

The link between learning, knowledge and action

An approach towards a scientific educational term of *reflection*

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INTRODUCTION	3
AN INITIAL CONVERSATION.....	5
QUESTIONS AND PRELIMINARY CONSIDERATIONS	8
REFLECTION FROM A PHILOSOPHICAL PERSPECTIVE	10
DESCARTES.....	10
KLEIST.....	12
KANT.....	13
FICHTE	14
HEGEL	15
BEYOND HEGEL.....	18
LEARNING.....	22
A RECENT DISCUSSION	22
LEARNING AS EXPERIENCE	26
CONSEQUENCES	32
KNOWLEDGE	36
RYLE’S KNOWING HOW AND KNOWING THAT	38
POLANYI’S IDEA OF KNOWING HOW AND KNOWING THAT	39
<i>A tacit integration</i>	39
<i>The skilful integration</i>	40
<i>Knowing as a tacit integration</i>	43
CONSEQUENCES THROUGH TACIT INTEGRATION	47
IMPLICATIONS FOR AN (SCIENTIFIC) EDUCATIONAL CONTEXT	52
ACTION.....	55
THE REFLECTIVE PRACTITIONER.....	55
SCHÖN’S CONCEPT OF REFLECTIVE ACTION.....	56
<i>Type one – knowing-in-action</i>	58
<i>Type two – reflection-in-action</i>	59
<i>Type three – reflection-on-action</i>	62
IMPLICATIONS OF SCHÖN’S CONCEPT	64
CRITICAL SUMMARY.....	66
PRACTICAL CONCERNS	69
AN OPERATIONALIZED MODEL OF REFLECTION	69
LEARNING LEADERS.....	72
EMBL.....	74
IMPLICATIONS FOR EMBL.....	74
DRAFTS OF DESIGNING A QUALITATIVE STUDY.....	80
<i>The interview</i>	80
CONCLUSIONS	86
PS	90
BIBLIOGRAPHY	91

Introduction

In February 2008 I met Elke Jagomast in Berlin at a congress for international organisations; she was presenting the organisation she works for as senior assistant of personnel. The organisation she works for is the European Molecular Biology Laboratory¹. EMBL's mission and structure is described as follows:

'The European Molecular Biology Laboratory, one of the world's top research institutions, is dedicated to basic research in the molecular life sciences. EMBL is funded by public research monies from 20 member states - Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom and an associate member state, Australia. Research at EMBL is conducted by approximately 85 independent groups covering the spectrum of molecular biology. The Laboratory has five units: the main Laboratory in Heidelberg, and outstations in Hinxton near Cambridge (the European Bioinformatics Institute), Grenoble, Hamburg, and Monterotondo near Rome. EMBL is international, innovative and interdisciplinary. Its 1,400 employees from 60 nations represent scientific disciplines including biology, physics, chemistry and computer science. The cornerstones of EMBL's mission are: to perform basic research in molecular biology, to train scientists, students and visitors at all levels, to offer vital services to scientists in the member states, and to develop new instruments and methods in the life sciences, and technology transfer (EMBL 2010).'

On my search for a facility which could provide me with impulses and structures for my Master thesis EMBL seemed to be an appropriate place to gain new perspectives. After a brief conversation with Elke Jagomast I decided to apply at EMBL for the position of a diploma student because I was convinced that as a diploma student I could create synergy effects between my theoretical background as student of educational science and EMBL's innovative and international culture, which is dedicated to the creation of knowledge and learning.

Several emails and two phone calls later I had an inspiring meeting with Matthias Haury the coordinating manager of EICAT² and the head of personnel Ulla Böhme.

1 Further abbreviated as 'EMBL'

2 The EMBL International Centre for Advanced Training

As a result of the conversation we decided that my ideas and interest would match best with the department of Ulla Böhme.

Subsequent to our first conversation I had a conversation with Ulla Böhme. The dialogue gave me a first impression where the journey could go; how the thesis could theoretically and practically cling to the needs of EMBL and match my scientific interests. The preparation for the conversation included that I prepared some questions. The conversation was supposed to give me a first overview about the situation of vocational training at EMBL and the corporative structures it was implemented in. Finally I left with a lot of open questions and more impulses than I could have hoped for. In the following chapters of this paper the potential reader encounters theoretical approaches to this questions as well as impulses for practical implementations.

It begins with a summary of the conversation between me and Ulla Böhme, then preliminary considerations about the theoretical framework follow. From here on it is tried to approach the term of reflection and depicture scientific educational concepts of learning, knowledge and reflective acting, which are needed to show further implications for EMBL in the final part. The main focus in the theoretical framework is lying on developing an idea of an educational scientific concept of reflection and its multilevel associations to the aforementioned concepts of learning, knowledge and professional acting. The work lying at hand is the result of a dynamic interaction between the questions which were initiated through my contact with EMBL and my attempt to answer them out of the perspective of educational science, taking into account reflection as vital human source of learning and thus the highly transcendent underlined constitution of the human existence.

An initial conversation³

When I first met Ulla Böhme I was especially interested in the development of professional skills through courses which mediate theoretical knowledge. Ulla Böhme as head of personnel is also in charge for the successful implementation of measures of staff development and training.

Having explained my ideas we were talking about EMBL's non-scientific training program, a two year old program which comprises classical elements of staff training and development, namely courses in developing: personal skills, communication skills, presentations skills, project management, management and supervisory skills, IT courses and language training. This training for EMBL employees is disconnected from the 'scientific' training whose contents are some kind of scientific topics of molecular biology; this training is implemented in EICAT⁴, which is a separate unit of EMBL.

During the talk with Ulla Böhme in April 2008 it quickly turned out that both of us, Ulla Böhme and me, were interested in the knowledge gained in vocational training and its effects on the professional practice of the individual participants.

'Is the learned content really applied? [B]'

'How is knowledge bound to my personality, what makes it individual? [M]'

As an example Ulla Böhme raised the question if participants of interview trainings are really more successful in later interviews. Talking about the leaders of the seminars it turned out that most of them are native English speakers with a scientific background. It was really important to the employees that only trainers with scientific backgrounds were employed, when the program was first invented. They were afraid people without a scientific background could not match their needs. In my personal opinion I assume they are afraid that their implicit knowledge would not be respected enough by trainers without a horizon familiar to their own. Mrs. Böhme cited voices of employees:

'Not that someone is coming and telling us how to lead our laboratory. [B]'

³ This is a short summary of the conversation with Ulla Böhme. The most important topics of the dialogue are pointed out. The quotes and questions are marked by [B] for Ulla Böhme and [M] for Cristian David Magnus.

⁴ EICAT, the EMBL International Centre for Advanced Training, coordinates integrated training activities for scientists at different levels. EICAT is the landmark representing one of the Laboratory's core missions: the provision of advanced training.

Her opinion was:

'Of course it is different to lead a LIDL⁵ store or a biological laboratory but certain things are similar because people work in laboratories and people work at LIDL and I think leading people is what one has to be able to do there .[B]'

According to an intern survey the employees of EMBL are mostly informed about the non-scientific training and development program by email, also by a catalogue and the intern web pages. After applying for a concrete course the employees can take part in it. After attending the course they are asked to fill out an evaluation form⁶. The predictive character of the evaluation forms is not researched; can knowledge gained in the courses enrich the practice of the learners?

'If the expectations [named in the application] are fulfilled, can it be applied what was learned? Yes or no, and why? For example: Do people know better what they want after taking part in a *manage your career course*? [B]'

The financial administration of the non-scientific training program is integrated into the division of personnel. An assessment of needs was conducted among the EMBL employees in 2007; the course program of today is the result of these former surveys but there are no implications for a renewed demand analysis. The implementation of the program into the structure of EMBL seems to be a task that, in some areas, still lies ahead.

'We do have performance management processes where the superior has a conversation with the employee but the non-scientific training program is not integrated into this [B]'

When it comes to special offers for individuals in leading positions EMBL has a two-part program called *The Effective Team Leader*. Employees which become team leaders have to take part in these courses. Ulla Böhme mentioned that she was planning an additional course for advanced leadership, which includes personal coaching. In connection with the intercultural setting EMBL resides in, it seems that cultural differences are less visible in the courses and the staff developing program than in the different styles of leadership. Yet there is also an own culture that EMBL develops.

⁵ LIDL is a well known German supermarket.

⁶ The evaluation form is attached to this paper and is described in the last chapter.

'The culture is very strong here and does what a culture is meant to do, there are rules what one is allowed and what not [B]'

The original creation of the program was to fulfill the guidelines the states participating in EMBL stated. They demanded on the staff's right to take part in staff development and training programs. Ulla Böhme claimed that this is a great idea but that:

'The program has to be more implemented in EMBL, the people need to identify the contents of the courses they take part within their daily practice. [B]'

Ulla Böhme suggests to change the program's name because the term non-scientific implies that this is something that does not have to be considered being serious, especially in a surrounding where the staff comes from a scientific background. In the creation of the program people from all EMBL sites participated so it could become an EMBL wide program and not something that is just required through headquarter.

'A plan you worked on for a long
time is gaining shape'

Questions and preliminary considerations

The theoretically oriented part of this work tries to build a basis for answering the questions which were raised by the previously mentioned interview and further raised questions by contemplation with the topic. The major questions which derived were the following:

What is the key to individual knowledge, why does one person know things differently than another one, why do we share meanings but they never fully match? For example when we mention the word 'tree', anybody sharing to our language code knows what is meant, but everybody's concrete meaning of this word is different, the connotations are different and so on. Where is this special connection, the rug loom that weaves personality and information together so we occur as a new person with every encountering of the world?

How are knowledge and action emulating? Why can knowledge not simply be transferred or copied into someone else's mind? This leads to a major idea of this work: Is reflection a key to this question that discloses a hidden dimension of structures of human existence? What is its function and how exactly does reflection work, also how can we operationalise a concept of reflection for research in the humanities?

An additive question is raised by the circumstance that everybody in education talks about reflection, yet nobody seems to have a concept or an idea of it. Almost every single recent glossary and dictionary of educational science is cloaking itself in secrecy when it comes to a definition of reflection. Some faint hints are given by dictionaries for practitioners telling one that reflection is something like 'the thinking about an educative situation that lies in the past'.

Further questions are: Which tools would we need to observe the interaction impact of reflection on professional action in a concrete situation? And of course in and educational context it must be asked what the results and ideas mean for the practice of teaching and learning, hereby for the single educator.

The structure of the work tries to take the questions above into account, meanwhile the focus is always meant to be a specific *scientific educational* one. This is not consistently similar easy for all parts of the work lying on hand because

it operated with several variables which are almost unspecified in the framework of educational science.

Firstly a philosophical term of reflection is depicted, showing a historical development and a recent, dialectical term of reflection. This philosophical view is employed because the German discourses of educational science crucially lack an own term of reflection. Subsequently a concept of learning is discussed, taking into account the insights gained about reflection; here learning as experience is evaluated. The next chapter treats a concept of knowledge as a vital element and outcome of the learning process, again the associations with reflection are considered and knowledge is understood as bound to the personality, not just as stored information one inherits. The following part focuses on the relation of knowledge and action, showing a concept that implicates the reflective practitioner (as link between them) as acting subject.

In the last part practical assumptions theoretically based on the preliminary theories are made, especially an operationalised model of reflection is depicted and the idea of learning leaders is associated with concepts of reflection. The conclusions provide further implications for EMBL's practice, emphasizing the value of reflection as crucial element of organisational learning and successful professional acting.

Reflection from a philosophical perspective

Here an approach towards the philosophical discourse about reflection is depicted because educational science crucially lacks an own (explicated) concept of reflection. The concept of reflection which is unfolded here is employed later on to examine concepts of reflection inside the framework of educational science.

Reflection coming from the latin word *reflectere* is a term which has its origins in optics. It means to 'bend back'. The term already shows its highly speculative character by the fact, that it is metaphorically connoted (cf. Zimmer 2003, 6). Originally it describes the circumstance that a light beam is thrown back to the light source itself by mirroring. If this metaphor is taken seriously, reflection has to be seen as a mirroring ratio (cf. Zimmer 2003, 7).

It is a fundamental term of modern humanities which amongst other implications denominates the self-reference of the reasoning. Although the self-reference of thinking has already been of importance to the ancient thinkers, neither the Platonian interpretation of *know yourself* neither Aristotle's idea of the *thinking of thinking* nor neoplatonic thoughts gave reflection a systematic consequence (cf. Sandywell 2008, 517). Descartes' work and his fundamental idea *cogito, ergo sum* provides modern thinking with the starting point to approach reflection in association with the idea of the subject. After Locke systematically works with the term reflection it is fostered and establishes (cf. *ibid.* 257).

In the following paragraphs some aspects of reflection are considered, which are crucial for understanding its effects and interrelations inside the framework of educational science.

Descartes

The connection of reflection and the philosophy of consciousness is an outcome of modern philosophy. Descartes represents in his thinking the starting point from which a transcendental notion of reflection can develop (cf. Zimmer 2003, 8); he dares the experiment of the radical doubt and hereby the idea of reflection receives methodical character. The Cartesian radical doubt shows, after all utterly traditional certainty has been utterly questioned, all that is left set is the certainty

of the doubter. For Descartes this is the point from which a human can gain reasonable knowledge about the world (cf. *ibid.* 9).

Through this deviation the following thinking of transcendental philosophy is massively influenced; before the inner structure of the self-reference of the mind in the world is the object of interest. Now the consciousness becomes a correlate, namely the fixed centre of the world emerging from the self's consciousness.

'Nothing more than a solid and immovable point demanded Archimedes, to move the whole world from its place and so I may hope for something great if I find only the slightest which is sure and immovable (Descartes 1996, p.43).'

He finds this point in the certainty of the self, this is the doubtless origin of philosophy to him. Zimmer claims that this argument is incontrovertible inside the thinking of Descartes and contains implications for the further development of a transcendental idea of reflection (cf. Zimmer 2003, 9). To gain the idea of a pure self-consciousness first the whole relation of the self and the world is destroyed by the method of radical doubting – left is the worldless self which depicts the diremption of the self and the world. Then the self reconstructs the world and hereby the idea of reality is only remaining as something created by the consciousness.

A presumption of the Cartesian reasoning is that the subject is placed in the centre of all considerations; because of this later critics reproach Descartes of solipsism. Not only the problem of solipsism (that the self is the only existing and thinking entity), but also that all the thinking of the self is independent from effects and influences of the world is a virulent problem in Descartes theory. Descartes clearly overemphasises the pure thinking 'here it is lying within: Thinking alone is it, it alone can not be separated from me. I am, I exist that's for sure, but for how long? Well, only as long as I am thinking [tbta]⁷ (Descartes 1996, p.47).'

The distance between mind and world, between the self and the other can not be dissolved by pure thinking and reasoning, but this seems to be the conclusion of Descartes argumentation. The human reflexivity is firstly grounded in a physical existence; this establishes a major problem because human

⁷ For a better understanding the German original cites are translated into English, from here on the translated cites are marked by [tbta] (translated by the author).

reflexivity itself creates a distance in the relation between the human to itself *and* it separates the world and the self. This gap can be bridged by thinking, but not filled up.⁸ The classical German philosophy until Husserl tries to keep the validity of the Cartesian fundamental idea of the self consciousness; meanwhile it tries to separate the consequences inherent in Descartes system by avoiding the problems with other philosophical models.

'You are dreaming about seeing the world'

Kleist

In 1810 Heinrich von Kleist releases a text whose name is *On the Marionette Theatre* (Kleist und Scholz 2008). In this essay Kleist shows that reflection and self-consciousness are not simply speculative concepts which help philosophy gaining insights on unanswered questions, but radical principles of human existence.

Self-consciousness creates a crack in our nature; we are left behind with doubts, no longer capable of acting like animals or puppets, always bound to the demand of being aware of ourselves but never fully sure of the significance these awareness has.

After stating this, the following question for Kleist is whether or not this crack in our nature - this being torn out of a natural implementation of life, can be healed⁹. Zimmer sees two possibilities shown by Kleist to encounter this humanly disunity: Firstly to be a marionette (analogous to an animal) and to have no consciousness at all and secondly having an overall and unending consciousness as a godlike being has. While it is not possible for humans not to have a consciousness, -and hereby not possible to be marionettes- a godlike overall aware consciousness is

⁸ Zimmer claims that 'Humans pay for naturalness and certainty always the price to exclude the actual infinity of the reflected being in the world, from of the horizon of life execution and stop questioning essential limitations in a transcendent way [tbta] (Zimmer 2003, 11).' To him reflexivity is problem and solution in one, it causes problems and helps solving them, and thus he comes to the conclusion that reflexivity is circular. 'If one does not seek for human transcendence as a theological or existentialistic one then it lies within the necessity of the human to transgress themselves [tbta] (ibid. Zimmer 2003).'

⁹ We leave the questions open what Kleist means by healing and why this circumstance has to be healed in his idea.

obviously also out of question for us¹⁰. 'Kleist not only distances himself against a philosophy of absolute consciousness, but also through the allegory of the mechanical puppet against the romantic cult of a return to nature [tbta] (Zimmer 2003, 12).' A central point in Kleist's essay is where the puppeteer explains to the narrator:

'Paradise is locked and bolted, and the cherub stands behind us. We have to go on and make the journey round the world to see if it is open somewhere at the back. (Kleist and Scholz 2008, 14).'

This passage tells us, that for Kleist's figure there is no returning to an unconscious (allegedly natural) state and furthermore it brings up reflection as crucial fact of human existence, although it can never ultimately heal the crack in human nature¹¹, it is an extensive structure in association with human self-consciousness, it is a journey through the world back to immediacy.

Kant

Kant develops the classical transcendental term of reflection. He declares human self-consciousness is a transcendental one. Everything the subject experiences has a relation to it, namely to its transcendental unity. This native apperception is not consciously initialized, but immanent to the consciousness. This aspect of Kant's thinking about reflexivity clearly follows the 'Cartesian line' (Zimmer 2003, 13). The thinking about the relations of the empirical world's objects and how they come to exist by apperception is not constantly thought about by the subject; but it can draw on this thinking of thinking every time and bend back to re-actualize its knowledge about its source of notions.

'This formal identity as basis of all notions hereby becomes the methodical basis of all knowledge (ibid., 13).'

¹⁰ The second argument of Zimmer is not as convincing as the first one where he claims there is no human without self-consciousness because even though we are not capable of freely steering our consciousness we can use it intentionally if we want to.

¹¹ If reflexivity *could* heal this crack then we could not think of the human as a human anymore, but as a godlike being. It is an interesting fact that for Kleist there only seems this possibility of entering Paradise from 'the back' and become a godlike being. In the explanation of the puppeteer the way to do so is to eat again from the tree of knowledge; but Kleist could have also bestired the metaphor that humanity has to disgorge (or digest) the fruit of knowledge that it has eaten before and by that falls back into a animalistic existence.

That means the subject does not simply recognize objects, but the objects have to become objects to the subject by entering the unity of human consciousness. Transcendental reflexivity, until here only implicit in the transcendental apperception, means an abstraction of all content (cf. *ibid.* 14). This abstraction differs from Descartes' universal doubt, it is not doubt but an evacuation of the consciousness until a final content which can not be abstracted any further (cf. *ibid.* 14). The transcendental reflection gets divided from common thinking. The subject can draw on the thinking of thinking, but does not do this initially rather than intentionally. This separates reflexivity and practical knowledge; item of reflection is the pure unity of the self.

The transcendental reflection according to Kant is capable of finding the subjective conditions by which we come to terms¹². Further, he distinguishes between wrong and right terms of reflection. To him knowledge is the relation of terms which constitute experience to intuition¹³. Reflection is not reflecting upon items of experience, but onto pure intellectual activity; the outcomes of this activity do not correspond to experience. A wrong term of reflection comes to exist when items of pure intellectual activity are taken for the appearance and the other way around. Thereby Kant denies the degree of reality of trans-empiric reflection; the only items of reflection left over, that do not occur in experience,

'are the >Noumenon<¹⁴ and the pure self-consciousness.[...] In such a way Kant accomplishes a radical separation of knowledge and knowledge about knowledge, experience and methodical reflection on the conditions of it [...] [tbta] (*ibid.* 16)'.¹⁵

['You can withstand everything except the temptation'](#)

Fichte

Fichte transgresses Kant's model of reflection he sets as a basis of knowledge, what was not a source of knowledge to Kant. Namely in the pure self-reference of

¹² Zimmer says about Kant's transcendental reflection: 'It is the awareness about the relations of given ideas to our different sources of knowledge (Zimmer 2003, 15)'.

¹³ This idea of Zimmer can also be found in Meyer-Drawe's and Polanyi's thinking which are depicted in the upcoming chapters.

¹⁴ This is a non sensual, transcendental item.

¹⁵ In Kants thinking our capability of understanding the world is limited to a certain point, if we imagine the world as a wall covered with wallpaper, we are only able to see these and never the wall itself.

the self the self sets itself founded identity as reality (cf. *ibid.*, 18). Fichte adopts Kant's idea of a formal unity of the self-consciousness but additionally he claims the self to be the origin of philosophy itself, which Kant strictly refused in his thinking. In Fichte's thinking object of reflection is not an abstract formal unity of the self but the circumstance of its pure and accessible identity.

By this small step Fichte blasts the methodical tightness that exists in the modern philosophy of consciousness since Descartes; he opens up the

`systematic dimension of reflection [...] not ontologically unfolded, but speculatively opened (*ibid.* 19).'

Fichte establishes the whole of the experience out of one principle – the absolute subject. As a result of this setting the structure of explanation gets circular¹⁶ and objective self-reflection is the result of a certain case of reflection by the self-related self. The self comprises the interaction between subject and object and is in Fichte's thinking only to be determined in this way. Reflection is here thought as an objective action. The self is nothing more here than into itself returning action; the object of reflection is also a reflective event (cf. *ibid.*, 18).

Fichte arrives at a term of reflection which does not abstract from the world of experience but penetrates it totally; all of this reflection's impacts onto the reality also refer back to it. He states that the self has two prime principles (*ibid.* 19): (1) The self aspires to occupy infinity and (2) the self carries the demand of reflecting itself; both coexist and build a dialectical unity¹⁷. Fichte does not reach the level of an ontological argumentation because his argumentation resides within the spectrum of the 'pole of the self'; therefore the interaction between self-consciousness and existence remains only partially analyzed.

`You will get respect because you can not be impressed'

Hegel

Hegel develops a very complex, dialectical and ontological thinking of reflection. The previous thinking about reflection which produces the idea that the human

¹⁶ Zimmer complements that it gets *objective reflexive* because of the self-restraining effect of the infinite self onto the existence which bends itself back into the self-consciousness as knowledge [tbta] (Zimmer 2003, 19).

¹⁷ Zimmer summarizes here about the reflective term of Fichte: 'differently formulated is reflection or the mediated self-relation the result of this interaction [between aspiration and reflection as demands of the self] whilst the external effect bends back into the self-consciousness [tbta]'.

existence is inherently split by the transgressive activity of the mind into itself and the other is adopted and emphasized by Hegel. To him the circumstance that we are reflected entities also implicates diremption. This diremption is the source of the requirements of philosophy, namely to unify what can never be unified in life and experience (cf. *ibid.* 23).

For Hegel diremption in modern thinking of subjectivity is not understood as a problem but it gets systematically determined; this takes place by hypostatizing one part of the whole of reflection as allegedly independent from the other one (cf. *ibid.* 23). Hegel criticises here that the modern philosophers keep up a separation between the finite consciousness and the absolute.

He leaves the level of understanding reflection only as *realising thinking* and develops the idea of reflection as *rational thinking*; hereby reflection gets a methodical character. As reasonable thinking it becomes the medium of philosophy. '[Here] [...] the question of Reflection is how the whole of the reflective ratio, whose moments are subject and object, can be imagined [tbta] (*ibid.* 23)'; the structure of this reflective ratio is the absolute. This is Hegel's point of view from which he unfolds his critic against Fichte¹⁸. From here on Hegel has to define the most delicate part of his term of reflection namely the severe difficulty of a dialectical term of reflection. Reflection is a structural term of human self understanding; thus we are confronted with a term that is not to be determined in a transcendental way¹⁹ because it concerns the whole of the 'being-in-the-world [tbta] (*ibid.* outside back cover)'. This means the term of reflection transgresses the human reality.

Hegel solves the problem by thinking transcendentalism as the relation of the substantial and structural aspect of the transcendent inside the self-consciousness; he combines the subjective and the substantial parts of it. After he develops this idea that whether a transcendental nor a subject-philosophical

¹⁸ In his work 'Glauben und Wissen oder die Reflexionsphilosophie der Subjectivität in der Vollständigkeit ihrer Formen, als Kantische, Jacobinische und Fichtesche Philosophie' Hegel shows that the one sided point of view that Fichte develops is not enough to come to a comprehensive term of reflection. In this context he speaks about the footcuffs of Fichte's (and other's) specific term reflection, which overemphasizes the subjective part and hereby stops being able to get to the absolute.

¹⁹ Zimmer claims we deal not in any way with a transcendental explanation of knowledge [tbta] (*ibid.* outside back cover)'.

view can claim a rightful approach of the term without falling behind Hegel's thinking²⁰.

Hegel breaks with the subjective idealism because not the subject is the solitary reason of knowledge anymore but its relation (and hereby also the being). The self-consciousness bents back to itself because of the structure of reflection; meanwhile it is part of being *and* depends on its real relations to the being itself. One part of this relation *between the self and the world* (the self-consciousness) is not only reflecting itself, but transgressively also the whole of this relationship. This transgressing access to the substantial relation leads Hegel to the discovery that this relation contains a conscious element²¹ (cf. *ibid.* 26). The transcendental subject is no longer a fixated point; it dissolves into the dynamics of its relation (cf. *ibid.* 26).

Now, what are the consequences of Hegel's term of reflection?

Hegel tells us that he sees the structural transcendence he discovers not as a solution for all the problems but it is rather a highly problematic constitution of the human existence to him (cf. Hegel 1967, 57). A consequence of this thinking is that all knowledge can only come to exist by mediation through the ('circular, self-reflecting (Zimmer 2003, 27)') consciousness. Accordingly a change of knowledge about an object is also a change of the object itself because it is only object inside the relation of the perceiving consciousness and its real entity.

Concerning this Zimmer states: Knowledge means that transformation of the other into thinking, but also always its transformation inside the thinking (Zimmer 2003, 27). It is important not to forget that this means experience can *not* be reduced to the presence of the being inside the consciousness; what we call experience is the outcoming of the consciousness reflecting of I) the being, II) itself and III) its position inside the being. Hence it can be concluded that there is no reality for the human being which is not reflected reality. Hegel's theory is capable of showing that knowledge is kept up and altered in the self-consciousness, but that it comes to exist by a reflective contention with reality.

²⁰ Zimmer sees this as the immanent problem of dialectical philosophy (cf. Zimmer 2003, 25).

²¹ For Zimmer this is the basic position on which Hegel founds his absolute idealism on. Reflection is not knowledge through the abstraction of experience, but rather a taking-the-inward-turn of experience itself inside the self-consciousness (cf. Zimmer 2003, 25).

Beyond Hegel

Inside Hegel's thinking about reflection the consciousness has an absolute priority. Only if it can be shown that the overarching character of the consciousness is anon itself depending on an overarching of the being, this priority could be overcome.

'Such a reasoning would only be possible if consciousness would be made perceptible as not being the Archimedian origin and centre, but a virtual moment of being [...] only by this the philosophy wins back a central, although decentralised, a real, although a hovering place in being for the human [tbta] (Zimmer 2003, 28).'

Inside such thinking a human would be an effected effecter. The wish of Zimmer to overcome this perspective of Hegel seems to be founded in the wish for a thinking of reflection that comprises the whole of the human existence the self and the being without overemphasizing one or the other.

To win this overarching view of reflection Zimmer adopts a thought of Heidegger in the first step; 'Dasein ist Seiendes, das sich in seinem Sein verstehend zu diesem Sein verhält. Damit ist der formale Begriff von Existenz angezeigt (Heidegger 1986, 52)'. This means that the entity resides inside the being and the being resides inside the entity²². Hereby Heidegger gets to the idea of subjectivity as interlocked doubled in-being.

In a second step Zimmer describes what is important to him about Sartre's idea of reflection, namely that Sartre tries to disprove the priority of the consciousness by showing that we '*claim* much more than we *know* when we say >I< and that this >I< is ultimately a transcendent one, which only appears in reflective acts (Sartre 1997, 39)²³.

²² Heidegger wants to show nothing less: only in the ontological term of the transcendental being-in-the-world is this doubled aspect of the in-being at all, namely that the entity according to its modus of being exists in the being, as well as the being as a whole one resides inside the entity [tbta] (Zimmer 2003, 34).'

²³ Sartre (as Heidegger) misses approaching a dialectical term of reflection because he only problematises the self-relatedness of the human being and ends up in a decisionistic perspective (cf. Zimmer 2003, 35/36).

Plessner²⁴ in turn discovered important elements of reflection in his anthropological philosophy (Zimmer 2003, 36). He states that through the biological equipment of self-consciousness the human is set into a dialectical tension throughout his whole life. Plessner divides the reflective ratio from the self-consciousness (where it resided in idealistic theorems) and transfers it into a ratio of being 'which is in the world und that does not set the self-consciousness, but that relates to it und must relate to it, because the structure of the life form demands it (Zimmer 2003, 37)'; this thought leads to the idea that the human is confined. Founded and confined by its position inside the being, constantly causing and transgressing this confinement. The nature of the self-consciousness causes an unbridgeable gap between the human and the world 'which must be mediated [by reflection] in every moment but can never be overcome [tbta] (ibid. 38)'. Plessner's thinking of reflection is a dialectical approach because it breaks with the priority of the self-consciousness and shows the structure caused by the entanglement of the transcendental reality and the self-consciousness.

To the idealistic age reflection was a fundamental term but to show that reflection is still a basic term of philosophy (and the humanities) today it has to be further researched now as an ontological actuality (it becomes an object of objective transcendentalism) (cf. *ibid.*, 38). A draft on such an approach of the term can be found in Holz's (Holz, 1972) metaphor of the mirror, Holz compares here the issues of reflection by reference to the metaphor of the mirror. His analysis of the metaphor is crucial for the argumentation that the reflective ratio resides inside the being. First there is the mirrored as ontologically prior to the mirror image because the mirror is not free in what it mirrors and without a mirrored entity there is no mirror image. To Holz the mirror only exists inside the being (world) itself and its reflecting depends on the world that surrounds it, the mirror itself is deduced being 'outside the world, without a counterpart would no mirror be possible [tbta] (Holz, 1972 cited by Zimmer 2003, 39)'. Holz concludes the primary position of the being in analogy; in the being the self-consciousness resides, this produces images of the being and these images are depending on the place from where they are reflected. The self-consciousness (thought of as a mirror image)

²⁴ We find similar thoughts employed by Pannenberg in his theological concept of human reflection.

whether purely produces neither simply reproduces something from outside (Zimmer 2003, 40); Holz thinks of 'the self-consciousness thus as a medium which is neither purely active, nor a purely passive point of transition [...] in which the *ratio of the being* [Seinsverhältnis] shows up as a reciprocal interconnection of its parts [tbta] (ibid. 41)'. The self-consciousness now is a primacy but not an ontological primary.

Reflection as a mirror image of the being is not the being itself but a special perspective on it, because every mirror image depends on the position of the mirror (the mirror image adds something to the mirrored object – beginning with the modification by the individual perspective); it can be said that it is a '*virtual and modified* [tbta] (ibid. 41)' iteration of reality. This thinking of reflection exceeds the idealistic view; here the being bends back to itself through the consciousness and appears reflected. The act of mirroring is a self-interpretation of the being (cf. ibid. 41); Holz's metaphor creates a dialectical term of subjectivity – subjectivity is here thought as objective transcendentalism. The mirror image works as a reflective self-reference; the being becomes truth as image of itself but therefore a receiving being must exist – this receiving being is the self-consciousness (cf. Holz 1972, 92). Zimmer who is convinced that we need to leave the primacy of the consciousness sees Holz's metaphor as a successful approach, he states: 'The mirror as *heuristic* metaphor is maybe the only way to expose this appearance and meanwhile to constitute the priority of the being and the primacy of consciousness by the structure of the mirroring [tbta] (Zimmer 2003, 42)'. Out of the ontological distinctiveness of the human conscious-being inside the being follows that self-consciousness is bidirectional (1) it is part of material reality and overarched by the being, (2) it is the only related entity that is aware of its relatedness, thus it transgresses the being by reflection. These thoughts lead back (or forward), although in a modified perspective, to Hegel's understanding of self-reference in thinking as world-ratio (Weltverhältnis). The consciousness is unavoidable for every human individual; reflection opens up the sphere to a metaphysical dimension of human existence, which is caused by the human self-consciousness.

The afore mentioned *priority of the being and the primacy of consciousness* are implicitly taken into account by Sandywell when he distinguishes between

reflexivity and reflection (cf. Sandywell 1996, 125-128). To him reflection is 'an instrument to protect the mind against its own contingency (ibid. 126)' while reflexivity 'primes the engines of cultural innovation (ibid. 126)'. He claims that reflexivity is not simply another level of reflection but a different 'domain of desire antedating the traditional practice of reflection (ibid. 125/126)'. The perceptual framework we gain through our lifelong physical and mental development, which will play a role later on, is an outcome of reflexivity and firstly enables reflection as we label it; our terms of reflection are entangled with the ideas of metaphysical principles and (have to) ignore the ambivalent surd of temporal existence. Sandywell argues that the classical, philosophical and western term of reflection leads to stricture structures (ibid. 126) and skips the fact that all temporal existence is already eroticized. In the next chapter Meyer-Drawe, who developed a term of learning as experience, also deals with this problem of dialectical thinking, which she claims to conceal the true nature of human learning. To Sandywell reflection is not as free as reflexivity, it is bound to by rules, while reflexivity, as the word already implies, is strictly egocentric and whispers 'We want to live as we want to live (ibid. 126)'. Sandywell as Meyer-Drawe argues more ore less aware of it that the dialectical thinking forgets that 'reflection's existential source and temporal matrix is not something controlled or authorized by reflection.

'It is rather the always-already operative world of everyday experience and quotidian of comportment toward the being of things, the rich chaos of everyday language, the contradictory pulses of lived history (ibid. 127).'

This reasoning has to be associated with Holz's idea of the mirror, because it enables keeping an eye on the priority of the being, in which the single reflecting individual resides in. Sandywell cites Pruffer when he says that self-objectification is only possible because of the temporality of reflection and yet *adequate* self-objectification is not possible because of it. We find a similar thought employed later on when Polanyi's statement is considered, which comprises that *we* [will always] *know more than we can tell*. That means our reflective abilities are clearly limited to the state that there will always be more pre- and un-reflected mass with us than we can reflectively work off. We will see this is what creates a 'tacit dimension' for Polanyi and an intangible dimension of experience for Meyer-

Drawe. Albeit the critic of Sandywell and others that the dialectical term of reflection might not be appropriate to embrace the whole of the reflective dimension of the human life, Sandywell himself gets to a dialectical relation of reflection and its domain reflexivity (cf. *ibid.* 126). He unfolds the dialectical tension between them by referring to Dewey, describing that reflexivity and reflection are like the relation a map has to the expeditions whose outcome it is. The map is a product which is free from its historicity after its production, its use is not depending from the fact that one knows how it came to exist. This is what creates the highly dialectical tension between reflexivity and reflection according to Sandywell it has even the potential to 'disrupt hierarchies, dissolves binarisms [and] subverts carefully drawn limits (*ibid.* 126)'.

'Good! You have a sympathetic ear for the new'

Learning

In this chapter first a short summary about the recent discussion on learning is depicted; in a second step, based on the insights on reflection of chapter one, the concept of learning as experience and its dependence on reflectivity is presented.

'Do not get stressed by others'

A recent discussion

The following thoughts about the concept of learning inside the framework of educational science refer among others to an article of G. Strobel-Eisele (Strobel-Eisele et. al. 2009), who tried to show how the learning term developed in pedagogical contexts and what denotes its speciality.

Today learning is a widespread term, not limited to human learning. Learning as a term spreads over several disciplines, 'at that the reasons for the boom of learning lies at hand. The temporal structures accelerated by economical and digital changes of modern societies demand from their members among mobility more and more learn- and relearn-efforts, to steadily keep up with the challenges [...] (Sandywell 1996, 125/126)'. There is a lot of research about learning going on and a lot of theories were conceptualized until now, not only by the classic subjects concerned with learning, namely philosophy, psychology and pedagogic, but also by sociology, neuropsychology, neurobiology. The latter motivates the founding of

a neuropedagogic which tries to develop a brain-sized concept of pedagogic (cf. Strobel-Eisele et. al. 2009, 6)'.

Different concepts of learning let us explore learners and learning processes where educational science would never have dreamt to find them: systems, organisations, programs and societies are learning but also car radios, neuronal networks, children and brains (cf. Meyer-Drawe 2008); obviously the perspective and the discipline make objects to learners – or not. Thought about it this way, learning is recently not understood as a generic term of educational science but firstly an empirically recognisable²⁵, not necessarily intentional change in behaviour or constitution of just any object. Of course this idea also includes partially the learning of humans, whereby this concept has already problems when it comes down to the visibility (its empiric ascertainability) of human learning processes. Consequently this concept does not explain human learning; it just gives us the opportunity to speculate that what we see *could possibly be* learning. Obviously this term is not very specific to educational contexts. These circumstances show how crucial an original concept of learning is to educational science, not trying to explore and not probing this term -from this genuine view- would be synonymous with a death sentence for the subject.

A notable German professor of the Max-Planck-Institute For Human Development, in Berlin said recently in an interview about the resumes on learning made by recent brain research that the only thing brain research showed us for sure till now is that learning takes place in the brain; it has not to be mentioned that her statement also means – *and that we knew before*.

This statement points into several directions; it shows how polemic the discussion about a right and a wrong idea of learning between different disciplines goes on sometimes and it raises the question what a genuine idea of an educational term of learning is and where it is located between and in interaction with other scientific subjects. This is not about a term that can be directly transferred into pedagogical concepts or explains special characteristics of learning like: natural, mimetic, bodily, explorative, exemplarily, reflexive, informal [or] aesthetic learning

²⁵ An example for such recognisable and empirically notable changes could be the variations in pictures of neuronal activities made by magnetic resonance tomography, still those changes show us just statistic data and variations but not what learning itself is. What the neurobiology can do for the improvement of learning in the future is recently not assessable et. al. 2009, 8).

(cf. Strobel-Eisele et. al. 2009, 8), but rather about an approach of an educational anthropology that clarifies what characterizes the concept of learning inside the science of education and where it comes from. Strobel-Eisele shows that educational science has to expose itself to the claim that educational science has till now no 'indigenous' term of learning (cf. Strobel-Eisele et. al 2009, 7); to her an educational idea of learning can not be disconnected from the social aspect of human learning and this is where the difference between other subjects and educational science crystallise the most.

But what are other specialities of and educational scientific term of learning? Educational science takes into account that the single learner possesses self-referentiality, the skill to reflect consciously and that one always resides in social contexts (cf. *ibid.* 12). Let us have a closer look to this with reference to the historical growth and development of the learning term inside pedagogy and educational science:

1. Learning is the reason for education, the fact that the single human is capable of learning leads to the fact of education because most of the human learning processes do not unfold themselves alone but have to be initiated by the social environment. Both terms correlate mutually, learning is the basic reason for education and hereby the prior one, but education is needed to unfold the learning process. This is a reason why in the historical development educational science considers learning from the perspective of education and social interaction. Learning in this context is the main topic of educational science and the educational reality, 'learning is the main concern of education and its institutions (cf. Buck 1967, preface)'.
2. With reference to Herbart (Herbart, 1955) it can be stated that learning is not simply an automatic process, learning is when something of the human experience remains with the learner and enables one to draw new conclusions.
3. Learning happens in intentional educational settings and in non specific educational situations. These circumstances require a learning term that is capable of including multiple variations of learning forms. It has to deal for example with the terms of socialisation and its similarities and differences

with learning, this has to be considered and implemented in a concept of learning.

4. The single human is capable of self-learning, but this self-learning is not possible without the acquisition of the basic abilities needed for that process, this happens in ones social environment. In the enlarging learning society the child remains an important subject of educational science but new challenges have approached for example in relation with the aging population in the western civilisation, a concept of learning has to take this into account.

As science which systematically analyses and supervises learning from an educational perspective Strobel-Eisele identifies three coordinates that play a vital role in educational learning concepts (cf. Strobel-Eisele et. al. 2009, 13).

(1) One important point of those concepts are the didactical *methods* and their reflection. Methods of learning, and in relation with education methods of teaching, are as old as pedagogy itself;

the spectrum reaches from the maueutics of Sokrates over the natural method, as it is suggested in the Didactica Magna of Comenius to the reflection of methods of the philanthropists and finally the progressive educationalists (Strobel-Eisele et.al 2009, 13).²⁶

(2) A second perspective is the question after the *contents* of learning. What has to be learned, has to be taught, has to be left out? This brings an ethical dimension of learning in that can not be left out because ethics are positioned in social environments and education is directly connected to these social dimensions.

(3) The third point of view is educational anthropology; it researches the natural, mental and not at least the spiritual suppositions of humans and sets its resumes in relation to the facts of learning and education.

In the following part it is tried to develop a rough draft of an educational concept of learning, which takes particularly the reflective directedness of the human existence into account. This approach is made by researching a concept of

²⁶ It has to be claimed that every didactical method, every approach to a concept of teaching already includes a reflective proximity to an educational term of learning. So we can explore different terms of learning in different times by researching the didactical concepts of the period.

'learning as experience' onto its reflective contents and starts from the perspective of educational anthropologist assumptions.

Educational terms of learning have to deal with transcendence.

In the course of acquiring this world they exist in humans learn; this learning builds up what we will further call *knowledge*²⁷. The human way to learn is a result of their reflective nature that characterises the human existence.

Learning results from experience, we would not learn without an ongoing confrontation with the other; in this dialectical concept experience means that one sets oneself into relation with himself or the other. Dialectical because this whole process of founding those relationships is driven by our reflective nature which bends back to itself and forward to the other, as we have seen in chapter one.

'You are going to win new friends and keep your old ones'

Learning as experience

Leaning onto a concept of 'learning as experience' by Meyer-Drawe (Meyer-Drawe 2008) and extrapolating its reflective contents, thus an educational concept of human learning is shown which implies that:

- a) Learning depends and hereby results from the reflective structure that characterises the human being in this world.
- b) The learning process is a conscious experience to the learner.
- c) The outcome of the learning process is knowledge²⁸.

If we think about what was stated above about the *priority of the being and the primacy of consciousness* we have to set this into relation with the priority of learning and the primacy of education. Education is the social answer to the fact of human learning; which is possible through the self-consciousness and hereby to the human being in the world.

Meyer-Drawe condemns herself decidedly against a theory of learning which understands learning only as a measurable accumulating of facts. She tries to separate the terms of methods of learning and the original process, which are mixed up today she claims. In this context she states that 'system theory and

²⁷ Please note that the term knowledge will be further amplified in the next part, but knowledge is here not understood as stored information.

²⁸ For a definition of 'knowledge see next chapter'.

constructivism provide a sleek vocabulary that learning is nothing more than the description of the fact that one can not observe the effects of incorporating information, on the operative closed, autopoietic working system [tbta] (ibid. 188)'. As a result we could no longer distinguish between learning and other forms of alteration. Learning as experience though opens up the perspective to understand the accumulation of facts as just one part of the whole of learning; but what denotes this so called *experience*²⁹?

Most theories about learning use a term of experience but without reflecting it, even modern brain research claims that experience somehow changes the 'hardware' of the human physiology and denotes a performance of the human brain (cf. Singer 2003, 97), but this concept does not explain how the human brain gets to an interpretation of the world. It misses the point of the original humanly and mixes it up with a biological explanation of the world. Experience is a special human possibility (not ability) and it is not the same as thinking or even perception. It occurs where the astonishing, surprising and unexpected takes place (cf. Meyer-Drawe 2008, 188). In our self-consciousness reside expectations but we are not aware of them until our perception denies fulfilling them³⁰, then we stumble and fall; we become aware of what our expectations were, respectively what our self-consciousness (the structures behind it) intended. Thus this denotes experience that it causes a 'crack in our consciousness' (Teneglyi 2002, 788). The human is capable of experiencing something new through one's perception; this is the nature, not to say the texture of perception while it must not be forgotten that this perception has its own historicity, the new that it discovers coincides with something that is already there. The consciousness can not decide to keep or not to keep its experience congruent with its expectations- by experience the world can break with those expectations³¹. 'Experience means thereby the opening to a world which can occasionally obtrude itself and come into the way of functioning expectations (Meyer-Drawe 2008, 189)'. Every experience influences the expectations behind the consciousness and thereby comes every experience back to itself and influences the next experience. The same can be stated for reflection.

²⁹ In Hegel's concept experience is the encountering of the world.

³⁰ This does not exclude that we can have experiences in thought.

³¹ The self as entity of that is existing in the world (being) can also be an item of world that the consciousness is confronted with.

While the world, the being has to enter our consciousness to come to exist for us³², we can not fully control what enters our consciousness and every time something new enters our consciousness, something we experience and that needs reflectivity to deal with, it alters our consciousness and the structures behind it and we can never reflect as we have done before, just as we can never experience like we have experienced before. It has to be further questioned what distinguishes and connects the terms of experience of Meyer-Drawe and the term of reflection; reflective movements feed our consciousness and the structures behind it, which are mainly pre-reflective.

The links between and relations of reflection and experience are obvious, but also the problem's research has to deal with, if we think of pre-reflective structures, experiences which we made before we experience and which created the structures behind our consciousness, only get visible when 'we are disturbed not to think about [them]'³³. The conscious usage of our brain is limited, we realize that when we hear ourselves saying something different than what we want to say, acting differently than we knew we could or being flooded with new and uncontrollable thoughts. Meyer-Drawe cites Waldenfels to explain that we come across the paradox of creative answers in which we give something that we do not have (cf. Meyer-Drawe 2008, 190). She recognizes in this 'giving of something we do not have' the limitations of our consciousness; from this point of view she argues against an idealistic but especially the Hegelian view of experience. Hegel claims that to experience the single human has to be aware of his separateness of the world (being). Meyer-Drawe argues with the help of Waldenfels that there is no such thing as a total awareness of the self, as separated unity from the world, and that experience would mean the opposite, namely that it causes cracks in the awareness of the self; it means the unfamiliarity of the self with the self. The critic against Hegel is surely eligible although Hegel's thought that experience needs the self-consciousness³⁴ is not wrong but clearly limited. Meyer-Drawe and Hegel meet in the point that experiences need a consciousness at all, although Meyer-Drawe

³² Keeping in mind the priority of the being and the primacy of the consciousness.

³³ To Meyer-Drawe this is the point where natural science can not help researching and measuring, but only questioning and understanding of the individual situation.

³⁴ With the term of the self, of the conscious being the need for a new contention of reflection appears.

adds that this consciousness is not just crucially needed but also affected by experience; it has to constantly assume itself, because it is not always a balanced entity and by experience it 'encounter[s] breaches, cracks and cleaves (ibid. 190)' with itself.

If we have a look after the development of the term of reflection after Hegel we notice his subsequent thinkers had the similar problem, if we take Holz's metaphor of the mirror into account again, we realize that the way things are reflected in the mirror depends on the being as well as on the subject; the being overarches the whole relation and that mirroring is a self-interpretation of the being but the self is part of the being. Consequently reflection is a steady self-interpretation of the self inside its existence in the being. Meyer-Drawe recognizes this problem for the learning term, if learning as experience is the confrontation with the surprisingly new and alters the consciousness and the structures behind it, and then learning can not be an accumulation of facts, because it is an alteration of the self –consequently the whole identity is affected by learning.

With a view to brain-research which conceptualizes learning as a neuronal activity of the brain, it has to be said that only brain functions can be made visible. The problem is that besides the visibility of the functions it explains nothing about the experiencing of sensory impressions or the processing and alteration of memories³⁵. Learning (mainly its output) is researched under the focus of behaviouristic or cognitive models, as behaviour or memories and the process itself is left out (cf. ibid. 192).

Learning is an activity which is recognized when it has already happened. Learning is like awakening, every thematisation of the event comes too late, it has already happened when we are aware of it (cf. ibid. 193). When one is surprised because their recent understanding of the world³⁶ is not sufficient anymore to explain it, then a learning process has taken place already – the fact that this subject now knows, that its knowledge is not sufficient anymore was caused by the learning process already. The realisation of what we do not know already is a crucial part of the learning process; this has also consequences for teaching. Learners can

³⁵ At least not in a way which explains how this events affects the learner physically and mentally as a whole person.

³⁶ Please note that this includes oneself as part of the world as well.

learn from their teachers what they do not know and teachers can learn from the learners how they came to know what they know. Because as soon as learning takes place we are altered subjects, we can not go behind our learning process anymore (at least not without a new one), of course we could intend to explore it by conscious reflection but it would still never be the same again. An educational term of learning consequently understood as *process* has clearly a temporal dimension.

The mere storing of more and more information is no learning process; but the implementation of knowledge into one's personality and into a growing interpretation and understanding of one's life-world is. In this context learning is a conscious process, since it is an active contention of the individual with itself and the world. Even if one can not consciously recognise the initiation of the learning process the moment of awareness that something is unknown is crucially conscious otherwise it would be no surprise³⁷. The surprising event of lacking knowledge, together with the moment of understanding something new (getting to new knowledge) and the implementation into one's pre-reflective structures, as well as the *possibility* of a reflected contention afterwards are all elements of the human learning process, as educational science can observe it. Concepts of learning and knowledge which do not include those elements are abbreviated. When we understand learning as a psychological term, as observable behaviour or as a diagrammatic depiction in brain research the differences between learning and other terms are concrete because then learning is not touching the whole human existence. Being confronted with a term of learning which tries to comprise more elements than its obvious outcomes the question appears to us what makes the difference between learning and Bildung³⁸ (literacy). Clearly between learning

³⁷ It is set that the nature of surprise is certainly conscious, despite the fact that the surprising event and the surprise can be temporally dissolved, although the surprising event always takes temporally place before the astonishment; otherwise the surprised subject would have to have a godlike perspective.

³⁸ In this context it is crucial to use the German term 'Bildung', because it implies a different discourse from the English term 'literacy' which is not used homogenous in the English-speaking-world either. The author recommends for a similar understanding the term of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The UNESCO has drafted a definition of literacy as the 'ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to fully participate in their community and wider society.'

as experience and Bildung are similarities because learning is here understood as a change of personality and hereby of the worldview, also the reflected disclosure of contextual implementation into a natural and social environment are clear connections to the term of 'Bildung' as it is understood in the scientific educational discourse. The ratio of learning and Bildung can here not be unfolded, but further research is intended. Differences in the terms could be searched especially by examine the intentional character of Bildung and Learning and what about the social components in both terms? The encountering of religion and transcendence, are they tied to the sphere of Bildung? Does Bildung depend on different forms of reflection and learning? These could be further questions of interest for research which focuses on terms of learning that clearly draw on the term of Bildung.

Meyer-Drawe claims that modern thinking of subject philosophy overemphasized the mind³⁹ and underrated the sensual dimension of human experience. She fosters the thought that the world befalls the single subject and is not exclusively passive; the subject is not as free as it seems to decide which part of the world it takes in, the human is exposed to the world – this means that the single human is not exclusively free in learning what one wants to. The learning process as reunification after Socrates, as well as restructuring of foreknowledge after Aristotle is revoked from the power of the learner; we are biased of the world before we talk about it (cf. Meyer-Drawe 2008, 206). Knowing is transformed into understanding when we look at our knowledge in a reflective way. One is confronted with given limits of understanding through the whole of human life. From this perspective learning and reflection can be a crutch to proceed on the path of knowledge but they are also limited to the sensual sensations the human body is bound to. 'Empedokles [...] explains Pausanias the senses as hands which are spread all over the body [...] they are unable to grab the whole, even if they often mean they do (ibid. 196)', likewise the reflective image of Bloch only shows a small cut-out of the mirrored being. Even if we think of reflective processes as events in mind, our mind only functions inside the borders which are determined by our corporal experiences, like temporality and space, to name the most vital

³⁹ A typical problem of thinking after Kant is characterized by the fact that subsequent thinkers almost ever overemphasized the human mind or corporality; they oversaw Kant's cautious handling of the delicate task to measure the human inside a sphere with multiple dimensions, where a tape measure is as useful as a fork to eat soup.

ones. In this context human recognizing means an entanglement of the world in which itself is highly active (cf. *ibid.* 196)'. In the end Empedocles comes to the resume that in the fight of the elements learning strengthens the mind. Learning as it is shown to us here is a vital experience of the human existence. This experience comes to our minds linguistically, reflecting on our experiences means reflecting on a linguistic base, the pre-linguistic dimensions can only be explored implicitly and they are pre-reflective. These pre-reflective dimensions can be the rules of society, moral values or customs of perception (cf. *ibid.* 206). This existing, pre-reflective dimension of understanding needs to believe in perception, hereby we feel the world existing and this opens up the possibility to reflect upon it; it is a preliminary condition of reflection.

Similar to a dialectical approach, learning as experience⁴⁰ suggests the ambiguity of learning, it is a process that always affects understanding and keeps the subject doubting of its certain knowledge; this unclear situation keeps the process (the search) in motion⁴¹.

['You react severe to unreasonable regulations'](#)

Consequences

Referring to Heydorn (cf. Heydorn 2004, 104) Meyer-Drawe points out the existence of a massive amount of things to learn and a term of learning that is almost empty. Developed in a more than two thousand year old discourse, recently learning contents are seen as fluctuating and unsteady, important is no longer what is learned but by which method. Of course in a concept that sees learning as an effect on the whole human, nothing that one learns is ever irrelevant or just an unsteady content. This relation of content and process is historically grown, Meyer-Drawe claims, and it helps to stabilize the differences between the social classes. Her explanation is that the different social classes are allowed to learn in different ways; some learners are conditioned in a classic way, others are allowed to reorganise their learning contents and some are even given

⁴⁰ It is important to repeat Meyer-Drawe's claim that it is called learning *as* experience and not learning *from* experience.

⁴¹ This motive of ongoing movement that keeps the human search for insights alive is also a theological (and philosophical) figure which we can find from Augustine till recent theological anthropological approaches of the human. 'This divine disturbance is to me the secret of mankind [tbta] (Moltmann 2005, 7)'.

the privilege of creating a real connection between learning contents and their actual life (cf. Meyer-Drawe 2008, 207). With contemplation of modern 'concepts' of learning like learning as self-regulated or self-organised process (selbstreguliertes-, selbstorganisiertes Lernen) it can be said that here 'also enacts a theoretically already determined privileging of such social groups, which are not unfamiliar with self-dependence (ibid. 207).' The emptiness of the learning term helps to keep up a high degree of universality and additionally it helps covering the societal functions of itself. Consequently this would mean different levels of reflection are offered to different social classes⁴², while the different types of secondary schools offer pupils different learning forms. Is the statement behind this that the pupils in lower secondary school forms are less capable of learning or that they are simply needed to fill up social classes? With a view to the development of the growing numbers of participants in higher education since the 1950s the latter can be assumed to be right. Hurrelmann show that since the 50s the participation in higher education expanded enormously whereas the numbers of lower secondary education have shrunk. This is probably not an effect of a growing number of better learners⁴³ but simply a reaction to social needs; namely the needs of a society which uses more learners of different reflective quality as before⁴⁴. The influences of society onto the subject are disguised and amplified by the education system; the picture of the self-referential learner depicts that the learners are independent from their environment. They are responsible for their success or failure, educators and teachers become coaches and moderators of the subjects, by this processes they show the single learner what a flexible and fitted personality is capable of. The self management of the life-long-learner gets into the centre of attention. Learners think of themselves as clients and providers of competitive learning offers on the market⁴⁵ (cf. Meyer-Drawe 2008, 209). The

⁴² Since learning comes with the capability to reflect it goes even deeper when the learning process itself is reflected. This is meant by creating relations between the learning contents and the actual life world of the individual subject.

⁴³ Especially not, since it can be statistically shown, that lower social classes are not as well educated as higher ones.

⁴⁴ To foster this argument in depth the statistical development described by Hurrelmann is recommended. It shows that the chances of children with a low social and economical background to participate in higher education has have increased since the 50s in Germany (cf. Hurrelmann 2006, 221).

⁴⁵ For the process of normalization of these self interpretations of learners are not only interests of the market responsible, but also theories which make one used to the ideas of cybernetic theories.

false⁴⁶ formalisation of the learning process leads to the misunderstanding that every kind of change is claimed to be learning.

But how can teachers and educators guide, initiate or stop learning processes when they do not have an idea of what learning means? The process of learning is forgotten as soon as it is initiated but how can teachers teach something that they have already forgotten? Meyer-Drawe sees this as one reason why psychological (social technological) models of learning are popular; they concentrate on partial results of allegedly learning which are measurable. They do not apprehend the problematic event of learning as a process but its outcomes and the variables improving the outcomes. Against an exclusive view of neurobiology and brain-research it is stated again that 'I do not experience the physical and chemical reactions of my brain. My brain is unfamiliar to me; my pleasure and my agony are not. If this difference is not noted one gets into a neuro-phenomenological gibberish, which is widespread today. *Cerebral* agents like the deciding, choosing, communicating and feeling brain step onto the place of the modern subject [tbta] (Meyer-Drawe 2008, 209/210).' But this does not get near to the position of a pedagogical and scientific educational term of learning as experience, which crucially needs and provides reflection, as it is stated above. Learning is not dissolving in its neurological structures; it disemboques in a way of disclosing the life-world of the learning subject. Modern subject philosophy and learning as experience can provide us with a sharpened view on learning as a scientific educational term, without losing pace with other modern ideas of learning. Still an approach of pedagogical anthropology has to deal with the problematic of the subject and the being. The *phenomenological* approach is not capable of getting to a (formal scientific) *transcendence* because the reflective movement never returns to the original point it has started from; it always bends back to the subject⁴⁷. The world as it is lies as experience at hand, but not as abstract theory before our eyes (cf. *ibid.* 211).

Maurice Merleau-Ponty tries to pay attention to the signatures of life, which means he admits that experience will never lie clearly at hand to us. Human life and

⁴⁶ It is false for an educational scientific or a pedagogic view on learning.

⁴⁷ This is the point where Sartre (see chapter p. 19f) fails including the priority of the being and falls back to a priority of the subject.

learning is always confronted with different offers of what is reasonable. Human life is ambiguous because our experiences are. Merleau-Ponty fosters the thought that a reflective human self-reference is connected to the fact of corporality of the human life. He sees a strange abstraction in the dualism between mind and body and claims that both only exist together, still his argumentation is not capable of disproving the dualistic argumentation (cf. *ibid.* 212)⁴⁸. Some of his conclusions for learning as experience have to be rejected; especially that he states the gaining of experience has generally no place in a dualistic thinking of body and mind. This is only the case when the material aspect – clearer the corporal aspect of human life, is left out in a concept of learning, which always includes as we have seen a concept of reflection⁴⁹. Another finding of Merleau-Ponty is that learning is the opening of new horizons. We already have experiences when we gain new ones and so learning leaves an index of former knowledge and opens new perspectives on experience we already have. Training and exercising as acts also contain those elements of learning; they are modifications of the experience we have gained (cf. *ibid.* 212/213). The transition, from not being able to rely on a given fact to a new one, which alters one forever, is the place where learning begins. The place of transition can not be determined and this is a possible reason why learning is often understood as its own outcome, the learning result. If we reduce learning to an observable behaviour we lose the sight of the reasons of learning not of the

⁴⁸ This thinking could lead into different directions of thinking, two of them are:

1. Mind and body are not separated at all and exist only together; this would also imply ethnic consequences which can not be discussed inside the frame of this paper and which would make this stance more a *Weltanschauung* (philosophy of life or ideology) or religion than a scientific approach.
2. Mind and body have to be seen as two different abstracts of human affiliations, which have to be thought together to think about the processes of learning and experience but do not simply dissolve in a body-mind entity. Since it does not lie inside the human capabilities to reach immediacy and become one with the world, it is obviously not the human essence to be a body-mind-entity. Learning as experience seen as a process means the consequent thinking of body and mind acting together, being part of each other. Both parts exist, sadly with a widespread overemphasizing of the mind-aspect of the human existence, although we can only experience it in a corporal way. Still a dualistic thinking of both is possible as long as the thinking of priority and primacy (see chapter one) is kept up. In this case the human body would be the prior as part of the world and the individual consciousness is the primacy as part of reflection, which enables experience and learning.

⁴⁹ If it does not have such an implicit term of reflection, then it is simply no concept of learning as a process, but maybe of learning as outcome or something else. This also shows the huge issue of learning and reflection. The author claims that an educational scientific concept of the learning process has to have a concept of reflection and that concepts of learning can be judged by this factor to see if they are scientific educational concepts or not.

causes (cf. *ibid.* 213). The single learners do not simply gain knowledge about the learning content but about the world, thus learning is not learning from experience but as an experience. 'Learning means under this aspect no accumulation [for example of facts]. It is a tightrope walk between convention and break up [tbta] (*ibid.* 214).'

How do we get from this term of learning and its associations to reflection to knowledge and its associations to reflection without plucking their connection out of the air? A hint is given by Buck, who also develops a model of learning of experience (cf. Buck 1989). To Buck learning is a mediation through experience where prior knowledge meets knowledge. This weaving of an individual human 'web of knowledge' refers to the rug loom mentioned above, which weaves personality and information together. Considering the metaphor of the rug loom, the author claims that the constant unconscious treading on the foot pedal, as well as the conscious use of the hands to guide the knowledge-threads is reflection in different states of aggregate.

In order to get from this metaphor to an educational idea of reflection we proceed from learning to a concept of knowledge.

Knowledge

This chapter researches knowledge⁵⁰ as crucial element and outcome of the learning process, which is enabled by reflection.

Learning as experience is a constant creation and alteration of knowledge. Not only the process of learning can not simply be observed, the knowledge we keep can not simply be shown explicitly either. We need a term that takes the reflective human nature into account, only by this we can hope to understand more about learning processes and the creation and alteration of knowledge. These would allow us to raise theories of (another) quality⁵¹ in educational science. This

⁵⁰ Dörpinghaus and his colleagues claim 'that the term of knowledge withdraws itself from a distinct and unitary definition [...] [tbta] (Dörpinghaus, Poenitsch, und Wigger 2008, 147)'. They also state that this term is crucial to Bildung (literacy). Further they point out a thought which is closer illuminated below, namely that the connection of knowledge and truth (as it is classically made in philosophy) leads to an false and unlucky understanding of different forms of knowledge, like intuition.

⁵¹ The word quality is here purposely placed ambiguous and may be understood in two ways.

theories would not simply (1) provide allegedly scientific recipes how to create, most certainly, specific learning outcomes based on data or (2) claim to know what good learning and teaching is based on practically successful, but basically pre-reflected experiences, which always exist under the demand of a socio-historical expiration date. In order to gain other insights which we need to raise such theories we have to examine recent terms of knowledge, still keeping the glasses of reflection on our nose. To do so let us first recall that Socrates chided the poets for being unable to give a *logos*, a rational account, of what their poems meant and how they compose them (Allen 2000, 45)'. Actually the reasons for complaints about the poets are two. Firstly because they are not able to show how their experiences and hereby their gaining and producing of knowledge about the whole being works; they do not reflectively research their sources of knowledge and so they cannot explain why their poems mean what they mean. Secondly because the poets are not capable of showing how they come to alter their gained knowledge in their works by expressing it through articulation. The critic is caused to the problem that the thinker cannot philosophically check on knowledge (like knowing how to poetize) if it cannot be fully *articulated* to probe it. Allen claims that the modern period strengthens such a tendency in order to gain cognitive purity and security.

Today modern society requires more learners, which also means it requires more and more knowledge, the complexity of this life-world leads to an increasing number of professions and professionals enacting inside them. The distinction between the 'expert sheep and the unprofessional [...] amateur goats [tbta] (Allen 2000, 46)' is made by a body of academic knowledge. Allen argues that today it matters to be able to talk about one's profession and then only in the second step it is important to successfully do it (cf. *ibid.* 46). This argumentation must be considered by an educational science which understands itself as critical science and not just as a branch of philosophy that has a pedagogical focus.

To get closer to the idea of knowledge and its educational dimension, in a first step we have a closer look on the theory of Gilbert Ryle (1949 Ryle 1984) and afterwards is shown how Michael Polanyi's theory of tacit integration (Polanyi 2009) can extend our understanding of knowledge.

Ryle's knowing how and knowing that

Ryle tries to develop a term of knowledge which is capable of showing that there is something like a clever practical acting which is not a planned strategy, but still successful. At the same time he tries to take into account his belief that the Cartesian thought of a powerful mind -which lies beyond observable behaviour-, is wrong (cf. Allen 2000, 46).

He develops his term of 'knowing how' as observable behaviour, he stresses this part of the idea and neglects the 'knowing that', which is itself a necessary element of 'knowing how' 'and he could not distinguish the elements of apprehension, insight and understanding (forms of 'knowing that'), which distinguish action [...] from blind and automatic reflexes (ibid. 46).'

'Knowing how' contains two different denominations, the first is 'knowing how something is done' the second describes the 'ability to do something'. Both denominations can occur separately, Allen uses a crippled man as an example. He cannot drive a car anymore but is still able to tell how to drive, he is 'knowing how it has to be done' while he is not capable of simply 'doing it'. But what if the crippled man has never been able to drive? Someone could know how something is done, but has never been able to do it, like we can exactly know how to play a ball in sports so it will hit the goal, but our practical execution is not successful at all. So this someone would only know about the way to play the ball, this sort of knowledge is embodied in manuals and help-lines (cf. ibid. 47). Allen claims that 'knowing how something is done' is already a form of 'knowing that'. I know *that* the ball has to be played that way to hit the goal. As claimed above a lot of recent practices would not exist without an enormous amount of theoretical expertise, respectively of a huge amount of 'knowing that'. Think especially of a doctor, who does surgery without explicit theory about the organs; he would risk a successful executing of his task. The executer's 'knowing how' crucially involves 'knowing that' without this it would be impossible. But if both 'knowing how' and 'knowing that' are entangled, how can we distinguishing them? Is there even a need to separate them? Just because it seems to be easier to distinguish between

observable behaviour (knowing how) and between some processes we cannot finally determine (knowledge), we should not simply divide them into two to make them controllable.

Thinking about 'knowing how' and 'knowing that' should not forget about the radical reflective character of the human existence, every encountering with the world is passing our reflective consciousness⁵², that means every practice, every action has a component of 'knowing that'. There is no enacting of 'knowing that' into 'knowing how' without reflective processes. Ryle's theory lacks of subtlety but shows much unveiled that need to rethink our separation of knowledge and abilities.

'Your ideas are praised'

Polanyi's idea of knowing how and knowing that

For better understanding Polanyi's concept is shown in several steps, starting with the idea of tacit integration which describes the integration of objects of our awareness into wholes within wholes, hereby the former objects of awareness become instruments of attending to new focussed objects:

A tacit integration

Allen claims referring to Brentano and Polanyi that all mental acts are intentional respectively directed to any object. But instead of Brentano, who thinks subject A attends to object B, Polanyi states that subject A attends to object C *from* object B. Polanyi depicts that our consciousness has a double set of objects 'the *subsidiary* and the *focal*, or proximate and distal (ibid. 48)'. Polanyi's metaphor to explain this is to imagine driving in a nail with a hammer. While the focal object is the nail one uses the subsidiary object, namely the hammer to drive the nail in. In this situation one is not attending to the hammer and its impacts on the palm of the hand, but integrating the sensations that the hammer causes into our awareness of driving the nail in. The integration of sensations the hammer causes guides us in hitting the nail and makes it the instrument of our attention but not its focal object (cf. ibid. 48). We have a proximate awareness of the hammer in

⁵² We leave out instinctive reflexes like a quick reaction, which are not going through our consciousness.

our hand and integrate this into distal awareness of the nail and finally we also integrate the events at the distal end, like when the nail is hitting something hard. Polanyi dissociates his theory of William James' pragmatic distinction between the focus and margins of perception. Polanyi's idea is a functional one in which we use the 'subsidiary awareness and its objects in order to attain a focal awareness of something else. We do not attend to the former objects themselves but only as pointers or clues to the latter (cf. *ibid.* 49)'. An important step is to recognize that nothing is subsidiary or focal itself but we give the things this meaning by attending *from* or *to* them. After realising that it is thinkable to switch our attention and change the view; we can feel the texture of the hammers handle if we want to – we can influence our perspective on the world and hereby alter the range and kind of experiences we are able to gain. Consequently this also means that we can reflectively influence our learning processes. This is where Polanyi sees the possibility to acquire skills 'by switching our attention so that the focal becomes the subsidiary pointing itself to a new focal object (*ibid.* 49)'. As an example when we learn to drive a car, we learn to attend to the road and not to the pedals and when we play a game we attend to the ball and not to our hands, everybody who has ever switched back the focus to the pedals or hands knows that this risks the successful use of the own skills. Consequently if we think of learning as understanding more and more of the world -by every piece of knowledge we collect-, then we have to understand it as constant extension of our capabilities to switch our focuses (subsidiary and proximate) into bigger contexts. Here knowledge is then a medium and outcome of the learning process and we can observe human reflection in different levels of and on this process.

The skilful integration

The idea of tacit integration of subsidiary objects into focal ones can also be applied to less practical and more intellectual skills⁵³, Allen even claims that 'we can safely generalise it to all skills (*ibid.* 50)' playing chess or computing subroutines, programming a recorder, or writing a text on the computer. We attend from the chess pieces to our opponent's tactics; we attend from the tasks of a computer to the subroutines a program needs; we attend from the remote to

⁵³ Note here Allen means skills as 'knowing how', as the ability to do something.

the recorder, we attend from the letters on the keyboard to the text we want to write. Further Allen concludes that a correct exercise of skills, of 'knowing how' meant as ability to do something, is always an integration of subsidiary objects into focal ones. Now Allen tries to show us that Polanyi's idea of knowing how, as skilful integration, is not only valid for forms of 'knowing how', but also that 'knowing that' is always a tacit integration of subsidiaries into a focal complexity (ibid. 50).

Allen claims with Polanyi that our perception is not structured as the empiricists suggest, namely a mere impact of stimuli on our sense organs, but something we do. We lay focuses on the world and create views and perspectives on everything. This can be proofed when we look at trick-pictures in which we can switch the focus from one thing that can be seen in the picture to another one which can be discovered (like the widespread picture of a young lady which can also be seen as an old hag, or a vase which can also be two faces in profile). This idea gets fostered when we turn again to Holz's idea of the primacy of the consciousness. Thought in Polanyi's terms we are residing in the world and our perception is first a focal object upon a field, by focusing and integrating subsidiary objects we move forward in collecting experiences but the former focal objects and the experiences with them do not simply become subsidiary objects and are forgotten. Bringing the idea of learning as experience in again, our former focal objects and experiences with them leave something with and to us; they alter the whole human personality and influence hereby the new focuses. All of the aforementioned leads to this point where reflection is a generic human capability which can be seen as steadily altering and altered⁵⁴. Again we see that the single human is restricted by the priority of the being. Even if one collects more and more knowledge about the world surrounding themselves, the reality created by the meeting of our consciousness and the world is full of obstacles; what is clear and reliable information in our thoughts can be an unsolvable paradox when the world claims its right on the human. At this stage we remember the theory of learning as experience, because if the world (the being) would not have the priority over our consciousness we could not encounter obstacles anymore, as

⁵⁴ Here we are leaving the transcendent idea of reflexivity and take care of what we can cling onto without making philosophy or theology out of educational science.

they are mentioned above. We could not experience that the computer in front of us is not reacting as it should; we could not recognise that we lack information to solve a mathematical problem; we would lose the discovery of our own ignorance and hereby the chance to learn. Everything would always be as our mind dictates it, but have you ever tried to tell your computer it should work properly when it did not function as you expected? If you did – did it work? Left over would be a human which could change routines of acting, but not one that could learn new languages, experience art, write a book or be empathic with other humans.

Our perception focuses on totalities and we discover meaning on their backgrounds which are undifferentiated, they contain almost infinite accessories and meaningless fragments. When we learn a new language it takes time from the point where all words sound unfamiliar till the point is reached where we are able to attend from the words to their meanings by recognizing them in the context of a whole sentence and the context the sentence resides in. Like letters or words in search puzzles the meaningful messages are hidden⁵⁵ (cf. *ibid.* 50). Between the poles of the being and the consciousness the meaning of the objects of our awareness comes to exist. When we are changing environmental variables like the voice or gestures, then we also change the meaning of the words which are said and also when the observer changes -when pre-reflective knowledge is altered-, because the view on the things changes then. Throughout our life we develop a perceptual framework⁵⁶ of the world which is constantly altered by learning, but 'these frameworks we employ in interpreting and coping with the world, even

⁵⁵ The word 'hidden' indicates that there could be - or is - a special method or pattern of perceiving, which is the right key of disclosing hidden meanings in reality. It has to be stated that this is obviously a problem of Allen's parlance. The meaning is hidden to every human individually, because the meaning could not be recognized the same way by others. Yet it has to be mentioned that meaning has a social dimension. This discovering of hidden potentials in the being, the way of encountering the world is a mixture of individuality and a social dimension. We can simply refer to Allen's own example, the word puzzle, to treat this problem by extending the metaphor. Just like in a word puzzle the single human can find words of meaning between all the letters of the puzzle, but the question is: Are there right words to find which can be seen by everyone? I claim yes and no, because on a social learned pre-reflective basis we all share a certain amount of words but every human has an own focus on the word puzzles which allows him to see his special part of it, simply the letters are the same, even the language code, but the words we find in our puzzle are different in their meaning and we find them at a different time and in a different place. In Polanyi's thinking we can say that the words (the focal) are the same but the meaning of them (the distal) is highly different. We can communicate about them, explain them and analyze them scientifically, but they will never have the same exact meaning for all and we do not find them in the word puzzle with the same presuppositions.

⁵⁶ Allen refers to Jean Piaget here.

when they result in erroneous or absurd results in abnormal situation (ibid. 52)'. Consequently knowing is skilful integration of subsidiary details, namely of the object as well as of its context and ourselves, into a focal awareness. We do this on a daily basis and therefore all knowing is an exercise of *knowing how* to know in the relevant way. Now do we have to give up the distinction altogether?

Knowing as a tacit integration

We know the objects we use to attend to other objects primarily tacitly; we know them by using them but not by themselves and so we can not easily articulate them, respectively make them easily explicit (cf. ibid. 52). Allen suggests the reader to write down the exact steps one takes to perform operations with computer programs or trying to recognise the photo of a friend's face when it is cut into pieces, to make the reader realise that one cannot always point out explicitly things that one tacitly knows. Polanyi himself asked cyclists and the manufacturers of bicycles how a human keeps the balance on a bicycle. In the end none of them could tell him, although they successfully built and rode bicycles, they just knew tacitly and not explicitly that a cyclists steers to the side to which one is starting to lean and hereby produces a centrifugal force to counter the gravitational centripetal force. Through those facts Polanyi came to his well known statement 'that we know more than we can tell' (Polanyi 2009, 4). We know those things we can not explain, that is because we are attending from them and not to them, this leads Allen to Polanyi's conclusion that 'all knowledge and actions are tacit integration of subsidiary details into focal wholes (Allen 2000, 53)'. Albeit the explication of tacit knowledge is possible or at least we are able to explicate some details 'we can not specify the ways in which we integrate them. [...] and even Kant had to admit that the subsumption of a perception under a concept remained an unfathomable mystery (ibid. 54)'. It would be a failure to think that the more tacit details we explicate the less tacit knowledge remains. Since explicit knowledge always depends on tacit knowledge, one grows with the other. Explicit knowledge in a manual is understood tacitly, the words used in it are not self-explaining; we have to understand them by using our tacit

understanding⁵⁷. Only tacit understanding of something explicit and articulated can decide which of several possible meanings is intended; it is this what makes us grinning when viewing Magritte's painting of a pipe which is subtitled 'This is not a pipe'⁵⁸.

To foster this idea of tacit and explicit knowledge Allen refers to two examples of Polanyi:

(1) We often search for a word we want to say but we can not find it, while we are searching other words come to mind but we deny to use them because we know that they are not the most appropriate ones and that we do know a better alternative, which is actually the one word we are searching for. According to this we do know that there is a word and that we know it, additionally we do know that we do not know the word now. Referring to Polanyi this is only possible because we know in two different ways, namely tacitly and explicitly (cf. *ibid.* 54) (picture one).

Additionally Polanyi brings another language based example in, namely that we know about how big our vocabulary in a certain language is, although we cannot count the words we know it is big or small and we know if we have a specific range of specifically technical words or not.

(2) The second point is that

'we can judge the correctness of our use of words, and grope for what the French call *le mot juste*, only because tacitly we know what we mean and so can recognize the right word when we have found it (*ibid.* 54).'

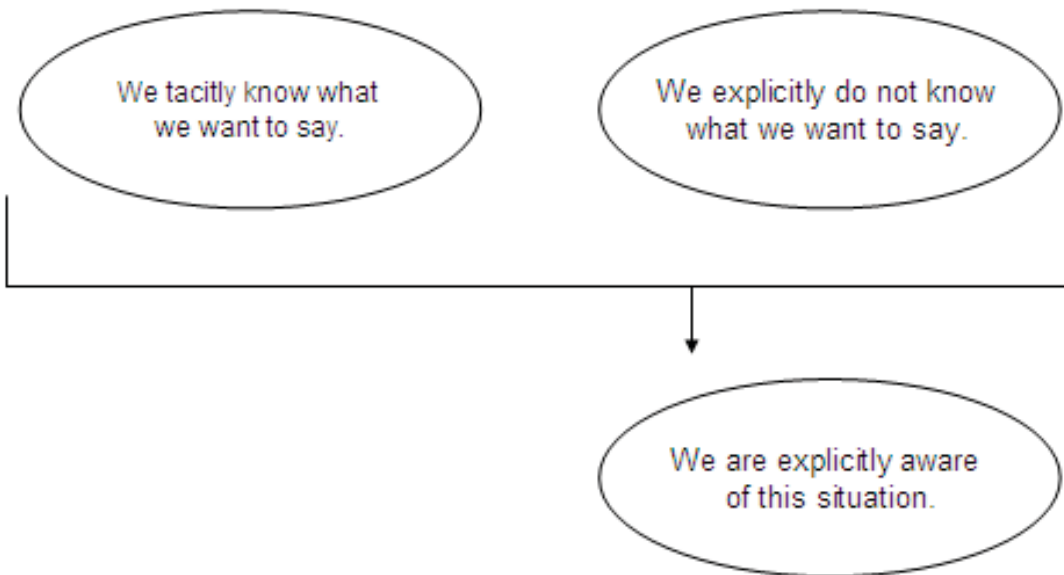
Tacit knowing allows us to compare our explicit statements with the tacit meaning; conversely if meaning would not be tacit we could not compare it to our utterances.

⁵⁷ The opposite idea of this is, as many philosophers argue, that we can articulate all knowledge; that we are able to make every bit of it explicit. Then '[...] Wittgenstein would have been correct when he said [...] that language is the limit of one's world. [...] We would be trapped within our existing stock of words [...]. It would follow that language and knowledge could not grow (Allen 2000, 54).'

⁵⁸ The Treachery of Images, 1928-1929.

tacitly knowing:

explicitly knowing:



Different levels of knowing.

Example: 'searching for a word we can not find'.

(Picture one)

Further Polanyi brings another language based example in, namely that we know about how big our vocabulary in a certain language is, although we cannot count the words we know it is big or small and we know if we have a specific range of specific technical words or not.

Both examples lead to the result that without the tacit dimension knowledge could not be extended and hereby human learning could not take place. We could especially never express new ideas, for which are no words existing already and if we invented one to express ourselves, yet it would mean nothing than strange sounds to other people. But inside the framework of educational science we have to take account of the radical new and that it steadily comes to exist, fighting with the existing, reflexive, reflective and pre-reflective, about the right of disclosing our reality. Allen claims that 'When you have something radically new to say, you have to rely on your audience's tacit powers of apprehension, their ability to attend *from* your words [...] *to* what you are trying to convey (ibid. 55). It is a confused concept of language to think that the literal meaning of utterances and written language is normal and that metaphoric statements and analogies are

outstanding or special cases. The literal meaning of language is empty; it is not living language but the corpse of it that remains when you take all other human aspects of language away; which is then not capable of expressing the unknown and new. Since language is always a reflection of the world, we know that as a reflection it depends on the perspective and the nature of the mirror, what mirror image is shown. Totally literal language would be a mirror which is not capable of reflecting anything; no picture would come to exist, because there would be no tension between the pole of the consciousness and the world. We cannot dissolve our consciousness from its reflective fixation, we cannot stop experiencing and learning, we can simply influence our perception, as it is something that we *do*. So language is also a highly tacitly underlined possibility of human nature, which can be the means of rendering knowledge explicit. The tacit controls the explicit – the pre-reflective controls the reflective. If we apply this line of thought to scientific proofs (humanities and life science), which are linguistic chains of reasoning (and hereby a matter of language) one will always end up in an infinite regress, when trying to explicate the tacit dimensions underlying the different proofs (cf. Allen 2000, 55).

Allen further talks about a tacit ability of recognition of what we cannot specify. A detective searching for 'something suspicious' in a crime scene, a person 'scanning' through pages of a book of a familiar language, to find some useful information on a special topic, the goalkeeper that copes with incoming balls; all of them depend on a feature of our knowing – the tacit ability of recognition.

Knowledge we explicitly acquire has to slip into our consciousness to be of use (cf. *ibid.* 56). Like when we familiarise with a foreign language by explicitly learning the rules and words; to the point where one forgets the explicit rules and simply remembers them tacitly in a fluent use of the language. 'All this knowledge, which we have acquired and at our command, but of which we are normally not focally and explicitly aware, is latent knowledge (*ibid.* 56)'. We reflectively know that we keep this knowledge and have an idea of what it enables us to do, but we cannot simply explicate all of it and we highly rely on it. It is like an 'intellectual [...] framework' to us 'to bear, to recognize, interpret, comprehend and act upon and within the world around us (*ibid.* 56)'.

Consequences through tacit integration

If we perform knowing as tacit integration there is always the chance that something goes wrong, we can never get to a logical knowledge. Descartes *clear and distinct ideas* and the *sense-data* of the empiricists are such examples for allegedly logical knowledge to which the single human simply has to receive correctly to get to incorrigible insights. Allen argues that even Descartes' *cogito sum* is possibly wrong and that thinkers mistakenly interpreted it as an inference, but it is an existential certainty (cf. Allen 2000, 57). The original of Descartes' cribbed quotation is *si fallor sum* (though I err, I exist) which was made by St. Augustine, it is this quote that seems to take into account human learning as experience and knowledge as a personal dimension, therefore it seems to be the much better option for an perspective of educational science to refer to this quote. *Cogito ergo sum* seems less like a real certainty or a convincing idea and more like the religious hope: *May it be this way, let us exist because we think we do*. Made explicitly it shows human longings for incorrigible knowledge and shows how it comes to the claims of science to search for absolute incorrigible knowledge. The simple truth that there is no such thing as an always and correct sentence, is something we explicitly know but we have to implicitly understand⁵⁹. As long as a theory does not take into account this circumstance, scientists will carry there pre-reflected believes into their work and albeit this can never be overcome anyways, is it doubtful how good a theory really clings to the human life-world which is not at least trying to. Reflexively illuminate their basics. The circumstance that knowledge is full of pre-reflected or tacit knowledge is also caused to the fact that knowledge is always personal; as we have seen above we never share exactly the same connotations to words, we never encounter new experiences with the same presuppositions. Therefore it has to be stated that knowledge is personal and there is no such thing as Popper's 'Third World' of 'impersonal' or 'objective' knowledge, in books and other recordings (cf. *ibid.* 57); when we encounter such documents, we get to them by ourselves, we understand them with our own mind – nothing is knowledge until someone knows it. The word *someone* is the

⁵⁹ This 'truth' itself is just another setting because there is a possibility that concrete and everlasting sentences exist.

important one in the last sentence, a machine does not perceive and interpret; nothing is sinking in into its tacit dimension, we have to interpret and understand to make knowledge out of data. This has also to do with responsibility for our own knowledge, since it is something we do perform, it is something we partially produce. We are not capable of fully steering the process but we are capable of reflecting about it, making it more explicit. One could argue this would end in a never ending circle of self-explication which would make us unable to act and decide anymore, although the author doubts this, here we are talking about science, whose task is not to perform and act inside its field of observation, but to explicate parts of human life, make them explicit so they can be improved.

The right way of explication is fought about, the different methods of gathering knowledge like qualitative ones and quantitative ones argue about their claim on the better access to the educational reality. Sadly this discussion ignores that it is the art of interpreting gathered data which also counts. The explicit fight goes on about the right instruments but tacitly we fight about the way of interpreting. There are those kind of interpretative techniques⁶⁰ which attend from the data of their instruments (let us take a questionnaire, for example) intuitively to their interpretations- naturally we interpret tacitly as we have seen above- but then there is no further step of disclosing this tacit interpretation (a questioning of the interpretation itself). This kind of interpretations simply collapse into themselves, the best they can get to is depicting the reality of education as they have seen and predicted it from the beginning. But what if there are surprising outcomes in such a research? Is not this the proof that this procedure is also capable of leading to something new, to outcomes which were not predetermined by the setting and that the result does not always reside inside its expectations? No, it does not, it simply shows that there were tacit contents in the preliminary and pre-reflected considerations before the data gathering which were not reflected (explicitly known) and now they show themselves explicitly. The key to recognize at least the predetermination of outcomes of research is to set the gather data and the interpretation into a bigger picture. The only techniques the author is familiar with which try to do so are hermeneutical procedures.

⁶⁰ In this case we also have to talk about people and not only techniques, because almost all interpretative techniques let the interpreter decide how to interpret the data and in which way.

Knowing how and knowing that contain and presuppose each other: 'knowing that always requires tacit skills of *knowing how to know that*, in the strong sense in which 'knowing how' means actual ability [...] while every exercise of any activity, [...], always requires a primarily tacit recognition and comprehension, a knowing that, of that with which one is dealing, one's situation, one's aim, and how they are all changing (Allen 2000, 57/58)'.

Allen suggests to leave the distinction between *knowing how* and *knowing that* behind and develops an own model. Allen proposes, depending on the actual situational variables, the following replacements for *knowing how* and *knowing that* (cf. *ibid.* 58/59):

1. 'Skills and arts⁶¹ in general'

Meant are skills and arts which one is able to perform, or once was able to perform and which are not forgotten; imagine a crippled man who could drive a car before, but now he lost the ability to do so; still he keeps the tacit knowledge how to do so. Skills and arts are primarily tacitly known and tacitly executed and include all forms of possible human knowledge.

2. 'Preceptory and motor skills and arts'

This includes skills and arts of the whole body or of specific parts of it, like dexterity, suppleness of movement and also movements for a successful execution of tasks.

3. 'Skills and arts of a more intellectual or personal nature'

They do not primarily require a physical ability as an example playing chess or cards, reading a book or being empathic with others, but also undertaking scholarly or scientific research.

Allen modifies his own differentiation, when he says that some activities need as well (2) as (3) like acting, playing instruments or surgery.

⁶¹ Allen distinguishes: ',by ,skills' I mean relatively specific abilities and by ,arts' complexes of skills and especially the ability to integrate specific skills into a complex and fluent performance or activity (Allen 2000, 58)'.

4. 'Explicit and articulate knowledge about'

Means explicit knowledge which can be shared with others; when this knowledge has skills as object, then it does not need to entail the ability to command these skills.

(1), (2) and (3) can be seen as 'practical knowledge' while (4) is meant to be 'theoretical knowledge'. Allen further claims that 'it is always practice and practical knowledge that are primary and theory and theoretical knowledge secondary because:

a) Theories of performing activities begin with an analysis that is already tacitly known by experts. Their successful performing is the starting point of an explication of their tacit knowledge into an explicit one. Additionally every new practice is partly an outcome of former experiences with the world, of encountering reality. We could especially not make up a theory about thinking, if we did not perform the activity of thinking beforehand.

b) Explicit knowledge about a practice will not come with the tacit information how to apply this knowledge. Rendering something more explicit can make it even more confusing; all implementation is necessarily tacit and comes to exist during performance.

c) The construction of theories has to be seen as a practice itself and so it cannot be reduced, as every practice, to a completely explicit level. No methodical guideline can tell one how to apply it and also not when to deny it because it is losing its adequacy of purpose and does not work inside the given parameters. Polanyi claims against Popper's theory that science is not distinguishable from non-science by its use of hypothesis and falsifications, because scientists often have to decide by intuition and experience, if a contrary result to their theory is simply caused by an experimental anomaly or if it shows that a further qualification of their theory is needed. 'All methodological rules are mere maxims carrying tacit and unspecifiable qualifications and exemptions, as in the rest of life (Allen 2000, 59)'.

d) The moment we test a theory resides always in practice, not in theory. The search for a rule or pattern starts with examples which raise our interest and then in theory methodological rules are made up. But we encounter these rules as rules

and not as grown ideas. We do not know the way they have come to exist. Just as learning as experience, we forget how it used to be before we have experienced and learned something; in this case before we have known something – as a result we think of methodical rules as generally correct formulations, but their proof always happens in a personal practice which is every time an individual one. According to Polanyi we cannot separate intuition from other forms of knowledge because the tacit dimension of human knowledge implies that there is always an intuitive content in every kind of knowledge. We can never make our knowledge fully explicit as we have seen, yet we have reasons, namely subsidiary details which we attend from and of which we can make only some explicit. So there is an aspect of intuition in every knowing (cf. *ibid.* 59), but an absolute immediacy of intuition is an illusion; we have actually no idea of the tacit integrations which we make. Allen states with Polanyi that intuitive powerful persons are capable of attending from subsidiary details which are not recognized by others, they recognize (focus on) things, that other people oversee like facial expressions, tones of the voice and gestures, but it has to be added that all people use this kind of subsidiary details; some people simply seem to have a stronger focus on them.

The mixture of tacit and explicit levels, the dynamic integration of wholes within wholes and the human handling of this environment by its abilities, is what makes discovery and learning possible inside Polanyi's theoretical framework. We add reflective abilities as the humanitie's capability of coping with the structures of their existence and experience as additive in the term of learning, we also include discovery as Polanyi mentions it⁶², take into account a surprising element as Meyer-Drawer describes it and end up with the fact of human learning.

Polanyi reaches Plato's *Meno* 'that either you know what you are looking for and so you cannot discover anything new, or you do not know it and therefore could not recognize if you met it (*ibid.* 60)'. Knowledge as tacit integration can show why we discover meaning, experience ignorance, learn hereby and still discover new aspects and invent the radically new. If our knowledge was be an

⁶² Polanyi's idea of discovery is mentioned above in the metaphor of the word search puzzle; as human beings we recognize individual, sometimes ,hidden' meanings and integrate them in wholes. From there we attend to other wholes constantly changing our focuses. The moment of discovery is the recognition of something hidden beyond the thing we are actually aware of.

accumulation of explicit bits of knowledge, stiff and sturdy, we could never get guided by our intuition from one aspect to another; the tacit dimension would be closed and therefore meaning and the possibility of reflectively disclosing the world. The attentive jumps from focal to subsidiary elements would not happen; we would not even be capable of *learning* how to use a hammer to drive a nail in. Anticipation of what something unknown is (or could possibly be) would also be an unknown phenomenon of our reality.

'You can convince very impressing'

Implications for an (scientific) educational context

The concept of tacit integration shows how human learning depends on the existence of a tacit dimension, enabling the single individual to discover, to experience and to learn. Inside this theoretical framework implications for learning and teaching obviously have to take into account that we do not have the ability to fully explicate our knowledge because how can we learn and teach what cannot be articulated? Polanyi uses the example of master and apprentice; the apprentice unconsciously embodies the tacit rules of the art and passes them on when becoming a master themselves (cf. *ibid.* 60). These chains of tacit rules can be passed on over and over again and we usually call this tradition. By this way tacit knowing is transmitted over centuries as long as the tradition is not failing.

This way of transmitting tacit knowledge is not restricted to the area of practical skills and professions. Polanyi talks about 'connoisseurship' and means the right way to recognise, distinguish and diagnose (cf. *ibid.* 60). Articulated, explicit information cannot replace real individual experiencing of the single learner like working with actual cases under real circumstances and eventually the guidance of a professional who posses the connoisseurship mentioned above. In this manner learners can encounter and experience contents of explicit knowledge in reality, recognize them there and develop their professionalism in dealing with the tasks ahead. We know from several disciplines that the students have to take part in practical courses to acquire the relevant connoisseurship, for example medicine students or trainee teachers. The practices and methods of a particular subject are arts themselves 'and therefore cannot be exhaustively specified and taught by explicit methods but only through supervised practice (*ibid.* 61)'. Polanyi argued

that this kind of learning is not represented enough at universities all over the world. The aforementioned is valid for every scientific subject. It has to be mentioned that every one of these subjects has a) a scientific practice and b) a field of practical application. Both of them, the scientific practice and the applicative field have their own connoisseurship; even though both are entangled they are more or less connected, depending on the subject. This seems to be a forgotten difference in educational science because it is often claimed that it has an exceptional position among the scientific subjects caused by its special relation between practice and theory; but this alleged theory-praxis-gap⁶³ is owed to the misjudged fact that scientific practice and the practical application have both an explicit and tacit amount of knowledge and that the relation between the two fields is different – but comparable – to other subjects.

This misunderstanding is maybe also owed to the fact that the afore mentioned practical training does not directly appear to us in the humanities as practical training, writing essays, designing questionnaires and considering philosophical drafts of the world, discussing with others and getting reinforcement for this work is the practical training of an 'apprentice' in the humanities. For mastering the tasks of the educational-reality one needs to find the explicit knowledge of one's studies inside a real framework of an educational setting, purposely reflection on tacit knowledge and implementation of explicit knowledge are the elements bridging the two fields, without disowning them of their value and dignity.

Other subjects such as medicine, psychology or chemistry are also not producing ready professionals either but also learners that have to experience a new field after their training, as well as finding explicit knowledge they gained by training in reality. The degree of institutionalisation of the particular work field seems to have influence on the explicit content of knowledge which has to be gained in the time of training, and the practical skills that have to be acquired. Talking about educational science it has to be mentioned, that since the determination of the concrete work fields for graduates of educational science is not as high as for example the ones of medics or teachers. The explicit contents and then practical skills which are mediated by the studies are not as determined as the ones of

⁶³ In German educational science the term is 'Theorie-Praxis-Schere'.

other subjects; this is possibly a secondary explanation for the myth about the exceptional theory-praxis-gap in educational science.

Every successful acquisition of a tacitly known art needs practice and apprenticeship (cf. *ibid.* 62). Educational systems (and this is equally significant for learning in the early childhood and learning of adults) and methods fail if they try to pour some recipe of programmed instruction out over the single learner's head. Learning, of practical skills like writing essays as well as fixing motors and of explicit knowledge, just for the next exam, kills the soul of learning. It fails to build up tacit knowledge⁶⁴ and to experience the world and the self new but both processes are crucial to the requirements of modern, western societies. The non-objective and even less individual tests in the qualification system for example in the German school- and university system are just the top of a seemingly huge misunderstanding of the character of learning and the needs of democratic societies. One could argue that this kind of learning is socially needed, because it predicts who will be a good employee, or even more specifically who will be a good baker or lawyer; for the field of university it could be mentioned that quantitative psychological studies show that the grades of the A-Level correlate with the success during the studies and that this is the evidence for the predictive powers of the educational system's rating scale. Not just since Bourdieu we do know that our educational systems are highly selective when it comes to social classes (especially in Germany), the studies like PISA (Baumert 2001) just renew this old explicit knowledge. Still the studies showing the success of students with a good high school diploma do not measure what a good medic the desk neighbour of this student could have become, since he did not pass the *numerus clausus*. Those studies show in the first place that the tacit knowledge of students is important when it comes to societal connoisseurship, as well as the ability to quickly learn by rote, this learning by rote gets even more important when multiple choice tests in universities start to drown the last creative sparks in a learner's mind. Since learning by rote is no real *learning*⁶⁵ but *remembering* and so

⁶⁴ Also motivation issues have to be considered but the connection of reflective processes and motivation surely is an own complex which has to be skipped here.

⁶⁵ Rote-learning and drill are surely needed to let the elements of the learning contents lapse into the sub-consciousness so we can attend from and not just to them, yet isolated from discovery and experience they are not sufficient to be called learning.

more a performance of the brain than of the mind; the recent grading system tells us nothing about the capability to learn, which an individual inherits; but modern society needs learners that create new knowledge because learning is not restricted to explicit knowledge it creates personalities which are needed by every organisation (institution) that wants to learn and develop.

'A great day! The best for every action!'

Action

This chapter examines how practical concerns can brought together with the ideas and aspects of reflection as they were depicted until here. At the end of this chapter EMBL's interest will also play a major role.

The reflective practitioner

On the basis of the aforementioned now we turn to Donald Schön's idea of the reflective practitioner (Schön et. al. 1984) because he shows realms which are only faintly illuminated by Polanyi; although Polanyi himself has similar ideas he develops other emphases. More than Polanyi Schön is capable of showing us a concept of reflection inside a theory of knowledge⁶⁶ (cf. Neuweg 1999, 356). Schön's thinking approaches the field of knowledge with a particular focus on the reflective moments practitioners deal with; according to Polanyi we keep in mind that the university professors and other practitioners, which do not seem to be practitioners on the first sight, are also practitioners with an own practice. The outlines of Schön's theory getting depicted and the consequences for the field of teaching and learning in professional settings are discussed. According to Altrichter (cf. Altrichter 2000, 201) Schön's ideas are almost not received and discussed in German discourses, there are even no translations of his major works, although they are very widely known in the English-speaking world (cf. Neuweg 1999, 356). Here they have especially influenced teacher training and action theory of professional expertise.

⁶⁶ Schön's theory is basically based on Polanyi's concept of knowing as tacit and skilful integration.

Schön's concept of reflective action

In the 'reflective practitioner' (Schön et. al. 1984) Schön pursues the question how professionals can successfully handle complex and changing situations of the everyday practice. He researches how knowledge and action are connected and which role reflection plays in their relation.

Schön starts developing his concept of an epistemology of practice by criticising the common understanding of the structure of professional practice as technical rationality. This understanding implies that problem solving as successful acting in practice depends on an intelligent use of theoretical knowledge (cf. Altrichter 2000, 202). It leads to the idea that there is some kind of standardised body of knowledge for every discipline, which can help solving standard problems of the particular work field. In this concept deduction and application are the dominant words. Here knowledge exists in a caste system, whose highest caste is basic scientific knowledge, which is deducted down to a practical application in different contexts, right up to the point where only problem solving techniques exist as an inventory of the practitioner and his practical acting remain. On the lowest level of this understanding is the knowledge contained in the action of practice and of course the lower levels depend on the existence of the higher ones (cf. ibid. 202); so is applied science depending on basic science and so on. The hierarchy of the different forms of knowledge then gets itself applied onto the hierarchy of the different work fields, on the top there is the scientist and looks down to the agents of practice. The didactic outcome of this theory is among others that students first learn some kind of basic knowledge before they are introduced to the practical field of their profession in the end of training. Employing Polanyi's thought again it is already clear that this idea is not taking into account the circumstance that practical work fields have their own kind of knowledge which cannot be mediated by theoretical instruction. This system was criticised owed to the fact that critical problems could still not be solved and that new occurring problems among differentiated professions occurred which were theoretically unknown. Schön claims that these problems result from a completely misunderstood concept of

professional life by the idea of technical rationality which worsens as professional disciplines get more complex; in clear structured work situations direct appliance of explicit knowledge is easier than in complex situations which afford the above mentioned *connoisseurship*. The difficult circumstance of these complex situation is that the problem does not lie at hand, it first has to be determined itself in its presence, before some technical expertise can be applied to it⁶⁷. From this point Schön searches for realistic description of the complex practical activities the single professional performs.

'Schön accomplishes this task by analyse of some case studies of professional activities (for example architectonical and technical design, psycho therapeutic conversation [...]) and develops finally the following picture [TBTA] (ibid. 203)'

of an epistemology of practice:

⁶⁷ One could ask why here (and in the whole of this work) recent concepts and models of competence are left out. This is owed to two major reasons: (1) the ratio of reflection (and the approach to a term of reflection inside the framework of educational science) is the core theme of the theoretical framework of this paper. To approach reflection as link between knowledge and action is owed to the orientation on the needs of a professional practice; and the debate about competences is not providing the discourse around reflection with starting points or insights. Competences are a theoretical construct which are created by a prior practice that leads to sets of variables which are called competencies in the end. It is surely interesting to compare what Polanyi calls *connoisseurship* with common concepts of competence but this is not intended here. In contrast Polanyi and Schön approach the term of reflection by implementing it into their theories of knowledge and action and conceptualize reflection as practically implemented term, which is clinging onto practice. The terms of Polanyi and Schön are partially implemented by German authors for example Rauner (cf. Rauner 2002) takes Polanyi's idea of forms of knowledge into account while he explains a model of competence. He also refers to knowledge from experience. Still models of competence employ foreign ideas of reflection but don't provide new ones. (2) The term of competence is often reduced to self-organisation and self-responsibility (cf. de Cuvry 2002, 65 f.) This is not considering professional development as Bildungsprozess (process of literacy). To the author the recurrence, at least the conscious contention with this idea is crucial to develop a term of competence which does not lack a scientific foundation. Simply the self-referenced acting which it is described as goal of competence is not the same. Albeit learning (which are all humans imputed of) is always a reflective process already. The argumentations and source of competence as reflexive self-organisation would be interesting to compare with other concepts of reflection. The measuring of competencies is not measuring the reflective movements of the single individual, or structures which help the individual in order to do so, but this is what this work is also interested in.

Succinctly models of competence do not provide this work with major theoretical approaches, because they state reflection without explaining it, and the practical measuring of competencies has no decisive focus on reflective processes. Finally is the term of competence additionally coined by psychological assumptions and by an affiliation to thinking of means and purposes (cf. Dörpinghaus, Poenitsch, und Wigger 2008, 144), this functionalisation is out bidden by the idea of Bildung (literacy), but this idea is a fundamental element to an educational term of human learning. The development of a concept of a scientific educational concept reflection must not bypass a thoughtful contention with the fact of learning.

- (1) Action type one: knowing-in-action
- (2) Action type two: reflection-in-action
- (3) Action type three: reflection-on-action

'Great how you realize your plans'

Type one – knowing-in-action⁶⁸

This type is the common aggregate state of professional knowledge; the knowledge is not articulated. It is tacit knowing-in-action, with Schön: 'our knowing is ordinarily tacit, implicit in our patterns of action and in our feel for the stuff with which we are dealing (Schön et. al. 1984, 49)'.

Inside this type thinking and acting are not separated, the skilful practice is not directly depending on an intellectual action, because of this circumstance the actors are mostly not capable of explaining the knowledge needed to perform professional action, it is simply expressed in their successful acting. Here we face Polanyi's statement again that *we know more than we can say*.

Actions of type one come to exist by socialisation in traditions, they are not just situations that are easy to handle but they have become easy through experience (cf. Neuweg 1999, 356). This means routines of action that were formerly reflected sink, by repeated usage, into the subconscious section. Purposely changing these type one routines in organised learning processes would according to Altrichter afford either a surrounding which would persistently require a certain way of acting, (this would be similar to the behaviouristic idea that a strong institution increases the chance of adaptation) or over the way of reflecting-on-acting. The latter could make the acting routines explicit to the actors and so they could reorganise these routines. Altrichter adds that this acquisition of knowing-in-acting is not constrained to the field of practical activities, universities also mediate knowing-in-acting, although it is not researched what role this knowing-in-acting plays in their curricula (cf. Neuweg 2000, 204).

⁶⁸ 'What Ryle calls unplanned and yet planned action, Polanyi implicit integration with relatively low effort and Dreyfus as intuitive acting, calls Schön *knowing-in-action* [tbta] (Neuweg 1999, 356)'

Type two – reflection-in-action

When it comes to troublesome situations which confront the professional with unknown problems the type-one-acting exceeds its operating range, it is no longer sufficient as strategy. For Schön reflection-in-action is a central aspect of the art how practitioners deal with troublesome (cause unexpected and therefore divergent) situations (cf. Schön et. al. 1984, 62). When someone reflects-in-action a unique theory gets constructed; a solution is designed for the particular case. Techniques and purposes are falling momentarily into one inside a state of experimental action. The difference between theory and practice dissolves; the range of the idea of technical rationality is overcome because reflection-in-action is not depending of the use of action strategies which are bound to knowledge that exists isolated from the real situation and gets (more or less successfully) deducted and applied when the right circumstances come. This is why reflection-in-action can deal with unforeseen circumstances. There is no conversion from thinking to action, it is an intuitive acting in a concrete situation and that is the reason why it can be called *experimental action*. The techniques developed during the reflection-in-action process are directly implemented into the actor's professional inquiry. Schön also calls this (cf. Neuweg 2000, 205) reflective way of encountering the life-world '*reflexive conversation with the situation*' and '*research in the context of practice*'.

Altrichter, according to Schön, differentiates between typical phases of reflection-in-action (cf. *ibid.* 205-208). Likewise as in Meyer-Drawe's idea of learning as experience the initial spark of reflection-in-action is that a situation is experienced as surprising, unsatisfying or insoluble. This makes it necessary to define the situation, Schön calls this defining 'naming and framing (*ibid.* 205)'. The actors are searching by reference to familiar experiences for an analogy to frame the problem; they try to encounter the new situation *as if* it was a familiar one. By doing this they also try to think the consequences through which are implied through the framework of the problem. This defining of the problem is not simply a subsuming of the new problem under an old routine because 'the familiar situation functions as a precedent or a metaphor [...] an example of the unfamiliar

one (Schön et. al. 1984, 138)'. The building of analogies has to be understood as an approximation to the unique case. Neuweg carves out that the elements of the whole problematic situation are measured together but then the reflective movement of reflection-in-action focuses on only some of them: 'so the question is what an element sub specie of the other elements, residing in this case, means or alternatively which distal whole can be projected onto the case (Neuweg 1999, 358)'. As examples of common focuses he names (cf. ibid. 358-359):

- focussing onto single elements of the situation
- criteria or values that lie under the decisions of the practitioner
- similar situations which have been experienced before
- strategies and theories which underlie the practitioner's behavioural pattern
- definitions or strategies of problem solving of themselves or others

It is interesting that those generative metaphors (the analogies) name the solution for the defined problems (which are made explicit) within themselves (cf. Altrichter 2000, 206). The hypothetical character of the first drafts of the problem definition often gets lost; it is seen as decisive clause then. The concrete situation gets wrapped into the hypothetical idea, this causes what Schön calls *on-the-spot experiment*. The actors implement their definition into the situation and have to be open for the consequences this causes. In a 'double vision (cf. ibid. 206)' the actors combine the try of putting their definition onto the situation together with the critical observation how the situation reacts to this; the inquirer listens for the situations 'back-talk (Schön et. al. 1984, 164)'. Reflecting practitioners try to organise the given problematic situation and hereby concretize the rules of the given setting, so they can follow them to solve problems – 'hereby they do not forget that the given order is their own [...] [tbta] (Altrichter 2000, 206)'. Altrichter claims with Allen that by this kind of occupying the given situation not simply becomes a self-fulfilling prophecy because vocational situations can normally not be wholly manipulated (cf. Schön et. al. 1984, 150). The measuring of the concrete consequences of the on-the-spot experiments is an integrated view of the whole situation, if the expected consequences did not occur through the first definition of the situation this does not necessarily mean that the evaluation through the actor is negative. The whole set of variables of the situation, before and after, are compared and if the outcome is better in a total view than it was in

the start, the experiment is a success, even if the outcomes vary from the expected ones. Schön calls this the logic of affirmation because when the expected results occur but the situation is in total worse than before, then a new reflection-on-action starts (cf. Schön et. al. 1984, 141-156). The reason of this logic of affirmation lies within the responsibility that the single practitioner carries inside his work field. This practical orientation together with the tight and iterative connection of action and reflection can be seen as the core of Schön's idea of 'research in practical context [tbta] (Altrichter 2000a, 207)'. Likewise Polanyi's concept of the world as meaningful wholes within wholes Schön's process 'spirals through stages of appreciation and reappraisal (ibid. 1984, 132)'.

Let us have a look at the research of Dörner (cf. Altrichter 2000, 207/208), who observes successful and not successful problem solving in complex situations. In this experiment successful and less successful problem solvers are not differing in their strategies of processing information but in the complexity of their analysis. This complexity is denoted by a more seldom returning to themes which have already been thematized, less frequent problem definitions and searches for information and a more rare transfer of explicit experiences onto the unique problem. This leads to less feelings of stress, loss of motivation and recurrence in irrelevant domains. The capability of complex analysing occurred independent from the factors IQ and motivation as well as from the previous experiences the subject has gained before; but this capability was enabled through a more intense creation of analogies and thus a generalizing of hypothesises to connect variables of the given problems. The successful problem solvers also had a bigger inventory of abstract schemes for all domains. This inventory does not come to exist by learning by rote these schemes, which only leads to a better capability of labelling. The successful ones in the experiment steadily transformed their concrete experiences into abstract schemes. As an outcome of the experiment Dörner states that two abilities are dominant for an autonomous acting in a particular sphere of life. The first one is (1) being able to transform the own thoughts by self-reflection, in doing so the subject compares different ways of the own process of problem solving, thus the person gets rid of misdirecting structures. The second ability Dörner names is (2) to import knowledge of an area into a new one through the creation of analogies (to get to hypothesises), their subsequent

testing and if needed their alteration. Dörner claims that this ability is more difficult to learn than the first one; in any case a diverse learning environment and high self-confidence are beneficial in doing so. This second ability is similar to Schön's idea of the 'reflective conversation with the situation', the first one, which is reflectively deals with the own action, is arranged in Schön's previously mentioned term 'double vision'. For Altrichter this self-reflection is steadily occurring in actions of type two but when the self-reflection step back from the actual acting and reflects the primary act itself then we are confronted with type three 'reflection-on-action' (cf. *ibid.* 2000, 208).

'Without hesitations you are solving
even the most difficult problems'

Type three – reflection-on-action

Knowing-in-action is according to Schön's concept the normal state of knowledge. Reflection-in-action is not an ordinary but regular process (cf. Schön et. al. 1984, 69), this reflection takes place in the actual acting and has not be verbalized. Now as we come to reflection-on-action the last circumstance changes, reflection-on-action is a purposely distancing and analyzing of the whole situation. It is needed when it comes to massive problems with an action, when there is no way forward. Besides the solution of problems of acting is reflection-on-action a crucial feature of professionalism (cf. Altrichter 2000, 208/209).

(1) It is capable of providing the individual with knowledge that helps analysing and reorganising the own knowledge. Problems of acting can be made explicit and an alteration of the own acting can be initiated, especially when reflection-in-action is placed in jeopardy by degenerating to an unending trial and error process.

(2) It is capable of providing more than one individual with knowledge that helps analysing and reorganising knowledge in general because it gets articulated and thus it can be verbalized and shared. Other learners and professionals can communicate about the knowledge. This is the precondition for developing and further developing of a common knowledge inside a professional field and

therefore for the knowledge passed to the next generation of professionals (cf. Schön et. al. 1984, 104).

Reflection-on-action is characterised (cf. Altrichter 2000, 209/210) by its distance to the actual situation of acting, because above the primary act is a secondary act invented in which the primary one is reflected. This procedure includes that the actual situation is left and the sequence of acting is interrupted; now the overlying act of reflection can be executed. Meanwhile the primary situation is kept statically. This is accompanied by an objectification of the primary act so it becomes an object of reflection. The objectification can cognitively take place by an articulation or a pictorial storage of the situation, likewise this operation has to be executed in reflection-in-action and there it is called *naming and framing*. More than just naming and framing of action type two, the action type three objectification can also produce real objectifications, like storable data that represent the situation. The cognitive components of the acting can hereby be coded and saved, this opens the possibility to analyse, reorganise and optimise the action. The limit of reflection-on-action as Schön conceptualizes it is the problem of time and the problem of transformation. The time factor includes that there are situations in which reflection-on-action can not interrupt the actual process and turn to a reflective mode. A further problem is the implementation of the results of the reflection, as claimed above it is not possible to technically implement the gained knowledge into a new situation, even the planning of a setting is depending on the existence of knowing-in-action. The knowledge has to slip into the sub consciousness as Polanyi suggested it and re-emerge as (implicit) part of an analogy, respectively of a hypothesis in the naming and framing process.

Altrichter states that reflection-on-action is usually considered being what the common discourse means by the term *reflection*. In his opinion this leads to the problem that other types of reflection, as the interactive reflection of action type two *reflection-in-action*, are neglected. In course of the aforementioned it should be self explaining that reflection-on-action is no special scientific type of action which is needed for research. The researcher as a practitioner, as well as the practitioner as researcher needs all three types of actions to professionally approach the tasks ahead. In the centre of this professionalism is here the

competence to reflect inside the acting, which has to be supplemented by reflection-on-action.

Implications of Schön's concept

Again we have to look at the implications for learning and teaching, as well as the character of reflection, which the theory indicates. In this case the main question is

'how can humans learn the handling of complexity, the abilities which are required for professional acting, under the circumstances of institutionalised learning processes? [tbta] (Altrichter 2000, 210)'.

Altrichter refers to Schön's book 'educating the reflective practitioner' to outline what Schön suggests (cf. *ibid.* 210-214) by the idea of reflecting teaching and its coaching:

For Schön the centre of a professional's training is the *learning by doing* as John Dewey developed it. To Schön the microstructure of learning by doing is similar with the one of action type two reflection-in-action. To him learning is acting and the experience we gain by our actions constantly test and alter the knowledge we possess. Further Schön refers to Carl Rogers and Plato's Menon to show his understanding of the teacher's role. The teacher assists the learners in their learning processes, who are in the end their own educators. They guide action and reflection of the learners and frame the learning environment. They reflect the intuitive forms of action of the learners and react to them with learning methods that match their needs.

Further are the teachers coaches in Schön's concept. They supervise the learners; this supervision is characterized in three ways:

(1) The supervision is contextualised by the learning actions of the learner. Hence content of this supervision is always the objectification of the concrete learning process.

(2) The coach not only uses articulation but also shows how something is really done (acting). This kind of mediating makes it possible for the learners to pick up implicit knowledge which could not be mediated by words alone, also because the learners normally lack speech and experience in enacting the new.

(3) The dialogue leads to two reflective ends caused by the mode of understanding communication. The learner probes in real situations what was understood through the supervision and if the understanding was based on right assumptions of the partner's meanings. Thus the communicated meanings are constantly researched.

Schön formulates three requirements reflective teaching and its coaching have, namely interest to what the learners say and do, the creation of strategies and competencies to learn from gained experience and to fight the normal cynicism. Learning from complex experiences means to learn from analogies rather than to copy strategies, or schemes which worked elsewhere. This iterative approximation to the unique situation enriches the already existing experience and helps encountering the new situation. The transformation of what was experienced is the key to a *reflective transformation of experience*, which is the goal of the efforts of reflective teaching and its coaching. Altrichter claims that according to this concept a case study is never a *record of method* which can be directly applied or replicated, but 'a metaphor for the construction of a new program (Altrichter 2000, 212).'

Another important task of the coaches is to establish a relation with the learner which is beneficial to reflection, researching and learning. This is vital to the reflective process; because usually reflection starts from a point of surprise and unsolvable situations which are usually intimidating events for the single learner (professional), but exactly these events are the ones to be thematized in supervision. Altrichter cites Schön, telling that

'Reflective teaching opens a teacher to confusion, to not-knowing, hence to vulnerability, to anxiety provoked by vulnerability, and to defensive strategies designed often automatically [] to protect against vulnerability [sic!] (Altrichter 2000, 212).'

This process of reflective learning⁶⁹ begins with a paradox for the learners because they are meant to learn something they do not understand and do something they are not capable of. They have to deal with the fact that they follow the teachers without knowing where the journey is going to and they live in the awareness that they can not follow their teachers forever, without knowing when the time is ready

⁶⁹ This also means self-educative learning.

to run another path. Altrichter claims that this state of disorientation and dependence causes much emotional stress for a lot of students (cf. *ibid.* 213). The institutional idea of this type of learning is the *reflective practicum*, it is guided by supervision and it is used to work of complex problems of the professional field. Instead of the classical traineeships Schön suggests to begin with a practical phase and then add theoretical courses which complete the training. According to Schön such a connection of practice and theory requires team teaching and teaching practitioners to evolve its potential.

It should be mentioned that Schön's ideas were mainly adopted in the Anglo-American teacher training and here in the vocational training as well as in the basic training modules.

'You would better not accept something
you do not want'

Critical summary

In Schön's theory acting is the antecedent, the starting point. Acting is revoked from a deductive technical rationality, similar to Meyer-Drawe and Polanyi, Schön takes into account, that there are things we cannot articulate and thus not research, at least not in a way we claim to be proper scientific research. Schön deals with the circumstance that there are contents which remain closed to this view on the world. Further is Schön constructing a term of reflection which is directly active in a present act, it does not have to be an event disconnected from action. Nevertheless his thinking is not residing within the sphere of practice and application, he also has an own idea of knowledge, which implies that his suggestions have also an epistemological dimension (cf. Altrichter 2000, 215); thus his theory does not withdraw itself from science, but refers to the undeniable fact that human immediacy permeates our life-world⁷⁰. Schön's idea of knowledge is a dynamic one because Schön observes knowledge in its active form in this form it is not separable from reflection. Yet the different types of action he describes show a varying relation of knowledge and reflection. While his idea of reflection is

⁷⁰ This immediacy has to be understood as immediacy within the framework of unconscious (formerly conscious) reflections (perceptual frameworks as Polanyi describes them), therefore this immediacy takes the human impossibility of a total immediacy into account. It simply means the human resides inside the being.

bound to Dewey's term of reflection, his focus on action enables him to integrate different pieces of acting in complex situations (which are insufficient explanations alone, like *reframing*), into a structural term of competent acting, which has a 'cyclic and iterative character [tbta] (ibid. 2000, 215)'.

Here learning takes place in action, but has a strong connection to language and reflection. The awareness of the actual learning process is a vital element of his term of learning. Finally Schön neither understands learning, nor knowledge as intellectual concept, but as the achieving of a technique⁷¹. Schön's theory is well known in the Anglo-American world not least because of his contemporary discussion of professional practice. Further he takes into account the value of practical knowledge and hits the core of a new self-esteem of reflective practitioners.

Schön's theory is politically ambivalent; it can provide traditional elements with reasons for their un-reflected acting and teaching, as well as it can foster the arguments of reformist powers which accuse traditional professionals to be followers of technical rationality (cf. ibid. 216). Schön's work *the reflective practitioner* provides us with a lot of suggestions and new ideas, yet it has attracted a lot of criticism. The main arguments of the critics are that Schön mixes up the sphere of descriptive and prescriptive categories. Further he does not clarify his epistemological ideas, or associates them with other epistemologies of professionalism, this is problematic since there seems to be no connectivity to existing ideas (like technical rationality); on the one hand is the radical new character something inherent to experiencing and learning. On the other hand is it definitely critical that Schön's idea has a difficult handling of scientific independence, but as Altrichter claims, this was not Schön's goal in the first place. The major problem is not that Schön does not foster the value of the independence of the scientific sphere and knowledge, in fact if one thinks his theory carefully through scientific and practical knowledge are both treated equally. Still if we implement his suggestions of reflective practica one on one, we have to deal with the fact that this group of professionals will not be confronted with the tacit dimension of scientific acting and hereby they will probably not bring

⁷¹ Altrichter sees this aspect of Schöns theory similar to Wittgenstein's citation 'the result of comprehensive- or learning process is a practice'.

in again their knowledge into a scientific discourse. That we need such discourses for every work field but especially inside the field of educational activities lies at hand when we see Schön's idea of the logic of affirmation, which lies within the responsibility that the single practitioner carries inside his work field. This affirmative logic has to be seen as a potential risk, because it can lead to the bypass that a way of handling a situation is construed as helpful and appropriate, even if it is dangerous and inappropriate. For example ethical values the single professional carries can fall over board, which means they can be lost in the process of reflection-in-action. A reflective movement like the reflection-on-action concept (which is still a concept of acting more than of reflecting) is surely not enough to work the socio-historical grown structures of and disclose us discourses; but we need this kind of view. Schön is interested in practical knowledge and acting professionals, that is why he only tells us something about the scientific sphere as long as we do not leave the focus of acting professionals (inside a scientific field).

Another reason why Schön is criticised is that his distinction between different types of reflection is not clear and his concept of three acting types is supposedly abbreviated. He answered to this critique that he is not searching for a clear separation of different action types, but for actions which are mainly different in the core of their character. Again we have to take into account that his description of reflective types is bound to the requirements of a theory of practical knowledge and professionalism, thus his idea of reflection-on-action maybe seems strange for a scientific view, because it is temporally hitched to the concrete situation but it is the modus needed for practice.

The critique that Schön does not take into account that reflection is also initiated by the wish of clarification or curiosity, but only the perceiving of obstacles can be denied. The own curiosity and a wish for clarification of one always imply that one has recognized to be ignorant. This surprising event of recognition is the major obstacle that activates reflective problems. The more interesting question would be: Why do such obstacles lead to a reflective process, respectively where does the motivation come from to do so? This question surely requires an own contention. It is claimed that Schön's idea of teaching is a too rationalistic concept in which the personal relatedness of the teacher is missing. This leads to the

circumstance that the observational stance (of the reflective and coaching teacher) is limited to observe behaviour and is not able to exhibit tacit knowledge. It sure has to be asked if this explication of tacit knowledge is a goal of Schön's concept of teaching and to which extend.

'Slowly draw the trumps out of your pocket.
You are unstoppable!'

Practical concerns

The following chapter tries to consider the questions which were initiated by the first conversation with Ulla Böhme. It employs different concepts of vocational and institutional learning and leading to approach a practical field of professional acting, the deliberations accord to the demands of the aforementioned theoretical approach of reflection.

'Your talents will be acknowledged'

An operationalized Model of reflection

McAlpine, Weston. J. Beauchamp, Wiseman and C. Beauchamp tried to take into account the fact⁷² that 'although there has been a great deal of reference to reflection in the literature, there is, in fact, little research that a) has been theory-based, or b) has attempted to operationalize the term (McAlpine et. al. 1999, 106)'.
'

They conducted a research on successful university teaching; therefore they observed the reflective processes of six university professors in their day-to-day planning. To do so they needed a model of reflection they could operationalize for their observation, thus they defined the term and used it as a referential framework of their research. The work at hand is less interested in showing the results of the researched and rather suggest the reflection model of McAlpine and his colleagues as a considerably employable model for research in educational science, especially in the context of adult education; particularly because of its basic focus on reflection as the crucial interactive process between knowledge and action, in professional acting. The outlines of the concept as they were described by McAlpine (cf. *ibid.* 106-110):

⁷² In referring to Kompf and Bond, Kremer-Hayon and Lanier Little.

The model is conceived as consisting of six components namely goals, knowledge, action, monitoring, decision making, and corridor of tolerance. Figure two shows the original diagram of McAlpine.

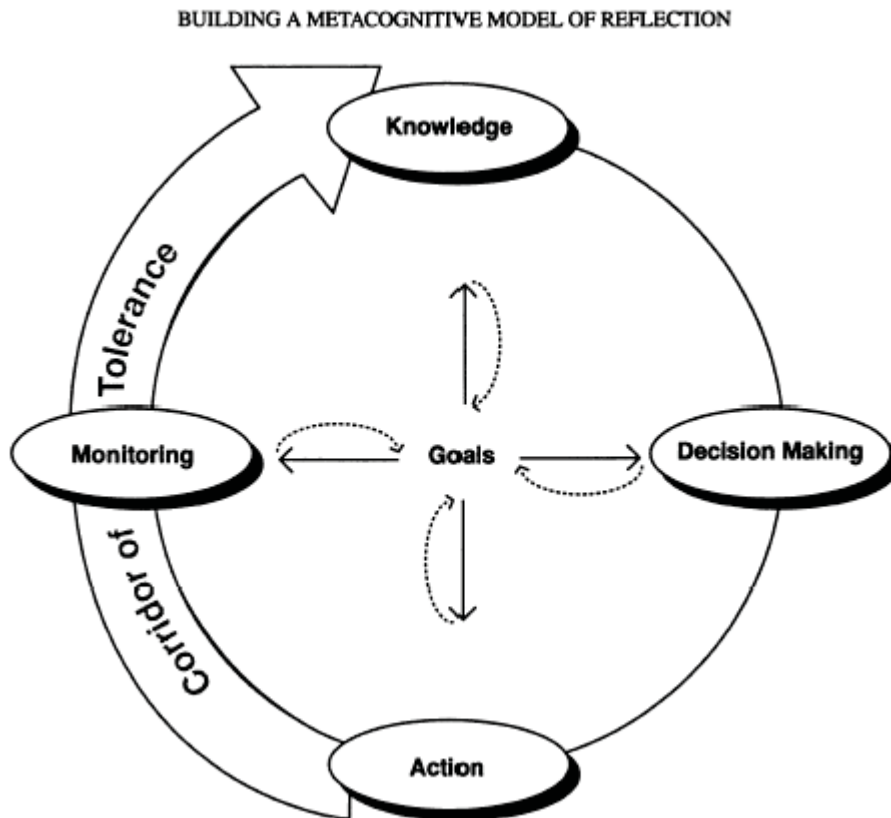


Figure two 'It represents an ongoing iterative process [...] it can be imagined as ongoing conversation. (McAlpine et. al. . 1999, 107)

The timeframes of the process can vary as well as the spheres of reflection.

(1) Action and knowledge

The interaction of the two inter-related elements action and knowledge is what the creators call reflection. Action is the external arena where the goals are implemented by observable behaviour. On the other hand knowledge represents a cognitive structure, lacking the transcend dimension mentioned above. The emergence of knowledge is depending on the factors experience and training. In a closer definition Polanyi's idea of different types of knowledge is implemented into the model, as well as Meyer-Drawe's idea of experience as reason for learning and the creation of new knowledge is being unwittingly in attendance.

(2) Goals

The model takes the theoretical idea of goal directed behaviour as essential human activity into account, as well as the psychological idea of goals as driving instructional decisions. 'The interaction between knowledge and action occurs related to specific goals that drive this thinking and action (ibid.108)', this goals direct and constrain the other features and thus they are placed in the centre.

(3) Monitoring and decision making

The two mechanisms are linking action and knowledge in the model, yet they are restrained by the goals. Monitoring checks on the back-talk of the environment and compares it with the plans that rose from knowledge. Meanwhile decision making allows knowledge to flow and influences action. 'Knowledge provides options or alternatives so that the outcomes of action match better the intended plan of the situation existing in knowledge (ibid. 108)'. Therefore decision making functions as the initiator or inhibitor of the enactment of plans.

(4) Corridor of tolerance

McAlpine and colleagues claims that this is their initial idea to explain why monitoring does not always lead to a change and this idea will be further observed in future research activities. The idea employs the thought of *acceptable progress* which reminds of Schön's term of *affirmative logic*, suggesting that as long as the measured outcome of a situation is better than its starting point, it will be acknowledged as success by the practitioner.

Further McAlpine considers the temporal structure of reflection and employs Polanyi's action types two and three (reflection-in-action and reflection-on-action) to show that reflection can be temporally disconnected from concrete events. Then another type is introduced namely *reflection-for-action*, which is characterized not by reflecting onto an event in the past but in the future, using the own experiences and knowledge.

Finally reflection is abstractly defined as 'driven by goals, resulting in plans drawn from knowledge, leading to actions that are constantly being revised and updated as feedback is monitored through the corridor of tolerance and decisions lead to adjustments in actions (ibid. 109)'. This definition was operationalized from McAlpine and his partners and used to create qualitative interviews. Although this term of reflection surely does not meet the requirements of a philosophical meta-

idea of reflection, it shows how reflection can be operationalized in the humanities.

[`Great you keep the track even in complicated situations`](#)

Learning Leaders

John Hailey and Rick James claim in their article: 'Learning leaders: The key to learning organisations (Hailey and James 2002)' that key individuals of organisations play a vital role in the development of the organisational culture of learning and knowledge creation. This culture partly depends on the leadership of these key individuals 'at the heart of a learning organisation is a learning leader (cf. Hailey and James 2002, 399)'. Thus, if we consider learning as a reflective event, at the heart of every learning organisation there also sits a reflective leader. Reflective Learning is important to the single organisation because it makes it capable of adapting to an uncertain future, likewise Schön's idea that makes the single individual adapting to new and unforeseen practical situations.

Referring to Senge Pedler Hailey and James understand by the term *learning organisation* an organisation which continuously expands its capacity to create its future and facilitates the learning of all its members, hereby constantly transforming itself. Inside the framework of such an organisation the individual is not simply an executive unit that follows rules and commands, but a primary information source, enabled by personal learning (cf. *ibid.* 399). For the learning organisation learning is about linking knowledge with action in a sustainable way. This linking depends on purposely reflective processes:

'The primary means of learning for most successful NGOs is the conscious reflection and analysis of their own implementation experiences (particularly where things have gone wrong) in order to learn and improve (*ibid.* 401)'.

An open handling is important of failure and criticism, as long as that is understood as something that marks the individual as insufficient and that has to be avoided, there will not be the possibility to develop an adequate culture. Hailey and James show that numerous institutions have invented institutionalised meetings for reflection and allude that this is crucial to learn from experienced practice.

Albeit the importance of those key individuals learning on an organisational level can only happen through the participation of all staff members. Such participation can be represented by meets, workshops and other forms of congressing, this needs a mutual respect of staff in different hierarchical positions otherwise a free exchange will not occur. There are known concepts in which staff members change their positions for a period of time, professionals take management positions and manager's work in professions they are unfamiliar with (cf. *ibid.* 402). Further it is important for the organisations, as described in the research of Hailey and James that they learn from formal training, from research and not least from evaluation and monitoring their own status as learning organisation. They also state that according to their results every organisation which was successful was committed to learning and development, some with more formal methods than others, but all with the goal to learn (cf. *ibid.* 404).

The role of the leaders is highly important for these processes of learning and development:

'Leadership is central to organisational learning and that learning organisations have leaders who are facilitators and educators [...]. Not only do founders tend to choose the organisation's mission and vision, but they also choose the staff. [...] The case studies we have looked at bear this out. It was the drive and insight of key individuals in a leadership position who, with the support of their management team, actively promoted the strategic role of learning and championed new learning throughout the organisation (*ibid.* 404/405)'.

Hailey and James comment on the different leadership between men and women that they could not research this field because only one person out of 16 past and present Chief Executives was a woman, although they see implications that women are better prepared to deal with challenging situations 'as they have taken more bruises along the way (*ibid.* 405)'. Learning leaders are characterized as interested in their own individual development as well and not exclusively into the development of the whole organisation. Such managers are teachers and have 'specific learning competencies such as a learning orientation, a proactive stance towards problems, the ability to reflect critically, and a tolerance of critical feedback (*ibid.* 406)'. It is common to all the learning organisations that they are

staffed with learning people. This may seem trivial but if we reflectively reconsider the term of learning promoted by this work, we see that learning staff means more than staff with a high level of un-reflected explicit knowledge, or staff that undergoes constantly training which is not connected to the practice of the daily business. If people are really meant to learn, they need a highly differentiated environment to develop their abilities and to create knowledge. The knowledge they keep is then tied to the roots of their personality and hereby an active and dynamic resource to benefit from.

The leadership style of successful learning leaders is depicted as being value driven, knowledge based, and responsive, also those leaders show a strong commitment to their tasks (cf. *ibid.* 406/407). Hailey and James conclude about efficient learning leaders: 'Right at their core, they passionately believe in the importance of learning and knowledge in shaping the future of their organisation (*ibid.* 407)'.

EMBL

In an attempt to try answering the initial questions and provide further implications this part focuses on the needs and structures of EMBL.

'Your own efforts promise a lot of success'

Implications for EMBL

Considering the specific history and the self-display of EMBL it has to be assumed that a lot of EMBL's efforts already match the ideas of employing and promoting the concept of the learning leaders. The core missions of EMBL like 'to train scientists, students and visitors at all levels (EMBL 2010)' indicates that this concept is considerably taken into account.

Yet further implementation of the aforementioned ideas can help improving the professional skills in enacting knowledge which for example has been gained in courses of the non-scientific training program.

- (1) Institutionalised meetings for joint reflection on different institutional levels.
- (2) An additional framework for mutual learning, enabled by workshops offered for staff by staff.

(3) Possibilities to learn about the different tasks of different jobs, to get new impulses for the own work.

(4) Introducing reflective conversations by connecting the participation in the non-scientific training program reflection-activating coaching, respectively the creation of a structure where reflective explication of gained knowledge is possible.

(5) Participants' reviews of courses.

(6) Performing Reflection on evaluation.

(1) Institutionalised meetings for the exchange of ideas and reflection upon special problems could integrate the exchange of experiences between the employees. It could provide others with solutions for their own problems. Likewise the fore mentioned theories suggested that it could help to frame problems by using analogies. This idea could also be connected to the possibility of employing a virtual learning environment platform like MOODLE⁷³, this would meet the special needs of an organisation like EMBL whose different facilities are far away from each other, but still meant to be an organisation that develops as one. For example relevant positions at the several locations could be invented that would keep contact and provide the employees with information and access to the program.

Of course the process of mutual reflection takes place in informal places like cafeterias as well. EMBL itself introduces an example on its homepage where problems were discussed in the cafeteria and in the end a great achievement to the molecular biology was the outcome. These structures could be researched and integrated into a concept of institutionalised reflection, especially inside EMBL's extensive framework of informal courses offered by employees (like cooking courses) that would provide this idea with a lot of connectivity options. The first step to foster the implementation of this idea would be to evaluate if there are already structures of institutionalised reflection and how they work.

⁷³ Modular object oriented dynamic learning environment, an e-learning solution which has become quite popular during the last years.

(2) An additional framework for mutual learning could offer the chance to review the practical dimension of special work fields. For example workshops could be invented with the learning of leaders as major topic, participants could be leaders of different units and teams of EMBL. The framework could provide presentations of practitioners, discussion rounds and could thus foster the learning of leaders. This kind of offer would complete the more formal promotion of leader learning. An approach of this idea would first have to reconsider the given structures at EMBL particularly the outcomes of the initial plans of Ulla Böhme to invent a particular coaching for advanced leaders and even more important the formal training course for effective leaders that EMBL offers to employees in leading positions. In a first step the curriculum of this course would be researched, especially how the mediation of tacit knowledge is taken into account. In a second phase the gained information could help creating a workshop for example 'leading labs and leading people', where the practitioners could exchange their experiences. It would also offer a platform to external professionals, which could be invited to share knowledge.

(3) The third idea indicates exchange programs where EMBL employees tell and show each other their work places and explaining their daily business. Especially the different locations of EMBL have completely different work fields; some are doing mouse biology whilst others work with advanced light cell imaging. But also several units like personnel and administration could benefit from such an exchange. It could help to identify with the organisation as whole, open new horizons of problem solving and create an atmosphere of transparency which enables the mutual exchange about processes.

(4) The creation of a structure where reflective explication of gained knowledge is possible. Knowledge gained by formal training is, as we already know, not simply applied to new situations, but forms a tacit dimension; it resides in emerging in a reflective process of analogisms and brought together with professional acting in concrete situations. Professional development through formal training, like the non-scientific training EMBL offers, needs reflection to come to its full potential and to minimize the risk of unwanted outcomes. This is meant neither reflection-

in-action nor reflection-on-action, but reflection-for-action; a temporally disconnected reflection from the concrete situation. This makes the situation and the personal acting understandable, as meaningful whole within wholes. But how could such an idea look like in daily practice?

Baernstein and Fryer-Edwards (Baernstein and Fryer-Edwards 2003) have conducted a research about the efficiency of interventions promoting professionals reflection. They used a randomized trial study with fourth-year medical students. These students took part in a four week enduring clerkship in emergency medicine. Baernstein and Fryer-Edwards evaluated three interventions: the critical incident report⁷⁴ (CIR), the CIR followed by an interview with a faculty member and the interview without the CIR. The results showed clearly that writing CIRs as well as writing CIRs combined with an interview was not as successful when it came to qualified in depth reflection on the own actions the students made. 'One-on-one interviews most effectively elicited reflection on professionalism (ibid. 742)'. The faculty members conducting the interviews were not participating in grading the interviewed students.

It would not be appropriate to simply implement such interviews into a performance management process at EMBL or any other organisation because a reflective conversation needs an atmosphere which is free from the threatening of judgement and efficiency rating. The offering of such interviews a period of time after an employee has taken part in a staff training program would have to be conducted by a person that is not involved in rating the participant, otherwise this could lead to the circumstance that interviewees answer as they expect it to be desired by the interviewer. It lies at hand that the evaluation of these interviews and the advising on the basis of this evaluation is a highly professionalized process itself. It would probably afford a particular coach or supervisor with therapeutically training to manage this task. Meanwhile the benefits through such an implementation could be a big deal for the staff development because professional feedback could help the single employees to develop their learning process and unfold their potentials.

⁷⁴ The CIR is a method where students reflect their practical experiences by writing down critical events they experienced during their training.

(5) Participants' reviews

The single courses of the non-scientific training catalogue of EMBL are described by: length, language, the target group, a short description of the course, aims and outline of the program as well as information about restrictions to the attendance figure. One of the initial questions was, if people were really able to benefit from the specific contents of courses, so why not ask them in the first place.

How would the participants of the courses describe them afterwards? Former participants could articulate their experiences with the course and reflect upon the experiences they have made and how it has affected their professional acting. These descriptions could provide other employees with first hand experiences of people who are familiar with their own work field and daily practices, they certainly share a familiar kind of tacit knowledge about their profession. This could also be implemented into an EMBL wide virtual platform.

It would also complete the current intervention by EMBL's evaluation⁷⁵ sheet, which would be an interesting object of a closer research.

(6) Reflection evaluation

One of the most vital questions Ulla Böhme asked in the first interview was, if the participants were capable of applying what they had learned in the different course. As we have seen one of the problems is the idea of technical rationality to 'apply' a certain explicit knowledge.

After intense contention with this question the answer is multidirectional:

- a) We will not predict by any kind of evaluation form that concerns a special course, if the participants are capable of enacting knowledge they gained in the courses. This is because the course can only activate the binding of knowledge, the reflective processes needed to act will not be learned inside the framework of a course⁷⁶.

⁷⁵ EMBL uses currently an evaluation sheet that contains questions about the course, the instructors, the visual materials and other issues like the workload, the specialisation of the workload and the relation of time and objectives. Further the participants have the possibility to describe strong and weak features of the program, give recommendations and indicate other topics. The questionnaire is anonymous and explains only to be used for the purpose of helping to plan future training. Inside the framework of this paper was a closer research indicated but not realisable.

⁷⁶ Still we try to simulate real decisions in classes and courses in adult training and beyond, just think of role-plays in trainings or the section of bodies in medicine. Still these settings remain as

- b) It is possible to implement methods such as reflexive learning (Reis 2009, 100-120) into the repertoire of trainers. By extending the trainer's abilities to teach, the participants could get offered better chances of binding more knowledge in a tacit way (through role-plays etc.); but since the conditions of such binding of knowledge are very likely extremely different, it would be an absurd idea to check the usage of those methods of reflective learning by evaluation forms, to find out about the abilities to enact knowledge. Even if one participant would benefit from *reflexive learning*, another one could forfeit the chance to do so by the same method and we would still go on observing the level of gathering knowledge and not the reflective enacting of the same.
- c) Finally there is the option to find out about the showed behaviour if a subject is capable of professional action but that is not telling us where the origins of this knowledge are (it could lie outside a training course). So we would only locate professional acting in a showed performance, but still the connection to the learning context would remain unknown.
- d) The author sees the following possibility to benefit from the results of the researched links, between knowledge and action, by the work at hand: A qualitative arranged study could analyze what kind of structures specifically at EMBL lead to successful reflective processes to enact gained knowledge and hereby lead to foster structures which are supportive to such processes. A first attempt would be to find participants that represent successful enactors of knowledge gained in the non-scientific training program. In a second step the successful actors could be interviewed about their reflective processes in the day-to-day use of knowledge they have gained in training and staff development, therefore McAlpine's model of reflection and data gathering could be employed. A third step would be to analyze similarities and differences in the gathered data to get information about institutional structures that could help fostering reflective enacting-processes, also existing structures could be revealed, enhanced and made

available for all employees, providing them with better chances of benefitting from vocational training.

Drafts of designing a qualitative study

The implications above led to the idea of developing a qualitative study which could help to find out more about structures that support the successful acting of professionals, by providing them with possibilities to reflect upon gathered knowledge respectively gained information.

The definition (which would need to be further research and coordination with the concrete situation at EMBL) of the successful enactor could be:

The successful enactor is capable of enacting explicit and implicit knowledge gained in the vocational training and staff development inside the framework of his professional day to day tasks.

The successful enactor is maybe not capable of telling us which knowledge is used to act, but the enactor knows if he or she is successfully acting in a trained field.

Participants that could be such successful enactors could be employees of EMBL who took part in the training program of EMBL; the time should not lie back too far. Maybe not more than two months. Always the last course should be the focused one.

'It is not the time that counts but what you make of it'

The interview

Based on the idea of successful enactors, learning leaders and the models of reflection in the former chapters a draft of an expert interview was developed. The following implementations indicate how an interview which is interested in the named structures can look like:

Information ahead:

The preparation of the interviews is executed in the following way:

The interviewers introduce themselves, tell their names and the institution they are associated with, in the particular case 'student at the University of Heidelberg, Institute of educational science' and the name. The interviewees get a short explanation about the goals/object of the interview: the links between knowledge

and action are researched with a particular focus on reflection as crucial process to their interaction. The concrete research interest is to find out about structures which help the single participant of the non-scientific training program of EMBL to reflect on gained knowledge and hereby be able to improve their professional skills. Then it has to be asked if the participants agree that the interview is recorded and they are to be informed that the gained data gets anonymised, especially the personal data. The sex of the interviewee should be noted and if the participants agree to everything and do not have any further questions, the interview starts with the first question.

The questions

The questions were designed by the presumptions based on the first conversation with Ulla Böhme and the insights that occurred during the theoretical work of the paper. Additively a dimensional model is indicated to support the conceptualizing of the further questions. The questions below are presented with further information about their function and a sampling of highly likely answers. The questions are sequenced into blocks and are linked together⁷⁷; the concrete interview situation will need an interviewer that adjusts the sequence of the questions, for example to react to the event that a question is answered before it was asked.

The notes what sex the participants are enables the possibility to research possible relations between sex and the focus of the research, when such differences are indicated by gathered data.

1. What is your position at EMBL?

Different structures of reflection are likely for different levels of management, this question further opens the possibility of insights on differences in intensity or frequency of reflection, relating to the position the interviewees hold.

2. How long have you been working for EMBL?

⁷⁷ For example question two has intended associations with all the following question about the reflective processes and the experiences with the course.

A lot of EMBL's positions are limited to a period of five years, afterwards the contract succeeds and the employee leaves EMBL. The experience employees of different employment periods have gained about reflective processes after training courses is interesting.

3. When did you first start working in the field you are working in?

In addition to question two it is of interest, how experienced the interviewee is in total. Possible answers like '10 years' could be followed by an additional question about the number of former employers because differences are to be expected not just by the length of employment but also the variety.

4. Which courses of the non-scientific training program of EMBL did you attend?

It must be expected that some participants maybe have taken part in more than just one course by now and that this caused changes to their presumptions about the outcomes of the course that is thematized, or about their needs. For example they could have better, because longer tested, strategies of using structures that support reflection. Additionally, question five is then interested in the comparability of the official goals in the descriptions of the courses like 'develop a practical networking strategy' with the goals participants used to have beforehand and reached afterwards is to explore.

5. Which is the last course you attended and what were the goals in the course description?

If this is not already answered by question four, this question is also meant to focus the following questions on the last course attended. It is important to know the concrete name of the attended courses to be able to find the course descriptions in EMBL's catalogue.

6. Which concrete contents were mediated in the course?

This questions draws on explicit contents the participants remember like 'we learned how to generate attractive figures and tables', the question also draws on explicit knowledge the interviewee remembers like 'that it is always important to define risks and opportunities'.

7. When you think about why you attended to the course, what was the motivation and what were your goals?

This question is interested in the circumstances of attending. Was the motivation to attend coming from own impulses or did the participant have to take part by instruction? If the interviewee is capable of reconstructing them, the concrete goals are of interest and later on if they matched with the final outcomes. Since the research indicates that the 'final outcomes' the implementation of the course contents are owed to reflective processes it would matter if these processes in turn also depended on motivation.

8. Did you have any sceptical thoughts when you attended?

The question is whether or not sceptical thoughts beforehand are influencing effects of the later outcomes, if the participants did have sceptical thoughts it is intended to ask them further if their experiences dissolved them or if they were fostered. Possible answers could be 'no, since I had taken part in three other courses before I was sure it would be a good training for me, so I was relaxed and did not have any concerns when I applied for the course', but also 'I am always uneasy being amidst strangers and that is why I was concerned about taking part in the course'.

9. Do you intend to participate in such courses in the future?

It is expected that young participants are more likely to answer that they will definitely take part in further training and development programs, but it also is of interest if the participants would take part in a similar course again, if their goals of improving skills or knowledge have not been reached.

10. Which skills did you hope to improve?

Question ten and eleven are intended to show if the participants distinguish between practical skills and more intellectual ones. If the interviewees ask what is meant by the question, the next question could be mentioned to contrast the both options of intellectual and practical skills. Again the measuring with the outcomes is important

11. Which explicit knowledge did you hope to gain?

This question goes together with question ten.

12. Are you able to apply knowledge you have gained in the course inside the institutional framework of your workplace at EMBL?

For reasons of understanding, the question uses the technological expression 'application' which implicates the application of knowledge, although this is not according with the theoretical idea of this work, it has to be assumed that the participants will understand the intended question best by this expression. Another source of information this question aims for is, if the structures at the concrete workplace allow the application of contents learned in the course. In vocational training a lot of learned contents in courses are not 'applied' because the concrete professional situation hinders the employees to enact their improved skills. These hindrances can occur from different variables of the setting like a lack of time or the unwillingness of colleagues to support new ideas.

13. Are you able to apply such knowledge in your private life?

Development of personal skills always has impacts on the whole personality of learners and maybe some participants only experience the attended course as altering their private life, still the reflow of such impacts on the vocational sphere would be programmed. Interviewees could answer that they exclusively used special knowledge like 'management skills' in their vocational training but also that they used such knowledge in private settings.

14. Were you able to improve your professional practice by attending to the course?

This question is further investigating on what Schön calls 'affirmative logic' and what is the 'corridor of tolerance' in McAlpine's model of reflection. It aims on the information if the whole situation has changed positively, independent from the concrete reasons of change. So could the participants tell that a concrete professional situation is easier for them to handle now, although they have not reached goals they intended or the course had initially implied. Additionally the answers to this question show, if they consider attending the course to be a success or not.

15. Do you associate things in your daily life to the course content?

Associated to the results of McAlpine and his colleagues, this question draws on the presumption that reflective processes take part in different life spheres and not restricted to concrete activities (reflection-on-action and reflection-for-action). Associative abilities seem to play a vital role for reflective processes.

16. Have you shared experiences with other people about the contents of the course?

An articulation of the experiences made with the gained knowledge, maybe even a mutual explication of tacit knowledge into an explicit form seems to be one the structures which enable a reflective contention with experiences and knowledge of attended courses.

17. Whom did you talk to and what was the conversation about?

Especially superiors, colleagues who also attended the course, other participants and peers of the individual participant are expected to be dialogue partners. Question seventeen further investigates if question sixteen was positively answered.

18. What did your boss and your colleagues think about you attending to the course?

This question is subsequent to sixteen and seventeen asking implicit for conversations with colleagues and superiors, but also about the atmosphere at the workplace, relating directly to question twelve this question is also interested in the individual institutional framework.

19. Do you think it could help you to talk to other participants of the course again to exchange experiences you made with practically applying the contents to improve your practice?

Here it is of interest if the participants assume conversation about their reflective processes ('applying', implies here that reflective processes are at work), to be helpful for improving this 'application'. Maybe some participants think of their

application as too individual to benefit from the experiences of others. Those participants would be interesting when it comes to the worth of communicative abilities and communication types and their reflection abilities.

20. Do you have suggestions what kind of structures at EMBL help to transfer knowledge of such courses into action?

The last and open question tries to win new horizons for the dimensional analysis and insights on existing structures which may have been left out in the first design of the questions.

'Rome was not build in a day'

Conclusions

The major goal of this work was to approach a scientific educational term of reflection; therefore I used the way of employing a practical concern, namely the interests of EMBL to develop the concrete interrogation.

Looking back to the beginning of this paper, the initial spark for my interest for reflection, reflexivity and reflective processes has its origins in the German literature of educational science. The term *reflection* is here used as if it was a sentence on a Tibetan prayer wheel; authors concerned with theoretical and practical approaches towards any parts of the sphere of education, constantly repeat and re-repeat the importance of reflection. So I decided to make myself familiar with the term – an exhausting search began, during which I encountered countless ways of how different authors used reflection; most of them either used it to describe a thoughtful turning back to past events or used it to fill up theoretical gaps with the term to disguise that the single theories which they employed exceeded their range when it came down to a practical implementation of their ideas. Some even deeply underestimated the term by using it synonymously for 'thinking'. Nonetheless these authors continuously refused to share their explicit theoretical or practical knowledge with me about what reflection is. They also rejected to provide me with vital information about sources of their assumptions. In the following time I made up several explanations why the situation had developed this way, namely that I constantly felt like I was ending up in a dead end. Two of my major ideas were: (1) the term itself is so

commonly known among the different actors in the field of educational science that there is simply no need for further explanation of it. (2) They authors using the term draw on an intuitive feeling (or maybe a hope) that this term could complete or complement the theories they employ, without keeping an explicit knowledge about what denotes it. After a journey through historical and common dictionaries of educational practice and theory, as wells as a huge amount of literature which decided not to answer my questions, my recent point of view developed. The German literature of educational science lacks a definition, even a serious approach to a concept of reflection, yet its theories suffer from this lack of knowledge. Implicitly showing their need for the structures and insights a scientific educational concept of reflection could provide them with, every time they (ab)use the term because they turn it into a stopgap.

This work tries to develop a draft and give hints what an educational scientific term of reflection could look like, to explicate such a term the connections between knowledge and action were focussed. One of the initial questions was: Is reflection a conscious or unconscious, an initial or automated process? In order to do so the metaphor of the rug loom is employed again. The rug loom has a foot pedal; the starting point when we first step onto this pedal sets reflection in motion, our ongoing treading as an unconscious process. Further scientific research could investigate our biological presuppositions and the primers which set the function in motion. We need this reflection to communicate with the world which constantly surges against our consciousness. Meanwhile with our hands, purposeful and willingly we guide the threads of the rug loom, our prior knowledge and weave them together with new knowledge we gain by learning. We do not control the threads and hereby the knowledge which we get to weave, because we constantly experience the world, but we decide partially which threads we keep, which ones we integrate and emphasize in the cloth and which ones we do not. By our constant treading we build up a perceptual framework by which we recognize meaning and reason our eyes become used to recognizing useful threads and common patterns in the cloth and after a time even our hands seem to work unconsciously although it was a long process of learning until we got to this professional performing the task. But then we constantly have the possibility to look at our hands, work new patterns into the cloth and see what the outcomes

are, this happens only when we encounter a situation where something does not fit into our perception, our expectations fail. We work a pattern into the cloth and suddenly a thread changes its usual colour or rips apart. Then we look onto our hands, recognize the new and think of a solution, a new pattern. This event can be caused by the environment or by ourselves.

Reflection is an unconscious but initial process that goes on our whole life; it is the constant contention with the texture the being offers us. It is unconscious, because we can not stop it, we can not shut ourselves off from the being since we are a bodily part of it. But we try to focus into a certain direction to search for mirror images we hope to find. We encounter a feeling for this circumstance the most when we try to put a perspective onto the world which just does not fit. By reflection we are transgressing ourselves and the world and then fall back into it. It is working at the border of the human sanity and comprises intuition, explicit knowledge, which we like to think of as reliable, and all the other forms knowledge is expressing itself like mechanical reproductions of our muscles or the reproduction of argumentations we are used to work off. Reflection as an involuntary possibility of the human existence characterizes our break with a natural immediacy and our natural ability to learn. It is a biological and mental ability. The working off of unforeseen events is what we call learning as experience, a connection between the given and the new. This term of reflection is surely not brought to a conclusion by the aforementioned but it gives us some hints where further research could intend to start at. Further it implicates already a lot for the practice of learning and teaching and the linking of knowledge and professional action as it was tried to show above.

Finally it has to be mentioned that the framework of this paper purposely skipped a major source which could provide us, if it is employed by further research, with even more vital information for a scientific educational term of reflection. This source is historical and recent concepts of education. The title learning, 'knowledge and action – an approach towards a scientific educational term of reflection' already implies that the most crucial part of an educational term, namely the role of education inside the framework of this paper, is not exclusively employed. This is especially true for historical concepts of education, the reason for leaving out this perspective is simply that the framework of this thesis does not

provide enough time and space to reflect upon this dimension. This is owed to the fact that there is no nameable literature on this topic, although there is a major work of the German professor Elmar Tenorth in release, which will provide new insights on the historical dimension of reflection in educational science and pedagogy.

In a second thought this work does not explicitly but implicitly employ a concept of education. The structures that foster reflective movement are researched so they can be operationalized, institutionalised – namely to make fields of action visible as fields of education, making them 'visible' already implies that they are not as obviously seen as educational settings, as for example the teaching in vocational courses or in schools is recognized as educational acting. Here the teaching inside the courses of EMBL was left out on purpose, because they were not expected to provide any insights into the reflective structures and for a term of reflection, because they already underlie presumptions about reflection, because they employ a educational concept. The same reason leads to the circumstance that concepts of competency were left out by this paper, because they also draw on an intuitive assumption of reflective capabilities of the single learner. Consequently further research has to investigate the historical dimension of reflection in concepts of education, search for structures that foster reflection in other educational spheres of activity and develop an even deeper understanding of the philosophical dimension of an educational term of reflection. A starting point from this work to research recent educational concepts onto their connectivity to reflective forms could be the educational learning concept of *learning to live* (Leben lernen) of professor Jörg Zirfas (Zirfas 2009), because it employs the idea that learning is divided in the cumulative activities of learning knowledge, learning action, learning to learn and learning to live. Further an investigation of the pragmatic philosophy could provide new insights, especially in association with Dewey's concept of reflection.

The further reconditioning of reflection and reflexivity, their intentional character, their genuine educational declaration and not at least their capability as vital spot of a educational idea that could renew theories of learning and educating lies within the future.

'Your patience is being abused but finally rewarded'

PS

Probably, you have recognized the prophecies and legacies of wisdom which accompanied the single chapters?!

Those were the insights of my favourite biscuits – fortune cookies – besides the fact that they taste horrible, they provide me on a daily basis with two holy and sacred major insight. The first and less important one is that phrase-mongering is one of the most common spread and unreasonable human practices we depend on and the second one is, although I am capable of telling that there is this low paid employee putting the little papers into the cookies, I cant stop from contextualising the phrases with my life world. I cannot distance myself far enough so I am not at least slightly irritated or angry, because I fail to pass those slips of paper by without referring, associating, interpreting and integrating them with my perceptual framework until their meaning is my personal meaning.

Today I dare suggesting to rather taking them as invitation than as irritation, let them show us our reflexive nature and qualities to reflectively transgress what has never actively bound us.

'Lean back and relax. You deserve it''

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ERKLÄRUNG*

Bezüglich meiner Magisterarbeit mit dem Thema

The link between learning, knowledge and action

an approach towards a scientific educational term of

reflection

erkläre ich hiermit, dass ich

1. die Arbeit selbständig verfasst habe,
2. keine anderen als die angegebenen Quellen und Hilfsmittel benutzt und alle wörtlich oder sinngemäß übernommenen Textstellen als solche kenntlich gemacht habe,
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Heidelberg, den 01.02.2010

(Unterschrift)

* Diese Erklärung muss in jedes der drei beim Prüfungssekretariat einzureichenden Exemplare der Magisterarbeit eingebunden und jeweils original unterschrieben werden.