The German Tradition of Didactics and Recent Research Findings about Teaching and Learning


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Abstract: This speech is held on 12th Shanghai International Curriculum Forum November 2014. You can read the first published version of this speech. My main message for this paper: The German tradition of Didactics and recent international research findings about effective teaching and learning coincide in one important point: They both emphasize the importance of self-reflection of the teacher and the students. I outline this thesis in six sections.¹

Keywords: Didactics, international educational research, effective teaching and learning, self-reflection

¹ There are several publications in English which give a first introduction to the European discourse about General Didactics. I recommend:
- A book 14 years old which still offers several important articles, edited by Ian Westbury, Stefan Hopman & Kurt Riquarts (2000), entitled: „Teaching as a Reflective Practice. The German Didaktik Tradition“.
- An overview on the European discussion about General and Subject Matter Didactics (respectively Domain Specific Didactics) edited by Brian Hudson and Meinert A. Meyer (2011) entitled: „Beyond Fragmentation: Didactics, Learning and Teaching in Europe“.
- The „Yearbook for General Didactics 2012“, edited by Klaus Zierer, focussing on „International Perspectives on the German Didactics Tradition“.
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1. Teaching and Learning as “reflective practice”

1.1 Teachers

How do professional teachers reflect and act in the messy reality of the classroom? Much research has been done in this field. 30 years ago the US-American sociologist Donald Schön (1983) published his book “The Reflective Practitioner”. He developed a model of three levels of reflexivity of professionals, which has been adopted by many other researchers:

• **Level 1: implicit-reflection-in-action.** Every teacher acquires routines of action and reflection in daily classroom work. This is a necessary process of professionalization. It enables him/her to decide intuitively on what to do and to improvise where necessary. Routines of reflection keep the teacher’s mind free for demanding, urgent, not foreseen problems in the classroom. These routines are stable components of one’s own teacher-personality. You can’t change them the way you change a t-shirt. Many of them have already been adopted when these persons were students at school. That’s why Dan Lortie (1975) wrote:

> “Teachers teach as they have been taught. They don’t teach as they have been taught to teach!”

Nonetheless, implicit-reflection-in-action can be successful and rational. And it allows the teacher to learn a lot – as Georg-Hans Neuweg (1999) from Austria declares: “The competences of professional teachers are broader than their explicit knowledge.”

Neuroscientists, for example Gerhard Roth/Bremen University (2011), can even show what happens in the brain of a teacher, when he transforms declarative knowledge (“knowing what”) into procedural knowledge (“knowing how”). The knowledge and emotions that at first are stored in the cortex, will then be stored in evolutionarily older parts of the brain, the basal ganglia.

• **Level 2: reflection-in-action.** Every teacher is able to reflect in action. When an unknown problem arises, when a student is getting angry without visible reason, when the introduction into the new topic does not work – then the routines of reflection and action do no longer suffice. The teacher then must analyze the new problem in a second and make quick decisions, a second later. Professional teachers know how to do this. They demonstrate “pedagogical tact”, as the German philosopher, psychologist and pedagogue Johann Friedrich Herbart (1776-1841) has called this competence. Pedagogical tact means to use one’s theoretical knowledge about teaching and learning to produce a solution for an unforeseen problem in a time-sparing, creative and elegant way.

• **Level 3: reflection-upon-action.** When the lesson has come to an end and the pressure to produce quick decisions is fading, most of the teachers start reflection-upon-action. They reconsider the demanding situation of this lesson. They try to interpret with new ideas and new assumptions. And suddenly they have found a new solution for their problems. That’s what Donald Schön (1983, p. 135) calls “reframing” a demanding situation.

A professional teacher is able to switch on to the level of reflection he needs at the moment. When classroom work goes on as usual, it is relaxing and clever to stick to implicit-reflection-in-action. However when a problem arises, the professional teacher instantly activates all his explicit knowledge about problem-solving and – led by his pedagogical tact – finds a sufficient solution for the problem (level 2). If not, the lesson will most likely turn into a

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2 Bromme (1992); Loughran (1996); Shulman (2004); Noffke & Somekh (2009); Hollenbach & Tillmann (2011); Reusser/Pauli & Elmer (2011)
catastrophy, and the teacher will have to spend a lot of brain activity afterwards to find a solution for the next lesson (level 3).

How does reflexivity grow? Donald Schön gives a simple answer: Professional reflexivity grows in a spiral of action and reflection.

There are some clever concepts to realize this spiral of action and reflection – first of all the widespread international tradition of Action Research, also known as Practitioner Research.

**Action research** helps the teachers to develop reflective distance to their own actions and to build up “personal theories” of quality of instruction. In German speaking countries this program was made known by the Austrian researchers Herbert Altrichter & Peter Posch (2007). And in Oldenburg, Wolfgang Fichten and I realized the Oldenburg concept of team research (“Teamforschung”; see Fichten & Meyer in Hollenbach & Tillmann 2011).

I have learned from Deng Zongyi (2012, p. 114) from Singapore and from Ian Hughes (Sidney/Australia) and Lin Yuan (Chengdu Medical University) that Action Research plays an important role in Chinese efforts to improve health services (Hughes & Lin 2005). Moreover, several Chinese universities try to establish action research in teacher training for foreign-language instruction. Deng writes that one of three paradigmatic texts for Action Research is written by Shi Liang-Fang & Cui Yunhuo from East China Normal University. Their Textbook „Theory of instruction“ (1999) includes a chapter on this subject.

### 1.2 Students

In German General Didactics, there is a long tradition to take care for the self-reflexivity of students.

- **Johann Friedrich Herbart** was the first educational researcher who constructed a “phase scheme of learning”. In his well-known “Allgemeine Pädagogik” (General Pedagogy 1806/1997, p. 76) he writes: The learning process develops as a repeated change of *deepening* in the new content (“Vertiefung”) and *reflecting* (“Besinnung”) to integrate the new content in what we today call the sense constructions of the students. In his later works, Herbart differentiates this concept of two phases and develops his model of five „formal steps of learning“, which up to now influences theory-building in German speaking countries (for example Klingberg 1989).

- **Wolfgang Klafki** defines *Bildung* as competence of self-determination – and this competence of course only grows when students reflect what they learn and why they learn (Klafki 2002 a).

- **Herwig Blankertz** writes (1975, p. 46): The overwhelming aim of education is to help the student to emancipate from his teacher. That’s why the main task of the teacher is to

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3 The Altrichter & Posch book has been published in Chinese in Taiwan.
4 Herbart’s works have been published by ECNU-PRESS; his role in the development of Chinese didactics is reconsidered by Deng Zhongyi (2012, p. 108).
5 In this paper I quote English translations of the German authors whenever possible and don’t care for the first year of publication in Germany.
6 He was my Ph.D-tutor at Münster University in 1972.
help the student in his sense-construction process. And that’s why didacticians should define didactics as „sense theory“ (Sinntheorie), by that combining the content with interests, preconditions and future development of the students.

- Michael Neubrand\(^7\) (2000) has analyzed reflective processes in the math classroom. He argues that “learning and reflecting are the two sides of one coin” (2000, p. 252). However this does not mean that there are clearly divided steps in the teaching-learning process. They are integrated from the beginning.

Neubrand poses an important second question and gives a clear answer to it:

\begin{quote}
“Is it possible to teach a student to reflect? In a strict sense, it is, of course, impossible. Reflecting is always a very personal task of the learner herself; that is, it is her own responsibility. But teachers can provide opportunities and the stimulation of reflection.”
\end{quote}

Contemporary empirical research findings on reflexivity confirm this tradition of German didactics. Teachers who help the students to reflect their own learning processes (= making meta-cognition) increase quality and quantity of their learning outcomes.

2. Classical German models of General Didactics\(^8\)

The Czech scholar Johan Amos Comenius (1592-1670) is the famous founder of General Didactics in Europe. In 1657 he published his “Didacta Magna” (“Great Didactics”), which up to now is a guideline and inspiration for didactical thinking (see M. Meyer 2012).

The so-called “Bildungstheoretische Didaktik” was dominant in Western Germany from 1960 till 1990. The most prominent representative became Wolfgang Klafki (born 1927), retired professor at Marburg University.\(^9\) Likewise important were and are: Herwig Blankertz (1927-1983) from Münster University and Dietrich Benner, Berlin Humboldt University. Lothar Klingberg from Potsdam Pedagogical Highschool (1926-1999) developed his own dialectical model, however in close neighbourhood to Bildung-centered models. Another classical model was the so-called “Learning-centered Approach” (Paul Heimann, Gunter Otto & Wolfgang Schulz 1965; see Arnold & Lindner-Müller 2012, p. 53).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{comenius_klafki_blankertz_klingberg.png}
\caption{Comenius, Klafki, Blankertz, Klingberg}
\end{figure}

\(^7\) He visited ECNU-conferences several times.
\(^8\) You find an up-to-date overview over General Didactics in German speaking countries published by Karl-Heinz Arnold & Carola Lindner-Müller (2012) in Zierer’s “Handbook of General Didactics”. In this article the authors analyse in which way the classical German models of teaching and learning from the second half of the 20th century have been redesigned at the beginning of the 21st century.
\(^9\) He was the second researcher from Western Germany who visited ECNU, invited by our honoured colleague professor Li.
It is typical for the European countries to have a plurality of didactical approaches (a full description in Jank & Meyer 2002 – not in English). Sometimes the authors are fighting against another, sometimes they live in co-existence. It gives the teacher (and the researcher) the opportunity to select a theoretical orientation fitting to his/her personality and professional demands.

In Zierer’s Yearbook (2012) this period from 1960 to 1990 is called „the golden age of General Didactics“. Today there is a different situation. We have heavy debates on outcome based education, on individualisation of learning processes and inclusive instruction, but a lack of widely accepted new didactical models for these innovations.

2.1 The key concept of “Bildung”

The German tradition of didactics culminates in the concept of Bildung as a process of negotiation of meaning between the teacher and the students. The roots of this concept can be traced back to Wilhelm von Humboldt (1768 – 1834) who strongly influenced the early ideas of Karl Marx about personal human development of „all capacities“.

It is impossible to translate the German word Bildung into English. It’s not just learning. It means a distinguished high quality of learning. That is the reason why most German authors prefer to stick to this word when they publish in English. I presume that you have a better translation of the word in the Chinese tradition of Confucius than the English-speaking countries have.

Bildung, in the words of Klafki, is “the capacity for reasonable self-determination”. He writes (Klafki 2000 a, p. 87).

“Bildung is understood as a qualification for reasonable self-determination, which presupposes and includes emancipation from determination by others. It is a qualification for autonomy, for freedom for individual thought, and for individual moral decisions. Precisely because of this, creative self-activity is the central form in which the process of Bildung is carried out.”

That’s why Bildung not only has cognitive, but also social, moral, aesthetic and practical dimensions. Klafki (1996, p. 52) describes three basic competences which are central for a modern concept of Bildung:

• Self-determination: the competence to decide about one’s personal living conditions, about one’s political, ethical and religious orientations.

• Co-determination: knowing not to live alone, but in mutual cultural, societal and political relations.

• Solidarity: the competence to show respect for other persons and to engage helping all those persons who up to now have not had the possibility to live in self-determination.

These three competences must be balanced out in daily classroom work. However we have problems to realize this balance in German schools. Growing individualism produces severe problems. Many teachers say: “Too many of our students behave like little princes and princesses.”

In the past, German Bildungs-Theorie has been criticised with the argument that it has focused one-sided on the individualization of the students and has forgotten to conceptualize the social duties and the objective of living in an intact community. My opinion: this criticism is not justified – at any rate not for Klafki, Blankertz and Klingberg.

I know, that „individuality“ and „individualism“ are typically Western concepts, at least in the eyes of Chinese reseachers. You have a long tradition of Confucian, Daoist, and Buddhist
reflections on the relation of the individual to the community (see the wonderful German introduction to Chinese philosophy by Wolfgang Bauer 2001). Indeed, in Europe there has been and there is a strong movement towards more individualism. This has been criticized by philosophers like Jürgen Habermas and sociologists like Ulrich Beck.

2.2 The Bildung-centered didactic approach (Wolfgang Klafki)

In 1963 Wolfgang Klafki published an article which became famous in the Federal Republic of Germany: „Didactic Analysis as the Core of Preparation of Instruction“ (English translation: Klafki 2000 b). It may be this article has been the reason for Ian Westbury to give his essay collection (Westbury et al. 2000) the title: “Teaching as a Reflective Practice – The German Didaktik Tradition”.

The strength of Bildung-centered didactics is to be seen in its concept of educational substance of contents. Every teacher, Klafki argues, must answer the following five questions for every lesson held (see Klafki 2000, pp. 151-155) – quite a lot of reflection for every teacher:

| I. | What wider or general sense does reality does this content exemplify and open up to the learner? |
| II. | What significance does the content in question, or the experience, knowledge, ability or skill to be acquired through this topic already possess in the minds of the children in my class? |
| III. | What constitutes the topic’s significance for the children’s future? |
| IV. | How is the content structured? |
| V. | What are the special cases, phenomena, situations, experiments, persons, elements of aesthetic experience, and so forth, in terms of which the structure of the content in question can become interesting, stimulating, approachable, conceivable, or vivid for children of the stage of development of this class? |

By analysing these five questions, the teacher can realize “a fruitful encounter between content and learner”, as Deng Zongyi said in the 2013 ECNU-Conference on Sino-German Didactics Dialogue.

In the seventies of the 20th century, some younger authors, following the spirit of the German student revolt of 1968, sharply criticized Klafki (Huisken 1972). They said that this 1963 model was backward bound and undemocratic, since Klafki accepted the national curriculum and the conservative school system without criticizing it.

Klafki accepted this critique and changed his model in the 80ies. He no longer took for granted the social conditions of teaching and learning. And he gave his model a new name: the „Critical-Constructive Approach“ (Klafki 1985/1996). The new model demands that the teacher has to foster a democratic culture in every classroom and fight together with other teachers, politicians and researchers for more democracy.

2.3 Lothar Klingberg’s dialectical approach

Klingberg (1926-1999) was the leading didactician of the German Democratic Republic. He taught at the Potsdam Karl-Liebknecht-High-School,11 Klingberg’s main achievement, in my

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10 The chances and challenges for the survival of Wolfgang Klafki’s conception of General Didactics are discussed in Meinert A. Meyer & Hilbert Meyer (2009).

11 Up to now, I did not realize whether one of his books has been translated in Chinese.
eyes, was to construct a dialectical process theory of instruction, inspired by Karl Marx on the one side, by Herbart on the other. He gave a modern definition of the conflicting roles of teacher and student – a definition without any romantic idealization:

- **Teaching**, Klingberg writes, is conservative in substance, even in case revolutionary content is transmitted. Teaching helps to preserve the ideals, norms and the cultural heritage of a community, and by that stabilizes the economic relations of society. That’s why it is normal for a teacher to take a leading role in the process of instruction.

- **Learning** on the other hand is revolutionary in substance and sometimes even anarchic. Learning has it’s own rules. It helps the students in their emancipation from the teachers, and that is why it is necessary for the students to learn with a high amount of self-regulation.

Teaching and learning are antagonistic strategies. Klingberg writes: „The dialectic contradiction of teacher’s guidance and learner’s autonomy is inevitable and helpful. It produces progress of instruction“. Instruction by that becomes a creative process, which cannot be determined completely by the curriculum or by any order of state. However, the leading role of the teacher is not a law of nature. It has to fade away as quickly as the learning progress of the students allows, and in the end it should disappear totally.

**“The collective subject of the classroom”**: When teacher and students respect one another und cooperate, they step by step build up what in Klingberg’s Marxist philosophy is called “the collective subject of the classroom” (Klingberg 1990, p. 154). This is more than a moral position. When students really help the teacher to help themselves the students must develop didactical competence, which is more than the competence to regulate your own learning-process. It means that the students become co-constructors of the teacher in planning, realizing and evaluating the teaching-learning process. Klingberg writes (1990, p. 78):

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Didactical competence of the learner means: The learners participate in decision-making and realization of teaching-learning situations. They become responsible actors in the classroom. (...) The teacher must respect them as active planners, realizers and evaluators of instruction. Since instruction is a dialogue, the teacher should discuss with his students the content, the methods, the organization and results of their classroom work. In short: What counts is a growing awareness and critical responsibility of teacher and students for the joint teaching-learning process.
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Klingberg’s description of the attended quality of the instructional process is easily formulated, but difficult to realize. It is not sufficient to define some moral guidelines. The teacher must create situations in which the students can really become responsible for the teaching-learning process. In a lecture at Oldenburg University, Klingberg said:

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„The students are responsible for the success of the teacher!“
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### 2.4 Dietrich Benner’s and Hans-Christoph Koller’s concept of transformational Bildung

A third important representative of Bildung-centered didactics in Germany is Dietrich Benner, who visited ECNU several times. Benner successfully tried to actualize the key-concept of Bildung (see above) and designed what he calls a „non-affirmative theory of education“. „Non-affirmative“ means, that it must be a distinguished goal of education to enable the young students to express their own points of view – of course in regard to the cultural
tradition of the country they live in, but at the end in their own responsibility. This includes the right, and even the duty to say „no“ to illegitimate expectations of the older generation.

A fourth author in the tradition of Bildungstheorie is Hans-Christoph Koller from Hamburg University. In his book “Bildung anders denken” (“How to think about Bildung in a different way”, 2012) he describes a modern concept of Bildung. For him, Bildung is “higher-order-learning” (Koller 2012, p. 15). It is characterized by “transformation”. Transformation relays not only to details of content, but the whole orientation of the student changes. He develops new frames and perspectives of thinking and feeling. Sometimes this is a joyful process; often it is a crisis for the students. In his book, Koller outlines a theory of these transformational processes, says why it is important to make empirical research about these processes and then describes the ways and means to do this.

Finally: All these models from Klafki’s to Klingberg’s, Benner’s and Koller’s have in common to emphasize the importance of self-reflection. And they combine this emphasis with a plea for “democratic culture” in the classroom. Students must learn to articulate own interests, to solve conflicts by themselves, to accept majority decisions etc. However, in the reality of German classrooms this is more a vision and not a stable foundation of school culture.

3. Contemporary didactical models in German speaking countries

There are two new orientations in German speaking countries, which are of interest: the constructivist approach and neurodidactic approaches, which try to analyze the neuronal foundations of didactics.

3.1 Constructivist approaches

We have a worldwide discussion about the constructivist paradigm of instruction and learning, however in German speaking countries the outlines of this paradigm are not very clear. Often, the subject matter didacticians don’t care about the methodological rules of constructivism – so they make no differences between radical and social constructivism, and just focus on the learning processes of the students (and that’s a good idea at any rate).

German representatives of Constructivist didactics at the beginning (in the 90ies) were in strong opposition to Bildung-centered didactics. But some ten years later they made many adaptations from European „Reformpädagogik“ from the beginning of the 20th century and the controversies again faded away (see Jank & Meyer 2002, p. 286 ff.). Most of the proponents of this position are working in the field of subject matter research, in General didactics only Kersten Reich (2002) is a well-known proponent. He developed an interesting new system of didactical principles such as “construction, re-construction and de-construction”.

The strength of Constructivist didactics is the strict orientation on individual learning-processes of the students – the weakness is the insufficient definition of the role of the teacher in these student-centered processes. Accepted handbooks for this position, useful for teacher training, are lacking.

3.2 Neurodidactics

Neuroscientists gained a lot of attention in the last ten years in Germany, and a model named “neuro-didactics” (Hermann 2006) has been published. Neuro-didacticians claim to help the teacher to realize „brain-adequate learning“, whatever this means. Some of the research findings of neuroscientists are really interesting, some well-known for centuries

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12 In March 2014, Koller has been elected president of the German Society for Educational Research (DGfE).
4. Two shifts of contemporary didactical discourse and the consequences for General Didactics

The actual didactical discussion in German speaking countries is characterized by two shifts:

- the shift from teaching to learning,
- and the shift from general didactics to subject-matter didactics (in short: subject didactics).

The first shift can be seen as an international development (discussed in Hudson & M. Meyer: "Beyond Fragmentation" 2011). However I stick to Klingberg's dialectical approach which says: You must balance out the leading role of the teacher and the self-regulated learning of the students.

The second shift has not yet come to an end and already now has produced a severe crisis of general didactics in Germany.

- It has become a normal situation since the year 2000, that university chairs for General Didactics have been abolished or have been redefined after retirement of the chair holders as „empirical instructional research“. The proponents of these new denominations argue that this was necessary since General Didactics had not managed to build up its own empirical research basis. This is an argument which from my point of view is widely, but not totally correct (see below)!

- At the same time, domain-specific didactic research was widely implemented at German universities (Bayrhuber et al. 2012). The leading subject-matter discipline today is didactics of mathematics. There are important research results on the quality of math instruction and on the professional knowledge of math teachers in Germany (Kunter/Baumert et al. 2011). Xu Binyan from ECNU is taking part in this academic discourse in Germany (Xu 2007; Sjuts & Xu 2007).

Some 50 years ago, authors like Klafki told us that General Didactics is the core discipline of educational theory. Today, hardly any author would dare to make such a statement. There is some evidence that Subject-Matter Didactics or respectively Domain Specific Didactics will take over all tasks of General Didactics in the near future in the German speaking countries.

5. New orientations for empirical didactical research in German speaking countries

5.1 Theoretical framework (Andreas Helmke)

Andreas Helmke (2009), well-known German researcher, developed a model of classroom-learning, which focuses on the learner, but does not forget the teacher. He calls it “Offer-Uses-Model for Explaining Educational Learning Success” (Helmke 2012, p. 71).
‘Opportunity-Uses-Model for Explaining Educational Success’ by A. Helmke

Helmke comments: This model broadens the perspective by incorporating features of general and subject-specific instructional quality, quality of teaching and learning material, and student’s learning activities. These processes and activities are stimulated by opportunities, the teacher provides. In addition, the model clarifies the influences of family and contextual factors on effectivness of educational practice. It is not a genuine theory but a framework illustrating the mutual links between different variables. At the same time it gives an overview of major aspects of empirical educational research (Helmke 2012, p. 71).

Most important in my opinion is one characteristic of this model: Research does not produce recipes! Since humans are no machines, all „laws“ of instruction have a high dose of contingency.

In my eyes, this model is helpful for researchers to locate the own research activities and to keep in mind the multi-causality of all learning-outcomes. And it is helpful for the practitioner also. She may keep this model in mind when she analyzes her own classroom work. The model tells her, that there are many causes for success and failure in the classroom.

5.2 Surface-structures and deep-structures of teaching and learning (Fritz Oser)

Actual research concepts about teaching and learning in German speaking countries emphasize the difference of surface structures and deep structures. The first author who constructed a theoretical frame for this concept was Fritz Oser from Fribourg University/Switzerland (see Oser & Baeriswyl 2001). Oser identified twelve “basic models of learning” and proposed to take them as guidelines for development of students’ competences.

Learning from China? Why is this difference important for classroom analysis? In 2009, the students of the municipality of Shanghai took part in the 4th PISA achievement tests. The students were on top of the ranking lists in every domain! My congratulation! But also my caveat: Are the Shanghai students, as some German authors assume, the best students in the world because they have much more teacher-centered instruction then students in
German schools have? Are they the best learners, since they have – compared with Germany – only very little amounts of individualized learning? - Of course not! These are surface-structure variables. To explain success, you must look for deep-structures as well:

Helmke argues: The students in East Asia\textsuperscript{13} are strong, since both surface \textit{and} deep structures are strong and effective:

- Surface: They have a much higher amount of learning time, much homework and regular assessments.
- Deep structure: More important, so Helmke, is the Confucian tradition of deep respect to the teacher and high esteem of learning.

So Helmke says: It is not correct to deduce from Shanghai student’s excellent results that teacher-centered instruction is more effective than individualized or cooperative learning. When the Shanghai students had had a higher amount of individualized and cooperative learning, the results might even increase further more (see Helmke 2012, p. 93-99).

5.3 Research on learner development and educational experience (Hamburg University)

We urgently need more research on the sense construction processes of the students. Hamburg educational researches, working together in Hamburg PhD Graduate School on \textit{Bildungsgangforschung} (= research on learner development and educational experience and its didactics) with Meinert A. Meyer\textsuperscript{14}, Arno Combe, Uwe Hericks, Hans-Christoph Koller and others have successfully developed the Klafki model of Bildung-centered didactics into a concept called \textit{Bildungsgangdidactics}. They have published quite a number of specialized studies dealing with individual processes of meaning and sense construction, of student participation and developmental tasks in different subject matter domains (M. Meyer 2012).

\textsuperscript{13} Helmke made much empirical research in Vietnam.
\textsuperscript{14} He is my twin brother.
As I mentioned, the core concepts of Bildungsgangdidactics are „negotiation of meaning“ and "sense construction", which relates back to John Dewey’s concept of learning by experience. Meinert Meyer (2012, pp. 39-40) sums up the Hamburg research findings:

| • “Sense is constructed against the absurd, against dilemmas, and against paradoxical situations of life. It is our situation … to think, feel, suffer and act in sense structures. |
| • Sense construction is subjective, intuitive, and very often the people who practice sense construction are unaware of the fact that they do it. Often sense will become a topic only after it has been lost. |
| • Learners in school may try to find sense in what they are expected to do in classroom interaction. They will endeavor to combine their developmental tasks with sense construction.” |

The self-regulated development of sense and meaning structures never is linear; it is embedded into small or big crises of learning resulting in regressions, refusals, detours or new starts.

**Task of the teachers:** They have to analyse the students’ and their own processes of sense and meaning construction; they have to compare them with their own academic constructions of sense and try to bridge the gap between both areas. This is a challenging task. It’s not enough to tell the students that the topics to be learned are “important”. The teacher must clarify meaning and relevance of the content and then translate his professional knowledge of sense and meaning construction and the structure of content into actions in the classroom – always keeping in mind that the students may have totally different, sometimes very odd ideas about the meaning of the new content.

6. **International research findings about teaching, learning and assessing and the impact of self-reflection (John Hattie)**

6.1 **The Hattie hype in German speaking countries**

John Hattie, educational researcher from Auckland/New Zealand and now at Melbourne University/Australia, published a synthesis of more than 800 meta-analyses, based on 51,000 single publications on teaching and learning. The title of this book is “Visible Learning” (Hattie 2009). Hattie published a second book, entitled “Visible Learning for Teachers” (Hattie 2012). And the works go on: In 2015, Hattie want’s to publish the effect-sizes for more than 200 variables, based on more than 1000 meta-analyses. Hattie is a hardcore empiricist. In 2013, he held a lecture at Oldenburg University. His first sentence was: “I like to count!”

![John Hattie](image)

**Hattie’s main message:** He brings a lot of empirical evidence showing the importance of a high level of self-reflection of the students. Metacognition, self-verbalization, reciprocal teaching, formative assessment, student-feedback, discussions between students, self-
This slogan is addressed to both sides: The teacher must reflect her influence on the students – the students must reflect their learning strategies and tell the teacher, by which means she can help the students to learn more effectively.

**Limitations:** There are some limitations to Hattie’s empirical findings, which are discussed in Terhart (2014):

- He analyzes empirical studies, which have been published in English. So Chinese or German characteristics of the school system are not identified.
- The larger part of the meta-analyses has been published between 1985 and 2000. So present time developments, for example in e-based learning, are lacking.
- There are no research findings about the effects of democratic classroom culture on learning outcomes. For me this is a pity.
- Hattie did not assess the methodological standards of his 800 meta-analyses. So some of them may have been of low quality.

However the number of 51,000 single studies, analyzed for his books, is tremendous. That’s why most of the German researches (for example Helmke 2012) say that Hattie’s Book is a milestone in empirical research.

**Misunderstandings:** Hattie reports on empirical evidence. His findings show us, how god or bad different instruments of teaching and learning are realized world-wide in average. His findings say nothing about the developmental capacity of these instruments and teaching-learning arrangements. My conclusion is, that nobody can force us to stick to the average. Of cause we can proudly say: “We want to be better than average and we can be better.”

**The Hattie hype:** His book produced a „Hattie-hype“ in the German speaking countries. Nearly every teacher knows his name; many of them toke part in teacher trainings to study Hattie’s research results. In TV and on broadcasting, heavy debates took place; in all leading newspapers one could read articles about his main research findings. And of course, the leading educational researchers also discussed his research findings (Terhart 2014).

The reasons for these intensive discussions may have been: First, Hattie produces simple answers to complex questions. Second, he helps the reader to get a broad overview over research findings on the effects of teaching, learning and assessment. However, many German researchers, politicians and administrators have read his book very selectively. In his books, you can find proof and evidence for nearly everything you want to know. And you can use it for one-sided argumentations (for example: Go back to teacher centered instruction).

**Effect-sizes:** Hattie says, and that’s correct form my point of view: It’s not enough, to find out a correlation between a classroom-variable and learning-outcomes of the students. The teacher wants to know, how strong the influence of a certain variable is and whether it is worth while to implant the instrument in the own classroom. That’s why Hattie develops a normativ framework, showing, which effect-sizes can be labeled strong, and which ones are weak or even contra-productive.
Barometer of influences: Hattie visualizes his data in more than 100 “barometers of influences”. One example is shown below – small group learning (Hattie 2009, p. 95):

<table>
<thead>
<tr>
<th>Effect Size (d)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>minus 0.00</td>
<td>a negative effect</td>
</tr>
<tr>
<td>0.00 up to 0.19</td>
<td>a very little effect – forget it!</td>
</tr>
<tr>
<td>0.20 up to 0.39</td>
<td>a little effect</td>
</tr>
<tr>
<td>0.40 up to 0.59</td>
<td>a medium effect</td>
</tr>
<tr>
<td>0.60 up to 0.99</td>
<td>a strong effect</td>
</tr>
<tr>
<td>1.00 and larger</td>
<td>a very strong effect</td>
</tr>
</tbody>
</table>

**Barometer of influences:** Hattie visualizes his data in more than 100 “barometers of influences”. One example is shown below – small group learning (Hattie 2009, p. 95):

Effects bigger than $d = 0.40$ are in the “zone of desired effects”, as Hattie says. Effects between $d = 0.00$ and $d = 0.15$ are called „developmental effects”. One should not interpret them as effects of schooling, since nearly every child develops from one year to another with an effect-size of $d = 0.14$, even if she/he has had no schooling in a specific domain at all.

**Major contributors:** Hattie (2009, p. 18) arranges these 150 variables, which influence learning outcomes, into six groups:

**Table 2.1 Average effect for each of the major contributors to learning**

<table>
<thead>
<tr>
<th>Contribution</th>
<th>No.</th>
<th>Studies</th>
<th>People</th>
<th>Effects</th>
<th>$d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>139</td>
<td>11,101</td>
<td>7,513,406</td>
<td>38,282</td>
<td>0.40</td>
</tr>
<tr>
<td>Home</td>
<td>36</td>
<td>2,211</td>
<td>11,672,658</td>
<td>5,182</td>
<td>0.31</td>
</tr>
<tr>
<td>School</td>
<td>101</td>
<td>4,150</td>
<td>4,416,898</td>
<td>13,348</td>
<td>0.23</td>
</tr>
<tr>
<td>Teacher</td>
<td>31</td>
<td>2,225</td>
<td>402,325</td>
<td>5,559</td>
<td>0.49</td>
</tr>
<tr>
<td>Curricula</td>
<td>144</td>
<td>7,102</td>
<td>6,899,428</td>
<td>29,220</td>
<td>0.45</td>
</tr>
<tr>
<td>Teaching</td>
<td>365</td>
<td>52,860</td>
<td>52,128,719</td>
<td>55,143</td>
<td>0.42</td>
</tr>
<tr>
<td>Average</td>
<td>816</td>
<td>52,649</td>
<td>83,033,433</td>
<td>146,626</td>
<td>0.40</td>
</tr>
</tbody>
</table>

**Figure 1: major contributors**
The figure shows that teachers have the biggest influence on learning results of the students. The influence of the school system is astonishingly low. That is why many German researchers say: Stop quarreling about the school system – teachers make the difference, not the school.

6.2 Low effects: Surface structures

Hattie is not a didactician. He is a fanatic collector of data. This makes understandable why he lined up the 150 variables from very strong influences to weak or negative influences. But it makes sense to bring a more theoretical order in his findings. We tried to do this (see Köller et al. 2013) and found an astonishing result:

Many of the deep structures have much higher effect-sizes than the surface structures.

That’s why some German authors say, the deep structures are more important than surface structure. And they add: Neglect the surface! But this argument is not correct, since you can influence the deep structures only if you take care for surface.

I start analyzing surface structures and just give you an overview about some of Hattie’s interesting findings.

<table>
<thead>
<tr>
<th>Surface Structure</th>
<th>Effect Size (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>classroom discussion</td>
<td>d = 0.82</td>
</tr>
<tr>
<td>direct instruction</td>
<td>d = 0.59</td>
</tr>
<tr>
<td>cooperative vs. individualized Learning</td>
<td>d = 0.59</td>
</tr>
<tr>
<td>peer tutoring (students help students)</td>
<td>d = 0.55</td>
</tr>
<tr>
<td>small group learning</td>
<td>d = 0.49</td>
</tr>
<tr>
<td>cooperative Learning</td>
<td>d = 0.42</td>
</tr>
<tr>
<td>computer-aided instruction</td>
<td>d = 0.37</td>
</tr>
<tr>
<td>individualized instruction</td>
<td>d = 0.22</td>
</tr>
<tr>
<td>class size</td>
<td>d = 0.21</td>
</tr>
<tr>
<td>long summer vacation</td>
<td>d = minus 0.02</td>
</tr>
<tr>
<td>retention (repeating a class)</td>
<td>d = minus 0.13</td>
</tr>
<tr>
<td>high amount of television</td>
<td>d = minus 0.18</td>
</tr>
<tr>
<td>high level of mobility (e.g. changing the school)</td>
<td>d = minus 0.34</td>
</tr>
</tbody>
</table>

Figure 2: Some surface-structure variables (selected from: Hattie 2012: 251-254)
There are three sets of surprising data for me:

**Class size:** Hattie has found out that learning outcomes do not increase, when the class size is reduced from 25 to 15 students. (25 is the normal class size in countries like GB, USA and Germany). In his lecture at Oldenburg University Hattie told us: "This is the research finding I have been attacked for most often. But why do they attack me? I only say what other researchers have found out." Hattie’s speculation concerning the reasons for this astonishing result: „Normal“ teachers don’t know to use the potentials of small classes! Hattie even found out, that in small classes teachers speak longer than in small classes.

**Individualized learning:** Really frustrating for progressive German researchers are the poor results of individualized learning. However one must always keep in mind that Hattie’s findings only show empirical data. These data say no single word about the *developmental potential* of a certain variable. That’s why I say: A higher amount of Individualized learning stays a fundamental option for a modern concept of teaching and learning. We have evidence in Germany, for example at Bielefeld Laboratory School, that a curriculum with more than one third of individualized learning can produce excellent learning results.

**Direct instruction – better than expected?** In German speaking countries, the most exciting discussions have been made to the question, whether direct instruction is better than cooperative and individualized learning. Some authors say: “Yes! Let’s go back to direct instruction. Stop all these experiments with individualization!” My opinion: It is better to combine direct instruction, cooperative and individualized learning.¹⁵

That’s why I developed an integrative model of “elementary forms” of instruction (see Meyer: What is good Instruction?" ECNU-PRESS 2011, p. 61):

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However, in German classrooms this model has been realized only in some few schools. Empirical studies show the average data in Germany (Hage, Bischof et al. 1985)\textsuperscript{16}:

- Direct instruction – 75 up to 85 percent.
- Individualized learning – 10 to 15 percent
- Cooperative learning – 5 to 10 percent.

My conclusion: A modern concept of instruction as shown in figure 2.11 should balance out the elementary forms of instruction. Progressive schools like Bielefeld Laboratory School show that it is possible to use even one third of time available for each of the three columns and have excellent learning outcomes.

### 6.3 Strong influences: deep structures of teaching-learning processes

More interesting than the surface structure results of Hattie are the deep structure results. Again I draw a list of my own out of Hattie’s books. Deep structure variables are difficult to measure. Nonetheless, we have today precise data in this field of research.

<table>
<thead>
<tr>
<th>Variable</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>self-reported grades and student expectations about learning outcomes (self-efficacy-expectations)</td>
<td>1.44</td>
</tr>
<tr>
<td>teacher credibility</td>
<td>0.90</td>
</tr>
<tr>
<td>providing formative evaluation (teacher gives feedback during working process)</td>
<td>0.90</td>
</tr>
<tr>
<td>student’s feedback to teachers</td>
<td>0.75</td>
</tr>
<tr>
<td>reciprocal teaching (students teach students)</td>
<td>0.74</td>
</tr>
<tr>
<td>good classroom climate</td>
<td>0.72</td>
</tr>
<tr>
<td>helping the students to develop metacognitive strategies</td>
<td>0.69</td>
</tr>
<tr>
<td>self-verbalisation and self-questioning</td>
<td>0.64</td>
</tr>
<tr>
<td>challenging goals</td>
<td>0.56</td>
</tr>
<tr>
<td>classroom management</td>
<td>0.52</td>
</tr>
<tr>
<td>strong self-concepts of students</td>
<td>0.47</td>
</tr>
<tr>
<td>expectations of the teacher about learning results (Pygmalion effect)</td>
<td>0.43</td>
</tr>
<tr>
<td>high amount of time on task</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Figure 3: some deep-structure variables (selected from: Hattie 2012: 251-254)

Figure 3 shows, what most of the educational scientists have told us for centuries, however without empirical evidence. Learning-outcomes improve,

- when teacher personality is strong,
- when classroom climate is good,

\textsuperscript{16} We don’t have actualized data.
• when the teacher initiates “meta-cognition” of the students (when she pushes them to think about individual and cooperative learning processes),
• when there is a continuous practice of formative assessment by the teacher and feedback of the students,
• when the students have a higher amount of classroom discussion.

So we now have clear empirical evidence:

(1) A high level of self-reflection of the students (for example: student-discussion, meta-cognition, feedback) significantly increases the learning outcomes.

(2) Teachers who have learned to see the learning tasks through the eyes of their students, are successful teachers.

The disadvantage: You need more time to realize these instruments. However, at long range the time spent at the beginning is paying off.

7. Consequences

7.1 Searching for a model of the “reflective student”

Teaching and learning should be conceptualized as joint reflective practice. (That’s what John Dewey preached 100 years ago!). Since we have elaborated concepts concerning the teacher as a “reflective practitioner” (Donald Schön, see above), we now can try to develop a concept of the “reflective student” who is aware of his learning capacities, who accepts the help of the teacher and develops didactical competencies (see above, Klingberg).

How to construct a theoretical model of the reflective student? I just make a simple analogy do Donald Schön’s concept and say:

(1) Students’ reflections are situated on three levels: level 1: implicit-reflection while learning; level 2: reflection-in-action; level 3: reflection-upon-action.

(2) The students’ reflexivity grows in a spiral of action and reflection.

A challenging model to realize these ideas has been developed by Andrea English/Edinburgh-Scotland (2013, pp. 142-154) in her book “Discontinuity in Learning”. Her model is inspired bei Herbart and Dewey. Her Ph.D tutor was Dietrich Benner/Berlin Humboldt University. That’s why she follows Benner’s concept of non-affirmative Bildung (see above). She argues that Bildung in a demanding sense means to confront the student with a challenging problem, which can be solved only, when she starts to reframe her up-to-now experiences. The task of the teacher in this process is to “interrupt” the students’ normal ways of thinking and to force them to reconsider their experiences.

Andrea English translates this abstract idea into a model of “reflective teacher-learner engagement”.
The task of the teacher in this model is the following: She must create “productive interruptions” in the learning process of her students and avoid destructive forms of interruptions. The task of the students is to be willing and prepared to get interrupted by the teacher or the classroom comrades. The author comments (English 2013, p. 145):

“The movement from point 1 through the ‘Teacher-Learner Point of Engagement’ (point 2) to the ‘Learner-Teacher point of Engagement’ (point 3) identifies the learner’s transition from established, taken-for-granted knowledge and ability to the interruption in the learner’s experience.

The interruption in the learner’s experience (point 3) marks a prereflective beginning of learning. The learner may experience this interruption as confusion or uncertainty about what she knows and has already learned. By reengaging the learner with a modified challenge (point 5), the teacher is attempting to support the learner’s transition from the prereflective beginning to a reflective-transformative beginning of learning.”

In my point of view, this is a good realization of Hattie’s main message: “Know the impact!” A second good example: John Loughran/Great Britain (2010) handbook for teachers “What EXPERT Teachers do” with many concrete examples how to foster students’ reflexivity.

### 7.2 Eight didactical principles of teaching, learning and assessing

I come to an end. I already defined several criteria of good instruction in parts 2 to 6 of this paper. I now summarize and define eight didactical principles.

| Standard 1: | Bildung is more than learning. Bildung from the teacher’s side means to help the student to develop reflexivity and responsibility for the teaching-learning process of the whole class. |
| Standard 2: | The learning process is characterized by an integrated and permanent change of “deeper understanding of content” with “reflection of sense” (sense construction). |
| Standard 3: | Teaching and learning is always a social process. It depends on respect and dialogue. |
Standard 4: The students can become “co-constructors” of teaching-learning-situations. Then students and teacher together form the “collective subject of the classroom” (Klingberg).

Standard 5: Surface structures and deep structures have different impact on learning results. However you cannot develop deep structures without taking for earnest the surface.

Standard 6: Direct instruction, individualized learning and cooperative learning are the elementary forms of instruction. They should be balanced out in quantity.

Standard 7: Continual formative assessment has to be integrated into nearly every teaching-learning process.

Standard 8: The teacher should try to create a democratic classroom culture.

Perhaps, a comparative study on Confucian “self-cultivation” and German Bildung can show the high affinity of both concepts. And perhaps Hattie’s empirical research findings can make clear that Anglo-American curriculum theory slowly moves in the direction of Chinese and German traditions.

Thank you for attention!

Bibliography


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