

Skills, qualification, competence, competency... A brief overview

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See WCC2010-paper:
Competencies and Skills: Filling Old Skins
with New Wine

What are we dealing with?

qualification

competency

soft skill

generic
skill

ability

competence

key competency

core skill

...and at the end „informatics competencies“?

Problems

- Different terms, same concepts
- Different concepts, same terms
- No concept or definition at all
- Different level of detail
 - Socialcompetence vs. „Student is able to deal with anger“
- Some competencies are vague:
 - What is the difference between „cultural competencies“ and „competencies in a partnership“?

By the way....

- Competencies and Qualifications are not the only terms, which are causing troubles. See also:
 - ...informatics, computer science (CS), computer engineering, information and communication technology (ICT), information technology (IT)
 - ...education, knowledge, skills, „Bildung“ (a German term for education, which includes also literacy, competency, skills...)

Problems with translations

- Several critical terms are construed differently:
 - German discussion focused on „competencies“ and „qualifications“
 - English discussion focused on „skills“ and „competencies“
- In English: „Qualification“ refers to „formal degree“
- In German: „Qualification“ also means „ability“
- The German term „ability“ is also translated with „competency“

English terms are prone to cause confusions as well....

- Terms we are dealing with are...
 - Skills (especially „generic skills“ and „core skills“)
 - Competence versus competency
 - Skills versus competencies

Competence versus competency

- Competence:
 - *Potential*
 - *competence as a generalised characteristic*
 - *Use of the term competency for a discrete knowledge element or skill invites the plural form competencies to mean a collection of competencies.*
- Competency:
 - *Actual ability*
 - *demonstrated skill in performing an actual task in the area where one has this potential.*
- *The use of competency as both an ‘envelope’ and an ‘elemental’ term can lead to confusion. The term competence is, admittedly, less common but it is still intuitively easy to understand. (D. Royce Sadler at the KoKoH in Berlin, 2011)*

Types of skills: Core Skills

- *„The conceptualisation of core skills is problematic for several reasons. The term has several synonyms, including personal transferable, key, generic, common, and work or employment related skills. To add to this semantic confusion, these skills are often referred to as competencies, capabilities, attributes, elements or learning outcomes, sometimes incorporating levels and sometimes not. Similarly, the various lists of skills elicited from employers, and contained in government reports, are diverse in both extent and purpose, reflecting differences in definitions and interpretations of their significance.” (Bennet, Dunne and Carré, p. 74)*

Types of Skills: Generic Skills

- Bennet, Dunne and Carré, p. 77: Generic skills contains four management skills *„of self, others, information and task. These skills are generic in that they can potentially applied to any discipline, to any course in higher education, to the workplace or indeed to any other context.“*

Let us start at the beginning...

- What is meant by the German term „Bildung“?
 - Before ca. 1950: Content-oriented education
 - Starting approx. 1950-1970: output-oriented and person-centered approach (“Subjektorientierte Lehre”)
- Breakdown of “Bildung” into formal and material aspects:
 - Formal aspects:
 - E.g. logical thinking, creativity, context situated thinking and acting
 - What somebody is doing out of his / her education
 - Material aspects:
 - E.g. the content, objective content of a culture
- In 1959, KLAFKI developed a concept to combine formal and material education, what is called “Kategoriale Bildung” (see [Ort99], p. 8f).

...in the beginning....: The Historical background

- Latin: „competere“ = conjunction, to grant or to be entitled to something...
- „conjunction“ like „constellation of stars“
- 13th century: term for income
- 16th century used in roman law as „*Beneficium competenciae*“ (How to deal with debtors)
- 19th century: used in the German military language
- 1959: WHITE used the term for the motivation psychology

...in the beginning...: The Historical background

- 1960: Noam CHOMSKY used the term competence in his language concept:
 - Competence (language skills) versus performance (individual use of language)
 - Connection to De Saussure: langue versus parole

...in the beginning...: The Historical background

- 1973/1974: Dieter Mertens, vocational education, life time 1931-1989
 - “invented” the term “key qualification” as reaction of the situation on the job market
- 1977: Heinrich Roth, pedagogy and psychology, life time 1906-1983
 - Exploratory focus: empirical research in the field of teaching-learning-processes and their anthropological background (see [JH09])
 - Used „competencies“ in his concept

...in the beginning...: The Historical background

- 1999: Over 600 terms in Germany found what is understood by „competency“ and
- Approx. in 2000: over 100 terms in the UK
- Scientists like these where questioning the skill agenda in the English speaking area:
 - Len Holmes
 - Bennet, Dunne and Carré
 - Bridges...

...in the beginning....: The Historical background

- Several lists do exist what (key) competencies are:
- National Committee of Inquiry into Higher Education (NCIHE) - also named „Dearing Report“ -is giving four key skills:
 - Communication skills
 - Numeracy
 - The use of information technology
 - Learning how to learn

...in the beginning....: The Historical background

- OECD / UNESCO (p. 8):
 - *“Key competencies involve a mobilisation of cognitive and practical skills, creative abilities and other psychosocial resources such as attitudes, motivation and values.”*
- 1) Using Tools Interactively
- 2) Interacting in Heterogeneous groups
 - 2a) The ability to relate well to others
 - 2b) The ability to cooperate
 - 2c) The ability to manage and resolve conflicts
- 3) Acting Autonomously

Short break....

- The list could be longer, but instead we are heading a step back now....
- ...forward the concepts

Concepts

- Mertens, 1974: More than content is needed to be a good employee for the future job market (see [Mer74])
- Key qualifications (meant somewhat equally like „key competencies“):
 - Basic qualifications (e.g. structured and logical thinking)
 - Horizontal qualifications (e.g. transfer of knowledge about one foreign language to another)
 - Ubiquitous Elements (cross-educational requirements such as basic arithmetic)
 - Vintage Factors (e.g. expiration of applicability of knowledge acquired at educational institutions)

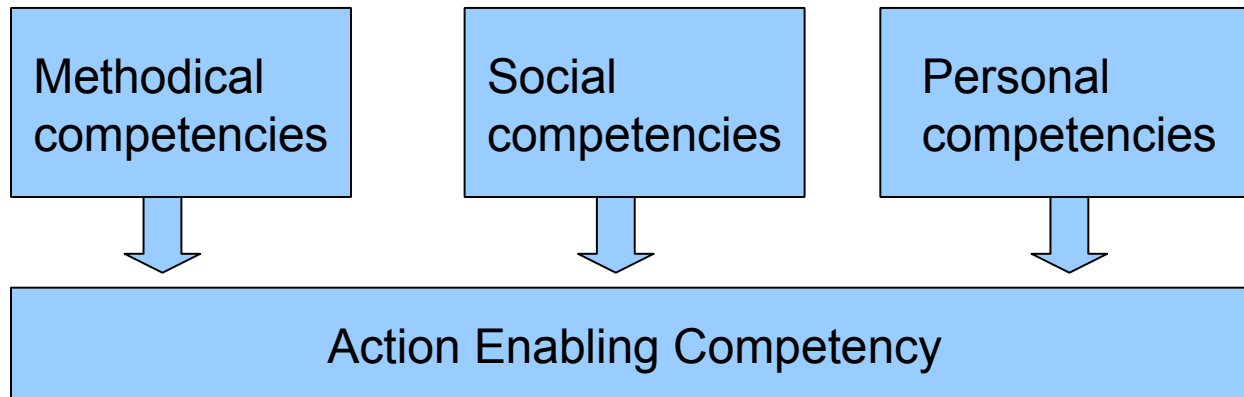
Concepts

- Roth, 1977: Maturity, in his view, can be interpreted as three-folded-competency (see [Rot77], p. 170):
 - a) self competence,
 - b) professional competence (**Sachkompetenz**),
 - c) social competence
- “Sachkompetenz” =
 - German word meaning to know (some) things about Biology, History and so on. In some contexts it can be translated into „professional competencies“

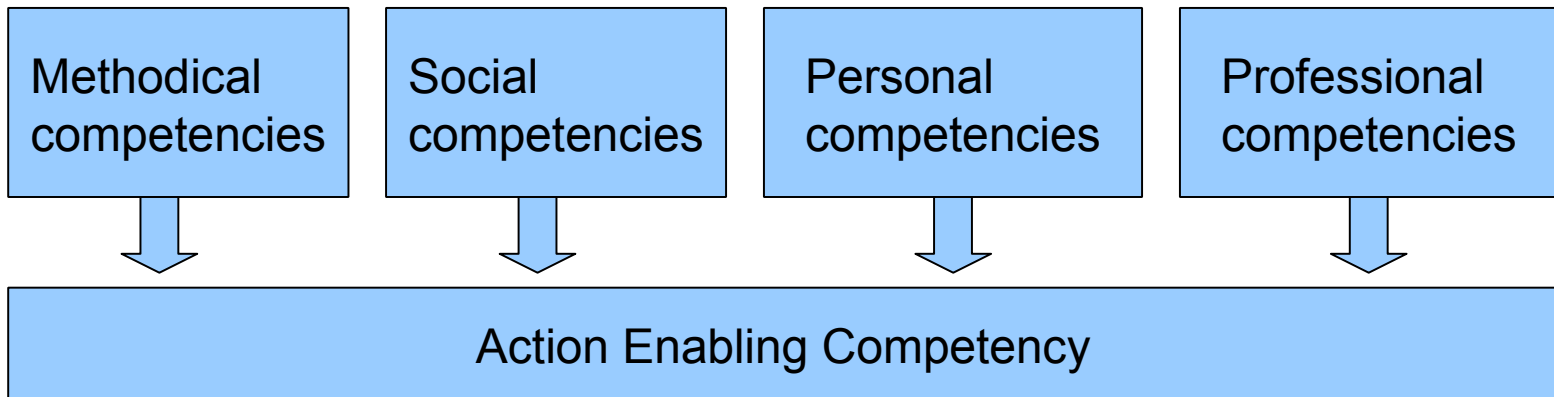
Concepts

- The „Action-Enabling Competency“ as Conceptual Framework:
 - Professional competency / “Sachkompetenz”
 - Social competency
 - Methodical competency
 - Personal competency
- „Professional competency“ often used in the concepts of vocational educators
 - The concept also exists without the “professional competency”

One possible result for a general education



Another possible result (e.g. for vocational education)



Computer Science

- What are competencies in CS?
- On what level of detail we want to talk about them?
- Who are the persons we are looking at?
 - Everybody?
 - Teachers? Lecturers? Educators?
 - Students?
 - IT Professionals?

Competencies and skills in CS

- International Federation for Information Processing (IFIP):
 - Representation of Information
 - Formalism in Information Processing
 - Information Modeling
 - Algorithmics
 - System Design
 - Software Development
 - Potentials and Limitations of Computing and Related Technologies
 - Computer Systems and Architectures
 - Computer-Based Communication
 - Social and Ethical Implications
 - Personal and Interpersonal Skills
 - Broader Perspectives and Context (included links with other disciplines)

Competencies and skills in CS

- Computer Science and Telecommunication Board (CSTB) of the National Research Council, USA: *Fluent with information technology (FITness)*
- Others will be presented today...
- Educational Standards of Informatics from the „Gesellschaft für Informatik (GI)“ in Germany

“Gesellschaft für Informatik“ is a group of CS professionals in Germany.

One suggestion

- What ever competencies we are talking about: It's not (only) the content we are dealing with, it's (also) the level of detail we are speaking about:
 - Are we able to use a programm?
 - Are we able to create a programm ourself?
 - Are we able to create a programm for a given task?
 - Are we able to create a good and sufficient programm for a given task?
 - ...and does it matter, if the person at hand is only good in creating programms for a specialized task?

Competencies in CS: Educational Standards (GI)



Creating educational standards in Germany

- Content and Processes:
 - The content (e.g. algorithms, datastructures, security)
 - The competency (operators like e.g. evaluate, understand, apply, advise)
 - The level of mastery (e.g. is able to speak about, is able to create, is able to transfer)
- ...And tasks:
 - „Students understand the connection between data and information.“

Measurably and Assessment

Is a competency measurable?

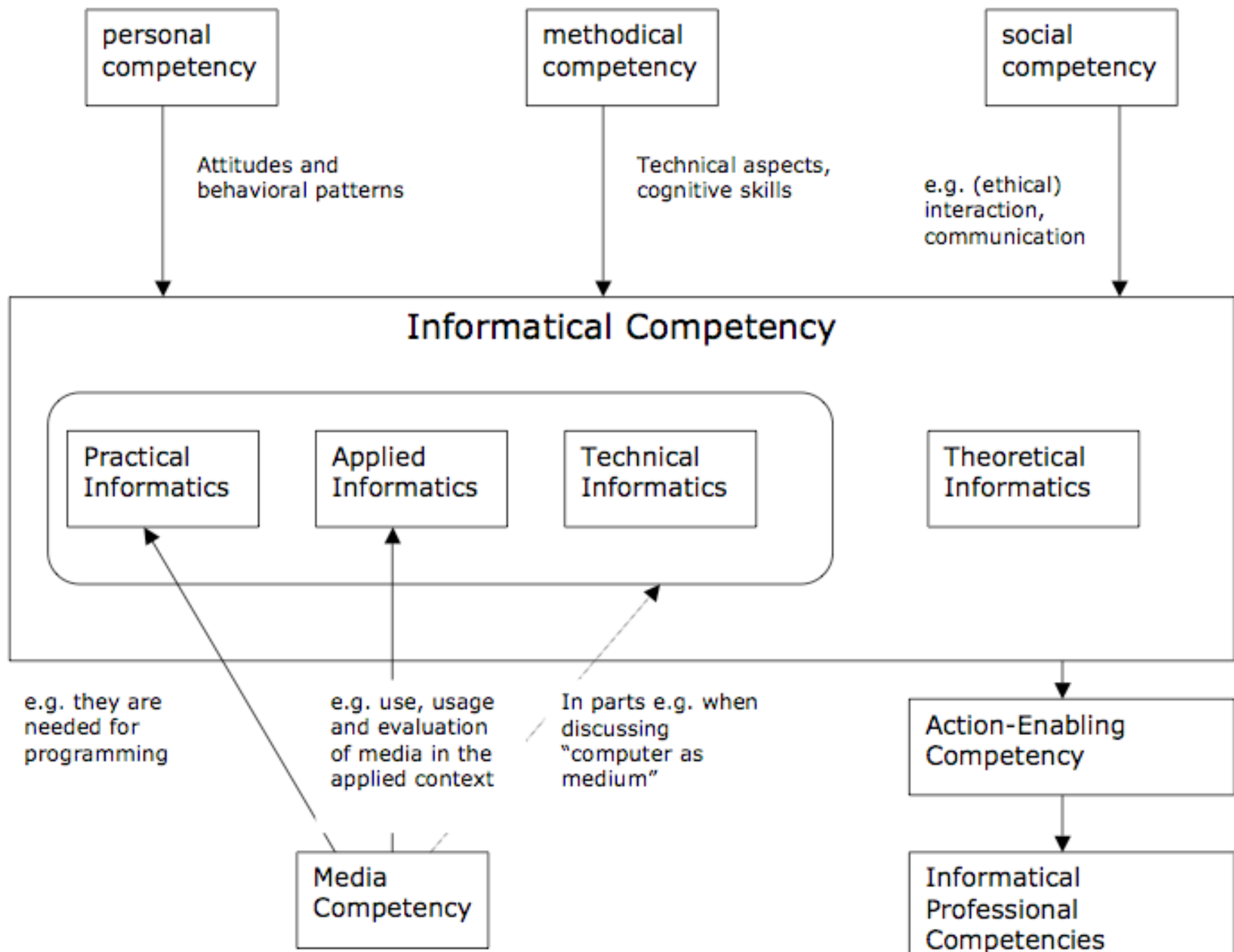
Is only the performance measurable?

Should we measure the dispositions instead of the competencies?

Where does a competency starts and where does it ends?

...and when does the CS competency starts?

- Speaking of „problemsolving“:
 - Is the competency of problemsolving in every area the same?
 - When I'm a good problemsolver in one area, will I have better skills to transfer it to a new area?
 - And when taken a look at CS: Should we end with something like:
 - „Problemsolving-competency-in-software-development-with-programms-written-in-JAVA“



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