia (GCA), n.d.). Further research initiatives target the development of new tests. One initiative concentrates on the conceptualization of the national "Tertiary Engineering Capabilities Assessment" (TECA) that was especially designed for engineering sciences and is also being used as part of the AHELO study (see below) (cf. Coates & Radloff, 2008). A further initiative is the "Work Readiness Assessment Package" that assesses different parameters (such as basic competencies, occupational thinking and others) and concentrates its contents and methods on the professionalism of students (cf. Coates & Edwards, 2008).

Direct Assessment of Competencies – International Research Projects

After the mainly country-specific studies now follows an analysis of cross-national studies. In this field of research, significant international cooperation exists where methods of direct assessment are applied. First, in the field of *teacher education* the "Teacher Education and Development Study in Mathematics (TEDS-M)", which was initiated by the International

Association for the Evaluation of Educational Achievement (IEA), should be mentioned[7]. The aim of this international large-scale comparative study is to obtain knowledge about the efficiency of teacher education based on the already established studies in the area of education, TIMSS and PISA. Prospective mathematics teachers for primary schools and lower secondary schools from 17 countries[8] were tested in regard to their content knowledge, pedagogical content knowledge, pedagogical knowledge and their beliefs and learning opportunities (cf. Blömeke, Kaiser & Lehmann, 2010). The structure of the used test was set up according to a theoretical model of professional action competence based on Shulman (1987) and Weinert (2001). This study can be regarded as an outstanding pioneer in the field of international comparative assessment in higher education institutions. However, it only focuses on a small number of subjects.

A further currently established research initiative has proven to be highly innovative, namely the OECD's AHELO study (OECD, 2009)[9]. The study's main objective is *to design a cross-cultural and cross- language concept with which the generic and domain-specific learning outcomes of students from different degree courses, programs and higher education institutions can be validly assessed on an internationally comparative base*. The study is of great interest as it is not only a *summative evaluation* ("*bottom line*"), but also a *formative evaluation that assesses the added value of a university*. The feasibility study narrows down the object of study (in the form of an online test) to (generic) analytical cogitation[10]and domain-specific skills of economics and engineering sciences. At the same time, students (sample size approximately 10,000–30,000) are questioned on general conditions such as structural and cultural characteristics (e.g. financial support from parents) and interpersonal attitudes (e.g. satisfaction). Until today, 11 OECD countries from all continents have confirmed their participation. They are all responsible for the conceptual and measuring-methodical design of this comprehensive feasibility study (on the conceptualization of an engineering-specific assessment design cf. the already mentioned Australian activities)[11]. These cross-country initiatives are very important developments in the

[7] On the pre-study of TEDS-M, the "Mathematics Teaching in the 21st Century (MT21)" study, where prospective lower secondary school mathematics teachers from six countries (Germany, Bulgaria, Mexico, South Korea, Taiwan and the USA) were tested and surveyed, see Blömeke, Kaiser & Lehmann (2008).

[8] The 17 participating countries were Botswana, Chile, Germany, Georgia, Canada, Malaysia, Norway, Oman, the Philippines, Poland, Russia, Switzerland, Singapore, Spain, Taiwan, Thailand and the USA.

[9] Two large-scale OECD studies on the assessment of competencies (PIAAC and IALS), which do not represent original higher education-related studies but concentrate on adults in general as objects of analysis, are OECD (2004) and OECD (n.d.).

[10] For the acquisition of analytical thinking, the American CLA test is used in an adapted form, i.e. it is adjusted for the international context.

[11] The participating countries of Finland, Korea, Mexico and Norway primarily address generic competencies; Australia, Japan and Belgium address engineering competencies; Italy, Mexico and the Netherlands address economical competencies.

current research landscape and have great potential regarding new concepts and methods. It cannot be said with certainty if this approach can match the complexity and multidimensionality of this field of research. Not only country-specific but also top-down regional and higher education and course-specific improvements pose too high a challenge to current research to be realized adequately.

The presented international research initiatives show how insufficient and alarming the state of the German higher education research landscape is. Therefore, it is important to initiate research programs that contribute to the national classification and stabilization of conceptual and measuring-methodical bases for the direct assessment of the higher education system (which already features a high degree of complexity). These should be adaptable to international innovative research activities. In a first step, it is necessary to focus on the research activities in individual countries and to analyze them according to their suitability for the German context. They can then be adapted, enhanced and implemented. This will create the preliminary conditions for further steps at the national level. Cross-national activities will follow according to the international movement. In the specific area of mathematics teacher education, this has already been implemented successfully (cf. the already mentioned projects MT21, TEDS-M and TEDS-LT).

After Germany and Europe, international fields of research that meet the reference criterion at least with respect to certain sub-criteria will now be discussed. Owing to the great number of findings from large-scale direct assessments on academically imparted performances, only a short overview can be offered.

Diagnosis of Scholastic Aptitude / Prediction of Student's Success

The SAT test, which is used nationally in the USA, is exemplary for international designs on scholastic aptitude. Next to generic tests for measuring writing, reading and calculating skills there exist special subject tests that measure domain-specific skills for the subjects of English, history and social affairs, mathematics, natural sciences and languages (cf. College Board, n.d.; Cohn & Johnson, 2006). The state of Texas uses the "Texas Academic Skills Program" (TASP), which is comparable to the common SAT test (cf. High, 2002). In the *USA*, *Canada* and other countries the "Graduate Record Examination" (GRE) for measuring generic skills of applicants for graduate schools is used (cf. ETS, n.d.a). Furthermore, the *Australian* "unites" should be mentioned as an aptitude test that also allows for predictions about the generic skills of prospective students (cf. ACER, n.d.).

Indirect Assessment of Competencies

Similar to the test-based (direct) survey for the assessment of academically imparted competencies, (indirect) competence assessment methods, which are mainly based on questionnaires, are very popular internationally (cf. Table 3a regarding "instrument"). In the *USA* and in *Canada,* the "National Survey of Student Engagement" (NSSE) is applied as a central survey (cf. National Center for Higher Education Systems (NCHEMS), n.d.). First- and last-year students are questioned about their study-related attitudes, expectations and activities. A domain-specific survey in *Canada* (Ministry of Advanced Education, British Columbia, 2008) refers to "English as a Second Language" (ESL). Students were questioned on their experiences and learning progress in their courses of study and on further aspects (i.e. motivation of participation, financial situation). In *Australia,* the "Course Experience Questionnaire" (CEQ) provides similar surveys on the output of specific study programs (cf. Graduate Careers Australia (GCA), n.d.).

"The Valid Assessment of Learning in Undergraduate Education" (VALUE) shows another research development in the USA (cf. Association of American Colleges and Universities (AAC&U), 2009). The pursued research approach prefers a valid assessment of competencies using *multiple expert opinions (external assessment)* and the *self-reflections of students (self-evaluation*) to establish standardized tests. Individual and systemic targets should be reached that enhance learning processes through formative evaluation (especially by stimulating self-reflection) and that strive for a comparability of different higher education systems. Defined competencies are assessed with the help of *electronic portfolios*. Nine meta-categories[12] (analytical skills, critical thinking, creativity, etc.) have been additionally defined next to the central competence area of "intellectual and practical skills". Four meta-categories (social commitment, moral concepts, etc.) have been added to the competence area of "individual and social responsibility". "Integrative learning" represents a further meta-category. An operationalization of these categories exists with regard to the core criteria, for which four different levels can be distinguished. At present, the VALUE study is in the pilot and validation phase for the conceptualized (cross-domain) meta-categories.

Furthermore, country-specific (and cross-country) research activities can be found in the field of *teacher education*. These all formatively analyze the development of the central competencies of prospective teachers with respect to certain teaching and learning methods and professionalization measures (for the subject chemistry, see the Israeli study by Mamlok-

[12] The term "meta-category" is used as it is the duty of higher education institutions to define these areas regarding university requirements (language, context, aims, etc.).

Naaman, Taitelbaum, Carmeli & Hofstein (2006), the Turkish study by Pitton (2005) and the American study by Veal (2004); for the subject foreign languages, see the German-American study by Müller-Hartmann (2005)).

The large-scale *cross-country* REFLEX study of the acquisition of required and acquired comprehensive (flexible) competencies should be emphasized within the modern knowledge-based society (Allen & van der Velden, 2005). A total of 36,000 university graduates from *15 mainly European countries*[13] were interviewed about their competence evaluation and the connection between structural factors such as university and labor market. The "cross-continent EU simulation" (EuroSim 2007) study, an initiative by the Trans-Atlantic Consortiums for European Union Studies and Simulations (TACEUSS), is a further new relevant research program (cf. Jones, 2008). It aims at investigating the effectiveness of using simulations as a teaching and learning method. Therefore, students from *13 American and nine European* EuroSim partner universities were interviewed about their learning behavior before and after the introduction of the simulation method. Positive effects on learning behavior were identified[14].

Graduate Student Surveys

Graduate student surveys are internationally well-established research projects (cf. Table 3c). One example is the *Australian* "Graduate Destination Survey" (GDS) (cf. Graduate Careers Australia (GCA), n.d.). Graduates from all disciplines were interviewed about their job situations four months after graduation (sector, annual income etc.). Similar studies can be found in *Canada* (cf. NGS survey, Statistics Canada (StatCan) for HRDC, n.d.a)[15], cross-national surveys exist for the *African continent* (cf. the AAU project according to Mugabushaka, Schomburg and Teichler (2007)), numerous *European countries* and *Japan* (cf. the CHEERS study according to Schomburg and Teichler (2006)).

University Rankings

University rankings contribute greatly to the research-based definition of the national, European and international university landscapes (cf. Tables 3d, e.g. the US News and World Report: America's Best Colleges, the Times Higher Education Supplement and the Academic

[13] The following countries took part in the REFLEX study: Belgium, Germany, Estonia, Finland, France, Italy, Japan, the Netherlands, Norway, Austria, Portugal, Switzerland, Spain, Czech Republic and the United Kingdom. A parallel project is being conducted in Russia and Latin America.

[14] For a further large-scale but not primarily higher education-related survey (ALL) in which the linguistics and numerical skills of adults from six different countries (Bermuda, Canada, Italy, Norway, Switzerland, the USA) are analyzed, cf. IES National Center for Educational Statistics (n.d.).

[15] For a further Canadian graduate student survey, which does not only concentrate on university graduates but rather on adolescents in general, see Statistics Canada (StatCan) for HRDC (n.d.b).

Ranking of World Universities (Shanghai)). However, as at the German and European scale, they are being critically discussed regarding their informational value (cf. Carey, 2006; Liu & Liu, 2005; Yonezawa, Nakatsui & Kobayashi, 2002). The comparative study by Guarino, Ridgeway, Chun and Buddin (2005) should also be mentioned. The authors clearly emphasize the problems of traditional university rankings based on *weighted and cumulated input factors in contrast to output-oriented university comparisons*. Comparative intra-national and international university research requires broad and intensive efforts to assess the skills of students and the actual outcomes of universities. Only if such a foundation is based on appropriate methods can acceptable and sound conclusions be reached. Such a foundation is indispensable in order to develop the necessary and sustainable measures to improve the university sector. Otherwise, this could partly lead to serious aberrations because of their speculative character, as has been shown clearly on many occasions.

4 Conclusion

This paper showed the research deficits on "the Assessment of (Domain-specific and Generic) Competencies among Students and Graduates of Different Fields" at a European level (incl. Germany) (cf. Tables 1a and 2a). Although the assessment of competencies has become central in the course of the TIMSS and PISA study at a school level, it has been fairly neglected in the higher education sector. In this globalized knowledge-based society, professional requirements to the labor market change rapidly and become increasingly complex. Therefore, the higher education sector and subsequent formal and informal (further) educational processes should be included more in (comparative) research under the guiding principle of "lifelong learning". Effectiveness has to be tested in order to find evidence of *actual* output or outcome of a still heterogeneous higher education landscape – despite educational policy efforts. Subsequently, structural and individual improvements can be made. The state of research shows that competence assessment among students and graduates sets complex demands for assessment and evaluation methods. Nonetheless, the numerous international research studies show that these demands can be met with relatively high efforts (cf. the findings in Table 3a).

After the multi-perspective analysis of the current state of research on relevant topics (cf. Tables 1–3), further initiatives will be recommended to gain a successful, sustainable and internationally compatible research program. In order to close the research gap in Germany, projects will be recommended that can contribute to more systematic and more stabilized concepts and assessment methods. International research offers a useful guideline that should

be adopted and developed further. Success will only be achieved when the necessary material and staff conditions are met and descriptions are empirically grounded in order to meet the international standard. The following recommendations for further research projects follow the compulsory steps for valid competence assessments (cf. Hartig, Klieme & Leutner, 2008).

1. Theoretical Conceptualization

a) Domain-Specific Competence Models

Theoretical models are indispensable for valid analyses. The object of study "the (domain-specific and generic) competencies of students and university graduates of various disciplines" first needs to be defined more clearly. Focusing on "skills and knowledge" can be a useful limitation as the cognitive component of the comprehensive term competencies – that is "(procedural) skills and (declarative) knowledge" – becomes the object of study. This limitation proves to be sensible as the genuine teaching role of universities lies in teaching specific skills and knowledge that creates academic expertise. However, it shows that focusing on the assessment of generic skills and knowledge (e.g. general problem-solving ability and analytical skills) does not fulfill the requirements for the acquisition of a valid information base. Generic competencies are indeed highly relevant as international research projects show (cf. the CAAP test from the USA). In order to raise their significance they need to be complemented by central domain-specific skills and knowledge (cf. MFT, ENC and EGEL from USA, Brazil and Mexico, which exclusively feature a domain reference as well, as the Brazil ENADE test and the AHELO study, which analyze generic and domain-specific competencies).

Research projects should be initiated that focus on the theoretical modeling of academically imparted *generic* skills and knowledge (e.g. analytic cogitation according to the AHELO study) and particularly on *domain-specific* skills and knowledge. A domain-specific competence model is characterized by a clear structure – that is, the type and number of different competence dimensions in a specific domain – and by a clear classification – i.e. which situations need to be managed with which individual levels or profiles of competencies. Not only institutional requirements (cf. the qualification frame for German university degrees (Qualifikationsrahmen für Deutsche Hochschulabschlüsse)), but also subject specifics (curricular aspects, content area, situational imbedding) and cognitive levels must be considered. For developing adequate models, it is indispensible to cooperate systematically with (higher education) specialists on didactics. Regarding the high diversity of the disciplines and their state-specific and higher education-specific realization it seems necessary to induce a consensus that is accepted

nationwide by specialists on didactics of one discipline (as is documented for economics in the USA; cf. Walstad & Rebeck, 2008).

The expertise of psychologists should be consulted in order to develop the cognitive component. New research projects should be designed to benefit from international preliminary works from various disciplines and these should be analyzed, adapted and developed further regarding their suitability for the German context (e.g. economic and engineering conceptualization in the context of the AHELO study as well as approaches for scientific subjects from Sweden and the Netherlands). National discipline-specific research at a school level should be tied in as well (cf. Table 1b). Synergies between related disciplines should be created to avoid unnecessary parallel or double research (e.g. mathematics teaching degree (handled by "educational sciences") and mathematics as an individual degree course (handled by the discipline "mathematics")).

Generally, it is recommended to adjust the initiation of projects to the significance of the disciplines. A (quantitative) criterion could be the total number of matriculated students of one discipline. According to one of the latest publications of the German Federal Statistical Office (Destatis, 2011), primary projects should focus on the disciplines of law, economics and social sciences (683,146 students), on linguistic and cultural studies (430,743 students), and on engineering (426,692 students) as well as mathematics and natural sciences (389,231 students). The given structure of a domain that facilitates a (theoretical and measuring-methodical) conceptualization can also be a (qualitative) criterion. Mathematics, natural sciences and psychology stand out as particularly structured disciplines. Preliminary studies on mathematics and natural sciences (at least in the context of educational studies) show that their structure favors complex (theoretical and measuring-methodical) conceptualization. It is thus recommended to prefer the qualitative criterion to the quantitative one.

b) Multidisciplinary Framework

With the development of domain-specific competence models for relevant German higher education disciplines, foundations can be created that – given they are adequately assessed (cf. point 2) – meet the purpose of an individual competence assessment (longitudinally for the period of study as well as a cross-sectional comparison of students of the same degree course and university). If the balancing of learning outcomes at a system level was the research objective as in the case of a "higher education PISA", it would require the *conceptualization of a multidisciplinary framework*. This comprises the discussed domain-specific skills and knowledge and includes far more factors (attitudes, courses of study, professional careers, curricula,

teaching performances etc.). Thus, an (umbrella) project should be initiated, which by developing a superior conceptualization, creates a systematic framework for further individual projects in this area. Furthermore, the project should develop and test a pre-structured approach for the implementation of a large-scale design. Owing to curricular divergences between individual domains, it is recommended to carry out a *domain-specific balancing of academically imparted learning outcomes.*

The existing expertise of international studies such as PISA and national studies such as VERA should be used, because (with the exception of the mentioned TEDS study from the academic teacher level) up to now large-scale assessments mainly come from the school level. Furthermore, the experiences of the mentioned related (higher education) research areas should be used, such as graduate student surveys (e.g. HIS), university rankings (e.g. student survey of the task group for university research of the University of Constance) and the indirect assessments of competencies (e.g. BEvaKomp). In these fields, useful expertise exists that can be used to create a concept.

A large-scale direct assessment of the (generic and domain-specific) competencies of students from different degree courses and universities can only be used to generate educational-political knowledge if the particular contextual conditions are being analyzed. Therefore, further context characteristics need to be defined. Based on the state of research, the following characteristics are regarded as relevant: (1) *non-cognitive competencies* such as (study-related and occupational) attitudes, interests and motivation; (2) *socio-biographic data* (alongside central characteristics such as age, sex etc., especially course of school and study, professional careers) of students and university graduates; (3) *degree course and higher education-specific data* (curriculum, teaching performance, learning opportunities/infrastructure, regional characteristics etc.) as well as (4) *required (generic and domain-specific) competencies* from the perspective of global employers. A (sub-)project could develop the conceptualization for a nationwide “mapping” in order to systemize and structure this differentiated and causally determined object of study. (cf. the CHEPRA activities for a pan-European “mapping“).

The complexity and multidimensionality of the object of study, which does not only become apparent because of the multidisciplinary structure, but already in relation to the domain-specific competence modeling, requires an equally complex and multidimensional assessment realization (cf. point 2). This particularly requires the expertise of *statisticians and psychometrics* experts.

2. Implementation of Measuring Methods

a) Domain-Specific Competence Models

Theoretic competence models that allow statements about the structure, levels and development of (generic as well as domain-specific) competencies provide the necessary conditions for the generation of suitable measuring instruments. In order to guarantee an adequate transfer of (one or multidimensional) competence constructs into concrete measuring methods adequate psychometric assessment models are required.

In particular, domain-specific competence models demand a *highly psychometric*, adequate implementation. Therefore, not only personal (latent) characteristics but also situational standards need to be captured. Psychometric models that meet these conditions are mostly based on the item response theory. Regarding the lack of research on domain-specific competence modeling, it is no wonder that research on measuring models for the university level is also not provided (an exception is, for example, the study by Guarino et al., 2005). Research needs to be conducted that focuses on the necessary demanding psychometric models (cf. Alisch, Hermkes & Möbius, 2009a, b). The existing expertise from completed school-related studies should be used systematically – even more than regarding theoretical competence modeling. A lot can be transferred from the school sector, as it is mainly a matter of statistical-psychometrical conceptualizations.

Based on theoretic and psychometric modulations, *concrete measurement methods* are needed. In the case of a large-scale assessment of domain-specific skills and knowledge, the main research interest should be the development of *standardized (domain-specific) tests*. At the German level, preliminary works from the area of teacher education should be focused on (in the context of the TEDS studies). At the international level, current research activities (AHELO study) as well as discipline-specific tests from the USA, Brazil and Mexico (e.g. MFT, ENC, EGEL) provide a relevant reference. Experts (higher education lecturers), specialists on didactics and global employers need to cooperate in order to practically substantiate theoretical and psychometrical models.

The state of research shows that particular attention must be paid to the respective *item formats*. A closed format should be preferred in a large-scale assessment (and the related reasons for objectiveness and economy) and during the recourse on findings on the overestimation of information gain by open-ended formats (cf. Baumert & Köller, 1998). However, because of widespread open-ended formats in the international context (e.g. CLA, CAAP, MAPP) as well as the latest findings on the discrimination of prospective female students

by the use of the EMS (cf. Spiel, Schober & Litzenberger, 2008) (sub-)projects should be initiated that include closed-ended as well as open-ended tests. In this way, the potentials and deficits of the formats can be tested in practice. In particular, in the case of a formative evaluation at the individual level (see above), (sub-)projects such as the VALUE overview should be initiated that deploy portfolio assessments as an alternative to standardized tests. At the same time, they can analyze the potentials of cultivating self-reflexive competencies or self-evaluation.

b) Multidisciplinary Concept

Previous considerations show the essential steps to a well-grounded assessment of domain-specific skills and knowledge in higher education. Taking these steps allows for evidence-based statements on the quality of courses and universities based on output-oriented tests. However, as mentioned under point 1b results from the assessment of competencies cannot be interpreted without a context. Therefore, (sub-)projects that take into account the multidisciplinary concept need to be initiated as well. For this purpose, the broad (partly national) expertise from the areas of indirect assessment of competencies, graduate student surveys and university rankings need to be *integrated*. The research *focus*, however, should remain primarily on the area of domain-specific competence modeling and its measuring implementation, because there is a clear lack of research in this field and systematic research progress is a pressing issue.

The following recommendations can be made with reference to the research area outlined under point 1b:

(1) At the German level (e.g. BEvaKomp, HIS surveys) as well as the European (e.g. SOMUL, CHEPRA projects) and international levels (e.g. NSSE, CEQ), numerous studies exist that focus on the indirect assessment of non-cognitive competencies such as attitudes, interests and motivation with the help of *questionnaires*. These are highly transferable. The existing survey instruments (questionnaires) should be tested, if necessary adapted (e.g. regarding linguistic and cultural aspects) and developed further in respect to their significance for the purpose of a national assessment.

(2) The same applies for measuring the socio-biographic living and working conditions of students and university graduates. These are the heart of competence-based surveys, university rankings and graduate student surveys. University rankings mainly assess the course of study, while graduate student surveys assess status passages and careers. These issues are highly transferrable – as under point 1a – and should therefore be specifically analyzed and used.

(3) University rankings provide methods to assess degree course and higher education-specific data (e.g. CHE ranking). It is also recommended to survey representatives of higher education institutions (university administration, lecturers).

(4) For assessing competencies relevant to the (domain-specific) global labor market, the study by Joumady and Ris (2005) and the REFLEX study should be consulted.

As a conclusion it can be recorded that a sample design including students, university graduates and representatives of higher education institutions and businesses is essential. Additionally, an integrative methodical concept comprising not only central domain-specific competence tests but also survey instruments for further relevant issues (see above) is highly relevant. The measuring implementation of the multidisciplinary concept exceeds the abovementioned points, because it unifies them all in an adequate design. This again requires the creation of a *comprehensible psychometric model*.

A further development perspective that should not be neglected is the *longitudinal design* of a large-scale comparative analysis. Output- or outcome-oriented competence assessments are particularly challenging for (quasi-)longitudinal models. The potential of the available statistical methods must be analyzed systematically. Adequate longitudinal designs are significant for the effective testing of higher education offers and for conclusions on the sustainable improvement of the system.

5 Bibliography

Abel, J. (2008). Der AIST als Evaluationsinstrument zur Erfassung des Berufs- und Wissenschaftsbezugs von Lehramtsstudierenden im Projekt GLANZ. In F. Hofmann (Ed.), *Qualitative und quantitative Aspekte. Zu ihrer Komplementarität in der erziehungswissenschaftlichen Forschung* (pp. 173-187). Münster: Waxmann.

Abele-Brehm, A., Spurk, D. & Uchronski, M. (n.d.). *Berufsverläufe in der Mathematik.* Universität Erlangen-Nürnberg Institut für Psychologie Lehrstuhl Sozialpsychologie. http://www.sozialpsychologie.phil.uni-erlangen.de/forschung/berufsverlaeufe-in-der-mathematik.shtml (Retrieved 19.11.2010).

ACT (n.d.). *Collegiate Assessment of Academic Proficiency (CAAP)*. http://www.act.org/caap/ (Retrieved 19.11.2010).

Alesi, B., Bürger, S., Kehm, B. M. & Teichler, U. (2005). *Bachelor- und Master-Studiengänge in ausgewählten Ländern Europas im Vergleich zu Deutschland. Fortschritte im Bolognaprozess*. Bonn, Berlin: BMBF.

Alisch, L. M., Hermkes, R. & Möbius, K. (2009a). Messen von Lehrprofessionalität I: Grundlagen. In O. Zlatkin-Troitschanskaia, K. Beck, D. Sembill, R. Nickolaus & R. Mulder (Eds.), *Lehrprofessionalität. Bedingungen, Genese, Wirkungen und ihre Messung* (pp. 249-262). Weinheim and Basel: Beltz.

Alisch, L. M., Hermkes, R. & Möbius, K. (2009b). Messen von Lehrprofessionalität II: Metrologie. In O. Zlatkin-Troitschanskaia, K. Beck, D. Sembill, R. Nickolaus & R. Mulder (Eds.), *Lehrprofessionalität. Bedingungen, Genese, Wirkungen und ihre Messung* (pp. 263-274). Weinheim and Basel: Beltz.

Allen, J., Ramaekers, G. & van der Velden, R. (2005). *Measuring Competencies of Higher Education Graduates. New Directions for Institutional Research*, 126, 49-59.

Allen, J. & van der Velden, R. (2005). *The Role of Self-Assessment of Skills. Research Centre for Education and the Labour Market*. Maastricht University (REFLEX Working paper, 2).

American Library Association (2008). *Information Literacy Competency Standards for Higher Education*. http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm (Retrieved 19.11.2010).

Andren, B. (2005). 17 Millionen Studenten an den Hochschulen der Europäischen Union. Studierende 2002/2003 - Hochschulabsolventen 2003. *Statistik kurz gefasst. Bevölkerung und soziale Bedingungen*, 19.

Artushina, I. & Troyan, V. (2007). Methods of the Quality of Higher Education Social Assessment. *Higher Education in Europe*, 32(1), 83-89.

Ashwin, P. (2008). Accounting for Structure and Agency in "Close-Up" Research on Teaching, Learning and Assessment in Higher Education. *International Journal of Educational Research*, 47(3), 151-158.

Association of American Colleges and Universities (AAC&U) (2009). The VALUE Project Overview. *Peer Review*, 11(1), 4-7.

Australian Council for Educational Research (ACER) (n.d.). *Graduate Skills Assessment (GSA)*. http://www.acer.edu.au/tests/gsa (Retrieved 19.11.2010).

Baer, M., Dörr, G. & Fraefel, U. (2006). Standarderreichung in der Lehrerinnen- und Lehrerausbildung. Analyse der Wirksamkeit der berufsfeldorientierten Ausbildung. In F. Eder (Ed.), *Qualität durch Standards? Beiträge zum Schwerpunktthema der 67. Tagung der AEPF* (pp. 237-251). Münster: Waxmann.

Bartosch, U., Maile, A. & Speth, C. (2008). *Qualifikationsrahmen Soziale Arbeit (QR SArb). Version 5.1*. www.fbts.de/uploads/media/QRSArb_Version_5.1.pdf (Retrieved 19.11.2010).

Bauer, J. (2009). *PaLea - Panel zum Lehramtsstudium*. IPN-Blätter, 26(1), 6.

Baumert, J. & Köller, O. (1998). Nationale und internationale Schulleistungsstudien. Was können sie leisten, wo sind ihre Grenzen? *Pädagogik*, 50(6), 12-18.

Beck, E., Baer, M., Guldimann, T., Bischoff, S., Brühwiler, C. & Müller, P. et al. (2008). *Adaptive Lehrkompetenz. Analyse und Struktur, Veränderbarkeit und Wirkung handlungssteuernden Lehrerwissens*. Münster: Waxmann.

Beck, K., Krumm, V. & Dubs, R. (1998). *Wirtschaftskundlicher Bildungs-Test (WBT).* Göttingen: Hogrefe.

Bergan, S. (2009). Academic Recognition: Status and Challenges. *Assessment in Education: Principles, Policy & Practice*, 16(1), 39-53.

Bernholt, S. & Parchmann, I. (2008). Die Untersuchung und Entwicklung von Kompetenz in der Chemie. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung*. Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 86).

Birtwistle, T. (1996). European Quality - Adding to the Debate? *Higher Education Review*, 28(3), 60-69.

Blömeke, S., Bremerich-Voss, A., Haudeck, H., Kaiser, G., Nold, G., Schwippert, K. & Willenberg, H. (Eds.) (2011). *Kompetenzen von Lehramtsstudierenden in gering strukturierten Domänen. Erste Ergebnisse aus TEDS-LT*. Münster: Waxmann.

Blömeke, S., Kaiser, G. & Lehmann, R. (Eds.) (2010). *TEDS-M 2008. Professionelle Kompetenz und Lerngelegenheiten angehender Mathematiklehrkräfte für die Sekundarstufe I im internationalen Vergleich*. Münster: Waxmann.

Blömeke, S., Kaiser, G. & Lehmann, R. (Eds.) (2008). *Professionelle Kompetenz angehender Lehrerinnen und Lehrer. Wissen, Überzeugungen und Lerngelegenheiten deutscher Mathematikstudierender und -refendare. Erste Ergebnisse zur Wirksamkeit der Lehrerausbildung*. Münster: Waxmann.

Blömeke, S., Zlatkin-Troitschanskaia, O., Kuhn, C. & Fege, J. (Eds.) (in press). *Modeling and Measuring Competencies in Higher Education*. Rotterdam: Sense Publishers.

Blossfeld, H.-P. (2008). *Nationales Bildungspanel (NEPS)*. BMBF. http://www.uni-bamberg.de/fileadmin/inbil/Abbildungen/NEPS_Projektvorstellung.pdf (Retrieved 19.11.2010).

Bodensohn, R. M. (2004). *Verbesserung der Beratungsqualität bei der Ausbildung beruflicher Handlungskompetenz von Lehramtsstudierenden im Kontext Schulpraktischer Studien*. Universität Koblenz, Landau, Zentrum für Lehrerbildung. http://www.lars-balzer.info/projects/verbal/VERBAL_ueberblicksrueckmeldung5.pdf (Retrieved 19.11.2010).

Borden, V. M. & Owens J. L. (2001). *Measuring Quality: Choosing Among Surveys and Other Assessments of College Quality. Tasks in Critical Thinking*. Washington, D. C.: American Council on Education and Association for Institutional Research.

Bornmann, L., Mittag, S. & Daniel, H.-D. (2006). Quality Assurance in Higher Education – Meta-Evaluation of Multi-Stage Evaluation Procedures in Germany. *Higher Education: The International Journal of Higher Education and Educational Planning*, 52(4), 687-709.

Boyle, B., Lamprianou, I. & Boyle, T. (2005). A Longitudinal Study of Teacher Change: What makes professional development effective? Report of the second year of the study. *Journal of School Effectiveness and School Improvement*, 16(1), 1-27.

Braun, E. & Hannover, B. (2008). Kompetenzmessung und Evaluation von Studienerfolg. In N. Jude, J. Hartig & E. Klieme (Eds.), *Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 153-160). Bonn, Berlin (Bildungsforschung, 26).

Brennan, J. & Jary, D. (2005). *What is learned at university? The Social and Organisational Mediation of University Learning: a research project*. London (SOMUL Working Paper, 1).

Brennan, J., Patel, K. & Tang, W. (2009). *Diversity in the student learning experience and time devoted to study: a comparative analysis of UK and European evidence*. Report to HEFCE by Centre for Higher Education Research and Information (CHERI), The Open University. http://www.tlrp-archive.org/cgi-bin/search_oai_all.pl?pn=21&no_menu=1&short_menu=1 (Retrieved 19.11.2010).

Briedis, K. (2007). *Übergänge und Erfahrungen nach dem Hochschulabschluss. Ergebnisse der HIS-Absolventenbefragung des Jahrgangs 2005*. Hannover (HIS Forum Hochschule, 13).

Briedis, K., Fabian, G., Kerst, C. & Schaeper, H. (2008). *Berufsverbleib von Geisteswissenschaftlerinnen und Geisteswissenschaftlern*. Hannover (HIS Forum Hochschule, 11).

Brunner, M., Kunter, M., Krauss, S., Baumert, J., Blum, W., & Dubberke, T. et al. (2006). Welche Zusammenhänge bestehen zwischen dem fachspezifischen Professionswissen von Mathematiklehrkräften und ihrer Ausbildung sowie beruflichen Fortbildung? *Zeitschrift für Erziehungswissenschaft*, 9(4), 521-544.

Buske, R., Förster, M., Klinke, S., Kuhn, C., Preuße, D. & Zlatkin-Troitschanskaia, O. (2011). Innovativer Lehr-Lernortverbund (ILLEV) in der akademischen Hochschulausbildung. In B. Schwarz, P. Nenniger & R. S. Jäger (Eds.), *Erziehungswissenschaftliche Forschung – nachhaltige Bildung. Beiträge zur 5. DGfE-Sektionstagung „Empirische Bildungsforschung"/AEPF-KBBB im Frühjahr 2009* (S. 27–33). Landau: Empirische Pädagogik.

Carey, K. (2006). *College Rankings Reformed: The Case for a New Order in Higher Education*. Washington D.C.: Education Sector.

Carini, R. M., Kuh, G. D. & Klein, S. P. (2006). Student Engagement and Student Learning. Testing the Linkages. *Research in Higher Education*, 42(1), 1-32.

Carrillo-de-la-Pena, M. T., Bailles, E., Caseras, X., Martinez, A., Ortet, G. & Perez, J. (2009). Formative Assessment and Academic Achievement in Pre-Graduate Students of Health Sciences. *Advances in Health Sciences Education*, 14(1), 61-67.

Center for Higher Education (CHEPS) (2009). *CHEPS and CHE to take the leading role in a new EC funded project to develop a multi-dimensional global university ranking. The CHERPA-Network wins a European tender to develop a multi-dimensional global ranking of universities*. Unter Mitarbeit von Frank Ziegele und Frans van Vught. University of Twente. http://www.utwente.nl/cheps/news/MGUR/ (Retrieved 19.11.2010).

Centro Nacional de Evaluación para la Educación Superior (CENEVAL) (n.d.a). *Examen General Para el Egreso de la Licenciatura (EGEL).* http://www.ceneval.edu.mx/ceneval-web/content.do?page=1676 (Retrieved 19.11.2010).

Centro Nacional de Evaluación para la Educación Superior (CENEVAL) (n.d.b). *Examen Nacional de Ingreso al Posgrado (EXANI-III).* http://www.ceneval.edu.mx/ceneval-web/content.do?page=1675 (Retrieved 19.11.2010).

Centro Nacional de Evaluaciòn para la Educación Superior (CENEVAL) (n.d.c). *Exámenes Generales para el Egreso del Técnico Superior Universitario (EGETSU).* http://www.ceneval.edu.mx/ceneval-web/content.do?page=2098 (Retrieved 19.11.2010).

Cheng, Y. & Liu, N. C. (2007). Academic Ranking of World Universities by Broad Subject Fields. *Higher Education in Europe*, 32(1), 17-29.

Chun, M. (2002). Looking Where the Light Is Better. A Review of the Literature on Assessing Higher Education Quality. *Peer Review* (Winter/Spring), 16-25.

Clarke, M. (2002). Some Guidelines for Academic Quality Rankings. *Higher Education in Europe*, 27(4), 443-459.

Clermont, M. & Höfer, Y. (n.d.). *Lehrerfolg - Messung des Lehrerfolgs als Teilaufgabe eines umfassenden Fakultätscontrollings*. http://www.empirische-bildungsforschung-bmbf.de/zeigen.html?seite= (Retrieved 19.11.2010).

Coates, H. (2009). What's the Difference? A Model for Measuring the Value Added by Higher Education in Australia. *Higher Education Management and Policy*, 21(1), 69-88.

Coates, H. & Edwards, D. (2008). *Work Readiness Assessment Package (WRAP).* Camberwell: Australian Council for Educational Research (ACER).

Coates, H. & Radloff, A. (2008). *Tertiary Engineering Capability Assessment. Concept Design*. http://dtl.unimelb.edu.au/view/action/singleViewer.do?dvs=1319034633735~437&locale=de_DE&VIEWER_URL=/view/action/singleViewer.do?&DELIVERY_RULE_ID=7&search_terms=SYS%20=%20000022927&adjacency=N&application=DIGITOOL-3&frameId=1&usePid1=true&usePid2=true (Retrieved 19.11.2010).

Cohn, E. & Johnson, E. (2006). Class Attendance and Performance in Principles of Economics. *Education Economics*, 14(2), 211-233.

College Board (n.d.). *SAT*. http://www.collegeboard.com/ (Retrieved 19.11.2010).

Commission on Higher Education (Middle States Association of Colleges and Schools) (1996). *Framework for outcomes assessment*. http://autoestudio.uprrp.edu/publicacionspdf/msafram.pdf (Retrieved 19.11.2010).

Contreras, A. (2008). International Quality Control Is No Easy Task. *Chronicle of Higher Education*, 54(38).

Council for Aid to Education (CAE) (n.d.). *Collegiate Learning Assessment (CLA).* http://www.collegiatelearningassessment.org/ (Retrieved 19.11.2010).

Council of Chief State School Officers (CCSSO) (n.d.). *INTASC Portfolio Development.* http://programs.ccsso.org/projects/interstate_new_teacher_assessment_and_support_consortium/projects/portfolio_development/ (Retrieved 19.11.2010).

Creech, A., Papageorgi, I., Duffy, C., Morton, F., Haddon, L. & Potter, J. et al. (2008). Investigating musical performance: commonality and diversity among classical and non-classical musicians. *Music Education Research*, 10(2), 215-234.

Daugherty, R., Black, P., Ecclestone, K., James, M. & Newton, P. (2008). Alternative Perspectives on Learning Outcomes: Challenges for Assessment. *Curriculum Journal*, 19(4), 243-254.

Destatis (Statistisches Bundesamt Deutschland) (2011). *Studierende – insgesamt nach Fächergruppen*. http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Cotent/Statistiken/BildungForschungKultur/Hochschulen/Tabellen/Content50/StudierendeInsgesamtFaechergruppe,templateId=renderPrint.psml (Retrieved 19.11.2010).

Deutsche Forschungsgemeinschaft (DFG) (2008). *DFG-Fachsystematik nach Fächern, Fachkollegien, Fachgebiete und Wissenschaftsbereiche* (Stand: 06/2008). http://www.dfg.de/dfg_im_profil/zahlen_und_fakten/download/dfg_fachsystematik_08_11.pdf (Retrieved 19.11.2010).

Dickhäuser, O., Schöne, C., Spinath, B. & Stiensmeier-Pelster, J. (2002). Die Skalen zum akademischen Selbstkonzept. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 23(4), 393-405.

Dickson, G. E. & Wiersma, W. (1980). *Research and Evaluation in Teacher Education: A Concern for Competent, Effective Teachers*. Center for Educational Research and Services. Toledo, OH. University of Toledo, Center for Educational Research and Services.

Eccles, C. (2002). The Use of University Rankings in the United Kingdom. *Higher Education in Europe*, 27(4), 423-432.

Educational Testing Service (ETS) (n.d.a). *Graduate Record Examination (GRE) General Test*. http://www.ets.org/portal/site/ets/menuitem.fab2360b1645a1de9b3a0779f1751509/ (Retrieved 19.11.2010).

Educational Testing Service (ETS) (n.d.b). *Major Field Tests*. http://www.ets.org/portal/site/ets/menuitem.1488512ecfd5b8849a77b13bc3921509/?vgnextoid=f119af5e44df4010VgnVCM10000022f95190RCRD&vgnextchannel=86f346f1674f4010VgnVCM10000022f95190RCRD (Retrieved 19.11.2010).

Educational Testing Service (ETS) and the College Board (n.d.). *Measure of Academic Proficiency and Progress (MAPP)*. http://www.ets.org/portal/site/ets/menuitem.1488512ecfd5b8849a77b13bc3921509/?vgnextoid=ff3aaf5e44df4010VgnVCM10000022f95190RCRD&vgnextchannel=f98546f1674f4010VgnVCM10000022f95190RCRD (Retrieved 19.11.2010).

Educational Testing Service (ETS) (2007). *Measure of Academic Proficiency and Progress (MAPP). Educational Testing Service (ETS)*. http://www.ets.org/Media/Tests/MAPP/pdf/ (Retrieved 19.11.2010).

Eggert, S., Gausmann, E., Hasselhorn, M., Watermann, R. & Bögeholz, S. (2008). Entwicklung eines Messinstruments zur Analyse von Bewertungskompetenz bei Schüler(innen) sowie Studierenden. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 285).

Eilerts, K. & Rinkens, H.-D. (2008). Mehrebenenanalytische Untersuchung der Entwicklung und Implementierung von Kompetenzen an der Universität Paderborn im Fach Mathematik. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 298).

Eilks, I. & Ralle, B. (Eds.) (2006). *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006*. Aachen: Shaker.

Falk, S., Reimer, M. & Hartwig, L. (2007). Absolventenbefragung für Hochschulen und Bildungspolitik: Konzeption und Ziele des "Bayerischen Absolventenpanels". *Beiträge zur Hochschulforschung*, 29(1), 6-33.

Fastre, G., Gijselaers, W. H. & Segers, M. (2008). Selection to Ensure Study Success: Looking for Multiple Criteria in the Case of a European Master of Science Program in Business. *Journal of Education for Business*, 84(1), 47-54.

Federkeil, G. (2002). Some Aspects of Ranking Methodology - The CHE-Ranking of German Universities. *Higher Education in Europe*, 27(4), 389-397.

Fehring, G., Rosendahl, J. & Straka, G. A. (2008). Lernförderliche Kontextbedingungen für die berufliche Fachkompetenz am Beispiel angehender Bankkaufleute. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 152).

Filinov, N. B. & Ruchkina, S. (2002). The Ranking of Higher Education Institutions in Russia: Some Methodological Problems. *Higher Education in Europe*, 27(4), 407-421.

Frey, A. (2008). *Kompetenzstrukturen von Studierenden in der ersten und zweiten Phase der Lehrerbildung. Eine nationale und internationale Standortbestimmung*. Landau: Empirische Pädagogik.

FUNDAÇÃO CESGRANRIO (n.d.). *Exame Nacional de Cursos (ENC or "Provão")*. http://www.inep.gov.br/superior/provao/default.asp (Retrieved 19.11.2010).

FUNDAÇÃO CESGRANRIO and CESPE (n.d.). *Exame Nacional de Desempenho dos Estudantes (ENADE).* http://www.inep.gov.br/superior/enade/default.asp (Retrieved 19.11.2010).

Gehrmann, A. (2007). Kompetenzentwicklung im Lehramtsstudium. Eine Untersuchung an der Universität Rostock. In M. Lüders & J. Wissinger (Eds.), *Forschung zur Lehrerbildung. Kompetenzentwicklung und Programmevaluation* (pp. 85-102). Münster: Waxmann.

Geißel, B. & Nickolaus, R. (2008). Kompetenzmodellierung und Kompetenzentwicklung in der gewerblich-technischen Grundbildung. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung*. Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 150).

Gembris, H. & Langner, D. (2005). *Von der Musikhochschule auf den Arbeitsmarkt. Erfahrungen von Absolventen, Arbeitsmarktexperten und Hochschullehrern*. Augsburg: Wißner.

Gold, A. & Souvignier, E. (2005). Prognose der Studierfähigkeit. Ergebnisse aus Längsschnittanalysen. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 37(4), 214-222.

Graduate Careers Australia (GCA) (n.d.). *Australian Graduate Survey*. http://www.graduatecareers.com.au/Research/Surveys/AustralianGraduateSurvey/index.htm (Retrieved 19.11.2010).

Gräsel, C., Krolak-Schwerdt, S., Nölle, I. & Hörstermann, T. (2010). Diagnostische Kompetenz von Grundschullehrkräften bei der Erstellung der Übergangsempfehlung. Eine Analyse aus der Perspektive der sozialen Urteilsbildung. Projekt Diagnostische Kompetenz. In E. Klieme, D. Leutner & M. Kenk (Eds.), *Kompetenzmodellierung. Zwischenbilanz des DFG-Schwerpunktprogramms und Perspektiven des Forschungsansatzes* (pp. 286-295). Weinheim, Basel: Beltz. (*Zeitschrift für Pädagogik*, Beiheft 56).

Grayson, J. P. (2008). Sense of coherence and academic achievement of domestic and international students. A comparative analysis. *Higher Education*, 56(4), 473-492.

Guarino, C., Ridgeway, G., Chun, M. & Buddin, R. (2005). Latent Variable Analysis: A New Approach to University Ranking. *Higher Education in Europe*, 30(2), 147-165.

Hagemann, S. (2006). Studien- und Berufswege im Übersetzen und Dolmetschen: Eine Germersheimer Umfrage. *Lebende Sprachen*, 51(1), 13-21.

Hansen, H. F. (2009). Educational Evaluation in Scandinavian Countries: Converging or Diverging Practices? Scandinavian *Journal of Educational Research*, 53(1), 71-87.

Hartig, J., Klieme, E. & Leutner, D. (Eds.) (2008). *Assessment of Competencies in Educational Contexts*. State of Washington, Göttingen: Hofgrefe & Huber Publishers.

Heger, H. K. (1991). *Designing a Mathematics Predictor Test for the TASP (Texas Academic Skills Program) Test*. Paper presented at the Annual Meeting of the Southwest Educational Research Association. San Antonio, TX.

Heine, C., Kerst, C. & Sommer, D. (2007). *Studienanfänger im Wintersemester 2005/06. Wege zum Studium, Studien- und Hochschulwahl, Situation bei Studienbeginn*. Hannover (HIS Forum Hochschule, 1).

Henn, G. & Polaczek, C. (2007). Studienerfolg in den Ingenieurwissenschaften. *Das Hochschulwesen*, 55(5), 144-147.

Henze, I. & van Driel, J. H. (2006). The Development of Experienced Science Teachers. Pedagogical Content Knowledge in the Context of Educational Innovation. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 99-112). Aachen: Shaker.

High C. F. (2002). *An Historical, Perceptive, and Qualitative Analysis of the Texas Academic Skills Program (TASP): Where Do We Go from Here?* (Paper prepared for the Annual Junior Community College Student Personnel Association of Texas (JCCSPAT)).

Higher Education Authority (HEA) (2005). *Review of quality assurance procedures in irish universities. Reflections document prepared by the high level reference panel.* http://www.hea.ie/files/files/file/archive/corporate/2005/Quality%20Assurance%20Reflections%20Document.pdf (Retrieved 19.11.2010).

Higher Education Authority (HEA) (2008). *What do Graduates do? The Class of 2006. Higher Education Authority (HEA).* http://www.hea.ie/files/files/file/statistics/48078%20HEA%20graduates%20report%2008.pdf (Retrieved 19.11.2010).

Higher Education Statistics Agency (HESA) (n.d.). *Destinations of Leavers from Higher Education (DLHE).* http://www.hesa.ac.uk/index.php?option=com_collns&task=show_colln&Itemid=232&c=C06018&s=3&wvy=any&wvs=1&isme=1 (Retrieved 19.11.2010).

Hill, H. C., Rowan, B. & Ball, D. L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. *American Educational Research Journal*, 42(2), 371-406.

Hochschul-Informations-System (HIS) (2005). *Eurostudent 2005: Social and Economic conditions of student life in Europe 2005. Synopsis of Indicators for Austria, Finland, France, Germany, Ireland, Italy, Latvia, Portugal, Spain, The Netherlands and United Kingdom (England and Wales).* http://www.dges.mctes.pt/NR/rdonlyres/C2284055-A07C-460E-BF13-E635ACCC87C9/542/EurostudenReport2005.pdf (Retrieved 19.11.2010).

Hochschulrektorenkonferenz (HRK), Kultusministerium (KMK) & Bundesministerium für Bildung und Forschung (BMBF) (2005). *Qualifikationsrahmen für Deutsche Hochschulabschlüsse.* http://www.kmk.org/fileadmin/pdf/PresseUndAktuelles/Beschluesse_Veroeffentlichungen/Hochschule_Wissenschaft/BS_050421_Qualifikationsrahmen_AS_Ka.pdf (Retrieved 19.11.2010).

IES National Center for Educational Statistics (n.d.). *Highlights From the 2003 International Adult Literacy and Lifeskills Survey (ALL)*. http://nces.ed.gov/Surveys/ALL/issuebrief.asp (Retrieved 19.11.2010).

ITB Consulting GmbH (Ed.) (2008). *Test für medizinische Studiengänge TMS.* http://www.tms-info.org/index.php?ID=10 (Retrieved 19.11.2010).

Jones, E. A. & Hoffman, S. (1995): *National assessment of college student learning. Identifying college graduates' essential skills in writing, speech and listening, and critical thinking. Final project report*. Washington DC: National Center for Education Statistics U.S. Dept. of Education Office of Educational Research and Improvement.

Jones, R. (2008). Evaluating a Cross-Continent EU Simulation. *Journal of Political Science Education*, 4(4), 404-434.

Jordan, A.-K., Knigge, J. & Lehmann-Wermser, A. (2008). Empirische Validierung eines Kompetenzmodells für das Fach Musik. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 246).

Joumady, O. & Ris, C. (2005). Performance in European Higher Education: A Non-Parametric Production Frontier Approach. *Education Economics*, 13(2), 189-205.

Kammerl, R. (2006). *Kompetenzanalyse für angehende Lehrer/innen - ein onlinebasiertes Development Center zur Bestimmung lehrerrelevanter Kompetenzen bei Lehramtsstudenten, um die Effektivität der Lehrerausbildung zu erhöhen*. http://193.175.239.23/ows-bin/owa/r.einzeldok?doknr=52906 (Retrieved 19.11.2010).

Kettunen, J. (2008). A Conceptual Framework to Help Evaluate the Quality of Institutional Performance. *Quality Assurance in Education*, 16(4), 322-332.

Klein, S. (2002). Direct assessment of cumulative student learning. (Analysis). *Peer Review*, 4(2/3), 26-28.

Klein, S. P., Benjamin, R., Shavelson, R. & Bolus, R. (2007). The Collegiate Learning Assessment. Facts and Fantasies. *Evaluation Review*, 31(5), 415-439.

Klein, S. P., Kuh, G. D., Chun, M., Hamilton, L. & Shavelson, R. (2005). An Approach to Measuring Cognitive Outcomes across Higher Education Institutions. *Research in Higher Education*, 46(3), 251-276.

Koch, S. (2005). Berufliches Selbstkonzept und eigenverantwortliche Leistung. *Gruppendynamik und Organisationsberatung*, 36(2), 157-174.

Kohl-Frey, O. (2007). *Informationskompetenz hinter dem Bachelor-Horizont. Ergebnisse einer Studie an der Universität Konstanz*. http://www.ub.uni-konstanz.de/kops/volltexte/2007/2412/ (Retrieved 19.11.2010).

Könekamp, B. & Glindemann, O. (2008). Empirische Lehr-Lernforschung als Beitrag zur Entwicklung einer kompetenzorientierten Lehre an technischen Universitäten. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung*. Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 275).

Kunter, M., Baumert, J., Blum, W., Klusmann, U., Krauss, S. & Neubrand, M. (Eds.), (2011). *Professionelle Kompetenz von Lehrkräften: Ergebnisse des Forschungsprogramms COACTIV*. Münster: Waxmann.

Lenzen, D., Krüger, H.-H. & Wulf, C. (2008). Editorial. *Zeitschrift für Erziehungswissenschaft*, 11(4), 513-515.

Liu, N. C. & Liu, L. (2005). University Rankings in China. *Higher Education in Europe*, 30(2), 217-227.

Maassen, P. A. M. (1997). Quality in European Higher Education: Recent Trends and Their Historical Roots. *European Journal of Education*, 32(2), 111-127.

Mallinger, R., Holzbaur, C., Dierich, M., Heidegger, M., Hänsgen, K. D. & Spicher, B. (2008). *EMS Eignungstest für das Medizinstudium in Österreich*. Zentrum für Testentwicklung Universität Fribourg/Schweiz, Medizinische Universität Innsbruck, Medizinische Universität Wien. http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf (Retrieved 19.11.2010).

Mamlok-Naaman, R., Taitelbaum, D., Carmeli, M. & Hofstein, A. (2006). A Model of Professional Development of Chemistry Teachers. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 113-124). Aachen: Shaker.

Martinez, M. (2008), Competencies and Higher Education Policy Analysts. *Educational Policy*, 22(5), 623-639.

Martinez, R. J. & Moreno, R. (2007). Validity of Academic Work Indicators in the Projected European Higher Education Area. *Higher Education: The International Journal of Higher Education and Educational Planning*, 53(6), 739-747.

Merisotis, J. P. (2002). Summary Report of the Invitational Roundtable on Statistical Indicators for the Quality Assessment of Higher/Tertiary Education Institutions: Ranking and League Table Methodologies. *Higher Education in Europe*, 27(4), 475-480.

Meyer, H., Frank, G. & Janas, D. (2007). Kompetenzerwerb im Studium messen. Das Projekt "moreQ" der Hochschule Bremen. *Wissenschaftsmanagement*, 13(4), 25-32.

Ministry of Advanced Education (British Columbia) (2008). *2007 ESL Survey: 2007 English as a Second Language Student Outcomes Survey Report*. http://www.aved.gov.bc.ca/esl/docs/2007_esl_survey_report.pdf (Retrieved 19.11.2010).

Mirchandani, D., Lynch, R. & Hamilton, D. (2001). Using the ETS Major Field Test in Business: Implications for Assessment. *Journal of Education for Business*, 77(1), 51-56.

Mugabushaka, A.-M. (2005). *Schlüsselqualifikationen im Hochschulbereich. Eine diskursanalytische Untersuchung der Modelle, Kontexte und Dimensionen in Deutschland und Großbritannien*. Dissertation. Universität Kassel.

Mugabushaka, A.-M., Schomburg, H. & Teichler, U. (2007). *Higher education and work in Africa. A comparative empirical study in selected countries*. Kassel: Jenior.

Müller-Hartmann, A. (2005). Interkulturelles Lernen in internationalen Telekollaborationsprojekten. Die Entwicklung von Erfahrungswissen angehender Fremdsprachenlehrer/innen. *Fremdsprachen lehren und lernen*, 34, 192-206.

National Center for Higher Education Systems (NCHEMS) (n.d.). *National Survey of Student Engagement (NSSE).* http://nsse.iub.edu/index.cfm (Retrieved 19.11.2010).

Nedwek, B. P. & Neal, J. E. (1994). Performance Indicators and Rational Management Tools. A Comparative Assessment of Projects in North America and Europe. *Research in Higher Education*, 35(1), 75-103.

Nilsson, P. (2006). Student Teachers. Reflection. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 53-64). Aachen: Shaker.

Nusche, D. (2008). *Assessment of Learning Outcomes in Higher Education: A Comparative Review of Selected Practices*. Organisation for Economic Co-operation and Development (OECD) (OECD Education Working Paper, 15).

Oesterling, C. & Boll, T. (2008). *Absolventenstudie Rheinland-Pfalz. Landesweite Absolventenbefragung Abschlussjahrgang 2005*. http://www.hochschulevaluierungsverbund.de/Dateien/abs.pdf (Retrieved 19.11.2010).

Organisation for Economic Co-operation and Development (OECD) (n.d.). *Adult Literacy*. http://www.oecd.org/document/2/0,3343,en_2649_39263294_2670850_1_1_1_1,00.html (Retrieved 19.11.2010).

Organisation for Economic Co-operation and Development (OECD) (2004). *PIAAC Draft Strategy Paper. Policy Objects, Strategic Options and Cost Implications*. http://www.oecd.org/dataoecd/3/3/34463133.pdf (Retrieved 19.11.2010).

Organisation for Economic Co-operation and Development (OECD) (2008). *Education at a glance 2008. OECD indicators*. 1. Auflage. Paris: Organisation for Economic Co-operation and Development (OECD).

Organisation for Economic Co-operation and Development (OECD) (2009). *The OECD Assessment of Higher Education Learning Outcomes (AHELO)*. http://www.oecd.org/dataoecd/3/13/42803845.pdf (Retrieved 19.11.2010).

Oser, F. K., Dick, A. & Patry, J. L. (Eds.) (1992). *Effective and responsible teaching. The new synthesis*. 1. ed. San Francisco: Jossey-Bass Publishers.

Paechter, M., Maier, B. & Grabensberger, E. (2007). Evaluation medienbasierter Lehre mittels der Einschätzung des Kompetenzerwerbs. Entwicklung eines Erhebungsinstruments. *Zeitschrift für Medienpsychologie*, 19(2), 68-75.

Pascarella, E., Bohr, L., Nora, A. & Terenzini, P. (1995). Cognitive Effects of Two-Year and Four-Year Colleges. New Evidence. *Educational Evaluation and Policy Analysis*, 17(1), 83-96.

Peschel, J., Senger, U. & Willige, J. (2006). *Fremdsprachenkenntnisse - Subjektive Einschätzung und objektiver Test* (HISBUS-Kurzbericht, 12).

Pitton, A. (2005). *Relevanz fachdidaktischer Forschungsergebnisse für die Lehrerbildung*. Jahrestagung der GDCP in Heidelberg 2004. 1. Auflage. Münster: LIT.

Pokorny, M. & Pokorny, H. (2005). Widening participation in higher education. Student quantitative skills and independent learning as impediments to progression. *International Journal of Mathematical Education in Science and Technology*, 36(5), 445-467.

Quarrie, S. P. (2007). Student Peer Review as a Tool for Efficiently Achieving Subject-Specific and Generic Learning Outcomes: Examples in Botany at the Faculty of Agriculture, University of Belgrade. *Higher Education in Europe*, 32(2/3), 203-212.

Rauin, U. & Meier, U. (2007). Subjektive Einschätzungen des Kompetenzerwerbs in der Lehramtsausbildung. In M. Lüders & J. Wissinger (Eds.), *Forschung zur Lehrerbildung. Kompetenzentwicklung und Programmevaluation* (pp. 103-132). Münster: Waxmann.

Reinalda, B. (2008). The Bologna Process and Its Achievements in Europe 1999-2007. *Journal of Political Science Education*, 4(4), 463-476.

Riese, J. & Reinhold, P. (2008). Professionelles Wissen und Handlungskompetenz von angehenden Physiklehrkräften. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung*. Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 299).

Riggs, M. L. & Worthley, J. S. (1992). *Baseline Characteristics of Successful Programs of Student Outcomes Assessment*. California State University (Reports - Research/Technical, 143).

Rigney, T. J. (2002). A study of the relationship between entry qualifications and achievement of third level business studies students. *Irish Journal of Management*, 23(2), 117-139.

Robley, W., Whittle, S. & Murdoch-Eaton, D. (2005). Mapping Generic Skills Curricula: Outcomes and Discussion. *Journal of Further & Higher Education*, 29(4), 321-330.

Rocki, M. (2005). Statistical and Mathematical Aspects of Ranking: Lessons from Poland. *Higher Education in Europe*, 30(2), 173-181.

Roger, B. & Hersh, R. H. (2003). Measuring the Difference College Makes. The RAND/CAE Value Added Assessment Initiative. *Peer Review*, 5(4).

Schaeper, H. & Briedis, K. (2004). *Kompetenzen von Hochschulabsolventinnen und Hochschulabsolventen, berufliche Anforderungen und Forderungen für die Hochschulreform*. Hannover (HIS Projektbericht).

Schaeper, H. & Spangenberg, H. (2008). Absolventenbefragung - Erfassung relevanter Kompetenzen für Studium und Beruf. In N. Jude, J. Hartig & E. Klieme (Eds.), *Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 161-175). Bonn, Berlin (Bildungsforschung, 26).

Schecker, H., Einhaus, E. & Schmidt, M. (2008). Struktur physikalischer Kompetenz - Modellierung und empirische Überprüfung. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung*. Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 91).

Schiefele, U. & Moschner, B. (n.d.). *Selbstkonzept, Lernmotivation, Lernstrategien, epistemologische Überzeugungen, Instruktionsqualität und Studienleistungen: längsschnittliche Verläufe und kausale Zusammenhänge*. http://www.uni-bielefeld.de/fb19/091b12.htm (Retrieved 19.11.2010).

Schmiemann, P. & Sandmann, A. (2008). Kompetenzmodellierung im Bereich des biologischen Fachwissens. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung*. Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 126).

Schmitz, B. & Bruder, R. (n.d.). *Modellierung der Beratungskompetenz von Lehrern unter besonderer Berücksichtigung der Diagnostischen Kompetenz*. http://kompetenzmodelle.dipf.de/de/projekte/projekt-beratungskompetenz (Retrieved 19.11.2010).

Schomburg, H. & Teichler, U. (2006). *Higher education and graduate employment in Europe. Results from graduate surveys from twelve countries*. Dordrecht: Springer.

Schubarth, W., Speck, K. & Gladasch, U. (2007). Die zweite Phase der Lehrerausbildung aus Sicht der Brandenburger Lehramtskandidatinnen - die Potsdamer LAK-Studie. In M. Lüders & J. Wissinger (Eds.), *Forschung zur Lehrerbildung. Kompetenzentwicklung und Programmevaluation* (pp. 169-193). Münster: Waxmann.

Schulte, K., Bögeholz, S. & Watermann, R. (2008). Selbstwirksamkeitserwartungen und Pädagogisches Professionswissen im Verlauf des Lehramtsstudiums. *Zeitschrift für Erziehungswissenschaft*, 12(2), 268-287.

Schweizer, K. & Koch, W. (2002). Fluide Intelligenz und mittelfristig erworbenes Wissen in einer spezifischen Wissensdomäne. *Zeitschrift für Psychologie*, 10(3), 111-121.

SCQF Scottish Credit and Qualifications Framework (n.d.). *The framework*. http://www.scqf.org.uk/The%20Framework/ (Retrieved 19.11.2010).

Seidel, T., Schwindt, K., Kobarg, M. & Prenzel, M. (2008). Grundbedingungen eines lernwirksamen Unterrichts erkennen - Eine Untersuchung zur Erfassung pädagogisch-psychologischer Kompetenzen bei Lehrerinnen und Lehrern. In W. Lütgert, GA. Röschner & K. Kleinespel (Eds.), *Die Zukunft der Lehrerbildung. Entwicklungslinien - Rahmenbedingungen - Forschungsbeispiele* (pp. 198-213). Weinheim: Beltz.

Sennewald, N. (n.d.). *Erforschung und Weiterentwicklung literaler Kompetenzen von B.A.-Studierenden (LiKoM)*. http://www.uni-bielefeld.de/lili/projekte/likom/ (Retrieved 19.11.2010).

Sheard, M. (2003). Hardiness Commitment, Gender, and Age Differentiate University Academic Performance. *British Journal of Educational Psychology*, 79(1), 189-204.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review,* 57(1), 1-22.

Simeaner, H., Dippelhofer, S., Bargel, H., Ramm, M. & Bargel, T. (2007). *Studiensituation und Studierende an Universitäten und Fachhochschulen. Datenalmanach Studierendensurvey 1983 - 2007*. Herausgegeben von A. H. Universität Konstanz. (Hefte zur Bildungs- und Hochschulforschung, 51).

Simpson, K. P. (2009). Empowering Faculty through Assessment. *Inquiry*, 14(1), 41-53.

Siwinski, W. (2002). "Perspektywy" - Ten Years of Rankings. *Higher Education in Europe*, 27(4), 399-406.

Smith, A., McCully, A., Moran, A. & Clarke, L. (2008). *A Value-Based Approach to Teacher Education: Non-Technical Summary*. Swindon: Economic and Social Research Council (ESRC).

Smith, C. (2008). Design-Focused Evaluation. *Assessment & Evaluation in Higher Education*, 33(6), 631-645.

Sowter, B. (2008). The Times Higher Education Supplement and Quacquarelli Symonds (THES-QS) World University Rankings: New Developments in Ranking Methodology. *Higher Education in Europe*, 33(2/3), 345-347.

Spiel, C., Schober, B. & Litzenberger, M. (2008). *Evaluation der Eignungstests für das Medizinstudium in Österreich*. Wien (Projektbericht).

Statisics Canada (StatCan) for HRDC (n.d.a). *National Graduate Survey (NGS).* http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=5012&lang=en&db=imdb&adm=8&dis=2 (Retrieved 19.11.2010).

Statistics Canada (StatCan) for HRDC (n.d.b). *Youth in Transition Survey (YITS).* http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=4435&lang=en&db=imdb&adm=8&dis=2 (Retrieved 19.11.2010).

Storni, M. & Schmid, M. (2008). *Hochschulabsolventen und Hochschulabsolventinnen auf dem Arbeitsmarkt. Erste Ergebnisse der Längsschnittbefragung 2007*. Neuchâtel: Bundesamt für Statistik (BFS) (Statistik der Schweiz).

Swedish National Agency for Higher Education (n.d.). *New entrants to higher education.* http://www.hsv.se/highereducationinsweden/studyingatheis/newentrantstohighereducation.4.28afa2dc11bdcdc557480002489.html (Retrieved 19.11.2010).

Siwiñski, W. (2002). Perspektywy - Ten Years of Rankings. *Higher Education in* Europe, 27(4), 399–406.

Taylor, N. (1993). Teaching science at the University of the South Pacific. Its special problems. *Journal of Indian education*, 18(5), 18-23.

Terenzini, P. T. (1989). Assessment with open eyes. Pitfalls in studying student outcomes. *Journal of Higher Education*, (60), 644-664.

Trost, G., Blum, F., Fay, E., Klieme, E., Maichle, U. & Meyer, M. et al. (1998). *Evaluation des Tests für medizinische Studiengänge (TMS). Synopse der Ergebnisse.* Bonn: HoF Wittenberg, Institut für Hochschulforschung.

UNESCO-CEPES (2001). *Transnational Education and the New Economy: Delivery and Quality*. Bucharest (Studies on Higher Education).

UNESCO-CEPES (2007). Higher Education Ranking and Its Ascending Impact On Higher Education. *Higher Education in Europe*, 32(1).

Veal, W. (2004). Beliefs and knowledge in chemistry teacher development. *International journal of science education*, 26(3), 329-351.

Waara, K. O., Petersen, A., Lanaras, T., Paulauskas, V., Kleiven, S., Crosa, G. et al. (2006). Inland Water Quality Assessment - A Joint European Masters Programme. *Journal of Science Education and Technology*, 15(5/6), 409-415.

Walstad, W. & Rebeck, K. (2008). The Test of Understanding of College Economics. *American Economic Review*, 98(2), 547-551.

Weiler, H. N. (2008). Keyword: International Research on Higher Education Scholarship Between Policy and Science. *Zeitschrift für Erziehungswissenschaft*, 11(4), 516-541.

Weinert, F. E. (2001). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and selecting key competencies* (pp. 45–65). Seattle: Hogrefe & Huber.

Weinert, F. E., Helmke, A. & Schrader, F. W. (1992). Research on the model teacher and the teaching model. Theoretical contradiction or conglutination? In F. K. Oser, A. Dick & J. L. Patry (Eds.), *Effective and responsible teaching. The new synthesis*. 1. ed. (pp. 249-260). San Francisco: Jossey-Bass Publishers.

Winkelmann, P. (1997). Kompetenz-Selbsteinschätzungen von Studenten. Ein Alternativvorschlag zur Evaluierung des Hochschulunterrichts. *Die Neue Hochschule*, 38(4/5), 30-32.

Wolanin, T. R. (2003). The Student Credit Hour: An International Exploration. *New Directions for Higher Education*, (122), 99-117.

Yonezawa, A., Nakatsui, I. & Kobayashi, T. (2002). University Rankings in Japan. *Higher Education in Europe*, 27(4), 373-382.

Zeegers, P. (2004). Student learning in higher education: a path analysis of academic achievement in science. *Higher Education Research & Development*, 23(1), 35-56.

Zhu, W. (2007). Assessing Kinesiology Students' Learning in Higher Education. *Quest*, 59(1), 124-142.

Zlatkin-Troitschanskaia, O., Beck, K., Sembill, D., Nickolaus, R. & Mulder, R. (Eds.) (2009). *Lehrprofessionalität. Bedingungen, Genese, Wirkungen und ihre Messung*. Weinheim und Basel: Beltz.

APPENDIX

Appendix

Index of Abbreviations

AAC&U	Association of American Colleges and Universities
AAU	Association of African Universities
ACER	Australian Council for Educational Research
ACRL	Association of College and Research Libraries
AHELO	Assessment of Higher Education Learning Outcomes
ALL	International Adult Literacy and Lifeskills Survey
AIST	Allgemeiner-Interessen-Struktur-Test [General Interests Structure Test]
BA	Bachelor degree
BAP	Bayerisches Absolventenpanel [Bavarian Graduate Panel]
BELA-M	Modell der Lebensplanung in Beruf und Privatleben [Model of life planning in private and professional life]
BEvaKomp	Berliner Evaluationsinstrument für selbsteingeschätzte studentische Kompetenzen [Berlin evaluation instrument for self-evaluated student competencies]
BIBB	Bundesinstitut für Berufsbildung [Federal Institute for Vocational Education and Training]
BIQUA	Bildungsqualität von Schule [The Quality of School Education]
BIS	Berliner Intelligenzstruktur-Test [Berlin Intelligence Structure Test]
BMBF	Bundesministerium für Bildung und Forschung [German Federal Ministry of Education and Research]
CAAP	Collegiate Assessment of Academic Proficiency
CAE	Council for Aid to Education
CATI	Computer-assissted telephone interviews
CEDEFOP	European Centre for the Development of Vocational Training
CENEVAL	Centro Nacional de Evaluación para la Educación Superior
CEQ	Course Experience Questionnaire
CFAS	Centre for Formative Assessment Studies (UK)

CHE	Centrum für Hochschulentwicklung GmbH [Centre for Higher Education Development]
CHEERS	Careers after Higher Education: a European Research Study
CHEPRA	Consortium for Higher Education and Research Performance Assessment
CHEPS	Center for Higher Education (Netherlands)
CHERI	Center for Higher Education Research and Information
CLA	Collegiate Learning Assessment
COACTIV	Professionswissen von Lehrkräften, kognitiv aktivierender Mathematikunterricht und die Entwicklung mathematischer Kompetenz [Professional Competence of Teachers, Cognitively Activating Instruction, and Development of Students´ Mathematical Literacy]
COACTIV-R	Kompetenzerwerb von Lehramtskandidat(inn)en im Vorbereitungs-dienst [Teacher Candidates' Acquisition of Professional Competence During Teaching Practice]
CPD	Continuous professional development
DFG	Deutsche Forschungsgemeinschaft [German Research Foundation]
DIALANG	Test on language proficiency in 14 European languages
DIPF	Deutsches Institut für Internationale Pädagogische Forschung [German Institute for International Educational Research]
DLHE	Destinations of Leavers from Higher Education
ED	Office of Educational Research and Improvement
EGEL	Examen General Para el Egreso de la Licenciatura [Higher Education Exit Assessments Tests in Different Disciplines]
EGETSU	Exámenes Generales para el Egreso del Técnico Superior Universitario [Higher Education Exit Assessments Tests in the Technical Field]
EHEA	Projected European Higher Education Area
EMS	Eignungstest für das Medizinstudium (Austria) [Aptitude Test for the Medical School]
ENADE	Exame Nacional de Desempenho dos Estudantes [Higher Education National Assessments Test on General Knowledge & Generic Skils]

ENC	Exame Nacional de Cursos [Higher Education National Assessments Tests in Different Disciplines]
ERIC	Education Resources Information Center
ESL	2007 English as a Second Language
ESRC	Economic and Social Research Council (UK)
ETS	Educational Testing Service
EuroSim	The cross-continent EU simulation
EXANI-III	Examen Nacional de Ingreso al Posgrado [Higher Education National Entrance Test]
FIS Bildung	Fachinformationssystem Bildung [Educational Information System]
GATE	Georgia Assessment of Teacher Effectiveness
GCA	Graduate Careers Australia
GCCA	Graduate Careers Council of Australia
GDS	Graduate Destination Survey
GLANZ	Grundschullehrerausbildung - Neukonzeption [Redesign of the Basic Teacher Training]
GLOKAL	Kompetenzzentrum "Nachhaltigkeit im Globalen Wandel" [Competence Centre “Sustainability in the Global Change“]
GRE	Graduate Record Examination
GSA	Graduate Skills Assessment
HE	Higher Education
HEFCE	Higher Education Funding Council for England
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency (UK)
HIS	Hochschul-Informations-System [Institute for Research on Higher Education]
HRK	Hochschulrektorenkonferenz [German Rectors´Conference]
IAB	Arbeitsmarkt- und Berufsforschung [Institute for Employment Research]

IALS	The International Adult Literacy Survey
IEA	International Association for the Evaluation of Educational Achievement
IES	Institute of Education Sciences
ifb	Staatsinstitut für Familienforschung [State Institute for Family Research]
ifo	Institut für Wirtschaftsforschung [Institute for Economic Research]
IFP	Staatsinstitut für Frühpädagogik [State Institute of Early Childhood Research]
IFS	Institut für Schulentwicklungsforschung [Institute for School Development Research]
IHF	Bayerischen Staatsinstitut für Hochschulforschung und Hochschul-planung [Bavarian State Institute for Higher Education Research and Planning]
ILLEV	Innovativer Lehr-Lernortverbund in der Hochschulausbildung [Innovative Teaching-Learning-Location-Network in Higher Education]
IMP	The Investigating Musical Performance (UK)
INBIL	Institut für bildungswissenschaftliche Längsschnittforschung Bamberg [Institute for Longitudinal Educational Research]
INTASC	Interstate New Teacher Assessment and Support Consortium
IPN	Leibniz-Institut für die Pädagogik der Naturwissenschaften [Leibniz Institute for Science and Mathematics Education]
IST	University of Melbourne's Information Technology Service
KMK	Kultusministerkonferenz [Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany]
LEAP	Liberal Education and America's Promise
LiKoM	Erforschung und Weiterentwicklung literaler Kompetenzen von BA Studierenden [Research and Development of Literate skills of BA Students]
MA	Master degree
MAPP	Measure of Academic Proficiency and Progress

MPIB	Max-Planck-Institut für Bildungsforschung [Max Planck Institute for Human Development]
MFT	Major Field Tests
MT21	Mathematics Teaching in the 21st Century
NAEP	National Assessment of Educational Progress
NAGB	National Assessment Governing Board
NCEE	National Council on Economic Education
NCES	National Center for Education Statistics
NCHEMS	National Center for Higher Education Management Systems
NEPS	Nationales Bildungspanel [National Educational Panel Study]
NGS	National Graduate Survey
NSSE	National Survey of Student Engagement
OECD	Organisation for Economic Co-operation and Development
PaLea	Panel zum Lehramtsstudium [Panel to the Teacher Training]
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
REFLEX	The Flexible Professional in the Knowledge Society New Demands on Higher Education in Europe
SOMUL	Social and Organisational Mediation of University Learning (UK)
StatCan	Statistics Canada
STREP	Specific Targeted Research Project of the European Union's Sixth Framework Programme
STUBUR-Studie	Studienverhalten und Berufseinstellungen von Lehramtsstudierenden [Student Behavior and Work Attitudes of Student Teachers]
TACEUSS	Trans-Atlantic Consortiums for European Union Studies and Simulations
TASP	Texas Academic Skills Programme
TECA	Tertiary Engineering Capabilities Assessment
TEDS-LT	Teacher Education and Development Study: Learning to Teach

TEDS-M	Teacher Education and Development Study in Mathematics
TIMSS	Trends in International Mathematics and Science Study
TLRP	Teaching and Learning Research Programme (UK)
TMS	Test für Medizinische Studiengänge [Test for Medical University Courses]
TPAI	Teacher Performance Assessment Instrument
TTK	Test of Teaching Knowledge
TUCE	Test of Understanding in College Economics
VAAI	Value Added Assessment Initiative
VALUE	The Valid Assessment of Learning in Undergraduate Education
VERA	VERgleichsArbeiten [Comparative testing of primary school students and students in the eighth grade]
WBT	Wirtschaftskundlicher Bildungs-Test [Test of Economic Literacy]

Matrix:

Theoretical and Empirical Foundation According to Disciplines

The following disciplines are arranged according to the German Research Foundation (DFG) (2008). To get an overview, their theoretical and empirical foundations can be evaluated – all the while with reference to the results of this report. Theoretical modeling here means the first approaches in the higher education sector towards a domain-specific competence model that allows for statements on the structure and level of competence. Empirical foundation refers to a standardized measuring instrument that allows for a direct competence assessment. National (German) and international results are separated.

Germany

Discipline / Foundation	Theoretical Modeling	Empirical Foundation
Humanities:		
History		
Art, Music, Theatre, Media		
Linguistics and Literature	x	
Theology		
Philosophy		
Other Humanities		
Social Studies:		
Pedagogics	x	
Teacher Training German	x	x
Teacher Training English	x	x
Teacher Training Mathematics	x	x
Teacher Training Biology	x	
Teacher Training Chemistry		
Teacher Training Physics	x	
Teacher Training Electrical Engineering, Engineering	x	
Psychology		
Social Studies		
Economics	x	x

Law		
Biology		
Medical Studies		
Agricultural Science and Forestry, Horticulture and Veterinary Medicine		
Chemistry		
Physics		
Mathematics		
Geoscience		
Engineering Sciences:		
Mechanical and Industrial Engineering		
Electrical and Systems Engineering and Computer Sciences		
Architecture		
Other Engineering Sciences		

International (Europe und Non-European Countries)

Discipline / Foundation	Theoretical Modeling	Empirical Foundation
Humanities:		
History		x
Art, Music, Theatre, Media		x
Linguistics and Literature		x
Theology		
Philosophy		
Other Humanities		
Social Studies:		
Pedagogics		x
Teacher Training German		
Teacher Training English		
Teacher Training Mathematics	x	x

Teacher Training Biology		
Teacher Training Chemistry	x	x
Teacher Training Physics	x	x
Teacher Training Electrical Engineering, Engineering		
Psychology		x
Social Studies		x
Economics	x	x
Law		x
Biology		x
Medical Studies		x
Agricultural Science and Forestry, Horticulture and Veterinary Medicine		x
Chemistry		x
Physics		x
Mathematics		x
Geoscience		x
Engineering Sciences:	x	x
Mechanical and Industrial Engineering		x
Electrical and Systems Engineering and Computer Sciences		x
Architecture		x
Other Engineering Sciences		x

Charts

Chart 1a: German Competence Assessment

Instrument	Object of Study	Sample (Field)	Design	Study (Initiator)	Local Scope	Source
Questionnaire, interview, analysis of documents	Self-monitoring, school practical studies and curricular adjustment (such as individual & structural aspects of research learning)	Students (teacher education, elementary school)	Cohort design	Reconception of primary school teacher training at the University Bamberg (GLANZ)	University of Bamberg	Abel, J. (2008). Der AIST als Evaluationsinstrument zur Erfassung des Berufs- und Wissenschaftsbezugs von Lehramtsstudierenden im Projekt GLANZ. In F. Hofmann (Ed.), *Qualitative und quantitative Aspekte. Zu ihrer Komplementarität in der erziehungswissenschaftlichen Forschung* (pp. 173-187). Münster: Waxmann.
Questionnaire	Job-related development during the course of studies with reference to the structure of the degree course	Prospective teachers (BA, MA, state exam)	Large-scale panel design, cohort design	Panel on teacher training at universities (PaLea) (PaLea), IPN Kiel	12 German universities	Bauer, J. (2009). PaLea - Panel zum Lehramtsstudium. *IPN-Blätter*, 26(1), 6.
Test	Basic economic knowledge	Adolescents from 15 years and older, adults		WBT (an adaptation of the American Test of Economic Literacy)		Beck, K., Krumm, V. & Dubs, R. (1998). *Wirtschaftskundlicher Bildungs-Test (WBT).* Göttingen: Hogrefe.
Test, questionnaire	(Content, pedagogical content and pedagogical) knowledge, opportunities to learn	Prospective teachers of German, English and mathematics in secondary school (pupils until the age of 16) (state exam and BA/MA students and teacher trainees)	Cross-sectional and longitudinal	Teacher Education and Development Study: Learning to Teach (TEDS-LT), funded by the BMBF	Five German universities in Northrhine-Westfalia	Blömeke, S., Bremerich-Voss, A., Haudeck, H., Kaiser, G., Nold, G., Schwippert, K. & Willenberg, H. (Eds.) (2011). *Kompetenzen von Lehramtsstudierenden in gering strukturierten Domänen. Erste Ergebnisse aus TEDS-LT.* Münster: Waxmann.

Questionnaire	Development of competencies, education processes, decisions and yields	Formal, non-formal & informal contexts during the whole lifetime (amongst others students and graduates)	Cross-sectional and longitudinal	German National Educational Panel Study (NEPS), institute for longitudinal research in education science Bamberg (INBIL), funded by the BMBF	Nationwide	Blossfeld, H.-P. (2008). *Nationales Bildungspanel (NEPS).* BMBF. http://www.uni-bamberg.de/fileadmin/inbil/Abbildungen/NEPS_Projektvorstellung.pdf (Retrieved 19.11.2010).
Questionnaire (self-assessment and assessment by others)	Course, social and methods-related competence	Interns (prospective teachers) during the first or second internship	Cross-sectional and longitudinal	Improvement in advisory qualities in training job-related didactic competencies among future teachers in practical school studies (VERBAL)	University of Koblenz, Landau	Bodensohn, R. M. (2004). *Verbesserung der Beratungsqualität bei der Ausbildung beruflicher Handlungskompetenz von Lehramtsstudierenden im Kontext Schulpraktischer Studien.* Universität Koblenz, Landau, Zentrum für Lehrerbildung. http://www.lars-balzer.info/projects/verbal/VERBAL_ueberblicksrueckmeldung5.pdf (Retrieved 19.11.2010).
Questionnaire (self-assessment)	Professional competence regarding subject, method, presentation, communication, cooperation and staff competence	Students (of all subjects)		Berlin evaluation instrument for self-assessing student competencies (BEvaKomp)	Nationwide	Braun, E. & Hannover, B. (2008). Kompetenzmessung und Evaluation von Studienerfolg. In N. Jude, J. Hartig & E. Klieme (Eds.), *Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 153-160). Bonn, Berlin (Bildungsforschung, 26).
Test, questionnaire	(Content, pedagogical content and pedagogical) knowledge, beliefs, motivation, self-regulating abilities	Teacher trainees for mathematics	Cross-sectional and longitudinal	Acquiring competencies: future teachers in school placements (COACTIV-R), MPI for education science, follow-up study of COACTIV	Nationwide	Brunner, M., Kunter, M., Krauss, S., Baumert, J., Blum, W., & Dubberke, T. et al. (2006). Welche Zusammenhänge bestehen zwischen dem fachspezifischen Professionswissen von Mathematiklehrkräften und ihrer Ausbildung sowie beruflichen Fortbildung? *Zeitschrift für Erziehungswissenschaft*, 9(4), 521-544.

Test	Content knowledge and pedagogical content knowledge, beliefs, motivation & intelligence	Diploma and BA students of economics end business education	Cross-sectional and longitudinal	Innovative teach-study network in higher education (ILLEV), University of Mainz, funded by the BMBF	University of Mainz	Buske, R., Förster, M., Klinke, S., Kuhn, C., Preuße, D. & Zlatkin-Troitschanskaia, O. (2011). Innovativer Lehr-Lernortverbund (ILLEV) in der akademischen Hochschulausbildung. In B. Schwarz, P. Nenniger & R. S. Jäger (Eds.), *Erziehungswissenschaftliche Forschung – nachhaltige Bildung. Beiträge zur 5. DGfE-Sektionstagung "Empirische Bildungsforschung"/AEPF-KBBB im Frühjahr 2009* (S. 27–33). Landau: Empirische Pädagogik.
Test	Teaching performance	(Higher education) economics lecturers		Two subprojects of the RWTH Aachen & TU Braunschweig, funded by the BMBF	RWTH Aachen, TU Braunschweig	Clermont, M. & Höfer, Y. (n.d.). *Lehrerfolg - Messung des Lehrerfolgs als Teilaufgabe eines umfassenden Fakultätscontrollings.* http://www.empirische-bildungsforschung-bmbf.de/zeigen.html?seite= (Retrieved 19.11.2010).
Questionnaire	Academic self-concept (with and without social, individual and criteria-related norms)	310 students studying computer sciences, psychology or prospective teachers	Cross-sectional		Universities of Gießen, Dortmund and Hildesheim	Dickhäuser, O., Schöne, C., Spinath, B. & Stiensmeier-Pelster, J. (2002). Die Skalen zum akademischen Selbstkonzept. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 23(4), 393-405.
Questionnaire (open-ended format)	"Assessing, deciding, reflecting" as central partial competencies of assessment competence	Students and pupils in the field of biology			University of Göttingen	Eggert, S., Gausmann, E., Hasselhorn, M., Watermann, R. & Bögeholz, S. (2008). Entwicklung eines Messinstruments zur Analyse von Bewertungskompetenz bei Schüler(innen) sowie Studierenden. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 285).

Test, questionnaire, document analysis	Influence of causal variables (interest, personality traits, previous knowledge etc.) on the acquisition of mathematical competencies (applies also to the macro- and meso-levels)	515 freshmen planning to become mathematics teachers		Development and measuring of competencies (KEM) as part of the model "standards-profiles-developments-Evaluation" (SPEE) for a new direction of teacher training at the University of Paderborn	University of Paderborn	Eilerts, K. & Rinkens, H.-D. (2008). Mehrebenenanalytische Untersuchung der Entwicklung und Implementierung von Kompetenzen an der Universität Paderborn im Fach Mathematik. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 298).
Questionnaire	Competence development (based on the standards by Oser)	132 prospective teachers in their first, third or fifth semesters	Cross-sectional	Study behavior and job attitude of future teachers at the University of Rostock (STUBUR)	University of Rostock	Gehrmann, A. (2007). Kompetenzentwicklung im Lehramtsstudium. Eine Untersuchung an der Universität Rostock. In M. Lüders & J. Wissinger (Eds.), *Forschung zur Lehrerbildung. Kompetenzentwicklung und Programmevaluation* (pp. 85-102). Münster: Waxmann.
Test, analysis of documents (grades)	Knowledge, interests (predictions on qualification for university studies)	Graduates of medical studies, law, engineering or economics	Prospectively cross-sectional and longitudinal			Gold, A. & Souvignier, E. (2005). Prognose der Studierfähigkeit. Ergebnisse aus Längsschnittanalysen. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 37(4), 214-222.
	Connection between previous mathematical knowledge and success in university studies	Students of engineering				Henn, G. & Polaczek, C. (2007). Studienerfolg in den Ingenieurwissenschaften. *Das Hochschulwesen*, 55(5), 144-147.
Test	Capability (i.e. problem solution, understanding of texts, memory, reproduction, basic medical and scientific understanding	Candidates for medical studies or dentistry		Test for medical degree courses (TMS), ITB Consulting GmbH	For all faculties in the state of Baden-Württemberg as well as Lübeck and Bochum	ITB Consulting GmbH (Ed.) (2008). *Test für medizinische Studiengänge TMS*. http://www.tms-info.org/index.php?ID=10 (Retrieved 19.11.2010).

Psychological test, survey, questionnaire (online), analysis of documents	Cognitive, affective and behavior related competencies (prediction of future performance in job)	Potential teachers (16 students within their first semesters or second half of university education)	Trend study, cross-sectional	UNI Erlangen-Nürnberg, chair of pedagogics		Kammerl, R. (2006). *Kompetenzanalyse für angehende Lehrer/innen - ein onlinebasiertes Development Center zur Bestimmung lehrerrelevanter Kompetenzen bei Lehramtsstudenten, um die Effektivität der Lehrerausbildung zu erhöhen*. http://193.175.239.23/ows-bin/owa/r.einzeldok?doknr=52906; http://www.wisonet.de/webcgi?START=A20&DOKM=1482374_ZDZI_0&WID=42632-7520939-41122_12 (Retrieved 19.11.2010).
Questionnaire	Four dimensions of self-responsibility (as an aspect of the job-related self-concept)	372 students, 225 managers	Longitudinal			Koch, S. (2005). Berufliches Selbstkonzept und eigenverantwortliche Leistung. *Gruppendynamik und Organisationsberatung*, 36(2), 157-174.
Online questionnaire (self-assessment)	Information competence	MA students, PhD students, post-docs		"Information competence 2“ project, funded by the DFG	University of Constance	Kohl-Frey, O. (2007). *Informationskompetenz hinter dem Bachelor-Horizont. Ergebnisse einer Studie an der Universität Konstanz*.http://kops.ub.unikonstanz.de/volltexte/2007/2412/pdf/Bregenz
Lists of competencies	Field-specific competences	First semester students of electrical and mechanical engineering			TU Darmstadt	Könekamp, B. & Glindemann, O. (2008). Empirische Lehr-Lernforschung als Beitrag zur Entwicklung einer kompetenzorientierten Lehre an technischen Universitäten. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 275).

Test, questionnaire	(Content, pedagogical content, pedagogical) knowledge, beliefs, motivation, self-regulating abilities	Mathematics teachers	Cross-sectional	Cognitively activating mathematics classes (COACTIV), MPI for education research, part of the priority program of the German Research Foundation (DFG) "BIQUA"	Nationwide (part of the national PISA survey 2003/2004)	Kunter, M., Baumert, J., Blum, W., Klusmann, U., Krauss, S. & Neubrand, M. (Eds.), (2011). *Professionelle Kompetenz von Lehrkräften: Ergebnisse des Forschungsprogramms COACTIV.* Münster: Waxmann.
Competence assessment "becobi," 360° analysis	Study course-specific professional and interdisciplinary competencies	Students (graduates and employers were additionally asked about their output expectations)		"moreQ"-project of the University of Bremen, nautics and international economics	Hochschule Bremen (University of Bremen)	Meyer, H., Frank, G. & Janas, D. (2007). Kompetenzerwerb im Studium messen. Das Projekt "moreQ" der Hochschule Bremen. *Wissenschaftsmanagement*, 13(4), 25-32.
DIALANG test, questionnaire (self-assessment)	English language skills	Students	Panel study	HISBUS panel		Peschel, J., Senger, U. & Willige, J. (2006). *Fremdsprachenkenntnisse - Subjektive Einschätzung und objektiver Test* (HISBUS-Kurzbericht, 12).
Questionnaire (self-assessment)	Assessment of competencies (depending on motivation, way of studying und experiencing pressure)	Prospective teachers	Longitudinal		Baden-Württemberg (Universities of Freiburg, Heidelberg, Schwäbisch Gmünd)	Rauin, U. & Meier, U. (2007). Subjektive Einschätzungen des Kompetenzerwerbs in der Lehramtsausbildung. In M. Lüders & J. Wissinger (Eds.), *Forschung zur Lehrerbildung. Kompetenzentwicklung und Programmevaluation* (pp. 103-132). Münster: Waxmann.
Vignette	Professional knowledge: content, pedagogical content and pedagogical knowledge	Prospective physics teachers			University of Paderborn and further institutions	Riese, J. & Reinhold, P. (2008). Professionelles Wissen und Handlungskompetenz von angehenden Physiklehrkräften. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 299).

Questionnaire	Professional capacity to act (field specific professional competencies, social, presentation and method competencies, organizational talent)	Graduates	Cross-sectional	University information system (HIS)	Nationwide	Schaeper, H. & Briedis, K. (2004). *Kompetenzen von Hochschulabsolventinnen und Hochschulabsolventen, berufliche Anforderungen und Forderungen für die Hochschulreform*. Hannover (HIS Projektbericht).
Questionnaire	Foreign languages, computer, economics and law skills	Qualified school graduates and graduates	Panel study	University information system (HIS)	Nationwide	Schaeper, H. & Spangenberg, H. (2008). Absolventenbefragung - Erfassung relevanter Kompetenzen für Studium und Beruf. In N. Jude, J. Hartig & E. Klieme (Eds.), *Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 161-175). Bonn, Berlin (Bildungsforschung, 26).
Questionnaire	Concept, motivation, strategies, epistemological beliefs and quality of instructions	Students (from all disciplines)	Longitudinal, cohort design	University Bielefeld, department of psychology	University of Bielefeld	Schiefele, U. & Moschner, B. (n.d.). *Selbstkonzept, Lernmotivation, Lernstrategien, epistemologische Überzeugungen, Instruktionsqualität und Studienleistungen: längsschnittliche Verläufe und kausale Zusammenhänge*. http://www.uni-bielefeld.de/fb19/091b12.htm (Retrieved 19.11.2010).
	Advisory competence focusing on diagnostic competence	(Prospective) teachers		Part of the priority program of the German Research Foundation (DFG) "competence models"		Schmitz, B. & Bruder, R. (n.d.). *Modellierung der Beratungskompetenz von Lehrern unter besonderer Berücksichtigung der Diagnostischen Kompetenz.* http://kompetenzmodelle.dipf.de/de/projekte/projekt-beratungskompetenz (Retrieved 19.11.2010).
Questionnaire	Self-expectations, professional pedagogical knowledge	247 prospective teachers (173 freshmen, 27 advanced students, 38 final-year students, 19 teacher trainees)	Cross-sectional	Funded by the German Research Foundation (DFG), University Göttingen		Schulte, K., Bögeholz, S. & Watermann, R. (2008). Selbstwirksamkeitserwartungen und Pädagogisches Professionswissen im Verlauf des Lehramtsstudiums. *Zeitschrift für Erziehungswissenschaft*, 12(2), 268-287.

Thesaurus test (WST), Advanced Progressive Matrices (APM)	Connection between fluid intelligence and mid-term gained knowledge within the domain of "university knowledge"	100 second-semester students of medical studies	Cross-sectional		University of Freiburg	Schweizer, K. & Koch, W. (2002). Fluide Intelligenz und mittelfristig erworbenes Wissen in einer spezifischen Wissensdomäne. *Zeitschrift für Psychologie*, 10(3), 111-121.
Video task formats	Pedagogical and psychological competencies	320 prospective and experienced teachers		OBSERVE project, part of the priority program of the German Research Foundation (DFG) "competence models"		Seidel, T., Schwindt, K., Kobarg, M. & Prenzel, M. (2008). Grundbedingungen eines lernwirksamen Unterrichts erkennen - Eine Untersuchung zur Erfassung pädagogisch-psychologischer Kompetenzen bei Lehrerinnen und Lehrern. In W. Lütgert, GA. Röschner & K. Kleinespel (Eds.), *Die Zukunft der Lehrerbildung. Entwicklungslinien - Rahmenbedingungen - Forschungsbeispiele* (pp. 198-213). Weinheim: Beltz.
Teaching assistant model	Scientific-literary competencies (regarding humanities and natural sciences)	BA students of German and physics	Cross-sectional and longitudinal	Studying and developing literary competencies of BA students (LiKoM)		Sennewald, N. (n.d.). *Erforschung und Weiterentwicklung literaler Kompetenzen von B.A.-Studierenden (LiKoM).* http://www.uni-bielefeld.de/lili/projekte/likom/ (Retrieved 19.11.2010).
Change analysis (self-assessment)	Job-related (professional and personal) competencies	Students of business studies (focus on marketing and sales)		FH Landshut	FH Landshut	Winkelmann, P. (1997). Kompetenz-Selbsteinschätzungen von Studenten. Ein Alternativvorschlag zur Evaluierung des Hochschulunterrichts. *Die Neue Hochschule*, 38(4/5), 30-32.

Chart 1b: German Competence Models

Field	Concept	Source
Social work	Formulating the reference frame "*Qualifikationsrahmen für Deutsche Hochschulabschlüsse*" (qualification standards for German university degrees) for the university course "social work"	Bartosch, U., Maile, A. & Speth, C. (2008). *Qualifikationsrahmen Soziale Arbeit (QR SArb). Version 5.1.* www.fbts.de/uploads/media/QRSArb_Version_5.1.pdf (Retrieved 19.11.2010).
Pedagogics (prospective teachers of German, English and mathematics)	Teacher competence as (content, pedagogical content and pedagogical) knowledge, beliefs, motivation and self-regulative abilities (according to Shulman, 1987; Weinert, 2001); additional KMK standards for teacher training for pedagogics (2004), creation of specific standards for German, English and mathematics as a guideline for the development of tests	Blömeke, S., Bremerich-Voss, A., Haudeck, H., Kaiser, G., Nold, G., Schwippert, K. & Willenberg, H. (Eds.) (2011). *Kompetenzen von Lehramtsstudierenden in gering strukturierten Domänen. Erste Ergebnisse aus TEDS-LT.* Münster: Waxmann.
Generic competence	Decision-making and responsibility in the fields professionalism, presentation, communication, cooperation and personal competence → success of the university training according to the higher education reform	Braun, E. & Hannover, B. (2008). Kompetenzmessung und Evaluation von Studienerfolg. In N. Jude, J. Hartig & E. Klieme (Eds.), *Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 153-160). Bonn, Berlin (Bildungsforschung, 26).
Economics	Economic concept for the quantitative assessment of teacher performance at universities (performance assessment), based on the theories on service production and performance measurements	Clermont, M. & Höfer, Y. (n.d.). *Lehrerfolg - Messung des Lehrerfolgs als Teilaufgabe eines umfassenden Fakultätscontrollings.* http://www.empirische-bildungsforschung-bmbf.de/zeigen.html?seite= (Retrieved 19.11.2010).
Biology	Modeling of a central sub-competence of assessment competence: "evaluate, decide, reflect"; classification of decision-making strategies in the form of competence levels	Eggert, S., Gausmann, E., Hasselhorn, M., Watermann, R. & Bögeholz, S. (2008). Entwicklung eines Messinstruments zur Analyse von Bewertungskompetenz bei Schüler(innen) sowie Studierenden. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 285).

Pedagogics (prospective teachers)	Formulation and validation of a model of "diagnostic competence regarding recommending a secondary school after elementary school"; based on the social judgment, taking into account different information processing strategies	Gräsel, C., Krolak-Schwerdt, S., Nölle, I. & Hörstermann, T. (2010). Diagnostische Kompetenz von Grundschullehrkräften bei der Erstellung der Übergangsempfehlung. Eine Analyse aus der Perspektive der sozialen Urteilsbildung. Projekt Diagnostische Kompetenz. In E. Klieme, D. Leutner & M. Kenk (Eds.), *Kompetenzmodellierung. Zwischenbilanz des DFG-Schwerpunktprogramms und Perspektiven des Forschungsansatzes* (pp. 286-295). Weinheim, Basel: Beltz. (Zeitschrift für Pädagogik, Beiheft 56).
Generic competence	Qualifications needed for German university graduations. Needed competencies ("knowledge and understanding" and "skills") and formal aspects according to degrees (BA, MA, PhD) are formulated interdisciplinary; definition according to the universities	Hochschulrektorenkonferenz (HRK), Kultusministerium (KMK) & Bundesministerium für Bildung und Forschung (BMBF) (2005). *Qualifikationsrahmen für Deutsche Hochschulabschlüsse*. http://www.kmk.org/fileadmin/pdf/PresseUndAktuelles/Beschluesse_Veroeffentlichungen/Hochschule_Wissenschaft/BS_050421_Qualifikationsrahmen_AS_Ka.pdf (Retrieved 19.11.2010).
Pedagogics (prospective teachers)	Cognitive, affective & behavior-dependent competencies (prediction of future job-related success and performance of teachers)	Kammerl, R. (2006). *Kompetenzanalyse für angehende Lehrer/innen - ein onlinebasiertes Development Center zur Bestimmung lehrerrelevanter Kompetenzen bei Lehramtsstudenten, um die Effektivität der Lehrerausbildung zu erhöhen*. http://193.175.239.23/ows-bin/owa/r.einzeldok?doknr=52906; http://www.wisonet.de/webcgi?START=A20&DOKM=1482374_ZDZI_0&WID=42632-7520939-41122_12 (Retrieved 19.11.2010).
Electrical and mechanical engineering	Lists of competencies for selected fields of competence	Könekamp, B. & Glindemann, O. (2008). Empirische Lehr-Lernforschung als Beitrag zur Entwicklung einer kompetenzorientierten Lehre an technischen Universitäten. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 275).
Pedagogics (prospective mathematics teachers)	Teacher competence as (content, pedagogical content and pedagogical) knowledge, beliefs, motivation and self-regulative abilities (according to Shulman, 1987; Weinert, 2001)	Kunter, M., Baumert, J., Blum, W., Klusmann, U., Krauss, S. & Neubrand, M. (Eds.), (2011). *Professionelle Kompetenz von Lehrkräften: Ergebnisse des Forschungsprogramms COACTIV.* Münster: Waxmann.
Pedagogics (prospective physics teachers)	According to the heuristic competence model of Kunter et al. (2011): see above	Riese, J. & Reinhold, P. (2008). Professionelles Wissen und Handlungskompetenz von angehenden Physiklehrkräften. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 299).
Pedagogics (prospective teachers)	Advisory competence concentrating on diagnostic competence: evaluation of five dimensions (reflection, cooperation, methods, targeted, personal distance); three postulated expert levels of advisory competence	Schmitz, B. & Bruder, R. (n.d.). *Modellierung der Beratungskompetenz von Lehrern unter besonderer Berücksichtigung der Diagnostischen Kompetenz.* http://kompetenzmodelle.dipf.de/de/projekte/projekt-beratungskompetenz (Retrieved 19.11.2010).

Pedagogics (prospective teachers)	Pedagogical and psychological competencies, divided into three sub-competencies	Seidel, T., Schwindt, K., Kobarg, M. & Prenzel, M. (2008). Grundbedingungen eines lernwirksamen Unterrichts erkennen - Eine Untersuchung zur Erfassung pädagogisch-psychologischer Kompetenzen bei Lehrerinnen und Lehrern. In W. Lütgert, GA. Röschner & K. Kleinespel (Eds.), *Die Zukunft der Lehrerbildung. Entwicklungslinien - Rahmenbedingungen - Forschungsbeispiele* (pp. 198-213). Weinheim: Beltz.
Humanities, Natural Sciences, also social sciences	Scientific-literal competence in a specific area (at first for the subjects German and physics) – embedded in a professionalization theory	Sennewald, N. (n.d.). *Erforschung und Weiterentwicklung literaler Kompetenzen von B.A.-Studierenden (LiKoM).* http://www.uni-bielefeld.de/lili/projekte/likom/ (Retrieved 19.11.2010).

Competence Models at a School Level

Field	Concept	Source
Chemistry	Model for describing the structure and development of chemical competence; development of a task set on “combustion”	Bernholt, S. & Parchmann, I. (2008). Die Untersuchung und Entwicklung von Kompetenz in der Chemie. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 86).
Banking economics	Distinction of professional competence between economic (knowledge, understanding, application, analysis and evaluation of economic content) and bank management (solving bank-specific tasks and problems) competence	Fehring, G., Rosendahl, J. & Straka, G. A. (2008). Lernförderliche Kontextbedingungen für die berufliche Fachkompetenz am Beispiel angehender Bankkaufleute. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 152).
Commercial-technical field	Competence models for the jobs "mechatronics technician" and "electrician" including statements on dimensionality, classification and indicators of difficulties for tasks and personal abilities	Geißel, B. & Nickolaus, R. (2008). Kompetenzmodellierung und Kompetenzentwicklung in der gewerblich-technischen Grundbildung. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 150).
Music	Staged competence model for the field "perception and putting music in a context" (normative model as source for the operationalization in the form of test tasks).	Jordan, A.-K., Knigge, J. & Lehmann-Wermser, A. (2008). Empirische Validierung eines Kompetenzmodells für das Fach Musik. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 246).
Physics	Valid, descriptive (multidimensional) competence model for the field of "energy and thermodynamics" (four processes/fields of competence "using expertise," "realization," "communicating" "assessing"; different values "reproduction" and "reorganization/active application")	Schecker, H., Einhaus, E. & Schmidt, M. (2008). Struktur physikalischer Kompetenz - Modellierung und empirische Überprüfung. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds.), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 91).
Biology	Structural competence model for the competence field "biological expertise" including the dimensions (1) biological concept, (2) terminology and (3) cognitive standard level	Schmiemann, P. & Sandmann, A. (2008). Kompetenzmodellierung im Bereich des biologischen Fachwissens. In Arbeitsgruppe für Empirische Pädagogische Forschung (Eds), *Kompetenz: Modellierung - Diagnostik - Entwicklung - Förderung.* Tagungsband zur 71. Tagung der AEPF in Kiel vom 25.-27. August 2008 (p. 126).

Chart 1c: German Graduate Studies

Object of Study	Field	Study (Initiator)	Local Scope	Source
Job development from a historiographical and social psychological perspective (focus: gender comparison)	Graduates of mathematics ("diploma" and teacher training)	Institute for psychology, chair of social psychology at the University (funded by the Volkswagen foundation)	40 German universities	Abele-Brehm, A., Spurk, D. & Uchronski, M. (n.d.). *Berufsverläufe in der Mathematik*. Universität Erlangen-Nürnberg Institut für Psychologie Lehrstuhl Sozialpsychologie. http://www.sozialpsychologie.phil.uni-erlangen.de/forschung/berufsverlaeufe-in-der-mathematik.shtml (Retrieved 19.11.2010).
Cornerstones of the university studies and the transfer of graduates to a professional career. (teach-study forms, motives, transfer profiles etc.)	Graduates holding a first qualifying degree	University information system (HIS), funded by the BMBF	Nationwide	Briedis, K. (2007). *Übergänge und Erfahrungen nach dem Hochschulabschluss. Ergebnisse der HIS-Absolventenbefragung des Jahrgangs 2005.* Hannover (HIS Forum Hochschule, 13).
Professional future	Graduates of humanities	University information system (HIS), funded by the BMBF	Nationwide	Briedis, K., Fabian, G., Kerst, C. & Schaeper, H. (2008). *Berufsverbleib von Geisteswissenschaftlerinnen und Geisteswissenschaftlern*. Hannover (HIS Forum Hochschule, 11).
Career progression, study conditions and the development of competencies during the university studies	Graduates of applied sciences	Bavarian graduate panel (BAP), Bavarian state institute for university research and university planning (IHF)	Bavaria	Falk, S., Reimer, M. & Hartwig, L. (2007). Absolventenbefragung für Hochschulen und Bildungspolitik: Konzeption und Ziele des "Bayerischen Absolventenpanels." *Beiträge zur Hochschulforschung*, 29(1), 6-33.
Review of the degree course in retrospect regarding job experiences, aspects of the labor market	900 graduates of business studies	Center for university development (CHE)	11 German universities	Federkeil, G. (2002). *Vergleichende Absolventenbefragung BWL an Universitäten. Centrum für Hochschulentwicklung (CHE).* http://www.che.de/downloads/AP43.pdf (Retrieved 19.11.2010).
Job opportunities, job-related requirements, problems on the labor market for musicians	Graduates from conservatories, labor market experts, university lecturers	Graduate project (funded by the DFG)		Gembris, H. & Langner, D. (2005). *Von der Musikhochschule auf den Arbeitsmarkt. Erfahrungen von Absolventen, Arbeitsmarktexperten und Hochschullehrern*. Augsburg: Wißner.

Relation between university course and job, occupation after completion of the study course	Students and graduates of applied linguistics and cultural sciences (translation and interpreting)		University of Mainz/ Germersheim	Hagemann, S. (2006). Studien- und Berufswege im Übersetzen und Dolmetschen: Eine Germersheimer Umfrage. *Lebende Sprachen*, 51(1), 13-21.
Assessment of the university studies or respectively PhD period, transfer into the job, connectedness to the university	2550 graduates, 243 PhDs (from all subjects)	University evaluation alliance at the University of Mainz	Rhineland-Palatinate	Oesterling, C. & Boll, T. (2008). *Absolventenstudie Rheinland-Pfalz. Landesweite Absolventenbefragung Abschlussjahrgang 2005*. http://www.hochschulevaluierungsverbund.de/Dateien/abs.pdf (Retrieved 19.11.2010).
Aspects of context, input, process, and output quality of the preparative training	Teacher trainees	Potsdam study of prospective teacher training students (Potsdam LAK study), initiated by the ministry of education, youth and sports Brandenburg	Brandenburg	Schubarth, W., Speck, K. & Gladasch, U. (2007). Die zweite Phase der Lehrerausbildung aus Sicht der Brandenburger Lehramtskandidatinnen - die Potsdamer LAK-Studie. In M. Lüders & J. Wissinger (Eds.), *Forschung zur Lehrerbildung. Kompetenzentwicklung und Programmevaluation* (pp. 169-193). Münster: Waxmann.

Chart 1d: German University Rankings

Study (Initiator)	Source
CHE Ranking of German Universities	Federkeil, G. (2002). Some Aspects of Ranking Methodology - The CHE-Ranking of German Universities. *Higher Education in Europe*, 27(4), 389-397.
Survey among freshmen *Befragung von Studienanfängern* (motives, attitude etc.)	Heine, C., Kerst, C. & Sommer, D. (2007). *Studienanfänger im Wintersemester 2005/06. Wege zum Studium, Studien- und Hochschulwahl, Situation bei Studienbeginn*. Hannover (HIS Forum Hochschule, 1).
Student survey of the task group for university research at the University of Constance (AG Hochschulforschung), funded by the BMBF	Simeaner, H., Dippelhofer, S., Bargel, H., Ramm, M. & Bargel, T. (2007). *Studiensituation und Studierende an Universitäten und Fachhochschulen. Datenalmanach Studierendensurvey 1983 - 2007*. Herausgegeben von A. H. Universität Konstanz. (Hefte zur Bildungs- und Hochschulforschung, 51).

Chart 2a: European Competence Assessment

Instrument	Object of Study	Sample (Field)	Design	Study (Initiator)	Local Scope	Source
Questionnaire, vignette, video analyses in class	Competence to plan classes in different scientific dimensions, expectations towards oneself	Prospective teachers	Longitudinal	Two pedagogical universities	Switzerland, Germany	Baer, M., Dörr, G. & Fraefel, U. (2006). Standarderreichung in der Lehrerinnen- und Lehrerausbildung. Analyse der Wirksamkeit der berufsfeldorientierten Ausbildung. In F. Eder (Ed.), *Qualität durch Standards? Beiträge zum Schwerpunktthema der 67. Tagung der AEPF* (pp. 237-251). Münster: Waxmann.
	Adaptive teaching competence	50 teachers	Longitudinal	Funded by the Swiss National Fund	Switzerland	Beck, E., Baer, M., Guldimann, T., Bischoff, S., Brühwiler, C. & Müller, P. et al. (2008). *Adaptive Lehrkompetenz. Analyse und Struktur, Veränderbarkeit und Wirkung handlungssteuernden Lehrerwissens*. Münster: Waxmann.
Survey	Effectiveness of teaching practice influenced by longer-term professional development (PD)	Primary and secondary teachers	Longitudinal approach	Centre for Formative Assessment Studies (CFAS)	England	Boyle, B., Lamprianou, I. & Boyle, T. (2005). A Longitudinal Study of Teacher Change: What makes professional development effective? Report of the second year of the study. *Journal of School Effectiveness and School Improvement*, 16(1), 1-27.
	Students' conception of learning and personal and professional identity	Students and graduates in three contrasting subjects: biology, business studies & sociology	Cross-sectional, longitudinal	The Social and Organisational Mediation of University Learning (SOMUL) - part of the Economic and Social Research Council´s (ESRC) "Teaching and Learning Research Programme (TLRP)" from the UK	Five study programs for each subject (UK)	Brennan, J. & Jary, D. (2005). *What is learned at university? The Social and Organisational Mediation of University Learning: a research project*. London (SOMUL Working Paper, 1).

Formative and summative assessment tests	Academic achievement influenced by mid-term formative assessment	548 pre-graduate students from three health science degrees (Medicine, Psychology, Biology)	Longitudinal approach		Four Spanish universities	Carrillo-de-la-Pena, M. T., Bailles, E., Caseras, X., Martinez, A., Ortet, G. & Perez, J. (2009). Formative Assessment and Academic Achievement in Pre-Graduate Students of Health Sciences. *Advances in Health Sciences Education*, 14(1), 61-67.
Questionnaire, interviews, individual case studies, focus groups, digital video analyses	Musicians' backgrounds, attitudes & approaches to advanced performance learning	Classical, popular, jazz and Scottish traditional musicians in undergraduate, postgraduate and wider music community contexts	Two-year comparative study (multi-site, multi-method project)	The Investigating Musical Performance (IMP) - part of the Economic and Social Research Council´s (ESRC) "Teaching and Learning Research Programme (TLRP)" from UK	UK	Creech, A., Papageorgi, I., Duffy, C., Morton, F., Haddon, L. & Potter, J. et al. (2008). Investigating musical performance: commonality and diversity among classical and non-classical musicians. *Music Education Research*, 10(2), 215-234.
Assessment instrument	Professional competencies	Prospective teachers and teacher trainees	Cross-sectional, longitudinal	Pedagogics	Germany, Switzerland, Austria, Italy, Poland	Frey, A. (2008). *Kompetenzstrukturen von Studierenden in der ersten und zweiten Phase der Lehrerbildung. Eine nationale und internationale Standortbestimmung*. Landau: Empirische Pädagogik.
Semi-structured interviews	Pedagogical content knowledge (PCK): Knowledge about instructional strategies, knowledge about students' understanding, knowledge about assessment of students, and knowledge about goals and objectives of the specific topic in the curriculum.	Nine experienced science teachers in their first few years of teaching a new science syllabus in Dutch secondary education	Longitudinal approach (over three subsequent academic years)		The Netherlands	Henze, I. & van Driel, J. H. (2006). The Development of Experienced Science Teachers. Pedagogical Content Knowledge in the Context of Educational Innovation. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 99-112). Aachen: Shaker.
Interview	Academic competencies	Graduates three year after graduation	Cross-sectional		209 HEI among eight European countries	Joumady, O. & Ris, C. (2005). Performance in European Higher Education: A Non-Parametric Production Frontier Approach. *Education Economics*, 13(2), 189-205.

Test	Capability (i.e. problem solution, understanding of texts, memory, reproduction, basic medical and scientific understanding	Applicants for Medical Studies and Dentistry		Screening test for medical studies in Austria (EMS)	Austria	Mallinger, R., Holzbaur, C., Dierich, M., Heidegger, M., Hänsgen, K. D. & Spicher, B. (2008). *EMS Eignungstest für das Medizinstudium in Österreich*. Zentrum für Testentwicklung Universität Fribourg/Schweiz, Medizinische Universität Innsbruck, Medizinische Universität Wien. http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf (Retrieved 19.11.2010).
	Academic work indicators: competencies achieved, time factors (learning), class activities	University students			Projected European Higher Education Area (EHEA) - in a specific course	Martinez, R. J. & Moreno, R. (2007). Validity of Academic Work Indicators in the Projected European Higher Education Area. *Higher Education: The International Journal of Higher Education and Educational Planning*, 53(6), 739-747.
Video analyses, stimulated recall interviews	Self-reflection on teaching (reflection on why they chose particular content for their lessons, how they interacted with the children and their own way of developing professional knowledge for teaching)	22 primary science student teacher	Longitudinal approach		Sweden (Science learning centre at Halmstad University)	Nilsson, P. (2006). Student Teachers. Reflection. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 53-64). Aachen: Shaker.
Survey	Capacity to act: professional, methodical, social (and media) competence	122 students from nine (media-based) courses in social or natural sciences, humanities or law		Pedagogical psychology	University of Graz, Austria	Paechter, M., Maier, B. & Grabensberger, E. (2007). Evaluation medienbasierter Lehre mittels der Einschätzung des Kompetenzerwerbs. Entwicklung eines Erhebungsinstruments. *Zeitschrift für Medienpsychologie*, 19(2), 68-75.

Case study approach	Factors of student performance on a introductory statistics module	Undergraduate students of Economics and Quantitative Methods	Longitudinal	University of Westminster (UK), Department of Economics and Quantitative Methods / Centre for Academic Professional Development	University of Westminster, UK	Pokorny, M. & Pokorny, H. (2005). Widening participation in higher education. Student quantitative skills and independent learning as impediments to progression. *International Journal of Mathematical Education in Science and Technology*, 36(5), 445-467.
Peer reviewing, self-assessment	Academic skills (Subject specific and valuable generic skills)	University students in Botany		Agriculture	University of Belgrade, Serbia	Quarrie, S. P. (2007). Student Peer Review as a Tool for Efficiently Achieving Subject-Specific and Generic Learning Outcomes: Examples in Botany at the Faculty of Agriculture, University of Belgrade. *Higher Education in Europe*, 32(2/3), 203-212.
Test	Academic achievement in second- and third-level education	Business studies students	Longitudinal approach		Ireland	Rigney, T. J. (2002). A study of the relationship between entry qualifications and achievement of third level business studies students. *Irish Journal of Management*, 23(2), 117-139.
Questionnaire	Hardiness (cognitive/emotional variable), age, gender	134 university undergraduate students	Two-year correlational study		UK	Sheard, M. (2003). Hardiness Commitment, Gender, and Age Differentiate University Academic Performance. *British Journal of Educational Psychology*, 79(1), 189-204.
Interviews, focus groups, questionnaires	Perceptions & understanding of the values underpinning teaching and learning experiences	40 postgraduate students through teacher education & professional development	Longitudinal approach	Part of the Economic and Social Research Council´s (ESRC) "Teaching and Learning Research Programme (TLRP)" from UK	Northern Ireland	Smith, A., McCully, A., Moran, A. & Clarke, L. (2008). *A Value-Based Approach to Teacher Education: Non-Technical Summary*. Swindon: Economic and Social Research Council (ESRC).
Test	Knowledge and skills (ability to succeed in HE)	Applicant for a university place		The Swedish Scholastic Aptitude Test by Högskoleverket (Swedish National Agency for Higher Education)	Sweden	Swedish National Agency for Higher Education (n.d.). *New entrants to higher education.* http://www.hsv.se/highereducationinsweden/studyingatheis/newentrantstohighereducation.4.28afa2dc11bdcdc557480002489.html (Retrieved 19.11.2010).

Chart 2b: European Competence Models

Field	Concept	Source
Teacher training (pedagogics)	Competence to plan classes in different scientific dimensions.	Baer, M., Dörr, G. & Fraefel, U. (2006). Standarderreichung in der Lehrerinnen- und Lehrerausbildung. Analyse der Wirksamkeit der berufsfeldorientierten Ausbildung. In F. Eder (Ed.), *Qualität durch Standards?* Beiträge zum Schwerpunktthema der 67. Tagung der AEPF (pp. 237-251). Münster: Waxmann.
Science teacher education	Pedagogical content knowledge (PCK): Knowledge about instructional strategies, knowledge about students' understanding, knowledge about assessment of students, and knowledge about goals and objectives of the specific topic in the curriculum.	Henze, I. & van Driel, J. H. (2006). The Development of Experienced Science Teachers. Pedagogical Content Knowledge in the Context of Educational Innovation. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 99-112). Aachen: Shaker.
Higher education in general	Key qualifications	Mugabushaka, A.-M. (2005). *Schlüsselqualifikationen im Hochschulbereich. Eine diskursanalytische Untersuchung der Modelle, Kontexte und Dimensionen in Deutschland und Großbritannien*. Dissertation. Universität Kassel.
Primary science teacher education	Shulman's model of Pedagogical Reasoning and Action (Shulman, 1987): When student teachers engage in self-reflective processes, they begin to understand the complexity of knowledge about science teaching and learning.	Nilsson, P. (2006). Student Teachers. Reflection. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 53-64). Aachen: Shaker.

Chart 2c: European Graduate Studies

Object of Study	Field	Study (Initiator)	Local Scope	Source
Employment and further study outcomes six months after graduation	General assessment of all eligible candidates	Destinations of Leavers from Higher Education (DLHE) by the Higher Education Statistics Agency (HESA)	UK	Higher Education Statistics Agency (HESA) (n.d.). *Destinations of Leavers from Higher Education (DLHE).* http://www.hesa.ac.uk/index.php?option=com_collns&task=show_colln&Itemid=232&c=C06018&s=3&wvy=any&wvs=1&isme=1 (Retrieved 19.11.2010).
Experience during the transfer, earnings	Comprehensive	Bundesamt für Statistik (BFS) (Swiss Federal Statistical Office)	Switzerland	Storni, M. & Schmid, M. (2008). *Hochschulabsolventen und Hochschulabsolventinnen auf dem Arbeitsmarkt. Erste Ergebnisse der Längsschnittbefragung 2007*. Neuchâtel: Bundesamt für Statistik (BFS) (Statistik der Schweiz).

Chart 2d: European University Rankings

Study (Initiator)	Source
Ranking of Russian universities (independent ranking agency RatER)	Artushina, I. & Troyan, V. (2007). Methods of the Quality of Higher Education Social Assessment. *Higher Education in Europe*, 32(1), 83-89.
Feasibility study of a multidimensional global ranking (by CHERPA: Consortium for Higher Education and Research Performance Assessment) - the final product is to be launched in 2011.	Center for Higher Education (CHEPS) (2009). *CHEPS and CHE to take the leading role in a new EC funded project to develop a multi-dimensional global university ranking. The CHERPA-Network wins a European tender to develop a multi-dimensional global ranking of universities*. Unter Mitarbeit von Frank Ziegele und Frans van Vught. University of Twente. http://www.utwente.nl/cheps/news/MGUR/ (Retrieved 19.11.2010).
University league tables and rankings published by British newspapers	Eccles, C. (2002). The Use of University Rankings in the United Kingdom. *Higher Education in Europe*, 27(4), 423-432.
Ranking of HEIs in Russia	Filinov, N. B. & Ruchkina, S. (2002). The Ranking of Higher Education Institutions in Russia: Some Methodological Problems. *Higher Education in Europe*, 27(4), 407-421.
Ranking of Polish public and private secondary schools and HE institutions (by "Perspektywy," a mayor educational publication house)	Siwinski, W. (2002). "Perspektywy" - Ten Years of Rankings. *Higher Education in Europe*, 27(4), 399-406.

Chart 3a: International Competence Assessment

Instrument	Object of Study	Sample (Field)	Design	Study (Initiator)	Local Scope	Source
MC-test and essay questions	Generic skills: writing, reading, mathematics, science reasoning, critical thinking, curricular content drawn from all fields	All types of students	Pre- and post-testing (cross-sectional or longitudinal)	Collegiate Assessment of Academic Proficiency (CAAP) by the ACT	USA	ACT (n.d.). *Collegiate Assessment of Academic Proficiency (CAAP)*. http://www.act.org/caap/ (Retrieved 19.11.2010).
Survey	Competencies in the knowledge society (and structural and institutional factors that shape the relation between HE and work in nine EU countries)	36,000 HE graduates	Cross-sectional, country study, quality study (36 months)	The Flexible Professional in the Knowledge Society New Demands on Higher Education in Europe (REFLEX) - a Specific Targeted Research Project (STREP) of the European Union's Sixth Framework Program	15 countries: Austria, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, UK, Belgium-Flanders, Czech Republic, Portugal, Switzerland, Japan, Estonia (parallel project in Russia and Latin America)	Allen, J. & van der Velden, R. (2005). *The Role of Self-Assessment of Skills*. Research Centre for Education and the Labour Market. Maastricht University (REFLEX Working paper, 2).
E-portfolios	Key learning outcomes: 9 metarubrics of intellectual and practical skills (inquiry & analysis, critical thinking, creative thinking etc.), 4 of personal and social responsibility (civic knowledge and engagement, ethical reasoning etc.), Integrative learning	College students		The Valid Assessment of Learning in Undergraduate Education (VALUE) project by the Association of American Colleges and University's Liberal Education and America's Promise (LEAP)	America (The approach is based on the shared understanding of faculty and academic professionals on campuses from across the country).	Association of American Colleges and Universities (AAC&U) (2009). The VALUE Project Overview. *Peer Review*, 11(1), 4-7.

MC test, writing tasks	Written communication, critical thinking, problem solving (possibly addition of other generic skills like basic skills, IT skills and domain-specific skills), interpersonal understanding	Students at entry and graduation level	Cross-sectional	Graduate Skills Assessment (GSA) by the Australian Council for Educational Research (ACER)	Australia	Australian Council for Educational Research (ACER) (n.d.). *Graduate Skills Assessment (GSA)*. http://www.acer.edu.au/tests/gsa (Retrieved 19.11.2010).
Test, questionnaire	mathematical, didactical and pedagogical knowledge, job-related beliefs, learning opportunities	Prospective mathematics teachers in primary and secondary schools (approx. until the pupil's age of 16) (for Germany N = 2300 students and teacher trainees)	International comparative study	Teacher Education and Development Study in Mathematics (TEDS-M) by the International Association for the Evaluation of Educational Achievement (IEA)	Botswana, Canada, Chile, Germany, Georgia, Italy, , Malaysia, Norway, Oman, the Philippines, Poland, Russia, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand and the USA	Blömeke, S., Kaiser, G. & Lehmann, R. (Eds.) (2010). *TEDS-M 2008. Professionelle Kompetenz und Lerngelegenheiten angehender Mathematiklehrkräfte für die Sekundarstufe I im internationalen Vergleich*. Münster: Waxmann.
Test, questionnaire	mathematical, didactical and pedagogical knowledge, job-related beliefs, learning opportunities	Prospective mathematics teachers in secondary schools (approx. until the pupil's age of 16) (for Germany N = 849 students and teacher trainees)	International comparative study	Mathematics Teaching in the 21st Century (MT21)	Germany, Bulgaria, Mexico, South Korea, Taiwan, USA	Blömeke, S., Kaiser, G. & Lehmann, R. (Eds.) (2008). *Professionelle Kompetenz angehender Lehrerinnen und Lehrer. Wissen, Überzeugungen und Lerngelegenheiten deutscher Mathematikstudierender und –refendare. Erste Ergebnisse zur Wirksamkeit der Lehrerausbildung*. Münster: Waxmann.
Open-ended questions, performance-based problem-solving tasks	Generic and domain-specific skills (inquiry, analysis, communication skills in the context of different disciplines)	All types of students	Single testing	Tasks in Critical Thinking by the Educational Testing Service (ETS)	USA	Borden, V. M. & Owens J. L. (2001). *Measuring Quality: Choosing Among Surveys and Other Assessments of College Quality. Tasks in Critical Thinking*. Washington, D. C.: American Council on Education and Association for Institutional Research.

Several instruments (tests etc.)	Relation between student engagement and academic performance (critical thinking and grades)	1058 students at four-year colleges and universities			14 four-year colleges and universities (USA)	Carini, R. M., Kuh, G. D. & Klein, S. P. (2006). Student Engagement and Student Learning. Testing the Linkages. *Research in Higher Education*, 42(1), 1-32.
MC test	Domain-specific skills (for 33 subject areas)	Students from non-technical HEIs	Single testing	Examen General para el Egreso de la Licenciatura (EGEL) by Centro Nacional de Evaluación para la Educación Superior (CENEVAL)	Mexico	Centro Nacional de Evaluación para la Educación Superior (CENEVAL) (n.d.a). *Examen General Para el Egreso de la Licenciatura (EGEL).* http://www.ceneval.edu.mx/ceneval-web/content.do?page=1676 (Retrieved 19.11.2010).
MC test	Generic skills: verbal and mathematic reasoning, capacities to infer, analyze and synthesize, competencies in information use	Graduates applying for entry into graduate study programs	Single testing	Examen Nacional de Ingreso al Posgrado (EXANI-III) by Centro Nacional de Evaluación para la Educación Superior (CENEVAL)	Mexico	Centro Nacional de Evaluación para la Educación Superior (CENEVAL) (n.d.b). *Examen Nacional de Ingreso al Posgrado (EXANI-III)*. http://www.ceneval.edu.mx/ceneval-web/content.do?page=1675 (Retrieved 19.11.2010).
MC test	Domain-specific skills (for all 19 areas of the Technical University Track), general content knowledge and generic skills (social and economic knowledge, IT, English)	Students from technical HEIs	Single testing	Exámenes Generales para el Egreso del Técnico Superior Universitario (EGETSU) by Centro Nacional de Evaluaciòn para la Educación Superior (CENEVAL)	Mexico	Centro Nacional de Evaluaciòn para la Educación Superior (CENEVAL) (n.d.c). *Exámenes Generales para el Egreso del Técnico Superior Universitario (EGETSU).* http://www.ceneval.edu.mx/ceneval-web/content.do?page=2098 (Retrieved 19.11.2010).
Test	Work-, career- and future-readiness	HE students		Work Readiness Assessment Package piloted by an Australian university	Australia	Coates, H. & Edwards, D. (2008). *Work Readiness Assessment Package (WRAP).* Camberwell: Australian Council for Educational Research (ACER).

Test	Engineering capability	HE students		Tertiary Engineering Capability Assessment (TECA) by ACER - part of the AHELO-Feasibility study	Australia	Coates, H. & Radloff, A. (2008). *Tertiary Engineering Capability Assessment. Concept Design.* http://dtl.unimelb.edu.au/view/action/singleViewer.do?dvs=1319034633735~437&locale=de_DE&VIEWER_URL=/view/action/singleViewer.do?&DELIVERY_RULE_ID=7&search_terms=SYS%20=%20000002292 7&adjacency=N&application=DIGITOOL-3&frameId=1&usePid1=true&usePid2=true (Retrieved 19.11.2010).
Test (examination)	Relation between class attendance and economic achievement	347 college students	Longitudinal (1997–2001)		USA	Cohn, E. & Johnson, E. (2006). Class Attendance and Performance in Principles of Economics. *Education Economics*, 14(2), 211-233.
Test	Students' knowledge of subjects that are necessary for college success: reading, writing, mathematics, critical thinking and subject-specific knowledge for five general subject areas (English, Mathematics, History, Science & Languages)	Students applying for entry into colleges		SAT Test & SAT Subject Tests by the College Board	USA	College Board (n.d.). *SAT*. http://www.collegeboard.com/ (Retrieved 19.11.2010).
Performance-based tasks	Generic and domain-specific skills (critical thinking, analytic reasoning etc.), real-life tasks	Freshmen and senior students	Cross-sectional, longitudinal is possible	Collegiate Learning Assessment (CLA) by Council for Aid to Education (CAE)	USA	Council for Aid to Education (CAE) (n.d.). Collegiate Learning Assessment (CLA). http://www.collegiatelearningassessment.org/ (Retrieved 19.11.2010).
Test, portfolio	Content knowledge (math, science etc.), teaching knowledge (pedagogy etc.), actual teaching	Teachers		TTK by 15 INTASC states (Interstate New Teacher Assessment and Support Consortium states)	USA (35 INTASC members)	Council of Chief State School Officers (n.d.). *INTASC Portfolio Development*. http://programs.ccsso.org/projects/interstate_new_teacher_assessment_and_support_consortium/projects/portfolio_development/ (Retrieved 19.11.2010).

MC-test and writing tasks	Generic skills: verbal and quantitative reasoning, analytical writing	Graduates applying for entry into graduate or professional schools	Single testing	Graduate Record Examination (GRE) General Test by the Educational Testing Service (ETS)	USA, Canada, other countries	Educational Testing Service (ETS) (n.d.a). *Graduate Record Examination (GRE) General Test*. http://www.ets.org/portal/site/ets/menuitem.fab2360b1645a1de9b3a0779f1751509/ (Retrieved 19.11.2010).
MC test	Domain-specific knowledge and skills (factual knowledge, ability to analyze and solve problems etc.) (for 15 undergraduate disciplines and for MBAs)	Senior students (four-year colleges)	Single testing	Major Field Tests by the Educational Testing Service (ETS)	USA	Educational Testing Service (ETS) (n.d.b). *Major Field Tests*. http://www.ets.org/portal/site/ets/menuitem.1488512ecfd5b8849a77b13bc3921509/?vgnextoid=f119af5e44df4010VgnVCM10000022f95190RCRD&vgnextchannel=86f346f1674f4010VgnVCM10000022f95190RCRD (Retrieved 19.11.2010).
MC test, essay question	Generic and domain-specific skills (reading and critical thinking in the context of different disciplines)	All types of students	Pre- and post-testing (cross-sectional or longitudinal)	Measure of Academic Proficiency and Progress (MAPP) by the Educational Testing Service (ETS) and the College Board	USA	Educational Testing Service (ETS) and the College Board (n.d.). *Measure of Academic Proficiency and Progress (MAPP)*. http://www.ets.org/portal/site/ets/menuitem.1488512ecfd5b8849a77b13bc3921509/?vgnextoid=ff3aaf5e44df4010VgnVCM10000022f95190RCRD&vgnextchannel=f98546f1674f4010VgnVCM10000022f95190RCRD (Retrieved 19.11.2010).
Test	Domain-specific skills (for 26 subject areas)	Students at graduation level	Single testing	Exame Nacional de Cursos (ENC or "Provão") by FUNDAÇÃO CESGRANRIO	Brazil	FUNDAÇÃO CESGRANRIO (n.d.). *Exame Nacional de Cursos (ENC or "Provão")*. http://www.inep.gov.br/superior/provao/default.asp (Retrieved 19.11.2010).
Test (objective questions, essay questions)	Domain-specific skills (for 26 subject areas), general content knowledge (biological and social diversity, public policies, etc.), generic skills (ability to infer, interpret poetic texts, etc.)	Students at entry and graduation level	Cross-sectional	Exame Nacional de Desempenho dos Estudantes (ENADE) by FUNDAÇÃO CESGRANRIO and CESPE	Brazil	FUNDAÇÃO CESGRANRIO and CESPE (n.d.). *Exame Nacional de Desempenho dos Estudantes (ENADE)*. http://www.inep.gov.br/superior/enade/default.asp (Retrieved 19.11.2010).

Questionnaire	Generic skills (problem solving, etc.), non-cognitive outcome (teamwork skills, student satisfaction with teaching, assessment etc.), general competencies (ability to plan work etc.)	Graduates completed requirements for any HE qualification	Single testing	Course Experience Questionnaire (CEQ) by the Graduate Careers Council of Australia (GCCA) and the Australian Council for Educational Research (ACER)	Australia	Graduate Careers Australia (GCA). *Australian Graduate Survey*. http://www.graduatecareers.com.au/Research/Surveys/AustralianGraduateSurvey/index.htm (Retrieved 19.11.2010).
Test	Student success on the mathematics subtest of the TASP, student readiness for college level mathematics	10 groups of high school, community college and university students (total number of 760 probands)	Cross-sectional	Texas Academic Skills Program (TASP)	Texas	Heger, H. K. (1991). *Designing a Mathematics Predictor Test for the TASP (Texas Academic Skills Program) Test*. Paper presented at the Annual Meeting of the Southwest Educational Research Association. San Antonio, TX.
Test	Mathematical knowledge for teaching (and their effects on students' mathematical achievement)	Teachers	Longitudinal		USA	Hill, H. C., Rowan, B. & Ball, D. L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. *American educational research journal*, 42(2), 371-406.
Survey	Literacy and numeracy skills	Adult population (16- to 65-year-olds)	International comparative study	International Adult Literacy and Lifeskills Survey (ALL) by the IES National Center for Educational Statistics	Six countries: Bermuda, Canada, Italy, Norway, Switzerland, USA	IES National Center for Educational Statistics (n.d.). *Highlights From the 2003 International Adult Literacy and Lifeskills Survey (ALL)*. http://nces.ed.gov/Surveys/ALL/issuebrief.asp (Retrieved 19.11.2010).
Pre- and post-test assessment survey	Effectiveness of simulations in promoting affective learning and discovering changes in patterns of student interactions	Participants in EuroSim 2007	Meta-analysis of a cross-continent EU-simulation as pedagogical tool	Cross-continent EU simulation (EuroSim 2007) by the Trans-Atlantic Consortium for European Union Studies and Simulations (TACEUSS)	Participants in EuroSim (over 200 students and faculty from 13 American and nine European partner institutions)	Jones, R. (2008). Evaluating a Cross-Continent EU Simulation. *Journal of Political Science Education*, 4(4), 404-434.

Various methods of directly measuring (open-ended rather than MC format)	Generic skills: certain writing, critical thinking skills	Undergraduate students	Two-year feasibility study	Value Added Assessment Initiative (VAAI), American Association of State Colleges and Universities (AASCU)	USA	Klein, S. (2002). Direct assessment of cumulative student learning. (Analysis). *Peer Review*, 4(2/3), 26-28.
Open-ended tests	Cognitive outcome	1365 students from 14 colleges	Feasibility of an approach to measure student learning		14 diverse colleges (USA)	Klein, S. P., Kuh, G. D., Chun, M., Hamilton, L. & Shavelson, R. (2005). An Approach to Measuring Cognitive Outcomes across Higher Education Institutions. *Research in Higher Education*, 46(3), 251-276.
Computer administered, open-ended test	Analytic reasoning, critical thinking, problem solving, written communication skills	College students		The Collegiate Learning Assessment (CLA)	USA	Klein, S. P., Benjamin, R., Shavelson, R. & Bolus, R. (2007). The Collegiate Learning Assessment. Facts and Fantasies. *Evaluation Review*, 31(5), 415-439.
Portfolio of protocols, audio and video recording	Development of effective teaching influenced by a continuous professional development (CPD) program	Seven experienced chemistry teachers	Longitudinal	Three CPD providers from the Department of Science Teaching at the Weizmann Institute (Israel)	Israel	Mamlok-Naaman, R., Taitelbaum, D., Carmeli, M. & Hofstein, A. (2006). A Model of Professional Development of Chemistry Teachers. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 113-124). Aachen: Shaker.
Survey interviews, questionnaire	Level of previous education, skill improvement, other aspects of training experience (and demographic characteristics, reasons or goals for enrolling in the training, sources of funding)	1,821 former students from the English language training from 17 different post-secondary institutions	Cross-sectional	2007 English as a Second Language (ESL) Student Outcomes Survey by the British Columbia Ministry of Advanced Education	British Columbia, Canada	Ministry of Advanced Education (British Columbia) (2008). *2007 ESL Survey: 2007 English as a Second Language Student Outcomes Survey Report*. http://www.aved.gov.bc.ca/esl/docs/2007_esl_survey_report.pdf (Retrieved 19.11.2010).

MC test	Ability to analyze and solve problems, understand relationships and interpret material in business	241 business students (undergraduate and MBA)	Meta-analysis of the Major Field Test in Business scores (in difference to the GPA)	The Major Field Test in Business by the Educational Testing Service (ETS)	USA	Mirchandani, D., Lynch, R. & Hamilton, D. (2001). Using the ETS Major Field Test in Business: Implications for Assessment. *Journal of Education for Business*, 77(1), 51-56.
	Intercultural communicative competence (ICC) in pre-service teacher training seminars (collaborative project) - knowledge via experiential learning	Future foreign language teachers	Longitudinal		German college of education and an American university	Müller-Hartmann, A. (2005). Interkulturelles Lernen in internationalen Telekollaborationsprojekten. Die Entwicklung von Erfahrungswissen angehender Fremdsprachenlehrer/innen. *Fremdsprachen lehren und lernen*, 34, 192-206.
Questionnaire	Student engagement (how undergraduates spend their time, gains from courses, extracurricular activities)	Freshmen and senior students	Cross-sectional (annually)	National Survey of Student Engagement (NSSE) by National expert team chaired by Peter Ewell (NCHEMS)	USA, Canada	National Center for Higher Education Systems (NCHEMS) (n.d.). *National Survey of Student Engagement (NSSE).* http://nsse.iub.edu/index.cfm (Retrieved 19.11.2010).
Test, survey	Literacy, numeracy and problem solving skills (and background information: demographic details, job requirements etc.)	Adult population (employees and employers)	International comparative study (cross-sectional) - expected for 2011	Program for the International Assessment of Adult Competencies (PIAAC) by the OECD	At least 22 OECD countries	Organisation for Economic Co-operation and Development (OECD) (2004). *PIAAC Draft Strategy Paper. Policy Objects, Strategic Options and Cost Implications*. http://www.oecd.org/dataoecd/3/3/34463133.pdf (Retrieved 19.11.2010).
Online test, survey	Analytical reasoning, discipline-specific skills in engineering and economics (and context information: organizational characteristics, cultural attributes, attitudinal outcome etc.)	10.000–30.000 HE students	Feasibility study	Assessment of Higher Education Learning Outcomes (AHELO) by the OECD	Finland, Korea, Mexico, Norway (generic skills); Australia, Japan, Sweden (skills in engineering); Belgium, Italy, Mexico, the Netherlands (skills in economics)	Organisation for Economic Co-operation and Development (OECD) (2009). *The OECD Assessment of Higher Education Learning Outcomes (AHELO).* http://www.oecd.org/dataoecd/3/13/42803845.pdf (Retrieved 19.11.2010).

Questionnaire, test (presented by an interviewer)	Literacy skills (and background information: demographic details, work history etc.)	Adult population (16- to 65-year-olds)	Large-scale comparative assessment (data collection between 1994 and 1998)	The International Adult Literacy Survey (IALS) by the OECD, Statistics Canada and Educational Testing Service of Princeton, NJ	Canada, France, Germany, Ireland, the Netherlands, Poland, Sweden, Switzerland, USA, Australia, Belgium, Great Britain, New Zealand, Northern Ireland, Chile, the Czech Republic, Denmark, Finland, Hungary, Italy, Norway, Slovenia	Organisation for Economic Co-operation and Development (OECD) (n.d.). *Adult Literacy*. http://www.oecd.org/document/2/0,3343,en_2649_39263294_2670850_1_1_1_1,00.html (Retrieved 19.11.2010).
Precollege survey, test (CAAP)	Changes in reading comprehension, mathematics & critical thinking influenced by two- and four-year college educational programs	Freshman students at two- or four-year colleges	Comparative analysis	Office of Educational Research and Improvement (ED)	USA	Pascarella, E., Bohr, L., Nora, A. & Terenzini, P. (1995). Cognitive Effects of Two-Year and Four-Year Colleges. New Evidence. *Educational Evaluation and Policy Analysis*, 17(1), 83-96.
Case studies, knowledge test	How the case study-influences individual performance	33 prospective chemistry teachers	Longitudinal and cross-sectional		Hacetteppe University (Ankara)	Pitton, A. (2005). *Relevanz fachdidaktischer Forschungsergebnisse für die Lehrerbildung. Jahrestagung der GDCP in Heidelberg 2004*. 1. Auflage. Münster: LIT.
Portfolios, interviews, senior and capstone projects, surveys, examinations	Student outcomes (to assess the effectiveness of general education and baccalaureate degree programs)	Students	Meta-assessment of 15 pilot projects	The Student Outcomes Assessment projects by the Academic Program Improvement grants of the California State University	California State University	Riggs, M. L. & Worthley, J. S. (1992). *Baseline Characteristics of Successful Programs of Student Outcomes Assessment*. California State University. (Reports - Research/Technical, 143).
Test	Analytical thinking, understanding in novel situations	Science students	Meta-analysis of the test results (poor performance and high attrition rates)	Adaptation of the British GCSE	University of the South Pacific (Fidschi)	Taylor, N. (1993). Teaching science at the University of the South Pacific. Its special problems. *Journal of Indian education*, 18(5), 18-23.

Vignettes	Knowledge base and beliefs about teaching and chemistry	2 pre-service, secondary chemistry teachers	Longitudinal case-study		USA	Veal, W. (2004). Beliefs and knowledge in chemistry teacher development. *International journal of science education*, 26(3), 329-351.

Chart 3b: International Competence Models

Field	Concept	Source
Information Literacy Competency Standards for HE	Framework for assessing student progress towards information literacy: five standards and 22 performance indicators; the different levels of thinking skills are based on Bloom's Taxonomy of Educational Objectives (lower and higher order)	American Library Association (2008). *Information Literacy Competency Standards for Higher Education.* http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm (Retrieved 19.11.2010).
Key learning outcomes & best practices	Development of 14 metarubrics: 9 metarubrics of intellectual and practical skills, four of personal and social responsibility, one of integrative learning; each metarubric contains the key criteria/characteristics and represents four levels of demonstrated performance for each criterion (to judge the quality of student work) → The VALUE metarubrics must be translated by individual campuses into the language, context, and mission of their institution	Association of American Colleges and Universities (AAC&U) (2009). The VALUE Project Overview. *Peer Review*, 11(1), 4-7.
Teacher training in mathematics	Mathematical, didactical and pedagogical knowledge, job-related beliefs, conceptualization of learning opportunities according to Shulman (1987) and Weinert (2001)	Blömeke, S., Kaiser, G. & Lehmann, R. (Eds.) (2010). *TEDS-M 2008. Professionelle Kompetenz und Lerngelegenheiten angehender Mathematiklehrkräfte für die Sekundarstufe I im internationalen Vergleich*. Münster: Waxmann.
Tertiary Engineering Capability Assessment (TECA) by ACER	Australian HE and dual sector (HE and VET) institutions will participate in the engineering stream of the assessment of discipline specific skills (as part of the AHELO-study) → Preparation of a conceptual framework for assessment of engineering learning outcomes	Coates, H. & Radloff, A. (2008). *Tertiary Engineering Capability Assessment. Concept Design.* http://dtl.unimelb.edu.au/view/action/singleViewer.do?dvs=1319034633735~437&locale=de_DE&VIEWER_URL=/view/action/singleViewer.do?&DELIVERY_RULE_ID=7&search_terms=SYS%20=%20000022927&adjacency=N&application=DIGITOOL-3&frameId=1&usePid1=true&usePid2=true (Retrieved 19.11.2010).
Chemistry teachers	Continuous professional development (CPD) program, focusing on the inquiry approach in the chemistry laboratory followed by protocols assembled in a portfolio, which can be used to demonstrate evidence-based accomplished practice in science teaching, towards achieving more effective teaching.	Mamlok-Naaman, R., Taitelbaum, D., Carmeli, M. & Hofstein, A. (2006). A Model of Professional Development of Chemistry Teachers. In I. Eilks & B. Ralle (Eds.), *Towards research-based science teacher education. Proceedings of the 18th Symposium on Chemical and Science Education held at the University of Bremen, 15-17 June 2006* (pp. 113-124). Aachen: Shaker.

HE Policy Analysts	Competencies HE policy analysts employ to perform their work: A total of 25 competencies were factor analyzed (based on responses from a U.S. sample of policy analysts) → Framework of four categories.	Martinez, M. (2008), Competencies and Higher Education Policy Analysts. *Educational Policy*, 22(5), 623-639.
Adult literacy skills	The IALS employed a sophisticated methodology developed and applied by the Educational Testing Service to measure literacy proficiency for each domain on a scale ranging from 0 to 500 points. Literacy ability in each domain is expressed by a score, defined as the point at which a person has an 80% chance of successful performance from among the set of tasks of varying difficulty included in the assessment. Five levels of literacy that correspond to measured ranges of scores are used in the third report for analytical purposes.	Organisation for Economic Co-operation and Development (OECD) (n.d.). *Adult Literacy*. http://www.oecd.org/document/2/0,3343,en_2649_39263294_2670850_1_1_1_1,00.html (Retrieved 19.11.2010).

Chart 3c: International Graduate Studies

Object of Study	Field	Study (Initiator)	Local Scope	Source
Employment outcome four months after graduation, availability for and sectors of employment, average annual salaries, job search activities, further study activities	Graduates completed requirements for any HE qualification	Graduate Destination Survey (GDS) by the Graduate Careers Council of Australia (GCCA), the Australian Council for Educational Research (ACER), the University of Melbourne`s Information Technology Service (ITS)	Australia	Graduate Careers Australia (GCA). *Australian Graduate Survey*. http://www.graduatecareers.com.au/Research/Surveys/AustralianGraduateSurvey/index.htm (Retrieved 19.11.2010).
Relationship between HE and work (graduates' view on the quality of HE, their experiences, their work orientation, job satisfaction, professional success)	Graduates	Study Program on HE Management in Africa by the Association of African Universities (AAU) - supported by the International Centre for HE Research Kassel	Six African countries (Ghana, Kenya, Malawi, Nigeria, Tanzania, and Uganda)	Mugabushaka, A.-M., Schomburg, H. & Teichler, U. (2007). *Higher education and work in Africa. A comparative empirical study in selected countries*. Kassel: Jenior.
Employment and work situation (study experiences, the transition from HE to employment and their early career up to four years after graduation)	40,000 graduates	Careers after Higher Education: a European Research Study (CHEERS)	12 countries: Austria, the Czech Republic, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, the United Kingdom and Japan	Schomburg, H. & Teichler, U. (2006). *Higher education and graduate employment in Europe. Results from graduate surveys from twelve countries*. Dordrecht: Springer.

Employment outcome two years and five years after graduation (information on the jobs, match between education and occupation, graduate satisfaction with their HEI experience)	Graduates from all public HEIs	National Graduate Survey (NGS) by Statistics Canada (StatCan) for HRDC	Canada	Statistics Canada (StatCan) for HRDC (n.d.a). *National Graduate Survey (NGS)*. http://www.statcan.gc.ca/cgibin/imdb/p2SV.pl?Function=getSurvey&SDDS=5012&lang=en&db=imdb&adm=8&dis=2 (Retrieved 19.11.2010).
Occupational competencies (include question on postsecondary education and engagement and employment outcomes)	Age cohorts 15 and 18–22 of the general population (not restricted to students and graduates)	Youth in Transition Survey (YITS) by Statistics Canada (StatCan) for HRDC	Canada	Statistics Canada (StatCan) for HRDC (n.d.b). *Youth in Transition Survey (YITS).* http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=4435&lang=en&db=imdb&adm=8&dis=2 (Retrieved 19.11.2010).

Chart 3d: International University Rankings

Study (Initiator)	Source
US News and World Report; America's Best Colleges	Carey, K. (2006). *College Rankings Reformed: The Case for a New Order in Higher Education*. Washington D.C.: Education Sector.
Academic quality rankings	Clarke, M. (2002). Some Guidelines for Academic Quality Rankings. *Higher Education in Europe*, 27(4), 443-459.
Bayesian latent variable analysis to determine rankings of universities in the UK and US (on the basis of a set of quality-related measures)	Guarino, C., Ridgeway, G., Chun, M. & Buddin, R. (2005). Latent Variable Analysis: A New Approach to University Ranking. *Higher Education in Europe*, 30(2), 147-165.
Chinese university rankings (six institutions)	Liu, N. C. & Liu, L. (2005). University Rankings in China. *Higher Education in Europe*, 30(2), 217-227.
University Rankings in Japan	Yonezawa, A., Nakatsui, I. & Kobayashi, T. (2002). University Rankings in Japan. *Higher Education in Europe*, 27(4), 373-382.

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