

Introduction

An experiment is characterised by the fact that its results cannot be foreseen by the experimenter. This is also true of this work. It began with the attempt to redetermine the relationship between *Bildung*¹ and technology. At the end stands the distinction between two forms of world disclosure—experiment and exploration—and, with that, the founding structure of a general theory of world disclosure.

The work began with a distinction between learning and *Bildung* that, until now, has been predominantly used in the German speaking world. It was further motivated by the idea that, through the use of analogy, insight into the processes of *Bildung* and learning in the individual could be drawn from the observation of processes of scientific research. It ended with the understanding that processes of scientific insight and processes of individual insight are nothing other than different forms of the processes of world disclosure, and these can only be appropriately understood with the aid of a logic capable of addressing paradox, that can conceptually capture the eventful nature of these processes. Both insights have a crucial effect on the understanding of science as well as of the processes of learning and *Bildung*.

With reference to the individual—with a decisive shift in content—processes of learning can now be reconstructed as being explorative forms of world disclosure and processes of *Bildung* can be reconstructed as being experimental forms of world disclosure.

This work assumes that processes of world disclosure exist. Correspondingly, the claim is made that certain phenomenon can be understood using the concepts of experiment and exploration that have been previously inadequately described using other, similarly oriented concepts, or, indeed, as in the case of the experimental, certain phenomena can be understood that have even been regularly and systematically neglected. At the same time, this work is supported by nothing else than previously existing work and therefore also assumes that these forms of world

¹ Translator's note: *Bildung*—it is important for the English reader to realise that there is a distinction in German between *Bildung* and *Erziehung* (both translated as “education”) which cannot be effectively rendered in English. “Cultivation” may be nearer in meaning to *Bildung* but suggests a nineteenth century discourse which is out of place here. For this reason, I will retain the commonplace non-translation of “education” as “*Bildung*” but would ask the reader to bear in mind that an act of cultivation beyond institutional forms is also implied here.

disclosure—both in the philosophy of science as well as in theories of learning and *Bildung* have always already been at stake.

One could speculate that, since the words exploration and experiment have already been previously used in the context of scientific research, this could be seen as an indication that we already try to intuitively distinguish that which can only later be systematically distinguished. Accordingly, it appears likely that some discussions of how science *in itself* proceeds stem from a confusion of these two forms of world disclosure.

On the part of educational science, together with the scepticism against a pedagogy exclusively focussed on learning there almost exists a consensus that “learning cannot be everything”, and that therefore, there must be something else. According to the results and, at the same time, the basic assumptions of this work, the philosophy of science and theories of *Bildung* have both for a long time been dealing with the same subject without actually exchanging views about it in any kind of sustainable form.

Instead of having to seek out analogies, available elements of various theoretical traditions could be assembled together to create something that, in the beginning, was not foreseen. This has been prepared for on the part of the philosophy of science by the overcoming of the idea that something like a universal “logic of research” must exist and the turn to the empirical study of science associated with this. On the other hand, educational science had extended its focus to meta-individual structures through the comprehensive criticism of such positions that still placed the subject at the starting point of their deliberations as the metaphysical centre of knowledge.

At the same time, a systematic distinction comparable to that between *Bildung* and learning in the theory of *Bildung* was absent in theories of science and research, while the theory of *Bildung* still to a great extent remained arrested in a representational understanding of language. This allowed all the obscuring of all that which was just at that point moving toward the centre of interest in the philosophy of science: the things in their materiality, our bodily dealings with them and thus finally also the handling of technology. In the following, all this needs to be rendered plausible.

Although it must be emphasised that experiment and exploration do not stand in a hierarchical relationship to one another, the focus of this work is still on the experimental, which is usually, and falsely, subordinated to the explorative. For it can only ever be thought as an independent form of world disclosure when both are brought together: a systematic distinction between two complementary forms of world disclosure with the help of a paradox capable logic and a theoretical instrumentation that is able to push the decentralisation of the subject beyond the area of language into material and bodily areas.

The concept of *Bildung* that creates the starting point for the deliberations unfolded here has increasingly gained attention in the last years in the German speaking world, and has now begun to attract attention at the international level—together with the very German concept of *Bildung* itself—and is slowly finding a following in international debate. At the centre of this concept of *Bildung* stands

the distinction between two types of learning processes, whereby the concept “*Bildung*” is meant to characterise the “transformative” kind of learning as opposed to more traditional learning, and can thus also be termed the “transformative concept of *Bildung*”. Helmet Peukert has expressed this distinction thus:

We have become accustomed to distinguishing two ways of learning. The one kind is more of an additive learning, i.e. in the context of a given framework of orientation and behaviour we learn more and more details that, however, do not change this basic orientation and our behaviour and our understanding of ourselves, but rather confirm them. However, in addition to this, there is also the experience that, if we really allow it to, explodes our previous ways of dealing with reality and our understanding of ourselves that exceeds our capacity to accommodate. If we wish to really take on such experiences then this requires a transformation of the fundamental structures of our behaviour and our relation to ourselves. (Peukert 2003, p. 10)

The approaches gathered beneath the “transformative concept of *Bildung*” refer to an extremely heterogeneous choice of theories. For example, Winfried Matotzki suggests with Gregory Bateson that *Bildung* should be understood as a kind of elevated learning in which not only knowledge is accumulated but also transforms the foundations of learning according to Bateson’s distinction of learning levels. Rainer Kokemohr has, in various places, and with reference to Jacques Lacan, undertaken the suggestion to “investigate *Bildung* [...] as a process of adapting and converting those experiences that resist their subsumption under the figure of an existing model of world and self” (Kokemohr 2007, p. 21). Jenny Lüders (2007) has systematically shown in her thesis how the transformative can be thought with the help of Michel Foucault. Hans-Christoph Koller has made the (empirically supported) suggestion of understanding *Bildung* in the critically reflected tradition of Humboldt, with the help of Jean- François Lyotard’s concept of dispute. He holds this to offer an “innovative process of emphasising new possibilities of language [...] which holds open the dispute by helping to give expression to a previously unarticulatable ‘something’” (Koller 1999, p. 150). This has itself become the starting point for further diverse empirical research.

Elsewhere, Koller, with reference to Kokemohr, summarises the distinction lying at basis of this thus:

According to this way of understanding, processes of *Bildung* are differentiated from simple learning processes in that not only is the acquisition of new knowledge or new information (as in learning processes) at stake, but also a fundamental transformation of the ways and means in which such information or knowledge is processed. Processes of *Bildung*, in the sense of a transformation of a fundamental figure of the relations to world and self therefore present a kind of elevated process of learning in which the treatment of knowledge is also transformed in a fundamental manner. (Koller 2007, p. 50 f.)

Despite all the heterogeneity in the theories referred to, these approaches are bound together by the idea that processes of *Bildung* are distinguished in terms of quality from those that are commonly understood as learning processes.

In what respect this concept of “Bildung as transformation” corresponds to that which is described as “transformative learning” in the Anglo-Saxon world is an open question.² Accordingly it is both an interesting and open question as to what extent the criticisms of the basic assumptions of the “transformative concept of *Bildung*” depicted in this work also apply to the basic assumptions of “transformative learning”.

Two aspects come to mind here: firstly, the attempt at raising the transformative to the level of a distinguishing criterion and, secondly, the way in which failure is conceptualised as a stimulus for these transformative processes. In contrast to this concept the following should present the advantages of a “general theory of world disclosure” based upon a paradox capable logic and which first makes the differentiation between experiment and exploration at all possible.

The structure of this work does not correspond to that of a classical introduction and this has, above all, two reasons: firstly, the argumentation indicates a more circular than linear structure which, in many places, requires both backward and forward referencing and so renders a graduated structure impossible. In a strong sense the results of this work form the starting point for its argumentation. That this does not result in a logically circular argument remains to be shown.

This more or less circular structure at the same time shares the characteristics of an experimental process which—and this is the second reason for the structure chosen here—it is here attempted to mirror in the form of this work. If this is more or less successful then the process depicted in the work, at the end of which the distinction between experiment and exploration stands, can itself be interpreted as an example of an experimental process of world disclosure. In the ideal case this work therefore serves not only as a depiction of its results but at the same time as a documentation of that which is depicted.

Those preferring a rapid entry into the work can jump to Chap. 2. Here you will find the most important theoretical building blocks, followed by the identified characteristics of experiment and exploration presented in the following Chap. 3. The fourth and final chapter is interesting as a starting point above all for those who wish to occupy themselves with the possible theoretical consequences of the theoretical approach presented here based on the example of a critical discussion of the concept of *Bildung*.

The structure in detail: in the *first chapter* the question of technology is discussed in a somewhat essayist fashion. This then leads to the question in what respect failure cannot be thought, as is often the case in both the theory of science as well as in the theory of *Bildung*, as being without precondition, but rather much more has as a precondition precisely that process that is triggered by it.

In Chap. 2 the concept of the experiment is introduced and delimited against conventional and misleading ways of understanding it. *Chapter 2* also serves to depict necessary and fundamental theoretical decisions. To these belongs the intensification of the central concepts of *Bildung*, learning, meaning and world until

² And was discussed this year at the conference “Transformative Learning meets Bildung”, Freiburg, Germany, June 20th to 22nd, 2013.

their respective paradoxical forms can be clearly grasped theoretically. Crucial to this is the introduction of Spencer-Brown's logic, capable of addressing paradox, known above all for its application in system theory by Niklas Luhmann, but here used with the aid of Urs Stäheli's deconstruction. This deconstructive interpretation allows the—admittedly very free—adoption of Jean-Luc Nancy's concept of the "shared world" [*geteilten Welt*], which here, as the paradoxical centre of every process of world disclosure, forms the hinge of the entire argumentation. Additionally, in Chap. 2, the methodological reasons will be given for the chosen approach.

In Chap. 3 twenty-one respective characteristics of experimental and explorative processes of world disclosure will be described and contrasted with one another, drawing on empirical laboratory studies, in order to then align them together with the distinction between *Bildung* and learning in Chap. 4. In contrast to what is normally done, the question regarding the procedure is not placed at the beginning, but rather at the centre of this work: in this way the form of presentation should also be kept as congruently as possible with the structure of the argumentation.

A translation always carries the temptation at one point or another of introducing new ideas, improving expressions, or altering the relation of different passages to one another according to the current focus of interests. It quickly became clear that—because of the structure of this work—a change in one place in the work almost always inevitably led to a change in another place, which once again would have led to another change, so that this book would have gradually become a new one. Not only would this have clashed with the sense of a translation, it would have also rendered even more difficult the dialogue between readers of the different editions which is being striven for here and is indeed only possible thanks to Andrew Rossiter's conscientious and careful translation.

Experiment and Exploration: Forms of World-Disclosure
From Epistemology to Bildung

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2014, XII, 237 p. 1 illus., Hardcover

ISBN: 978-94-017-8708-6