# A comparative analysis of the perspectives of three German educational theorists on constructivism and instructional design.

by

Helga Brigitta Hambrock

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Department of Curriculum Studies
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Supervisor: Prof. Dr. J.C. Cronjé

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# Chapter 1

## 1. Introduction

Before I present the article on the research concerning the perspectives and perceptions on constructivism in Germany, in chapter 2, I would like to explain the route I followed to finally arrive at the topic and  the outcomes of this thesis.

My curiosity in the field of constructivism started with the perception that constructivism was the new learning theory and didactics which need to be addressed and applied in a computer integrated society. I was curious about the application of this new learning theory in Europe and more specifically in Germany. Before reaching this objective, I attempted to find the background on the development of constructivsm under the following headings and used these as guidelines during the literature review:

1)  Constructivism from a historic point of view. - Here I looked into the literature and followed the development and perception of the concept.

 2)  Historical development of constructivism in Germany**.**  Since the Americans claim to be the forerunners in this field I took a closer look at constructivism in the German context and specifically at its development.

3) Constructivism v.s. Objectivism. - When I came upon Merrill's model of Intructional design and Jonassen's theory of constructivism and objectivism I wanted to include their views. The topic, if constructivism can be sided as Learning Science or as part of Instructional design is under debate in America and I wanted to include this in my research in order to refine the position of constructivism in America as well as in Germany.

4) Does Constructivism really exist? – This question may be unexpected, but since Terhart as one of the chosen German voices in this research, addresses this question, I used it as a valuable starting point for the article.

With these thoughts in mind I attempted to structure the literature on constructivism, which will be discussed in more detail in the following section.

## 2. Literature Review

### 2.1  Constructivism from a historic point of view.

The question "What is constructivism?" includes the questions: "Where did the term constructivism originate.", "How was constructivsm understood and interpreted by the forerunners from the earliest of times?" Several opinions and interpretations were found since the 17$^{th}$ century until the perceptions of today. (The specific interpretations are accentuated by italics and bolded)

The earliest mentioning of constructivism was by *Giambattista Vico* (1668-1744) who "first articulated the ideas of constructivism and claimed that clear understanding for a human being resulted from *meaning that they have **constructed** for themselves* " (SEDL, 1995).

In the 16$^{th}$ century *Immanuel Kant (1724-1804)* said that "the synthesis of rationalism and empiricism, in which knowledge gained through perceptions of the world is organized within cognitive structures" (Heylighen, 1993) and added that, "based on sense information gathered before or during an event, *humans **reflect** on the event and **analyze** what occurred.* Both of these processes are unique to each individual's perceptions" (Brooks & Brooks, 1999).

Then followed *Lev Vygotsky (1896-1934).* He is seen as a social constructivist. Vygotsky claimed that *higher levels of mental functioning originate in social processes.* Kant believed that "the *social dimension of consciousness* was the most important, with *individual consciousness derived from* it" (Bauersfeld, 1995), but

*Vygotsky* claimed that, "for some, **social constructivism** *is more credible than* **radical constructivism** because rather than focusing on independent individual knowledge building, *social constructivism uses consensus as the criterion for truth"* (Heylighen, 1993). Others see that social constructivism values both the individual and social realms. "*Humans are* **constructed** *not only through individual processes but through meaningful interactions with others*" (Gergen, 1995). *Vygotsky* also identified the level of potential development (the "zone of proximal development"). This is a level of development that learners can reach with the guidance of teachers or *in collaboration with peers*. The zone of proximal development is the level at which learning takes place.

Thereafter came *John Dewey* (1859-1952) who explored the *active relationship of an organism with its environment, introducing the notions of* **transaction, experience and reflection**.. He said that "reflection ensures the continuity of action, with the development of knowledge occurring over time, making inferences from current situations. *Each act of an individual* **creates** *a new reality for that individual*" (Vanderstraeten & Biesta, 1998). Critics would point out that if every human lives in his own subjective world, so how can we gain mutual understanding? Dewey believed that *social interaction was also a crucial component, with each participant observing and paying attention to the* **inferences constructed by others**.

The next important forerunner in the field of constructivism was Jean Piaget (1896-1980)- known as a modern theorist credited with the development of constructivist thought. He believed that, "human *learning allows individuals to* **adapt to the environment** *around them*" (Phillips & Soltis, 1991).

He also identified the processes of *assimilation and accommodation as an integral part to knowledge building whereby the learner grows in knowledge through the* **making of constructions**.

*Piaget* "suggested the controversial notion that learners attempt to develop *cognitive equilibrium* when they *encounter conflict between their internal perceptions and "reality."* This results in the development of new cognitive structures that bring stability and restore equilibrium" (Brooks & Brooks, 1999).

*Ernst Von Glasersfeld* (1917-Present) who is recognized as "a proponent of radical constructivism", radical in the sense that it breaks with the traditionally accepted theory of knowledge. *He says that knowledge is not passively received, but rather is **built up actively by the individual**.* And he also claims that cognition has an *adaptive function*. As learners adapt to new information from their environment they *attempt **to make the most viable fit***" (Glasersfeld, 1995). *Glaserfeld* refers to viability rather than truth, reflecting the temporary nature of knowledge construction and the context of goals and purposes in which each individual lives. "*The most viable model is **constructed** and utilized until new information is encountered and a discrepancy occurs.* He adds that these notions fly in the face of traditional ideas about knowledge, truth and objectivity and require that *the notion of reality be **reconstructed**.* Reality is the experiential world in which we live. This doesn't deny absolute reality. We just have no way of knowing it. *So our personal reality is defined as the network of things and relationships that we rely on in our living* "(Glasersfeld, 2003). To him ***"constructivist principles** cannot be adopted as absolute truth, but rather as a viable hypothesis to explain knowledge building in the present time*. By nature, knowing is an adaptive activity, and knowledge will change over time. *A solution is relative to the individual **who constructed it**, and to their sphere of experience.* If the solution solves the problem then it is no more "right" than other solutions, although it may be judged by other standards such as speed or elegance" (Glasersfeld, 1995).

As one of the more recent constructivists *Kuhn* (1922-1996) ,a post-modern philosopher, who embraces the constructivist's view. He will be remembered for his classic work explaining 'paradigm shift' (Brooks & Brooks, 1999). The notion of paradigm shift seems to

parallel Piaget's concept of accommodation. *When a way of thinking no longer fits our perceptions of the world, **it needs to change** to accommodate new understandings*.

*Maturana and Varela* said that the *nervous system cannot distinguish between perception (caused by an external phenomenon) and a hallucination (a purely internal event)*. They said that they rejected the possibility of objective knowledge, since "*all knowledge depends upon the **structure** of the knower*" (Botella, 1994).

The above mentioned concepts developed from the first thoughts of knowledge being constructed by the learner and was refined and redefined until it was known as knowledge depending on how it is structured by the knower. These constructivist thoughts developed in the greater Europe and the next passage focusses on the development of the concept in Germany.

**2.2  Historical development of constructivism in Germany**.

In Germany, the concept 'constructivist didactics' was first mentioned by *Siebert* (1994) and then by von *Glasersfeld* (1996), *Müller* (1996), and *Reich* (1996). The first thoughts in this direction were developed by *Kösel* (1997). In Germany, *Siebert*, *Reich*, *Kösel* and *Müller* can be regarded as the most important constructivists.

The above mentioned dates seem to be recent, only about 10 years ago, compared to the Americans in Alessis and Trollip who refer to Papert as the first constructivist applying his view in 1980, when he devised Logo, the programming language. ( Alessis and Trollip,2001) This observation may be true if one looks at the *words*: "constructivist didactics", but the question is, if the concept of constructivism may have been referred to or applied, under a different terms, in earlier times.

*Siegfried Schmidt* for example discusses several research perspectives and is extremely critical about the expression, "There is talk about a new constructivsm", "Ein neuer radikaler

Konstruktivismus macht von sich reden." He does not agree with the fact that the term "new" is used. He refers to the existence of the "Erkenntnistheorie", which to him refers to the same basic theory, as established many years before. He also refers to *Luhmann* who says that previously existing knowledge is put in a new light, but from a new perspective and thereby promoting interdisciplinary approaches. Schmidt does not support Luhmann, who seems to be totally absorbed by the new perspective of the constructivist theories. (konstruktivistische Theorieangebote). (Luhmann (1988)

*Schmidt* explains that the development of radical constructivist research originated in the 1950's. At that time, however, the theoretical models were not as clearly defined as today. The forerunners in this process worked towards interdisciplinary development of models which included self-organization, Schmidt gives the example of interdisciplinary development from Physical Science to Climatology. Another important contribution of bringing the "new" views together, was the translation of articles by important constructivists like *Maturanas*, *von Foersters* and von *Glaserfeld* .

According to Schmidt, it is a very specialized process to actually find and define which of the developing methods can be dinstinguished and categorized. He adds, that in order to distinguish a new theory, a theoretical and empirical consolidation process is vital.

Schmidt says that since radical constructivism includes wide and versatile fields, some similarities or "Gemeinsamkeiten" in the basic approach can be established, that includes the theory that we are constructing the world in which we are living by "Zusammen-Leben" or bringing factors and issues together. This construction consists of observation, experience (Erfahren), action, experience (Erleben) and communication. From a cognitive theoretical point of view, it ends with the observer in society and from a sociological point of view, it ends as an observation. Only if the observer and the observation can be communicated as "one world", constructivism can become the result. It may therefore be interesting to find similarities between *Niklas*

*Luhmanns* systems theory and the theory of *George Spencer Brown*'s Differenzlogik as Models developed by constructivists, who are including biological, psychological and cybernetic assumptions.  Both include a differentiation between system and environment, including the operative inclusion of social and cognitive systems. They say that systems can be understood (erkennen) by self referentiality and operational inclusion. (Schmidt, 1998)

Besides the similarities, differences can also be found. These are concerning the conception of the cognitive theory, which may not be quite applicable in this discussion. The greatest deficit as identified by Schmidt concerns the development of methods in the area of empirical constructive projects.  (Blankertz, H. (1991)


Other approaches which started my curiosity into the German perspectives and applications of constructivism, included the following: *Renate Kock* who looks at the three theories of *Gerstenmaier and Mandl* who distinguish three levels of constructivism 1): the radical constructivism as recognition and scientific theory, 2) the new constructivism in sociology, 3) cognition sciences and psychology like constructivist approaches in the instructions psychology and the empirical pedagogics. (Gerstenmaier/Ma  ndl 1995, p. 868). (Free translation).

Kock mostly concentrates on the interpretations of *Freinet* and explains how he sees constructivism. As contrast to radical constructivism Freinet distinguishes between knowledge and understanding (Erkenntnis) and points towards a possible philosophy of knowledge (Freinet 1948), where knowledge receives a public dimension and includes a social-critical dimension. Because Freinet does not concentrate on the question concerned with reality, he can see man as a creator of reality.(Free translation)

"Im Unterschied zu Radikalen Konstruktivisten trennt Freinet zwischen Wissen und Erkenntnis und verweist auf eine mögliche

Philosophie des Wissens (vgl. Freinet 1948. Wiederveröffentlicht April/1976, S. 35), wobei Wissen im Verständnis Freinets mit dem für ihn zentralen Begriff der Laizität (vgl. Kock 1995) eine öffentliche Dimension gewinnt und eine (sozial-) kritische Dimension einschließt. Gerade weil Freinet die Frage nach der Wirklichkeit nicht thematisiert, kann er den Menschen als ein wirklichkeitsschaffendes Wesen sehen."(Kock, 2000)

Considering the views of the constructivists in Germany and seeing how the concepts have developed over time it became clear that Germany was already thinking in this direction for many years. The question however stays how their concepts and perpectives were actually applied in the German context.

In order to bring the philosophy and ideology of constructivism together in a nutshell I took a step further and set out to find specific models which had been constructed to visually sum up the concept. In the following passage I looked into existing models and also found a comparative study which showed how constructivism could be distinguished from objectivism.

## 2.3  Constructivism v.s. Objectivism.

 During the actual research phase on constructivism I hoped to find a specific model by which constructivism could be plotted. That was when I discovered David Merrill. Although he may not be considered as a constructivist his model gave an interesting starting point of how and where constructivism could be plotted.

Looking at Merrill's First principle - Four quadrant learning model, which rather falls in the area of objectivism than constructivism, it became clear to me that one needs to distinguish between constructivism and objectivism, but that certain areas could possibly be overlapping. I realized that Merrill had developed a model which could partially be included in the constructivst learning theory, since it included constructivist characteristics like constructing/finding

solutions for a problem by demonstrating, activating and integrating
the solutions.



INTEGRATION                    ACTIVATION

PROBLEM

APPLICATION                    DEMONSTRATION
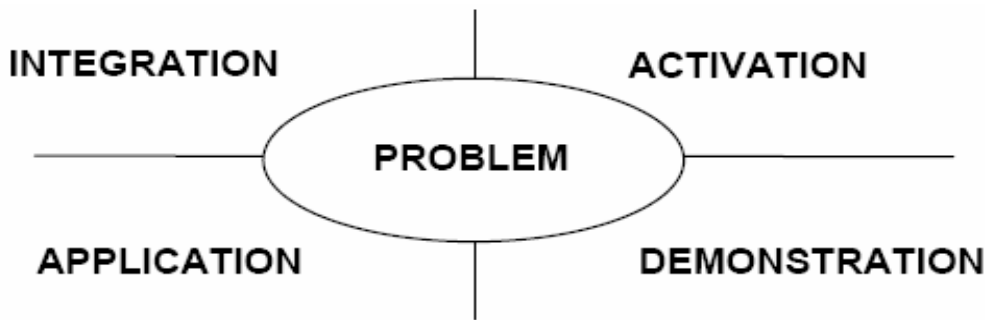
(Merrill,2002, p.2)

**Description of Merrill's First Principle Model:**

Learning is facilitated when learners are engaged in solving real-world
problems.
Learning is facilitated when existing knowledge is activated as a
foundation for new knowledge.
Learning is facilitated when new knowledge is demonstrated to the
learner.
Learning is facilitated when new knowledge is applied by the learner
Learning is facilitated when new knowledge is integrated into the
learner's world

The following table by Schindelka (2000 p.2), attempts to set out the
differences between objectivism and constructivsm.

| Table 1  A comparison between objectivism and constructivism | |
| --- | --- |
| **Objectivists Orientation** | **Constructivist Orientation** |
| Roots in cognitivist information processing and behaviorist theories: Gagne, Bloom, Skinner | Influences include Piaget; Bruner and Vygotsky; philosophies of Kant and Dewey |
| Systematic procedures leading to learning outcomes | A philosophy which avoids step-by-step recipes, "one size fits all" or "cookie cutter" approaches |
| Focus on building instructional systems | Focus on creating or fostering learning educational environments rich in embedded knowledge |
| Goal: efficient and effective transfer of knowledge; focus largely on declarative (factual, or "what") and procedural ("how to") knowledge | Goal: emphasizes experience and reflection: constructing, reasoning and analysing meaning |
| Focus on simplification (start with easy and progress to more | Real world experience, authentic activity, situated learning Examples: |

| | |
|---|---|
| difficult) and repetition (rote learning / drill and practice) | "micro-world" and multimedia simulations; construction kits (Perkins, 1991); social interaction |
| Linear/hierarchical approach to learning | Holistic approach to learning |
| Concrete and defined instructional goals, objectives & strategies for all learners | Learner negotiates objectives; objectives may emerge depending on learner and context. Multiple goals, objectives, strategies |
| Assessment and evaluation integral part of program design; learning is observable and measurable | Traditional assessment difficult; learning is context-dependent |
| Teach cognitive strategies for assisting in storage, transfer and retrieval of information; cueing, chunking, etc. | Enable learner to reflect on experiences and information to "internalise" into meaningful knowledge |
| Focus on skills, sub-skills, and attaining specific objectives | Focuses on "general domain of knowledge" |
| Separation of content and delivery/media (model exists independent of content) | Content and delivery/media are linked; generally do not exist independent of each other |
| Instructor-controlled instruction | Learner-centered instruction |

From this table one can deduct that constructivism and objectivism are mostly distinguishable as opposites from each other, but Johannes Cronje attempts to find a model which describes the relationship between objectivism and constructivism.

In his article, "Paradigms Regained – Towards Integrating Objectivism and Constructivism in Instructional Design and the Learning Sciences"(Cronje, 1999) Cronje questions the linear relationship between constructivism and objectivism as originally constructed by Jonassen. He states that "The two theories are generally described as polar extremes on a continuum from externally mediated reality (objectivism) to internally mediated reality (constructivism)" (Jonassen 1991, p. 8).

Figure 1. Polar extremes on a continuum

| Objectivism | 5  4  3  2  1  0  1  2  3  4  5 | Constructivism |
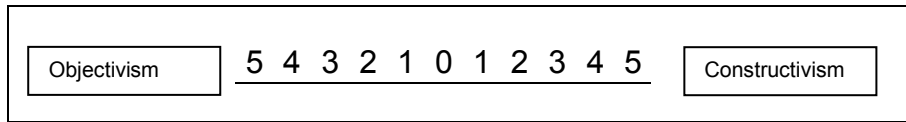
(Cronje,1999, 3)

Cronje constructs a four quadrant model as an opposing possibility

Figure 2. Four quadrant model as an opposing possibility

Constructivism

| 10 | | |
| 9 | | |
| 8 | Construction | Integration |
| 7 | | |
| 6 | | |
| 5 | | |
| 4 | | |
| 3 | Immersion | Injection |
| 2 | | |
| 1 | | |
| 0  1  2  3  4  5 | 6  7  8  9 10 | Objectivism |
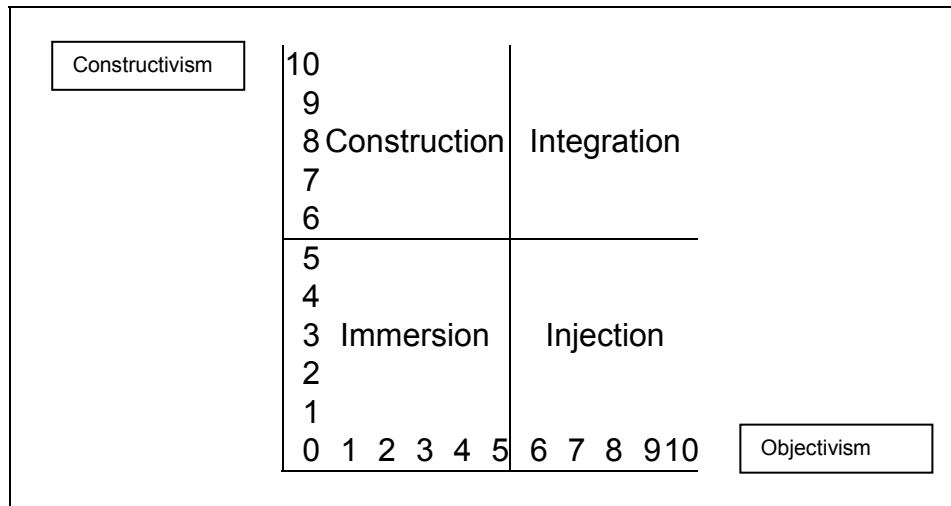
(Figure 3, Cronje,1999,3)

The above mentioned models are giving clear direction  to understand the position of constructivism as a learning theory to be applied in our new computer integrated-society. One understands that constructivism is the constant developing and creation of new ideas and therby new realities. Now the question is how this theory can be applied.

## 2.4  How is constructivism applied?

At first I wanted to include the American *and* German perspective and application of constructivism, but after reading Spector's article, "Instructional technology and the learning sciences: Multiple communities and political realities"(Spector, 2004) it became evident that the actual application of this learning method had been done in America for a longer period and that it was time to move away from

America and rather only concentrate on Germany, I therefore approached the constructivists in Germany.

In his article Spector points out the debate between the fields of *Instructional design*, which rather concentrates on the practical application of constructivism and *Learning sciences*, which are including the philosophy of the learning method. As a reaction to Spector's question, "Where are the African, Asian, European, Pacific Islander and South American voices in this dialogue?", I preferred to answer his challenge from a European, or rather German perspective.

## 2.5  Does Constructivism really exist?

During further discussions with Cronje he referred me to the article of Ewald Terhart, "Constructivism and teaching: a new paradigm in general didactics?" in which Terhart says that *there is no such thing as constructivism* in Germany. Terhart is a German constructivist, but in this article he questions and argues that constructivism is only an old didactics which has been adapted to be called 'constructivism'. Cronje, as my mentor and study leader, therefore led me to ask the question: *Does constructivism really exist in Germany*? *And if so, how?*

The mentioned article became the basis from which my research was done and Terhart's argument was used to compile the questionairre which I sent to Siebert and Reich, two well-known constructivists in Germany. In the questionnaire I asked them what their opinion on this matter was. The answers to the questionnaire made their positions clearer and gave me some background, which led me to come to the conclusion that I have given at the end of my article.

## 2.6  Constructivism and postmodernism

I interpreted the opinions of the mentioned constructivist from a postmodern perspective if one considers that "in a postmodern world, identity is not natural or God-given, it is a human construct changing constantly; each individual has multiple identities at different times"

(Jansen, 2003). This approach gives the different opinions and interpretations of constructivists a space for individualism, which is intrinsically accommodated in constructivist perspectives.

## 3. Research method

A qualitative research method was used which included the following:

3.1 **Target group:  constructivists in Germany  -**Identification of the German constructivists to be involved.

3.2 **The questionairre and text. -**Their articles and literature were studied

   and a questionnaire was sent to them.

3.3 **Analysis and Conclusion** -The articles and questionnaire were analyzed

   and a summary was compiled.

### 3.1  Target group:  constructivists in Germany

By using the article of Terhart as one opinion of a constructivist in Germany, I approached  two constructivists in order to have three possible views and thereby establishing the most commonly presented opinions. I chose the same Siebert and Reich who were mentioned as the two forerunners of constructivism in Germany in Terhart's article.

### 3.2  The questionairre and text.

As already mentioned above, I compiled a questionnaire which included questions based on the article of Terhart.  The questions were sent to  Horst Siebert and Kersten Reich with an accompanying letter, asking them to view their opinion on the article and also their perpective on constructivism in Germany. (See Addendum 1 and 2 , 3 and 4 pg.45).

Besides the questionairre, I also tried to find relevant articles from Reich and Siebert and tried to establish a comparison of similarities and differences amongst the three constructivists.

### 3.3  Analysis and Conclusion

The collected information was compared in the form of a table and analyzed according to topics which were addressed by the constructivists. During the research it became clear that different opinions existed concerning the answer to my question. "What is constructivism?", Terhart argued that constructivism was a new name for an old didactics, whilst Siebert and Reich did not question the existence of constructivism, but elaborated on how they interpreted contructivism in the German context.

## 4. Limitations

The research does have limitations specifically concerning the number of participants. It could have been more elaborate with more views and opionions, but since the chosen three are known to be the most important contributors especially considering the amount of articles and books they have written, I restricted my research and only concentrated on them.

I would have liked to include the American viewpoint on this study, but since they did not answer to my mail, I only focused on Germany.This study may be used as an inspiration for other researchers to look into the development of constructivism in their country or continent.

## 5. Structure of thesis

The thesis is structured in three parts: Chapter 1, in which I explain why I have done this research, how it all began and how I did it. Chapter 2 includes the article I have written in order to establish the German voices on constructivism, and in Chapter 3 follows the enlightening  journey I had specifically with Prof Kersten Reich.  who made constructivism "a –theory-come-alive" for me. The thesis ends with a final chapter which summarizes, and discusses what was learned from this research and also adds recommendations for further development in this field.

# Chapter 2.  The research article

**Three German voices on constructivism-**

The voice of a continent, a country or an individual?

## 1. Abstract

This article presents an overview of three German perspectives on constructivism, in an attempt to provide a German perspective on the debate between instructional design and the learning sciences. The article first considers Jonassen's (1991) plea for a move towards constructivism in instructional design.  Upon this follows a summary of a proposal by Ewald Terhart (2003) that current constructivist learning theory is not new, and is well-known in traditional German Didactics. Terhart's argument was presented, in the form of an email-based interview to two German theorists, Horst Siebert and Kersten Reich. An analysis of their comments indicates that the Germans tend to be holistic, individualistic and conclilary in their approach to both constructivist learning theory and instructional design, as opposed to the more collectivist, American approach.

## 2. Introduction

There is a longstanding debate between behaviorism and constructivism in instructional technology and the learning sciences. The subsequent debates from different angles are pleading for the following: Jonassen (1991), asks for a more constructivist approach. Nordkvelle says: 'The "new" educational technology of the 1960s had developed with little debate about how didactics contained a viable and legitimate "technology" and what its legitimate borders and imperatives are concerning educational technology. Contemporary web-based learning environments offer a similar challenge to a

"critical" didactics but a critique must avoid the naïve anti-technological romanticism of the previous generation of critics to reinterpret the relationship between technology and didactics' (Nordkvelle 2004: 427). In his comment on the debate between instructional design (ID) and the learning sciences (LS) presented in a special edition of *Educational Technology,* Mike Spector argues that 'a fundamental limitation of the discussion is that it is centered on North America and ignores the larger ID and LS communities in other parts of the world' (Spector 2004: 48). He then asks, 'Where are the African, Asian, European, Pacific Islander and South American voices in this dialogue?' (Spector 2004: 48). This article takes up Spector's challenge from the perspective of a German-speaking South African.

Three voices are considered: Ewald Terhart, working, from the German perspective of general didactics *(Allgemeine Didaktik),* investigated constructivist didactics and concluded that 'constructivist didactics is not a new paradigm in the sense that its proponents claim it to be' (Terhart, 2003:25). Terhart lists a number of important writers on constructivism: 'In Germany, the concept "constructivist didactics" was first mentioned by Siebert (1994) and then by von Glasersfeld (1996), Müller (1996), and Reich (1996). In Germany, Siebert, Reich, Kösel, and Müller can be regarded as the main proponents of constructivist didactics,'(Terhart, 2003:43). For the purpose of this article Siebert was selected because of his position as the first user of the term, and Reich was selected as a further participant as he was mentioned by Terhart as one of the forerunners. After an analysis of their work the two were approached for comments by means of an email questionnaire. Their responses were synthesized to arrive at the conclusions that end this article.

Over the past few years there has been considerable debate about the approaches to constructivist learning. It has become clear that constructivism moves from the simplistic term 'learning by doing', through to radical constructivism and also includes a kinesthetic approach of constructivist learning. Several constructivists have

represented these approaches. The question attempted in this article is concerned with the approach of the European and more specifically the German approaches. It would seem that there is a great variety of opinions on the nature of constructivism. There may not necessarily be a specific uniform approach found in a specific country or continent, but since constructivism has a wide range of possible applications, one may see it as an individual experience of 'creating one's own reality'.

In the search of German voices I discovered Terhart's article, 'Constructivism and teaching: a new paradigm in general didactics?' (1994). I selected Terhart as one of the important voices since it became apparent that he had done a great deal of research in the field of constructivism and as a critical constructivist, was especially questioning the relevance of the term in context of the already historically applied general didactics.

The second constructivist included in the research, was Professor Horst Siebert, from the University of Hannover. He was mentioned in Terhart's article, as the first constructivist who used the term, 'constructivist didactics' in 1994. He approaches constructivism from a philosophical background and is mainly involved with adults.

The third constructivist, Professor Kersten Reich from the University of Cologne had an informative website and invited communication with him. He may also be considered as one of the forerunners in Germany, since his publications are widely distributed and read throughout the country. . He suggested that his book, *'Die Ordnung der Blicke'*,1998, which discusses the historical development of constructivism in Europe, should be used as background.

The research involved the following steps:

2.1  An analysis of the work of the three authors,

2.2  A questionnaire, emailed to Reich and Siebert

2.3  An analysis of their feedback.

2.4  A Conclusion.

## 2.1 An analysis of the work of the three authors.

The past decades have witnessed exciting debates in the field of the application of educational theories. Is there really a debate between traditional didactics and contructivists theory? What do the German voices say? The first voice to be heard is the voice of Ewald Terhart.

### 2.1.1 Ewald Terhart

Terhart approaches constructivism as a theory, which he rather considers as an 'old' learning method which can be found in the approaches of historical educationists, like Piaget, than a new method, as many constructivists argue it to be. In his article he sketches four background theories of constructivist didactics, which include:

2.1.1.1 Radical constructivism

2.1.1.2 The neurobiology of cognition

2.1.1.3 Current theories

2.1.1.4 Current conceptions of learning in the field of cognitive
psychology

### 2.1.1.1  Radical constructivism

According to Terhart, Radical constructivism includes the concept of acquisition of knowledge 'as some kind of reality that lies outside of the knowing subject and existing as such by itself, is in principle impossible. Everything that can be known of this external reality is a creation of the observer' (Terhart, 2003:27).  He also claims that, 'We can understand our reality only in the form in which it has been constructed by ourselves'. The sum of all constructions is, so to speak, the "experienced reality" (Wirklichkeit) in which we live' (Terhart, 2003: 27).

To him the social-context in which learning takes place has a prominent place during the learning process. 'Constructions not only have an individual character; they take place as co-constructions in social contexts, and, thus, must be tested there' (Terhart, 2003:27). He also agrees with other constructivists such as Von Foerster

(1984), Schmidt (1987, 1992), von Glasersfeld (1996), and Bardmann (1997) who say that knowledge has neither a specific beginning, nor a specific end.

### 2.1.1.2  The neurobiology of cognition

In the field of neurobiology Terhart assimilates the research done on the function of the brain with another part of radical constructivism, 'The research into the neurobiology of the brain used by radical constructivism says that, the connection between the outer world, sense organs, and the brain is not such that the external world is, transported through the sense organs into the brain and that the brain then builds a plain copy of the outer world. Rather, the starting point is an assumption that the brain, beginning with only a few pieces of information about the environment which are possibly distorted and full of gaps, buildsup a world of experience (Erlebniswelt), an "experienced reality" or actuality, "Wirklichkeit"' (Terhart, 2003:28).

### 2.1.1.3  Current theories

The current theories he points out include, the theory of anti-poetic, self-referential systems, radical constructivist, neuron-biological, and cybernetic-information-theoretic concepts to develop a general systems theory. He adds that these theories all play a role in forming the reality of the person. 'From this point of view, a psychological system, a group structure, an apparatus, an institution, a society, and a whole world are closed self-referential, autopoetic systems which observe their environment. In this environment, there may be other systems, which are, conversely, observing them. And, while systems are not transparent to each other, they are able, on the basis of the other systems' reactions to their own actions, to construct models of these other systems for themselves, or to model these other systems' models.  (Terhart, 2003:29).

To these complex systems or system models, which form the reality of the mind, he adds that there may be a 'super-observer located analytically 'outside' this space' (Terhart, 2003: p.30).

## 2.1.1.4 Current conceptions of learning in the field of cognitive psychology

According to Terhart, current conceptions of learning in the field of cognitive psychology, include new methodology which started with behaviorist and then cognitive learning methodologies, which have developed by means of the computer during the development process of learning methodologies, 'now, an internal apparatus—usually conceived of as analogous to the computer—mediates between, on the one hand, perceived pieces of information from the external world, and action and decision-making of the learner vis-à-vis—or in—the external world on the other hand' (Terhart, 2003:30).

Despite the new methods to be applied, the learning process is still monitored or constructed by the individual learner, 'accordingly, learning is an independently performed activity that is strongly embedded in situations. Knowledge, contents, abilities, are not being acquired or "absorbed", but constructed. (Terhart, 2003:31).

In conclusion he sees that learning is not controlled by external factors, but sees it as a process, which is influenced by internal structuredness. 'Further, the participation of the learner in the learning process , has changed from largely passive to (hyper) active. And finally, the possibility of formulating general laws of learning—which was the promise of the now-outdated behavioral orientation, and even of the information processing approach—has dropped to zero on the newer conceptions of learning' (Terhart, 2003:31).

With the above four theories in mind, Terhart draws a parallel between constructivist learning and the general didactics. 'In constructivist didactics, we are dealing with a revisiting of the total field of didactics in that it develops comprehensive conceptions of the learning process, of the character of the content of instruction, of the instructional situation and interaction, of the task of the teacher, and

of the overall perspective and goal of didactic activity' (Terhart, 2003:32).

He also adds that what was said about radical constructivism is not the true picture in the classroom, where it is 'rather applied as a moderate form of constructivism' (Terhart, 2003:33). He continues to point out the weaknesses of applying constructivism in the classroom, addressing the following:

- One cannot find a precise analysis of the term and he sees a wide range between radical constructivism, a moderate constructivism and a type of pseudo-constructivism. He refers to constructivism as 'a fuzzy combination of different lines of thought only held together by the fact that they all, in a way, include 'construction' or 'constructivism' as concepts' (Terhart, 2003:39).

- Terhart does not see any new development, he rather sees it as something old being modified towards self-directed learning, and 'Constructivist didactics really does not have any genuine new ideas to offer to the praxis of teaching, rather, it recommends the well-known teaching methods and arrangements of self-directed learning, discovery learning' (Terhart, 2003:40).

- He also adds that 'we see in constructivism the familiar, old, and romantic conceptions of learning and teaching well-known in 'progressive education' (Reformpädagogik). These ideas are presented in a new language, thus receiving new justification, new inspiration, and a new power of conviction, this time using the latest ideas from neurophysiology, systems theory, and cognitive learning theory research' (Terhart, 2003:39).

Terhart may argue that constructivism is a method which has already been used for many years, but more important for this article is what he actually says about constructivism.

It seems that to him the most important parts of the learning process include an 1) inductive process of learning, by creating ones own reality 2) within a social context, which may introduce the learner to experiences of others and thereby providing a platform of what reality may be.
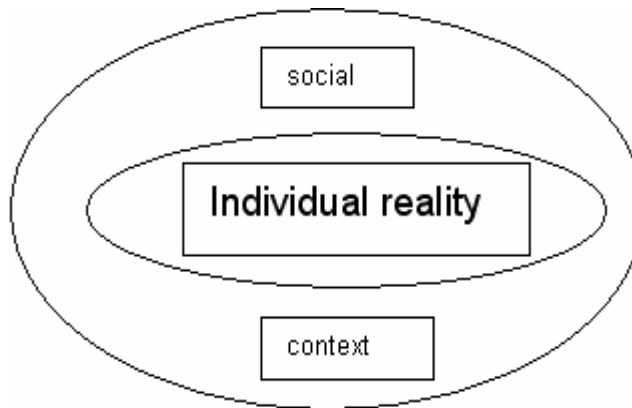


 **Figure 1. Individual reality in social context**

Considering this viewpoint it may now be relevant to involve the work of the next constructivist, Horst Siebert, as he has answered on many of Terhart's perspectives,  including the perspective of the reality of the learner.

**2.1.2  Horst Siebert**

Horst Siebert, born 1939, Dr. phil., since 1970, Professor for adult training at the University of Hannover has published many articles on the theory and didactics of adult education and on pedagogical constructivism. In his article 'Konstruktivistische Didaktik – ohne Inhalte?'(Siebert, 2005) Horst Siebert compares constructivist learning to a coin with two sides. Whilst Terhart pointed out that the learner learns in a certain social context. Siebert goes on to refer to individualistic constructivism and socio-cultural constructivism, which include self-driven learning and social or collaborative learning. He distinguishes between three sections:

2.1.2.1  Auto poetic psychosomatic systems – individual learning

2.1.2.2  Learning in context – socio-cultural learning

2.1.2.3  Constructivism: meaningful content?

Here follows a short description of each section:

### 2.1.2.1  Auto poetic psychosomatic systems – individual learning

Siebert says that from a constructivist point of view the thinking, feeling and learning processes are self-referentiated, structurally determined and neurobiological processes in an autopoietic, operationally closed system. '

Our mind is only partially busy with the processing of information inputs. To recognize (erkennen), is rather an inner monologue, in which the mind is interacting with existing memory content, which is networked into a new form. Therefore learning needs pre-knowledge. A pre-requisite for acquiring new knowledge results only on the foundation of previous knowledge and previous experiences. We see what we already know, we hear what we can and want to hear. In other words, our cognitive and emotional structures can only perceive and process, what they are able to process, that is, if it fits into the existing world of the brain. Each person perceives knowledge from his own perspective and therefore 20 people can repeat information given, in 20 different ways. In other words it is rather the rule than the exception, if misunderstandings or misinterpretations occur.

### 2.1.2.2  Learning in context – socio-cultural learning.

The second thought he discusses is the importance that we are not living in an isolated world, but in a world shared by others and formed with others. The systems theory accentuates the dependence of learning and recognizing in a context. Learning takes place in contexts , this includes the learning with books, which are part of a communicative and social activity. He says that, we are living in a society where everything has meaning. Our language for instance, provides a social coordination of our actions. Our emotional and

cognitive patterns are based on tradition, socio-cultural value-conceptions and shared habits and rituals.

Therefore individual and socio-cultural constructivism belongs together. Here he refers back to his introductory metaphor of the coin with two sides, where both are part of a whole.

## 2.1.2.3  Constructivism: meaningful content?

The question he addresses here is the issue of the quality of the learning content. He supports Terhart by agreeing that schoolbooks and curricula are important structures, but he says that a development from the processing of information to construction of knowledge, is taking place, during the learning process. This is where content and abilities are no longer absorbed, but constructed. This construction process, however, never starts at zero, but has a basis of already existing knowledge. Terhart says that in this psychological didactics process, the actual subject matter is lost.

Here Siebert agrees that no-one is interested in a didactic without content. This would mean that without a sound foundation of knowledge the fundamental didactics would be shaky and unstable.

Siebert says that constructivists assume that relevant learning is emerging in their minds. Content is not transported from A to B, but grows as a self-referential process, including the process of growth by group interaction. For example, often topics develop into a completely different direction than intended during a discussion.

Content of learning is a mixture of psycho-logic, content-logic, socio-logic (group dynamics) and application-logic. Siebert points out that content is the most important part of learning. Only meaningful learning makes sense. We can identify with meaningful content, which is part of our identity and of planning our life.

The following mind map summarizes the most important aspects of Siebert's idea of constructivism (Siebert, 2005:12).
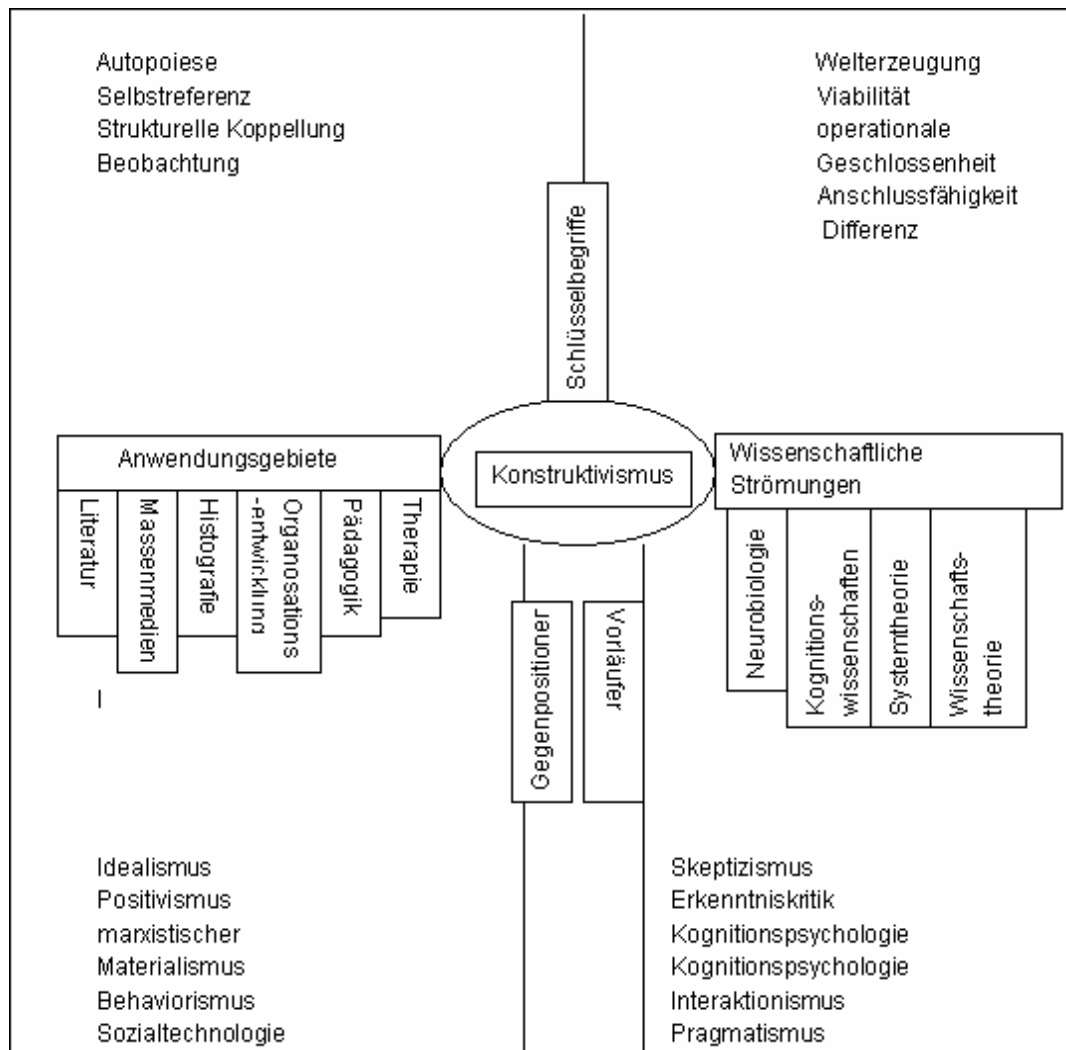


**Figure 2. Siebert's mind map on constructivism**

Siebert gives three examples from his experience on how the development of learning is different from situation to situation, especially in the dynamic of a group. He refers to the brain researcher and constructivist Gerhard Roth, who says, that meaning cannot be transferred from the teacher to the learner but must be constructed in the mind of the learner. *'Bedeutungen können gar nicht vom Lehrenden auf den Lernenden übertragen, sondern müssen vom Gehirn des Lernenden konstruiert werden'* (Roth 2003; 21). He also adds that, modern memory research shows, where there is content, learning is taking place, by whomever, whenever and wherever this content is provided.

Siebert says that the roles of the learners are changing. The task of knowledge provision does not become less important, but the meaning of the learning diagnose , the observer, the metacognitive help, the perturbation, by lecturing and provocative questioning, improves knowledge.

### 2.1.2.4  Terhart v.s.Siebert.

At the end of Siebert's article he agrees with Terhart (2003), who says that the didactics theory has not changed much in the past centuries, but refers to one exception, the constructivist didactics. Terhart explained that constructivism is expressed in a relatively radical way in theory, but rather modest if applied in practice. In the school context, reform pedagogical- and communicative models are preferred. The constructivist provocation becomes pedagogically normal and didactically less radical. According to Siebert this observation of Terhart seems correct as he has experienced it in adult education and further training. He also uses the old learning methods, but with a constructivist approach, a changed perspective from teaching to learning, a modified pedagogical process of self - understanding, including a relaxed and open atmosphere. The content or knowledge is defined differently from traditional mediated didactics. Informal learning and learning context outside the school, new learning environments and networking the learning processes, working and multicultural togetherness, are all upgraded self-organized e learning. Therefore the term didactics is replaced by the term 'teaching and learning cultures'. The constructivist core thesis says*: Learning results of autopoetic systems can neither be planned nor be organized.*

Comparing these two articles, it becomes evident that many similarities are found. Both include the autopoiesis and socio-cultural importance of constructivism. Siebert agrees with Terhart in the discussion of constructivism, but differs from him in a sense by saying, that constructivism is not an old method, with a new look, but

rather a new method in itself. It may, however, not be as radical in practice as in theory.

In Horst Siebert's book, 'Pädagogischer Konstruktivismus' (Siebert, 2005), he refers to the context of learning and reality. He emphasizes that the construction of reality is a lifelong process. Learning ability means therefore openness for acquiring new knowledge and a willingness to change. He includes the following:

- Our reality consists of what we have learned.
- This learned and experienced reality forms our world.
- We are what we have learned.
- Self-perception and world perception are intertwined.
- To tell and to reflect are elements of identity learning.
- Learning is a self- and world-construction, which is a lifelong process.
- Living together means to change perspectives.

Another aspect, which he refers to, is that constructivism includes recognition and action. (Erkennungstheorie und Handlungstheorie). He takes it one step further by molding the two together as 'Erkennen ist Handeln'. The one activity is invisible and system intern, that takes place in the mind of the individual and the other is visible as he acts out what he has thought.

Siebert also places great emphasis on the emotional part of learning. And he refers to Roth who says that reason and mind are imbedded in the affective and emotional nature of a person. ' *Vernunft und Verstand sind eingebettet in die affective und emotionale Natur des Menschen'*(Roth, 2001: 232). He refers to Roth's book, '*Fühlen, Denken, Handeln,*' where he accentuates the feeling part of learning.

He includes Paul Wladslwaick's discussion, *'Wie wirklich ist die Wirklichkeit*?'* He says that constructivism accentuates the how as an opposite of the what. How do we see and how do we decide?

## Self-perception and world perception are intertwined
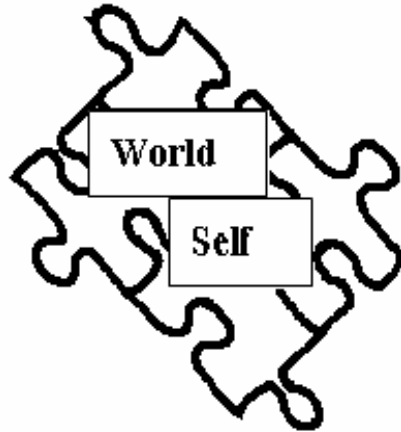


**Figure 3. Selfconception and world perception are intertwined.**

According to the above discussion it seems that Terhart and Siebert share most thoughts. It, however, seems that for Siebert the relationship between individual and learning by impulses from "outside" are more integrated with each other than for Terhart. He refers to these two perspectives as being intertwined.

In order to establish another perspective from a German constructivist, the work of Kersten Reich from the University of Cologne is included, because he is known as one of the forerunners of constructivism in Germany and supports a perspective which looks at constructivism from a philosophical-critical point of view. Kersten Reich is the founder of the Interactive Constructivism, a brand of constructivism which is culturally orientated and stands in close discussion with pragmatism (esp. Dewean pragmatism). Reich has an approach which expands on the work of Terhart and Siebert. Where Terhart and Siebert are saying that the learner is *constructing* his reality, Reich says that the learner *invents* his reality. Looking at all discussed subjects it seems that placing Reich as the third constructivist in this discussion, also points out his own unique position in the debate.

### 2.1.3  Kersten Reich

After considering Terhart and Siebert's points of view,Kersten Reich's book: '*Ordnung der Blicke Bd I*' (1998), includes the following important perspectives:

According to him the learner is the observer, *der Beobachter,* which does not only mean that we are merely observing, but also that the sentiment and feeling is important, which includes all possible situations.

Kersten Reich develops a didactic with a socio-constructivist grounding. He says that several societies are cohering after one another or even next to each other. *'Die Definitionsmacht einer Vernunft ist immer dadurch relativiert, dass mehrere Verständigungsgemeinschaften nach- und nebeneinander existieren*' (Reich 1998: 9). He supports a pluralisation of reason. Characteristics of his didactics are:

- Precedence of relational to contents didactics

- Application orientation

- Interdisciplinary networks

- Reflection on cultural contexts

- No didactic-methodological recipes

To Reich the *Bildungsbegriff,* or understanding of education, depicts orientational greatness of didactics. He believes that in constructivistic didactics, all learners are also didactic 'developers'. They need vision, magic, a level of experience and most of all motivation to accomplish success in their learning. '*In der konstruktivistischen Didaktik sind alle Lerner auch Didaktiker. Auch sie benötigen Visionen, Zauber, eine hohe Erlebnisdichte und vor allem Antriebe, um ihr Lernen erfolgreich zu gestalten'* (Reich 1998: 59).

One could see Reich's didactic as a *didactic of understanding* which means, realities aren't safe, the learning content is not given,

observations are not definite. Objects are observed and language needs to be used carefully as not to create dualities.

Reich prefers an ironic perspective – also towards himself. He says the irony, which is used in the postmodern approach, is different to other approaches, in the sense that one can acknowledge different perspectives and that from these perspectives we can understand and learn and laugh about these. '*Die Ironie, in der wir in der Postmoderne stehen, zeichnet sich als reflexive Haltung gerade dadurch aus, dass wir aus verschiedene Perspektiven sehen und lachen lernen können*' (Reich 1998:107).

Kersten Reich's finding is that no method exists for all situations '*Es gibt keine Methoden für alle Fälle. Es besteht noch nicht einmal eine eindeutige Theorie darüber, welche Methode für wen in welcher Situation immer passen könnte*' (Reich, 1998:188). Methods do not depend on learning objectives, but also on situational factors, the group dynamics, of moods and atmosphere. An important part is the dramatology of a lesson. All these form a complete situation.

In his article '*Systemisch-konstruktivistische Didaktik*' (Reich, 2002), he distinguishes learning processes of construction, deconstruction and reconstruction. According to Reich from a systematic and constructivistic point of view, didactics is:

- No longer a theory of duplication, which includes the memory and the most important reconstruction of knowledge and truth, which has been developed from previously designed patterns to be transferred, accepted and applied socially, but is a constructive place of your own world.
- No longer a safe theory of the enlightenment, the emancipitation, which knows who can be emancipated how and with which content, but an observation theory, which knows how to apply these elements for teachers and learners as the most possible self-action.

- No longer a planned process by teachers, but a constructive process where the role of teacher and learner change to observers, who observe and analyze the process which follow each other and move next to each other.
- No longer a theory from a school orientated perspective, which will finally find all solutions for didactical problems, but by opening up an interactive relationship between learners and teachers and thereby including content.

Reich asks why people are afraid of constructivism and answers that people feel insecure with the "content-less" learning process. Why do teachers study if they do not want to acquire true knowledge?  Why does science have specific fields and boundaries?

He adds that a constructivist didactic cannot side-step these insecurities. It is the objective of didactics to organize teaching and learning processes, which convey knowledge, develop skills, and so that measurable results can be develop. Because these structures are not in place with constructivist learning a constructivist dilemma develops. As constructivists we want to give learners and teachers the opportunity to find their own truth, and if possible in the most free-thinking perspective, from different viewpoints, which are intertwined in several distinguishable life forms and world pictures. We can, however, not see these constructivist activities as absolute, since we need to have the socially obtainable reconstruction of truth.

The ultimate goal for constructivist learning is to develop a didactic with a huge group of observation, whereby theoretical and methodological joy can be developed, but achieving a high level of reconstruction, symbolic clarity of the world, to take the risk of new perspectives. Measuring the learning rate of the learner should not be done by sciences, the schoolbiocracy, but by finding the learners open-mindedness.

How will a learner fill in the gaps if previous work was not done precisely? This is the most common complaint he says that teachers should not only convey the tables to learners, but also include the didactics and psychological realizations (Erkenntnis).

What does it help if the teacher works through a whole text and the learners are not motivated to read their own material?

How can the spark of learning jump over to the constructivist work, constructivist language games, a contructable Esthetic, Music, Art and Sport to become part of your own experience. He refers to the movie 'Dead Poet's Society', where the teacher has applied reconstructive teaching on the construction of the learners, which is only understandable by seeing what others have constructed and achieved.

He concludes that uniformity was present in the old scientific approach, which cannot be said about the schooling system of the late 20th century. One rather finds a huge variety of different, even opposing systems. It seems to be the most important task of the education systems to engage in a constructivist method, which will provide them the abilities to work independently and to give their own opinion, sometimes against the opinions of the subject disciplines.

Three observer perspectives, (*Beobachter perspectiven*) of constructivist didactics are identified by Reich:

**1. Construction**

Learners and teachers are constructing the reality of their school, which also includes the outer environment in which they live. Content of the material, as well as relationships in teaching are important, and should be applied as constructivist as possible, by trying, experimenting, always as own construction. With their motto being: 'We are the inventors of our reality', *'Wir sind die Erfinder unserer Wirklichkeit'* (Reich 2002:12).

## 2. Reconstruction

According to Reich the motto for reconstruction is: 'We are the discoverers of our reality', *Wir sind die Entdecker unserer Wirklichkeit'* (Reich 2002:13).     To him the role of the observer is to be interconnected with the role of the discoverer of reality.
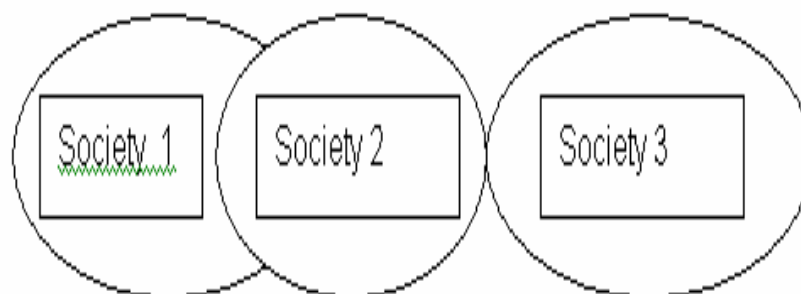
## 3. Deconstruction

Reich argues that the above-mentioned perspectives are not sufficient and another perspective of the observer may have the motto: 'It could be different'. '*Es könnte auch noch anders sein!'* (Reich 2002:16).This does not mean that one is sceptical about everything, but that one includes other possible perspectives, which may develop. He believes that in a constructivist didactic all should become deconstructivists, to find their way back in a circle of construction and reconstruction. It depends on the content and situation which of the perspectives are to be applied.

He believes that if these three perspectives are applied, a systemic-constructivist didactic could be built, which will contribute to rebuilding of self-confidence and self- worth in the classroom and school life.

**Figure 4.**

Several societies are cohering after one another, or even next to each other.

## 2.1.3.1 Terhart v.s. Reich.

It seems that the questions and fears of Terhart concerning contstructivism are cleared by the enlightening perspectives of Reich. What Terhart sees as a disadvantage, Reich sees as the advantage of constructivism. Terhart wants structured didactics, since constructivism just seems to 'fuzzy' for him, 'a fuzzy combination of different lines of thought' (Terhart, 2003:39),  whilst Reich explains that the traditional structuredness needs to be replaced by a systemic-constructivist didactic. He believes in the actual application of contructivism. To him the learner needs to create his own reality, which as it seems, is a more natural and fruitful learning process than the 'old' didactics.

## 2.1.3.2  Terhart, Siebert and Reich.

As discussed previously it appears that Terhart and Siebert share many perspectives on constructivism. Siebert , however, expands on the four theories given by Terhart by adding the importance of recognition and action (Erkennungs- und Handlungstheorie) by placing emphasis on the emotional part of learning and by contemplating how true reality (die Wirklichkeit) is.

Reich, it seems, is interpreting constructivism from another level. To him didactic is a perspective of the learner who is not only observer, 'Beobachter', but also develops a didactic with a social-constructivistic grounding. The ultimate goal for constructivist learning is to develop a didactic with a huge group of observations. According to Reich no method exists for all situations. He distinguishes learning processes as construction, deconstruction and reconstruction.  To him constructivism is a completely new  didactic.

In the following table the most important perspectives of the three constructivists are summarized, with a short conclusion after each section.

| Table 2  Radical constructivism | | |
|---|---|---|
| **Characteristics of Constructivsm** | **Perspective.** | **Author** |
| **A. Radical constructivism:** 1. Reality (Wirklichkeit). | Reality is understood in the form in which it has been constructed by ourselves. | Terhart |
| . | Our reality consists of what we have learned. This learned and experienced reality forms our world | Siebert |
| | We are the inventors of our reality. | Reich |
| **Conclusion** Terhart and Siebert say that we construct our reality, by what we have learned and experienced, whilst Reich says that we are inventing our reality. | | |
| 2. Knowledge or content | Acquisition of knowledge is explained, "as some kind of **reality that lies outside of the knowing subject** and existing as such by itself, is in principle impossible. Everything that can be known of this **external reality is a creation of the observer.** Knowledge has no certain beginning or end. | Terhart |
| | Content and abilities are no longer absorbed, but constructed. The process never starts at zero. Each person perceives knowledge from his own perspective. Content of learning is a mixture of psycho-logic,content-logic, socio-logic and application logic | Siebert |
| | **It is no longer a theory from a school orientated perspective**, which will finally find all solutions for didactical problems, but by opening up an interactive relationship between learners and teachers and thereby including content. | Reich |
| **Conclusion** Terhart and Siebert are talking about knowledge and content as influenced by several factors. To Reich the content is part of an interactive relationship between teachers, pupils and content. | | |
| 3. Experienced reality (Erlebniswelt) | The mind builds a world of experience. | Terhart |
| | Meaning cannot be transferred from the teacher to the learner, but must be constructed in the mind of the learner. | Siebert |

| Individual reality or experience | Individual reality or experience, constructs the world of the individual's mind. | Terhart |
|---|---|---|
| | Individualistic constructivism Autopoetic psychosomatic systems or individual learning. | Siebert |
| | **We are the discoverers of our reality.** Learners and teachers are given the opportunity to find their own truth. | Reich |
| **Conclusion** Individual experience  constructs the reality as Terhart and Siebert see it, as for Reich we are rather discovering our own truth (reality). | | |
| 4. Current theories Observer of the environment | A psychological system, a group structure, an apparatus, an institution, a society and a whole world are closed self-referential, autopoetic systems which observe the environment. | Terhart |
| Perception/observation | **Self-perception and world perception are intertwined.** | Siebert |
| The Observer | Didactic is a perspective of the learner. To him the learner is the observer,  der Beobachter. In the learning process. | Reich |
| Three observer perspectives | The ultimate goal for constructivist learning is to develop a didactic with a huge group of observation Construction Deconstruction and Reconstruction | Reich |
| **Conclusion** For both Terhart and Reich it seems important that the learner is the observer. of the environment,  but as for Reich he includes a process of Construction, Re-construction and De-construction,which gives the observing process an additional perspective. | | |

The table is based on the most important characteristics mentioned by Terhart. The reaction of Terhart, Siebert and Reich are recorded as a comparison. The first topic includes the characteristic of radical contructivism. It points out the different perspectives on the 1. reality of the learner, 2. the knowledge of content, 3. the experienced reality (Wirklichkeit), and 4. current theories, which includes the observer of the environment (Beobachter).

The **shared perspective** of Terhart and Siebert concerning the characteristic of *radical constructivism*, include the idea that **we are constructing our own *reality***. This is expanded by Reich who believes that we are **constructing and inventing our reality.**

Terhart sees *the content of knowledge* as an **external reality, which is a creation of the observer**. Siebert says that **content and abilities are no longer absorbed**, but **constructed** and as for Reich, the **content is part of an interactive relationship between teachers, pupils and content.**

*Experienced reality*,  according to Terhart and Siebert is **constructed by experience**, whilst Siebert says that we are the **discoverers of our reality**.

As a current theory of radical constructivism for both Terhart and Reich, it seems important that the learner is the observer of the environment,  but as for Reich, he does not only include a process of Construction: **We are the inventors of our reality**, Re-construction : 'We are the discoverers of our reality' ,but also the perspective of De-construction: **It could be different'** ,which gives the observing process an additional perspective.

In Table 2 the different approaches of learning methods are compared.

| Table 3 Learning methods | | |
|---|---|---|
| **Learning methods** | The computer is a new means of learning after behavioristic and cognitive learning. | Terhart |
| Learning internal structuredness | Learning is not controlled by external factors, but is influenced by internal structuredness. | Terhart |
| Learning active process | Learning is no longer a passive process, but an active learning process. General learning laws no longer applicable. | Terhart |
| Learning is an independently-performed activity | Knowledge, contents and  abilities are not being acquired or absorbed, but constructed. | Siebert |
| Learning method | No method exists for all situations. | Reich |
| Learning and emotions | Reason and mind are interlinked with the affective and emotional part of learning. | Siebert |
| Constructivistic learning and motivation. | Achieving a high level of reconstruction, symbolic clarity of the world and to take the risk of new perspectives. | Reich |

> **Conclusion**
> Terhart and Siebert are pointing out the construction of reality and this may impact on the method of learning, whilst Reich says that no specific method exists and that new perspectives need to be involved.

Both Terhart and Siebert are saying that the construction of reality may include behavioristic and cognitive learning and it is not influenced by external factors, but by internal structuredness and this may impact on the method of learning, whilst Reich says that no specific method exists and that new perspectives need to be involved. Here Siebert adds the importance of the emotional part of learning.

In Table 3 the different perspectives on learning in context of society are compared.

| Table 4 Learning in society | | |
|---|---|---|
| **Socio-cultural learning** | Constructions not only have an individual character; they take place **as co-constructions in social contexts** | Terhart |
| | Learning is **a socio-cultural process.** We are living in a world shared by others and formed with others. | Siebert |
| Didactics with socio-constructivistic grounding. | Several societies are cohering after one another or even next to each other. | Reich |
| **Conclusion** Terhart sees learning as a co-construction in social context, whilst Siebert sees it as a socio-cultural process. Reich also recognizes the importance of societies in learning, which he sees as a co-hering after and next to one another. | | |

From Terhart's perspective learning is a co-construction in social context, Siebert sees it as a socio-cultural process and Reich also recognizes the importance of societies in learning, which he sees as a co-hering after and next to one another. (See fig. 1 – 3). For all three, the social context *in* learning, *next to* learning each other, or *around* learning, is important. Here as one example the individualistic approach of each constructivist, becomes evident.

*General didactics vs. constructivism*. Terhart sees constructivist learning as nothing but the same didactics with a new name. In

contrast Siebert, does acknowledge the existence of a new constructivism as a new method, developed from the old or general didactics. For Reich, however, constructivism is not in the same category as the old didactics. He identifies a new approach and believes in the positive impact  it may have in the invention of a learner's knowledge and concept of reality.

| Table 5 General didactics vs. constructivsm | | |
|---|---|---|
| **General didactics vs. constructivism.** | Learning should not be directed from the outside, (Piaget) Constructivism, is an old process, being modified towards self-directed learning. | Terhart |
| | General didactics, but with a constructivist approach. A changed perspective from teaching to learning. | Siebert |
| Didactic of understanding | Orientational greatness. In constructivistic didactics, all learners are also didactic 'developers'. | Reich |
| | Realities are not safe, conventions cannot be changed, the learning content is not given, observations are not definite. Objects are observed and language needs to be used carefully as not to create dualities. | Reich |
| | A huge variety of different even opposing systems. The learner needs to work independently and to give his own opinion, sometimes against the opinion of the subject disciplines. | Reich |
| **Conclusion** For Terhart constructivist learning is nothing but the old didactics with a new name, whilst Siebert does acknowledge the existence of a new constructivism as a new method developed from the old or general didactics. Reich does not see constructivism in the same category as the old didactics l. He recognizes a new approach and believes in the positive impact it may have in the invention of a learner's knowledge and concept of reality | | |

Considering the discussed approaches, it becomes clear that similarities in the approach of the three discussed constructivists are to be found, but from this comparitative research, it becomes clear that constructivism lends itself to individualism and that often the approaches of the above mentioned constructivists are individualistic.

## 2.2 The questionnaire

## Development

A questionnaire was developed with Terhart's theory as basis. The questions were systematically developed from his point of view to determine if other constructivists agreed with his theory. It also seemed important to know their opinion on the history and development of constructivism, compared to the application of constructivism. From there it seemed significant to ask if other methods were more applicable and if so, which models or methods needed to be addressed. This led to the question whether constructivism may have weaknesses, as a learning model or theory. It also seemed relevant to look at the present situation in Germany and asking if constructivist methods needed to be applied more directly and then ending with their view point on constructivism for the future on a global level.

This questionnaire was sent to Siebert and Reich, The objective of the questionairre was to receive their direct opinions on the above mentioned article of Terhart Reich and the questions that followed, concerning how they saw the development of constructivism in the future, who they thought the forerunners of constructivism were and if they considered constructivism a European or American development. Another question was included, which addressed Spector's question, concerning the perspectives of different countries. Finally it was fascinating to know their opinion on how constructivism can be applied in the context of globalization.

## 2.3  An analysis of the questionnaire.

The opinions of the above mentioned authors were asked on various topics concerning their views by which they approached constructivism. This was done by an email questionnaire, sent to the authors and answered by them personally. These questions were either asked to confirm what was found in their writings or as extension to what they had addressed.

The first question was directly approaching the authors concerning their opinion on the article of Terhart. It was asked if they could accept his idea on what constructivism was or not.  As was derived from the above mentioned articles, Siebert agreed with the content which Terhart presents, but points out that the conclusion is not correct. Siebert, however, thinks that constructive methods are new and not to be placed in the same category as older instructive methods. His actual words were:'I agree with Terhart's description, but not with his conclusion. Constructive methods of teaching and learning are new and differ from instructive methods.' As discussed in the previous section, Reich disagreed with Terhart's article and added that Terhart had delivered a one-sided view. According to Reich, Terhart's perspective is simplified and the context he gives on constructivism is insufficient.

The second question was taking a step back and asking where they believed constructivism began and where it had been applied initially.

Reich referred to Dewey, Piaget and Vygotsky, as the developers of constructivism and Siebert includes, H. Maturana, F. Varela, E. v. Glasersfeld, P. Watzlawick, as forerunners.

Siebert said that he supposed, that American educationists were the first, who applied this concept. He added that constructivist ideas in the educational system in Germany , were practised since the beginning of the nineties.'

This question was asked because of debates about who the actual pioneers of the constructivism theory were. It seems that the Americans have taken the theory and were the first to apply the theory in a more practical way, especially in the field of computer integrated learning.

The next question asked was concerned with the actual application of constructivism in Germany. To this question Siebert answered that the German approach seemed to be more philosophical and added that constructivism was a new perspective on learning and teaching.'

To the question if constructivism should become the new approach in schools, Reich answered with a clear 'yes' and Siebert said, 'I hope, that constructivist thinking will become dominant in schools He added that pupils have to learn different ways of constructing their life and their world.'

To the question if there may be weaknesses in the constructivist learning approach, Reich describes possible weaknesses in the constructivism approach. He said that no perspective is perfect and that it needs to be developed. *Kein Ansatz ist vollkommen, alle müssen sich entwickeln.'*

Siebert replied by saying that,'weaknesses seem to be found in the development of the curriculum and that evaluation of learning results are still following traditional conditions.'

Finally it was asked where constructivism would fit in the process of globalization,
Siebert said that, we have to learn to accept different multicultural values and ways of thinking from a global perspective.

## 2.4  The Conclusion.
In the first section it became clear that several similarities, but also differences were found in the writings of the three constructivists. These were already discussed at the end in section a.

Comparing the answers of Reich and Siebert to the questionnaire, additional perspectives have been found. They are both constructivists in Germany, but each one is focusing on his own specialized field: Reich a critical constructivist and Siebert a constructivist from a philosophical background. Reich disagrees with Terhart, since he has his own well defined and developed perspective on what constructivism is, whilst Siebert does give Terhart acknowledgment for the discussion on constructivism, but does not

agree with the idea that constructivism is part of the inductive approach.

It also becomes clear that both consider their approach different to that of the Americans, they are both attempting constructivism from a philosophical point of view, but are also applying their perspectives in their university and school environment. Reich however does include his interest and support of the American approach in the sense that his perspectives are founded on the principles of Dewey, which are also the basis for the Americans.

They both agree that constructivism needs more attention and needs to be applied more seriously in their schools. This interest and support for more and better **application of contructivist methods** in Germany , can also be found in Jonassen's (1991) request for a more constructivist approach in instructional technology and the learning sciences in America. In the article of Nordkvelle (2004), from Finland, she pleads for a more positive attitude concerning the relationship between technology and didactics and argues that 'a critique must avoid the naïve anti-technological romanticism of previous generations' (Nordkvelle 2004: 427). Both Jonassen and Nordkvelle are supporting the application of constructivism together with the application of technology. Although the German constructivists may have had a less technological approach in the past, it is important to point out their individualistic ideas of possible applications of constructivism which may be applied more effectively in the future, with the use of technology.

It is therefore possible to give some indication of a German perspective in response to Spector's call for European voices. It seems clear that these voices have a more philosophical approach to constructivism, especially including a systematic approach, which may be part of the LS (Learning Science) section of Spector's differentiation, but both Siebert and Reich are applying their philosophies practically in their teaching environment, which can be

seen as a movement into the IT (Instructional technology) section, of Spector's differentiation.

To conclude: It has become evident that Reich, Siebert and Terhart support the overall idea of constructivism, but important is that each one has specific individual perspectives about what they believe. This can be accepted in the true sense of the word and is quite in line with the fundamental idea of constructivism, namely, 'creating your own reality'.

# Chapter 3

# My journey with Kersten Reich.

## 1. Introduction

During my research on the opinions of German constructivists concerning the topic: "does constructivism exist and if so, then how in the German context", the discussions with Kersten Reich, were the actual impulses which developed my thoughts and opinions about the position of constructivism in Germany more specifically. The first indications for me to move into this direction came from Cronje, (as discussed in chapter 1), the academic starting point came from Terhart, (with specific referral to his article "Constructivism and teaching: a new paradigm in general didactics?"(Terhart 2002), but the person who accompanied me and opened new doors of thought along the journey into the world of constructivism, was Dr Kersten Reich.

My first encounter with Reich was when I found his website during a search in the Internet. What immediately struck me on his website was the invitation to a discussion with him. This was a golden opportunity for me to 'talk' to a constructivist in Germany. I told him about my intentions to find relevant articles and books in the field of constructivism in Germany and his reaction was immediate. He referred me to his book: 'Ordnung der Blicke I'. I also realized that he was a man who was a committed academic and researcher in this field and was very pleased to have 'discovered' him. (It was a long and difficult process to finally receive his book from Germany, which I had to order through a friend who lives in Berlin.) During the waiting period he, however, referred me to articles he had written and thereby I got a foretaste of the immense depth of his studies. After the final completion of the article "Three German voices on constructivism", I sent the final draft of my article to Reich and asked him to comment on what I had found and interpreted from the mentioned information. His comments will be presented towards the end of this discussion.

## 2. Reich and Constructivism

After having read and interpreted different angles and opinions of constructivists during my studies I formed a specific opinion on what constructivism was. To me in a nut-shell constructivism was *a learning theory which had the objective of guiding the learner into a learning style in which he would construct/create his own reality within a social context* .

Reich made it clear that the learner does not only create or construct his reality, but also *invents* his reality. Concerning the social position of the learning process, Kersten Reich develops a didactic with a socio-constructivist grounding. He says that several societies are cohering after one another or even next to each other (see fig 4:p 17). In other words that learning takes place *in and along several societies.*

Other points which I found most insightful included the following.

To Reich the learner does not only construct his own reality, but while he is learning he is also *developing didactics*. He believes that in constructivist didactics, all learners are also didactic 'developers'. What may have 'worked' in one situation, may not work in another.

*My comment*: *I had never thought about the construction of a didactics outside the prescribed didactics, but I understand that it is a process of constant adaptation and re-adaptation which takes place during constructivist learning, as each class may differ and therefore each pre-knowledge may differ, temperaments (intro and extroverts) may differ and thereby social interaction may differ and so the didactic or teaching style may also change and be constructed every time.*

He believes in an ironic perspective, where the learner learns to laugh, to see and to learn from different perspectives.

*My comment*: *In most constructivist learning environment situations, a great amount of self-realization and contribution of learners is allowed, but this* **ironic** *perspective may empower the learner to see wider and further than his own reality.*

- As with the construction of a new didactics Reich also believes that there is no such thing as one method for all situations or circumstances.

*My comment: A huge amount of flexibility is expected from the facilitator who needs to adapt his methods as the situation arises. For example if a learner contributes to the discussion by something he has read, the topic may turn away from the original idea. Instead of leading him back to the original topic the facilitator may let the learner give his contribution to the class discussion and learning. This may not only be a change of topic, but also a change of method from a collaborative or collective learning style in the form of a group discussion, to an individual contribution.*

- Reich addresses the fear or criticism of people towards constructivism and answers that people feel insecure with the "content-less" learning process. But he sees the strength of constructivist learning in the opportunity given to learners and teachers to find their own truth, and if possible from free-thinking perspectives and from different viewpoints, which are intertwined in several distinguishable life forms and world pictures.

*My comment: This learning process includes further learning of the learner* and *the teacher. The teacher may have had an idea of the truth, but now during a lesson he may be convinced of another truth. Example: Do teenagers need discipline. The students may agree, but they may suggest that they would rather have their own form of discipline than the form super- imposed by the school. They would determine what discipline a learner in their class needs, as discussed in a group. This may impact on the opinion of the facilitator who may*

*have agreed with the methods of the school, but he may understand the debate of the learners and thereby increase or even change his insight.*

- He does, however, mention that we cannot see these constructivist activities as absolute, since we need to have the socially obtainable reconstruction of truth.

*My comment:  In the review to my article, he says that most of the constructivist ideas have been philosphical and have not been implemented in Germany.*

- Reich believes that the ultimate goal for constructivist learning is to develop a didactic with a huge group of observation, whereby theoretical and methodological *joy* can be developed, but achieving a high level of reconstruction, symbolic clarity of the world and to take the risk of new perspectives.

My comment: *The motivational aspect in learning from the point of the learner as well as the facilitator is of great importance in any classroom situation, but to bring it into the context with the theory and method , is a new challenge.*

- He addresses the question concerning measurements of achievement and suggests that the learning rate of the learner should not be measured by sciences or the schoolbiocracy, but by finding the learners open-mindedness.

My comment: *For many years I have thought about assessment in schools and universities and I often wondered if the existing scientific approach is the ideal method to test the actual knowledge acquired by the student. The questions may only test a certain part of the syllabus and secondly the learner who has a better auditive and verbal ability than writing ability is not given the opportunity to show his full*

*potential. What Reich says is that the degree of open-mindedness of the student needs to be included in the assessment.*

• The most inspiring theory I discovered was when I came upon Reich's theory of distinguishing three constructivism levels namely 1) Construction by which he says that we are the inventors of our reality' 2) Reconstruction, which says that we are the discoverers of our reality and 3) Deconstruction, which explains that reality could also be different.

*My comment: The first two theories were also distinguished by Terhart and Siebert, but the deconstruction theory brought about a new perspective which I had not encountered before. It opened a new world for me and I could understand that all possible realities might also be different. It was mentioned by Siebert that if 20 people had received the same information there would be 20 different report backs on the information. The reality of each individual may differ from the world of another individual and could even be the complete opposite. This may bring us back to the basic question of "What is truth?" For Reich truth may also be another perspective and needs to be acknowledged. He believes that in a constructivist didactic all should become deconstructivists, to find their way back in a circle of construction and reconstruction. It depends on the content and situation as to which of the perspectives are to be applied.*

What I have noticed during the time I  met Reich and his constructivist theory, is that he is a man who has done a great amount of research in the field of constructivism and has written more articles and books than most of the other constructivists, besides Siebert. Both have made a large contribution towards bringing constructivism to the foreground in Germany. What I have noticed is the depth and wide perspective which Reich has in this field. His approach is critical and clear.  He has made a lasting impression on me and I have learned to appreciate the work of this man.

**The review**

As mentioned above, I sent the article to the approached specialists and asked them for a short review on my interpretation and opinion of their perspectives. Reich pointed out some possible misunderstandings and firstly addressed the difference I distinguished between his approach of what reality was with the reality of Terhart and Siebert. He did not agree with the fact that I had used his approach as an opposition. He says the following:

"Die Realität ist auch bei mir als konstruiert gedacht. Erfindungen (inventions) sind Konstruktionen. Daher sollten Sie diesen Gegensatz aufgeben. Der Unterschied zu Siebert liegt vielmehr darin, dass ich stärker auf den sozial-kulturellen Hintergrund aufmerksam mache und deutlicher als er den radikalen Konstruktivismus wegen seines Subjektivismus kritisiere. Damit stelle ich mich auch ´stärker auf die amerikanische kollektivistische Sicht, gerade weil ich an Dewey anschließe. Dies müssen Sie stärker herausstellen, denn es macht für mich gar keinen Sinn, den deutschen Konstruktivismus etwa als individualistisch orientiert zu bezeichnen."(Reich)


For me reality is also constructed, inventions are constructions. Therefore you should give up this contrast. The difference between Siebert and I lies rather in the fact that I concentrate on the social-cultural background and I am more critical about the radical constructivism than he is since I think that he sees it too subjective. Thus I want to stand more on the side of the American collectivism, because I  support Dewey. You need to make this clearer since it does not make sense to establish the German constructivism as individualistically orientated. (Free translation)


*My reaction: I did not mean this as an opposition but rather as an addition to what Terhart and Siebert are saying. I therefore changed the wording to avoid misinterpretations.*


He secondly addressed the question concerning the differences the Germans have from American constructivists.

'Wenn Sie fragen, was uns vom amerikanischen Konstruktivismus unterscheidet, dann insbesondere eine stärkere philosophische Begründung und, das ist noch wichtiger, ein systemischer Ansatz. Dieser systemic approach zeichnet sich dadurch aus, dass vor allem aus Kommunikationstheorien und der systemischen Familientherapie Konzepte und Methoden aufgenommen werden. In meinen Methodendarstellungen nehmen die systemic methods einen sehr großen Raum ein. Sie erlauben Lehrenden und Lernenden sowohl bei der Inhaltsvermittlung als auch in den wechselseitigen Beziehungen (das didaktische Leben gestalten) mit einem noch nicht in der Pädagogik vorhandenen Repertoire an Methoden zu arbeiten. Dazu gehören Methoden wie das refraiming, sculpturing, circular questioning, reflecting teams und andere mehr."

If you ask what distinguishes us from the American constructivism then I would say especially a stronger philosophical approach and even more important a systematic approach. This systematic approach distinguishes itself from others by including communication theories, systematic family therapy concepts and methods. In my method presentation, the systemic methods take up a prominent position. They allow teachers and learners to work with a wide range of methods which include reframing, sculpturing, circular questioning, reflecting teams and others.(Free translation)

My opinion: *Although his approach may be in the trend of the Americans which includes both Learning Sciences and Instructional design, I do see something else in the interpretation of Reich. He has addressed issues the others have not and his work has a depth which has made the constructivism theory receive a new meaning. This means not only the creation of your own reality, but also the possibility that your construction of reality could be different. I respect his opinion, but from a postmodern approach I would again like to point out his individualism.*

The third point he addresses is concerned with the application of constructivism in Germany.

"In Deutschland sind konstruktivistische Ansätze schwierig, weil es hier eine lange Tradition von universalistischen und metaphysisch begründeten Ansätzen gibt, die sehr genau zu wissen meinen, was Realität ist. Deshalb gehört es bei uns zu den besonderen Ansprüchen, dies zu widerlegen und den eigenen Ansatz sehr umfassend zu begründen, um überhaupt ernst genommen zu werden. Der Vorteil ist dann aber auch, dass diese Begründungen für den englischsprachigen Raum interessant sein können, weil wir stärker auf Gefahren eines zu einfachen Konstruktivismus aufmerksam machen."

In Germany constructivist approaches are difficult, because we have a long tradition of universalistic and metaphysically founded perspectives, who think that they know exactly what reality is. Therefore it is a huge challenge to counter argue their opinion and you need to prove your own approach outstandingly in order to be taken seriously. The advantage is that this could be interesting for the English speaking countries, since we are strongly pointing out the dangers of simplifiying contructivism. (Free translation.)

My comment: *I find this interpretation most meaningful since he, as a constructivists, has realized the boundaries in his country. The observation which he makes is that the Germans are very confident about their concept of what reality is ,which makes the application of the constructivism theory very difficult in Germany. I therefore understand Reich's dilemma and also his wish to rather be associated with the American perspective. My question is that in how far this confidence in the correct form of teaching, may have impacted on the PISA result of Germany.*

# Chapter 4.  Conclusion

## 1. Summary

**Research question and result.**

Looking back at my research done in the field of constructivist learning methods, and trying to establish an answer to my research question:*What are the German voices saying about constructivism as an applied method in Germany,* the opinions of the three involved constructivists have given an indication of the approach and attitude of Germany in this field. Several similarities have been found as thoroughly depicted in the chapter 2, but some profound differences have been found, which lie in the approach towards the actual existence of constructivism, which is questioned by Terhart, the more intrinsic philosphical approach of Siebert and the actual movement into the application of constructivism by Reich.

What has become evident is that Germany in general *may have to take an active step to apply the ideologies and philosophies of what constructivsts want to achieve*. It may still be a long journey, which will need more understanding of this learning theory.

## 2. Discussion

### 2.1 Methodological reflection.

My initial objective was to perform a comparative study on American and German opinions and perspectives on constructivism. In order to receive hands-on relevant information from the actual constructivists in the respective countries, I addressed  two constructivists in America and two German constructivists in the form of an e-mail. In America I chose Merrill and Jonassen and although Merrill is not officially considered to be an constructivist, I included him, since his model of First principle's is accommodating the constructivist thought of application and integration. Jonassen was the other constructivist I wanted to involve, but since both Americans did not respond favorably to filling in the questionnaire and immediate response was

received from the Germans, I had to change my original idea and concentrated on the literature of the German constructivists and to find their opinion on this topic.

Studying the literature of German constructivists, Terhart, Reich and Siebert, I chose the article of Terhart, who questions the existence of constructivism as a new learning method and used his article as background to the interpretations and perspectives of the German constructivist thinking. Thereafter I addressed Reich and Siebert personally in the form of questionnaires, which were sent to them electronically.

Several articles and literature of the constructivists were used to establish their opinions and the questionnaires were interpreted. The comparison was made from these sources.

Since this is a qualitative form of research, where opinions are asked and interpreted, the result is mostly an interpretation and not an absolute. I would have preferred to have included case studies of application of the mentioned German constructivists in the class room, but as this methodology still seems to be in an embryonic state i.e. more philosophical, it was not possible to include case studies.

## 2.2 Substantive reflection

What seemed to be a dead end with the Americans not participating, actually became a more focused research in the attitude and approach of Germany, which could possibly represent other European countries. The only previous research of this kind has been addressed by Spector in his article, and I would like to adhere to his challenge towards  the voices of other countries and continents to participate in this study in order to establish the direction on which this learning theory has developed in their specific country up to date.

There might be a movement towards this methodology in other countries, but one may only be able to establish this by actual research.

It may also be also be a methodology which connects to the actual "Zeitgeist" of a country. The political impact on an educational system may not be excluded, as it may greatly influence the methodology which is applied in the classroom. It may be quite possible that a more liberal and accommodating government may open its doors for the constructivit approach, where each learner may have his "freedom of speech", whilst a more conservative political leadership may rather implement or stick to the behaviouristic approach.

## 2.3 Scientific reflection

The contribution of this research to the so- called 'body of knowledge' lies in the fact that constructivism needs to be developed further and deeper in the German curriculum. In Reich's review to the article he is, however, sceptical about whether this will happen since the Germans need a great deal of persuasion to accept another reality as the truth.

Considering the challenge of Spector to hear more voices in the debate about the position and application of constructivism in other countries I have given a snapshot of what its position is at the moment in Germany during this specific day and age. As the development and application of learning methods are constantly changing and adapting to the requirements of the times, this may change and alter in the following years to come. It may move back to the behaviouristic, frontal teaching method or the computer may be applied in a behavioristic way or it may happen that the development may be in a selfdiscovery of knowledge by use of the computer.

What may not be argued away is the library of knowledge which is growing daily and made available to all computer uses in the form of

the internet. How it may be used or applied lies in the hands of the political leaders and the educationists of a country.

## 3. Recommendations

As a German speaking South African, the  direction in which I would like to continue my research for a Phd would include the study of curriculi of Germany, South Africa and Finland. I have become aware of the shortcomings of the South African Outcomes Based Education (OBE) curriculum and am asking the question, "What are the shortcomings in the content and application of the curriculum?" The greatest concern in the circles of educationists is the low pass rate of matriculants in South Africa, which is  68% for the year 2005. This problematic situation is also reflected in the high rate of matriculants not passing the University entrance exam which has brought about a serious debate about the methodology, the didactics and the teaching approach in the classroom.

As a comparison I would like to establish the situation of the German educational system, which as mentioned above, has also been identified to be experiencing a backdraw in the international PISA study. In contrast to the above, I would like to look into the Finnish curriculi who at present are the top achievers in the PISA study.

As this will be a comparison of first and a third world countries, several completely different factors may be contributing to these problems. It will however be enlightening to look into the situations separately and then to find possible similarities and finally finding solutions towards addressing these problems. One of the possible factors may be the historical background of Germany and South Africa, since both have been undergoing a process of bridging the gaps of different "worlds". In South Africa it might be the seperation of cultures and education departments during the previous regime, which are no longer separated and are using the same syllabi. In Germany it might be due to the fact that the seperated Germany has now become one nation after the fall of the iron curtain.

Another may be the due to the fact that the methodology needs to be addressed in order to adapt to the challenges of the academic world. Hereby I do not want to imply that Germany may be on the same educational level as South Africa, but I do hope that this research may bring the countries closer together.

If one considers the successes of the American and the Finnish educational systems, it may be worthwhile for the German and South African education departments to get on to the bandwagon and to apply the principles of constructivist thinking in their school curriculum. This is after all a theory which originally developed in Europe and if one considers the fact that we are living in and developing towards a computer-integrated society, it may be worthwhile to address the possibilities of other learning methodologies as possible realities, as Reich has stated in the construction-deconstruction-reconstruction theory: Another reality may also be a possible reality, "Es könnte auch anders sein".

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# Appendix

## Original letter of request to the involved parties.

**Umfrage bezüglich der neuen Tendenzen im Bereich des Konstruktivismus in Europa und Amerika. 10 Minuten**

File   Edit   View   Tools   Message   Help

Reply   Reply All   Forward   Print   Delete   Previous   Next   Addresses

OE removed access to the following unsafe attachments in your mail: Terhardt.pdf,merrill.pdf

**From:** Walter Johannes
**Date:** Saturday, July 30, 2005 10:28 PM
**To:** Reich
**Subject:** Umfrage bezüglich der neuen Tendenzen im Bereich des Konstruktivismus in Europa und Amerika. 10 Minuten
**Attach:** Questionnair2.doc phd.doc (25.6 KB)

Dear Professor Reich, Siebert, Jonassen and Merrill

At the moment I am doing research on the new tendencies of constructivist learning and computers, under the supervision of Prof Johannes Cronjé. I would like to include **your opinions** in my research article and have therefore compiled a questionnaire, which I truly hope you will be able to answer.

The questionnaire consists of ten questions and should not take more than 10 minutes to answer.

I have chosen two German and two American constructivists, since it may be very interesting to establish if your opinions on this subject differ or if you are agreeing on specific aspects.

I am a Masters student at the University of Pretoria in South Africa and am very interested in this subject, since our government has implemented a "new" constructivist learning approach in our schools.
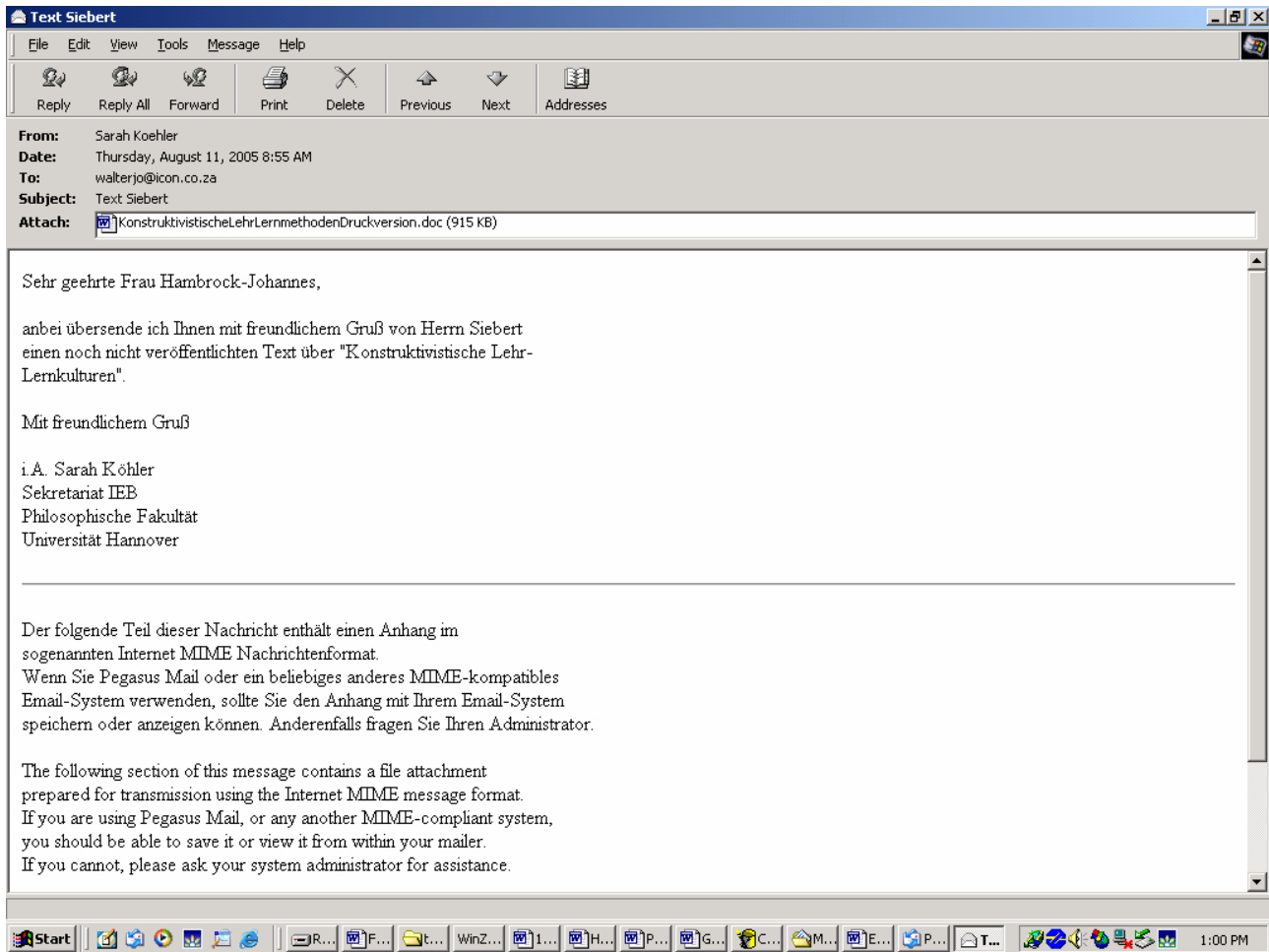
As soon as I have completed my article I will gladly send you a copy.

I thank you for your time and interest.

Yours truly
Helga Hambrock-Johannes

Start   Removable Disk (E:)   Final_Article_helga_hj...   Sent Items - Outlook ...   Umfrage bezüglich ...   7:41 PM

# Text of Horst Siebert

**Text Siebert**

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**From:**      Sarah Koehler
**Date:**      Thursday, August 11, 2005 8:55 AM
**To:**        walterjo@icon.co.za
**Subject:**   Text Siebert
**Attach:**    KonstruktivistischeLehrLernmethodenDruckversion.doc (915 KB)

Sehr geehrte Frau Hambrock-Johannes,

anbei übersende ich Ihnen mit freundlichem Gruß von Herrn Siebert
einen noch nicht veröffentlichten Text über "Konstruktivistische Lehr-
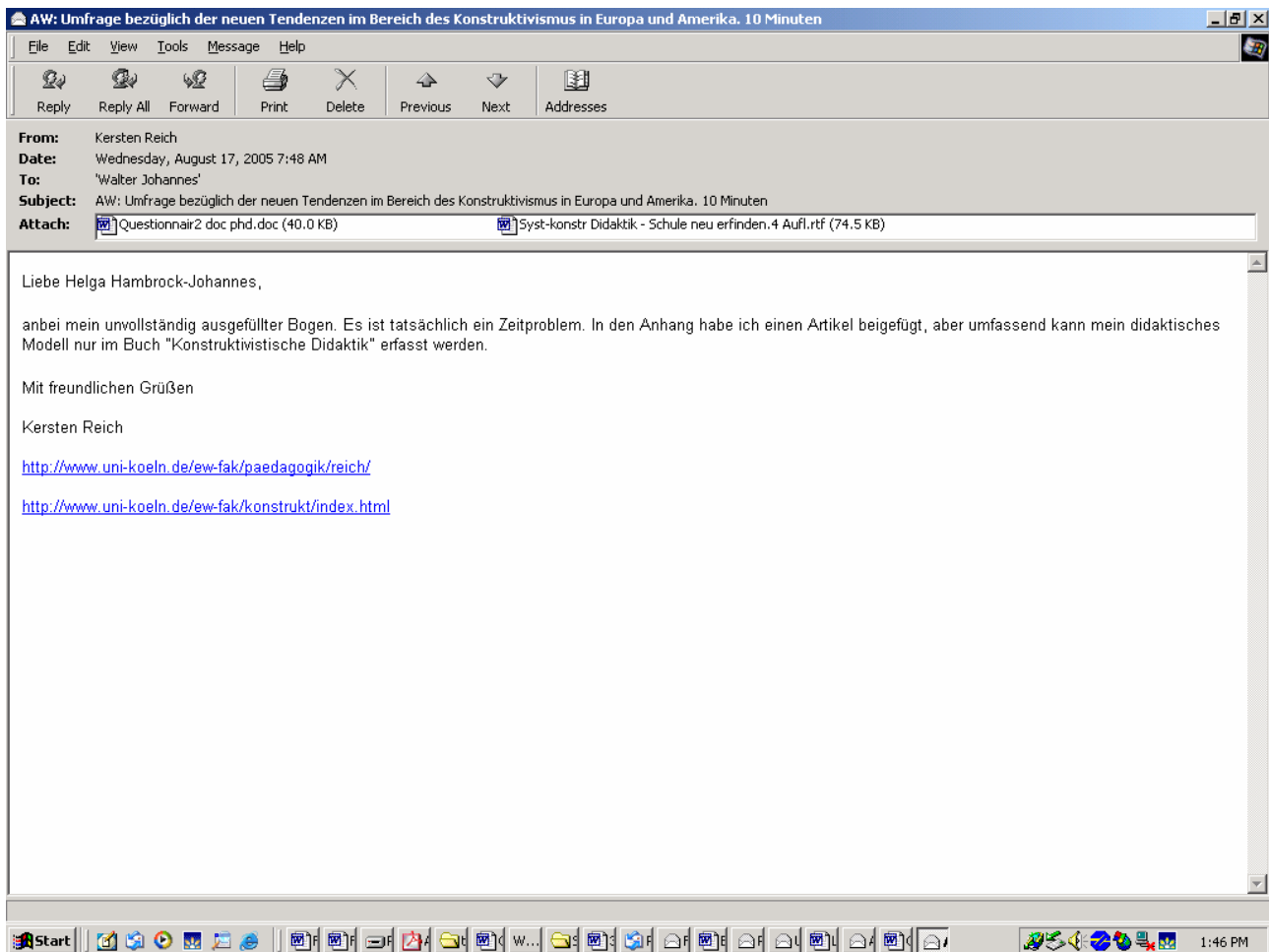Lernkulturen".

Mit freundlichem Gruß

i.A. Sarah Köhler
Sekretariat IEB
Philosophische Fakultät
Universität Hannover

_____

Der folgende Teil dieser Nachricht enthält einen Anhang im
sogenannten Internet MIME Nachrichtenformat.
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Email-System verwenden, sollte Sie den Anhang mit Ihrem Email-System
speichern oder anzeigen können. Anderenfalls fragen Sie Ihren Administrator.

The following section of this message contains a file attachment
prepared for transmission using the Internet MIME message format.
If you are using Pegasus Mail, or any another MIME-compliant system,
you should be able to save it or view it from within your mailer.
If you cannot, please ask your system administrator for assistance.

Start | 1:00 PM

**Letter from Kersten Reich including questionnaire and article used in this research.**

AW: Umfrage bezüglich der neuen Tendenzen im Bereich des Konstruktivismus in Europa und Amerika. 10 Minuten

File   Edit   View   Tools   Message   Help

Reply   Reply All   Forward   Print   Delete   Previous   Next   Addresses

| | |
|---|---|
| **From:** | Kersten Reich |
| **Date:** | Wednesday, August 17, 2005 7:48 AM |
| **To:** | 'Walter Johannes' |
| **Subject:** | AW: Umfrage bezüglich der neuen Tendenzen im Bereich des Konstruktivismus in Europa und Amerika. 10 Minuten |
| **Attach:** | Questionnair2 doc phd.doc (40.0 KB)     Syst-konstr Didaktik - Schule neu erfinden.4 Aufl.rtf (74.5 KB) |

Liebe Helga Hambrock-Johannes,

anbei mein unvollständig ausgefüllter Bogen. Es ist tatsächlich ein Zeitproblem. In den Anhang habe ich einen Artikel beigefügt, aber umfassend kann mein didaktisches Modell nur im Buch "Konstruktivistische Didaktik" erfasst werden.

Mit freundlichen Grüßen

Kersten Reich

http://www.uni-koeln.de/ew-fak/paedagogik/reich/

http://www.uni-koeln.de/ew-fak/konstrukt/index.html

Start   W...   1:46 PM

## Questionnaire1 : Kersten Reich

| | |
|---|---|
| 1. | **Considering Terhart's article: 'Constructivism and teaching: a "new paradigm" in general didactics', do you agree with his opinion? Could you give a brief explanation of your opinion? (See article as attachment.)** |

Ich stimme überhaupt nicht überein. Terhart hat eine sehr einseitige Auswahl getroffen, er hat mit der Kategorie neu und alt eine zu vereinfachende Perspektive gewählt und insgesamt den Kontext des Konstruktivismus nicht hinreichend bearbeitet.

| | |
|---|---|
| 2. | **In which country, in your opinion, did the constructivist approach in teaching begin?  Was it developed in Europe, or were the American Educationists the first to apply this approach? Kindly explain your answer.** |

Mehrere Entwicklungen, die hauptsächlich drei Quellen aufweisen: Dewey, Piaget. Vygotsky.

| | |
|---|---|
| 3. | **Would you say that your countries approach towards constructivist teaching differs from the learning models of other countries? If yes, please explain.** |

Ja, mein Ansatz unterscheidet sich deutlich. Siehe dazu mein Buch "Konstruktivistische Didaktik" (3. Aufl. 2005) und http://methodenpool.uni-koeln.de

| | |
|---|---|
| 4. | **Which researchers do you consider as the most important forerunners in the field of constructivist learning?** |

Dewey

| | |
|---|---|
| 5. | **Considering Merrill's model of First principles, do you agree with the process of learning as depicted by him in the form of four quadrants? Please explain your answer. (See article as attachment).** |

*No answer*

| | |
|---|---|
| 6. | **Do you have a specific model, which you would suggest as the most applicable in the learning process?** |

*No answer*

| | |
|---|---|
| 7. | **Do you find differences and / or similarities between the fourth quadrant of Merrill's 'First Principles and the classic Didactics Theory of Blankertz.** |

*No answer*

| | |
|---|---|
| 8. | **Looking into the future and considering the recent PISA study, do you think that constructivism will stay or become the teaching/learning model of the future? If not, in which direction are the newest curriculums developing?** |

Ja. *Yes*

| | |
|---|---|
| 9. | **Do you think that there may be weaknesses in the constructivist learning approach? Please explain your answer.** |

Kein Ansatz ist vollkommen, alle müssen sich entwickeln. *No perspective is perfect , it needs to be developed.*

| | |
|---|---|
| 10. | **How will globalization impact on constructivist learning?** |

*No answer*

## Questionnaire 2: Horst Siebert

| |
|---|
| 1. **Considering Terhart's article: 'Constructivism and teaching: a "new paradigm" in general didactics', do you agree with his opinion? Could you give a brief explanation of your opinion? (See article as attachment.)** |
| I agree with Terhart's description, but not with his conclusion. Constructive methods of teaching and learning are new and differ from instructive methods. |
| 2. **In which country, in your opinion, did the constructivist approach in teaching begin?  Was it developed in Europe, or were the American Educationists the first to apply this approach? Kindly explain your answer.** |
| I suppose, that American educationists were the first, who applied this concept. In Germany constructivist ideas in the educational system were practiced since the beginning of the nineties. |
| 3. **Would you say that your countries approach towards constructivist teaching differs from the learning models of other countries? If yes, please explain**. |
| The German approach seems to be more philosophical. Constructivism is a new perspective on learning and teaching. |
| 4. **Which researchers do you consider as the most important forerunners in the field of constructivist learning?** |
| Important forerunners are in my opinion H. Maturana, F. Varela, E. v. Glasersfeld, P. Watzlawick. |
| 5. **Considering Merrill's model of First principles, do you agree with the process of learning as depicted by him in the form of four quadrants? Please explain your answer. (See article as attachment).** |
| I agree with Merill's model of first principles, if knowledge and skills ("well structured goals") are learned (f.e. vocational training, foreign languages). |
| 6. **Do you have a specific model, which you would suggest as the most applicable in the learning process?** |
| My discipline is not learning in schools, but adult education. Therefore I prefer concepts of self-directed learning, metacognitive learning, and biographical learning. |
| 7. **Do you find differences and / or similarities between the fourth quadrant of Merrill's 'First Principles and the classic Didactics Theory of Blankertz**. |
| Blankerts describes several didactic concepts. He has no own didactic model like Merill. Therefore they are not comparable. |
| 8. **Looking into the future and considering the recent PISA study, do you think that constructivism will stay or become the teaching/learning model of the future? If not, in which direction are the newest curriculums developing?** |
| I hope, that constructivist thinking will become dominat in schools. Pupils have to learn different ways of constructing their life and their world. |
| 9. **Do you think that there may be weaknesses in the constructivist learning approach? Please explain your answer.** |
| Weaknesses seem to be the curriculum development and the evaluation of learning results under traditional conditions. |
| 10. **How will globalization impact on constructivist learning?** |
| In a global world we have to learn to accept different multicultural values and ways of thinking. |

## Acknowledgements

Thank you to Prof. Johannes Cronjé for his inspiration and support during my studies. His enthusiam kept me going in times when the time was little and the energy levels low.

Thank you to Prof. Terhart, Reich and Siebert for their valuable contribution to this study.

Thank you to my children, Heinz-Werner Hambrock and Lara Hambrock, who had to bear with their mother spending many hours in front of the computer.

Thank you to my sister Reinhild Niebuhr who has been a major motivator and supporter, especially during the times when things got out of hand.

Thank you to all my friends who understood that I did not have much time for them during these past two years.

Thank you to Deanne Struwig my special English specialist friend, who proof-read my work in a very restricted time.