ASSESSMENT OF KEY COMPETENCIES – A CONCEPTUAL FRAMEWORK

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Abstract
While the notion of critical competencies and the need for competence development is widely accepted, there still is a lack of theoretical grounded approaches to describe and operationalise such competencies as well as methods for measuring key competencies. This is certainly not least due to some general challenges the measuring of key competencies is confronted with: particularly heavily abstracting and generalised key competencies face the problem that key factors of these competencies are hardly measurable and may only be compared with difficulties.

In the Article, necessary steps for the measurement of key competencies are discussed on the basis of four theses, whereas their consequences are presented by using the development of possible approaches to the key competency “ability to collaborate inter- and transdisciplinarily” as an example.

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About the author
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Assessment of Key Competencies – a conceptual framework

Within the concept of education for sustainable development, the notion of critical competencies and the need for competency development is widely accepted. Although there are many different approaches to define and select required competencies, a broad consensus can be found for a distinctive number of essential competencies (e.g. De Haan 2006; McKeown 2002; Parkin et al. 2004).

Beside the quest for critical competencies for sustainable development, there are two main reasons to pay attention to the assessment of such competencies:

1. To be able to evaluate the effect of a certain learning setting in the field of education for sustainable development, the assessment of competence development as the main learning target is crucial to be able to compare different learning approaches and learning units.

2. To be able to analyse the individual demands and to identify useful further educational methods, both aimed at the development of competencies for sustainable development, a comprehensive appraisal of the existing competencies and their value is needed.

Challenges in the Measurment of Key Competencies

Even though these two points seem beyond dispute, there are hardly any concrete approaches to be found how to describe, operationalise and finally measure key competencies. This is certainly not least due to some general challenges the measuring of key competencies is confronted with: particularly heavily abstracting and generalised key competencies face the problem that key factors of these competencies are hardly measurable and may only be compared with difficulties (Harris 2001).

Since competencies only manifest themselves in action and behaviour in certain contexts, we have to infer indirectly to the underlying competencies and connected attributes. At the same time, competencies cannot be displayed or detected by single, isolated performances, since they are supposed to prove themselves cross-contextually. (Rychen / Salganik 2003).

Thus, different methods become necessary in different contexts to measure competencies. Beside the gap between performance and competence and the connected context dependency, we particularly have to consider that a measurement scale can only describe
the current status, yet competencies have to be comprehended in terms of development corridors (Fischer et al. 1993). Thus, measurement instruments have to consider not only different specifications of a competency but also future fields of development. A further difficulty is found in the complex interplay of cognitive and non-cognitive dispositions within one key competency. To cope with this interplay, that is, the interactions between different key competencies, it is necessary to apply several different methods (Gilomen 2003).

The development of theoretically well-founded and empirically proven competency models as starting point for the development of measuring systems remains the basic challenge for competency measuring. Two completely different approaches are to be found: first, a measurement of competencies in the job-related context, and second, the analysis in national or international comparative studies. In the area of both national and international comparative studies, school tests (e.g. PISA, IGLU, etc.), adult surveys (IALS, ALL, etc.) and longitudinal studies are of particular importance (Schleicher 2003). Here, the procedure is test-based and generally aims at cognitive dispositions from which the respective competencies shall be deduced. The measurement procedures in the job-related context differ in the width of the competency to measure, an in their key factors respectively. Erpenbeck / Rosenstiel (2003: XIXff) distinguish two measurement procedures: first, objective measurement systems which try to define and to measure competencies as scientific variables and thus try to enable a measuring ‘from the outside’. Second, subjective estimation processes that aim at comprehending competencies and thus intend to obverse them ‘from the inside’. For the ‘assessment’ of competencies, or the observable behaviour by which competencies are realised, respectively, cognitive as well as non-cognitive dispositions are of importance.

Furthermore, in the area of higher education, we can find processes of self-assessment or peer assessment, and more and more approaches of computer-based assessments, albeit all these approaches are not yet solved satisfactorily (see Anderson et al. 2005; Gonyea 2005). A possible solution is given by more comprehensive competency analyses which try to delineate a more extensive overall picture instead of quantitatively measuring individual characteristics. Such an approach that covers and evaluates the entirety of one person’s
abilities, knowledge and potentials is realised in France in the form of a competency balance ("bilans de compétences"). With this approach, an attempt is made to expatiate and accept the entirety of existing competencies (Drexel 1997). Such competency analyses are used for the attempt to develop an individual competency profile which is consists of a combination of different measurements or assessments and a feedback of the respective individual. All these different approaches have in common that they predominantly refer to single competencies or dispositions, which again are analysed singularly.

**Necessary Steps in the Measurement of Key Competencies**

The development of adequate measurement systems for the measurement of key competencies, understood as bundle of relevant competencies consisting of different dispositions, still represents a research desideratum. Necessary steps for this are to be discussed in the following on the basis of four theses, whereas their consequences are presented by using the development of possible approaches to the key competency “ability to collaborate inter- and transdisciplinarily” as an example.

**Thesis 1:**
The measurement of key competencies requires the consideration of the specific characteristics of the construct ‘key competency’.

First of all, this applies to the characteristics of the competency approach which necessitates the interplay of internal structures in terms of cognitive, emotional and motivational dispositions to meet complex, holistic demands (Ridgeway 2001). Weinert (2001: 51) particularly refers to “intellectual abilities, content-specific knowledge, cognitive skills, domain-specific strategies, routines and subroutines, motivational tendencies, volitional control systems, personal value orientations, and social behaviours.” Furthermore, the term key competency results in a qualitative extension of the competency concept. Initially, this extension refers to the exceptional importance of certain competencies. Key competencies are – in contrast to ordinary competencies – relevant across different spheres of life and are important for all individuals (Rychen / Salganik 2003). Competencies necessary for certain jobs or applications do not satisfy these
requirements. Key competencies do not substitute such domain-specific competences which are necessary for successful action in particular situations and contexts, they rather have a different, wider focus. A key competency as comprehensive construct may therefore be depicted as longitudinal competency which may be broken down into different classes. Accordingly, a key competency may be described by sub-competences which can be assigned to different competency classes as personal competencies, decision-making competencies, professional and method competencies as well as social-communicative competencies (Erpenbeck / Rosenstiel 2003: XVIII ff.). The measurement of key competencies must therefore regard the operationalised sub-competencies just as thoroughly as the complex interplay of cognitive and non-cognitive dispositions must be methodically considered.

**Thesis 2:**
The assessment of relevant key competencies for dealing with sustainable development needs a theoretical and conceptual foundation that can underpin the conceptualisation of a set of specific key competencies

The operationalisation and specific consideration of single key competencies requires a theoretically sound framework that enables a well-founded selection of and restriction to certain key competencies. Such a far reaching and comprehensive approach for the definition of key competencies is presented with the project initiated by the OECD “Defining and Selecting of Competencies: Theoretical and Conceptual Foundations (DeSeCo)”. During this project, a conceptual framework for the definition of such key competencies was developed that are crucial for the personal and social development of human beings in modern, complex societies. According to this, key competencies may be localised in three categories: (1) Interacting in socially heterogeneous groups, (2) Acting autonomously and (3) Using tools interactively. These three categories open a space in which different constellations of the different key competencies become effective in different contexts. (Gilomen 2003: 184; Rychen 2003: 104f.). *Education for Sustainable development* and *Competencies for dealing with sustainable development* as educational targets offer high connectivity to this approach for
defining relevant key competencies. And taking Sustainable development as explicit normative anchor point does not least take up the assumptions inherent to ESD that sustainability is one of the most important prerequisites for future developments. Based on the educational target “Gestaltungskompetenz” (or shaping competency) according to de Haan, the specific capacity to act and solve problems can be divided into a number of sub-competencies (de Haan 2006).

If we revert to this design and apply it to the framework of the DeSeCo concept, then relevant key competencies for dealing with sustainable development may be depicted as described in Figure 1 (see also Barth 2007). This can be used to realise a normative and well-founded selection and a theoretically sound allocation of relevant key competencies.

**Figure 1: A three-fold categorization of “Gestaltungskompetenz” (see Barth in press)**

**Thesis 3:**
In order to identify relevant key competencies, these have to be operationalised and described concerning their relevant dispositions.

Prerequisite for the operationalisation of relevant key competencies is, on the one hand, the development of theoretical models for the description and explanation of the competencies’ structure and, on the other hand, a characterisation of different levels in which the key
competency appears and thus becomes verifiable. This requires as a first step the theoretically and empirically well-founded identification of underlying competencies and a classification into the different sub-competencies. Furthermore, the different cognitive and non-cognitive dispositions are to be defined. Accordingly, an operationalisation of the key competency “ability to collaborate inter- and transdisciplinarily” may be realised in a first step via the allocation of sub-competencies to the relevant competency classes (see Table 1).

This classification addresses the interplay of knowledge and emotional, normative and motivational dispositions. This interplay characterises the ability to inter- and transdisciplinary collaboration. Necessary is an inner readiness to get involved in ‘new’ and ‘unfamiliar’ views and to look for compromise and understanding in heterogeneous job situations in order to broaden one’s own perspective. While the available sub-competencies can describe the structure of a key competency, a description of relevant competency levels is still missing. The point of describing these levels is to find out which concrete situational demands individuals can handle with which intensity. Therefore, the development of a sound and empirically well-founded step model still presents an essential research desideratum.

Table 1: Sub-competencies of the Ability to collaborate inter- and transdisciplinarily

<table>
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<tr>
<th>Personal competencies</th>
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<tbody>
<tr>
<td>- Ability to adopt perspectives, associated with the tolerance and acceptance towards other disciplines.</td>
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<td>- Ability to realise the relativity of one’s own disciplinarily produced knowledge, and to relate it to other relative findings</td>
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<td>- Ability for second order observations</td>
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<th>Action competencies</th>
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<td>- Ability to apply specific expertise in new contexts which thus becomes effective.</td>
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<td>- Ability to exchange existing knowledge, and to co-operatively assemble new knowledge</td>
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<th>Professional and methodological competencies</th>
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<tr>
<td>- Professional competence in one’s own discipline</td>
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<td>- Ability to comprehend and to retrace the way to act of other disciplines</td>
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<th>Social-communicative competencies</th>
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<td>- Ability to manage heterogeneous group processes</td>
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- Ability to adequately react to the specific characteristics of interpersonal and emotional aspects of group situations.
- Team competency and communication competency
- Abilities concerning conflict management and moderation
- Ability to communicate about certain issues between different disciplines and between experts and laymen.

**Thesis 4:**
Prior to the measurement of key competencies, the focus must lie on the target direction of the measurement process which affects range and depths of the analysis.

Dealing with the assessment of key competencies may remind of the *Uncertainty Principle*, Heisenberg introduced in quantum physics: the more detailed a single component of the total system is pinpointed, the less can be said about the behaviour of the other components. Applied to the concept of key competencies, this appears in the antagonism to either assess single components of a key competency in detail and therefore ignore the assessment of other aspects (e.g. only cognitive skills) or to explicitly analyse the interaction between different components at the cost of detailed analyses of single components.

Regarding the aim of the assessment, (at least) two assessment approaches with different consequences for the methodology can be distinguished:

1. An as objective as possible assessment with an underlying competency model that focuses on the main cognitive, motivational and social components as well as their interaction.
2. A cooperative assessment in terms of a competency portfolio which is more detailed and uses self-assessment and observation methods as well as objective testing.

For the measurement of a key competency such as the „Ability to collaborate inter- and transdisciplinarily” this means that either a test design is applied which contains specific details or single competencies and which aims at cognitive or non-cognitive dispositions. The advantage of this is the comparatively large number of test persons which may be analysed, e.g. to determine aspects of the socio-communicative competency in a certain
student cohort. On the other hand, a more comprehensive approach may develop a picture of the existing characteristic of the key competency itself. Here, the focus lies on the interaction between unequally effective sub-competencies. The determination takes place in dialogue with the analysed person or with relevant peers, if necessary, and it aims more at an assessment of the development of key competencies during a certain time period. Thus, different specification “patterns” of the “Ability to collaborate inter- and transdisciplinarily” can be determined and compared, and consequences may be drawn in co-operation.

In both cases it is imperative to define and to empirically verify relevant competency levels and their effects on action in different context, and to test the adequacy of different approaches.

References


