Learning by teaching (LdL): Conceptualization as a source of happiness

JEAN-POL MARTIN

Caveat: This is not a professional translation. It is a machine-translated English version of the German original (URL see end of text), made by deepL.com.

Preface

At the beginning of the 1980s, the author of this article, a grammar school teacher and French teacher in Eichstätt, had the idea of delegating teaching duties to his students in French lessons (Martin 1985). This was primarily intended to increase their intercom share, because only by speaking can one learn a language. Furthermore, the assumption of teaching functions would lead the students to intensive, authentic communication, thus making them more communicative. Finally, the procedure would increase the motivation of learners, because they would be more involved. All these goals have been achieved. In particular, the motivation of learners was greatly increased. In search of a theoretical explanation for this increase in motivation, the author devoted himself to research into needs, but at the same time came across the neurosciences, which were still more peripherally involved in educational science at the time.

1. Learning by teaching

The method "Learning by teaching" (LdL) in its modern form has existed since 1985 (Grzega, 2011, p.13). Initially limited to foreign language teaching, the application gradually extended to all other subjects, learning levels and teaching areas. Within the last decades, LdL literature has reached an unmanageable volume (Oebel, 2009, p.507 ff.). Therefore, only the core characteristics of the method are recalled in the following:

"When pupils open up a subject matter section independently and present it to their fellow pupils, when they also check whether the information has actually arrived and when they finally ensure that the material is internalised through suitable exercises, then this corresponds ideally to the method of learning by teaching (LdL).

The quoted definition from the Basic Essay on Theory and Practice of LdL (Martin 2002) summarizes the method well. The newly acquired material is divided into small sections and entrusted to two students for teaching in class. The preparation takes place in class time. It turns out that after an adaptation phase most students are able to present the contents to their classmates competently and practice with them (Cau, 2015).
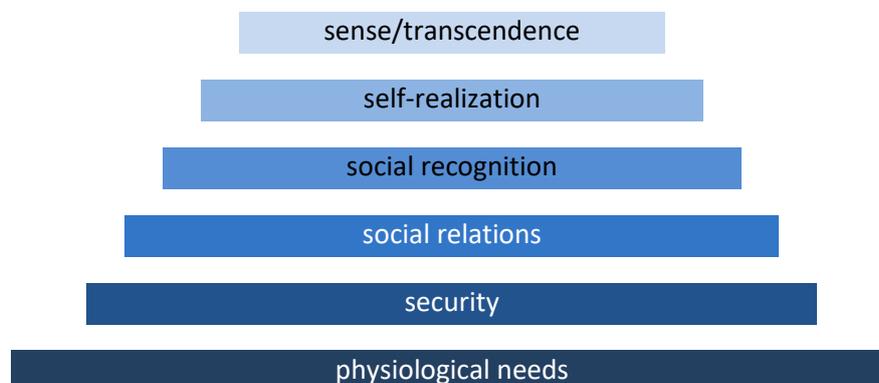
2. Happiness: basic needs, control, flow and LdL

The literature on happiness cannot be overlooked (Bormans 2011). Happiness can be defined as a permanent state of emotional well-being, with downward and upward fluctuations. The emotional state is controlled by the satisfaction of needs and their physiological correlates (e.g. release of dopamine, oxytocin, adrenalin). In the positive area, intensive flow experiences (Csikszentmihalyi 1999) stand out under certain conditions, which can last longer. If you want to make people feel happy, it is a good idea to put them in situations that induce flow.

With regard to teaching according to the LdL method, the question arises as to which needs the pupil better satisfies when not the teacher but the pupil introduces the new material in the plenum and practices it with his or her fellow pupils.

2.1 The basic needs according to Maslow

Pyramid of needs

sense/transcendence
self-realization
social recognition
social relations
security
physiological needs

The Maslow model (Maslow 1981) is widely accepted and need not be discussed here. It summarizes the needs that motivate people to act. If they manage to achieve an acceptable level of satisfaction, they experience a relatively stable feeling of satisfaction. Maslow distinguishes several levels of needs, starting from the physiological-biological ones, whose satisfaction is indispensable for life support, through the need for security, for social inclusion and recognition, for self-realization up to the need for meaning or transcendence.

More than teacher-centred models, the LdL method seems to be suited for satisfying these basic needs: As far as the level of physiological needs is concerned, the LdL method leads to more movement in the classroom. The students practise partner work, prepare posters, and their teaching includes pantomimes and role-plays. Your confidence in expression and appearance grows from presentation to presentation. Classes are kept free of grades so that students are not afraid. Evaluations are carried out in specially designed phases. If the pupils convey the contents, the social needs are better satisfied, because the demanding task brings the partners together and with successful material mediations the participants are praised intensively by their classmates and the teacher. Self-realization is therefore made more possible, because each student can bring to the presentation of the material the skills he or she has, for example musical or graphic skills. Overall, there is the feeling that all teaching activities are embedded in a demanding context.

2.2 The need for control

Emotion research points to the importance of the feeling of control (Austria 1981, 24ff). Dörner (1983, 433) states: "An essential characteristic of emotions seems to us to be that they are reactions to experiences of loss of control, regaining control, having or not having control. (...) U.E. generates loss of control emotions such as fear, terror or fear. "regaining control generates emotions such as pride, triumph, joy." In everyday language, control means "having the situation under control". Closely considered, control is existential in the sense of life support. Permanent loss of control leads to death. The feeling of control signals that you are able to sustain your life. And the goal of every activity and every action is to preserve life.

Against this background, it is striking that all the basic needs listed by Maslow can be subordinated to an all-encompassing need, that of control. In fact, the physiological needs correspond to the task of keeping the individual functioning by maintaining and supplying energy. This starts with brushing your teeth, continues with breakfast and extends to all activities that are beneficial to your health. With regard to sexuality, which belongs to the physiological needs, it does not aim at the life support of the individual but at that of the species. Physiological needs therefore signal that action is needed at the level of the organism and that its functioning must be kept under control. The next level, the need for security, is also about control: the individual feels comfortable if he or she is not threatened and keeps his or her habitat under control. The need for social inclusion corresponds to control at the social level. When people are integrated into a social network, they have more resources at their disposal to "keep their field of life under control". This applies accordingly to the need for social recognition. When people are recognized, they strengthen their self-confidence and their sense of control. In the next stage, the level of deficit needs will be left. The need for self-realization is a need for expansion. Here the point is no longer to maintain control, but to extend it: when you feel talents, for example musical talents, then it urges you to develop the corresponding abilities and "get a grip" on the - extensive - field of music. The same applies to sporting activities, the acquisition of knowledge, the discovery of foreign countries. In this way, the cognitive and emotional map is expanded. You "control" more and more areas of the world. Finally, the need for meaning can also be subsumed under the generic term "control". Man also strives to understand his life cognitively. He wants to know what drives him, discover reasons for his successes or failures and recognize causalities. Religion and philosophies offer meanings that give people a feeling of control and thus security. Not only for life, but also beyond death.

2.3 Information processing and control

Information processing is not the goal, but only a means. Without the permanent processing of the information flowing from the environment, the organism would very quickly be decoupled from the environment and no longer viable. It must be used for permanent cognitive control of the environment.

In his study on motivation (Portele 1975), Portele concentrates on the positive feelings that trigger the processing of information at the neural level. The prerequisite is that the brain is supplied with adequate stimuli:

"First, organisms try to avoid or reduce over-activation. They try to increase under-activation. In this respect, they strive for an optimum of activation. (…)

8) In order to maintain the optimum of activation, the organism must constantly absorb new stimuli, because the activation triggered by a stimulus is reduced by adaptation. (...) The permanent state that is aimed for is the processing process, the continuous reduction of the deviation, the creation of always new consistency. (…)" (Portele 1975, 235 f.)

It's fun to process information. Not all information, though. A certain type of stimuli is required:

- Quantity: not too high and not too low (to avoid overstraining or understraining)
- Complexity: not too complex and not too simple
- Speed: not too fast and not too slow
- In order to achieve optimal activation and thus motivation, the learners must be given the opportunity:
- to turn to stimuli uncontrolled and unimpeded;
- finding information that encourages permanent processing.

Information Processing and LdL

In teacher-centred teaching, the teacher is usually the source of the stimuli. Both the amount of information and the pace of teaching are regulated centrally by the teacher. Learners need to focus on a single source and adapt their processing capacity to that source. You can only avoid underactivation or overactivation in exceptional cases. This can quickly lead to boredom. At LdL, students are given the task of presenting a given material and practicing it with their fellow students. You must prepare the information contained in the materials. This means that they select the content that they will later convey in the plenary. Already in this phase they are free to regulate the uptake of the stimuli themselves without external control. Your job is to make sure that:

- they understand the given material and pick out the essential elements (reduction of complexity) with regard to the mediation in the plenum;
- they teach in such a way that the fellow students are optimally motivated and guided to a full understanding (creating slides, diagrams, questions on the contents, guiding partner work);
- they plan a consolidation phase so that the learning group memorizes and automates the contents. All these tasks require a great intellectual effort from the students. They are required to a high degree.
- there is a possibility of independently selecting the information (informative stimuli) and processing it according to a self-chosen mode so that rewards are generated on the neuronal level, i.e. happiness, ensures lasting motivation.

2.4 Explorative behavior and flow

There is an urge not only to maintain but also to expand cognitive control of the way of life. Further fields of action are sought and cognitively penetrated. This applies to space, but also to time. You want to know other countries but also other, past epochs and also look into the future. This attitude should be supported in the classroom. Dörner (1983, 331 ff.) examines the characteristics of successful problem solvers and emphasizes their explorative attitude. An explorative attitude is the willingness of people to enter situations that contain a high degree of uncertainty. The logical chain can be described as follows: exploratory people seek out fields with which they are not familiar and try to assert themselves in these fields in a problem-solving manner. Every experience gained in this way is processed into an abstract, cognitive scheme. The more experience, the more schemes, the wider the cognitive map. A wide cognitive map ensures control over more areas, enables faster processing of new impressions and protects against emotional burglaries. It ensures that new situations are successfully mastered. The feeling of control is strengthened, self-confidence grows and thus the willingness to tackle unknown fields, i.e. to behave in an explorative manner again.

Explorative behavior must be rewarded. The control feeling achieved with explorative behavior in case of success culminates in the flow effect described by Csikszentmihalyi (1999). From his point of view, flow is a feeling of flowing, of merging into an action. The prerequisites are the following:

- Enter unknown fields, discover new things;
- Open-ended situations for which one is responsible;
- Solving problems, mastering high demands;
- Exploitation of your own resources;
- Feeling of self-limitation;
- Control over one's own actions and the environment.

In principle, any demanding exploratory activity can lead to flow. Sports such as sailing or riding have the characteristics that induce flow. Teaching, lectures, workshops are usually connected with flow if you keep control of the process.

Explorative behavior at LdL

The task of introducing a new substance initiates a chain of activities that are all aimed at cognitive control of content. Since a didactic strategy is being developed at the same time, various presentation models must be developed and memorized as options so that they can be used as alternatives in the concrete teaching situation depending on the course of the classroom discourse. Planning lessons means developing complex scenarios on stock that ensure maximum cognitive control. If these tasks are delegated to students, an unlimited field for gaining control at a high level opens up. If the lessons succeed in the concrete situation, the actors are rewarded with intensive flow.

2.5 Providing instruments for cognitive control

The needs research with the needs pyramid and the neurosciences with the findings on information processing provide useful thinking tools. They provide explanatory models for the functioning of people and groups of people. These cognitive instruments are made available not only to teachers but also to students. System-theoretical elements are added as a supplement.

2.5.1 Systems in the field of tension between antinomies

With system theory another heuristically fruitful analysis model can be offered. Observations from biology, physics and psychology show that entities maintain their inner-systemic balance by permanently establishing the balance between integration and differentiation. Systems are continuously exposed to centripetal and centrifugal forces and must ensure that neither of these forces gains the upper hand (see also the law of entropy). If the centripetal forces are stronger, the system implodes. In the opposite case, the system dissolves. This knowledge can be applied to people and groups of people. People are in a tense relationship between antinomic needs.

Antinomic structure of needs

Control	Uncertainty
Order	Chaos
Clarity	Blurriness
Simplicity	Complexity
Integration	Differentiation
Society	Individual
Coercion	Freedom
Concretion	Abstraction
Linearity	Non-linearity
Centralization	Decentralization

People are consciously longing for order, clarity, simplicity... But they quickly become bored with such structures. Nature's blueprint provides that living beings are constantly training to reduce uncertainty, chaos, complexity and ambiguity. People are constructed to seek chaos, indeterminacy and complexity to create order, clarity and simplicity. The condition they have to restore to sustain life is the balance between both tendencies of need. The reward for these efforts are flow feelings. The fact that a balance

between the two tendencies of need is never definitely achieved means that people must constantly strive to keep their balance. As soon as we are integrated into a group, we pay attention to our individuality and do not want to be assimilated. We demand freedom. As soon as we are given a lot of freedom, we demand clear lines and a little more pressure. As soon as this pressure is exerted, we want more freedom. This applies to all dimensions. Political parties address different needs tendencies. Conservative parties thus address the need for peace and order. Progressive parties, on the other hand, address groups of people who view innovations and changes positively and are prepared to endure indeterminacy. Knowing this is very important, because it gives us the opportunity to analyse why we feel uncomfortable in certain situations and want to change the existing structure. It is even more important because we understand our fellow human beings better and can act in groups we lead against the background of their current needs. For each individual, the desired degree of freedom or leadership depends on the current situation. It is not possible to offer every individual in a group of people the degree of freedom or leadership that satisfies them at a given time.

2.5.2 Dialectical thinking

The tension between order and chaos, between centripetal and centrifugal forces, between integration and differentiation, between rationalism and empiricism, between "mind" and matter is recognized in philosophy. In this context, Hegel's dialectic using history as an example is particularly fruitful. In fact, development seems to unfold in the dynamics of thesis, antithesis and synthesis. In everyday life it means that every thought, every action leads to a counter-thought or counter-action. This counter-thought is to be welcomed, because it triggers a reflection which, if an effective strategy is used, is cancelled out in a synthesis. Dialectical thinking permanently leads to the integration of apparently contradictory positions that unite and develop on a (higher) line of balance. Especially for political actors this insight can be very fruitful, because it enables a common approach to problems across parties.

2.6 Conceptualization

On the mental level, information processing is connected with positive feelings. However, the most rewarding aspect of Flow is the conceptualization. Conceptualization is the creation of cognitive schemes that bundle extensive information into compact, action-motivating models. For example, overviews of the history of French literature from its beginnings to the present, the history of Europe from its beginnings to the present, etc. Creating such overviews means an intensive work of complexity reduction. On the background of great intellectual effort, a highly complex material is reduced and compressed in such a way that it can be communicated to addressees in an appealing way. This complexity reduction process in the preparation phase is rewarded with flow. Using Hegelian thinking as an example, the phases that teachers go through are described below: as a rule, when preparing the lesson, the group to whom the knowledge is to be taught is taken into consideration. The positive reactions of the audience are anticipated in spirit. The conceptualization efforts are motivated on the one hand by "conceptualization flows", and on the other by anticipating the flows entering the plenum when the material is attractively presented to the participants. In the sense of LdL, these activities are carried out by students with a corresponding increase in competence and motivation.

The procedure for reducing complexity is as follows:

First stage: the wealth of information to be memorized and controlled, in this case Hegel's life and work, initially conveys a feeling of helplessness.

Second stage: The first smaller knowledge units are created, so that control grows in sub-areas: one understands what Hegel means by being on oneself, being different and being on and for oneself. However, the feeling of helplessness still prevails.

Third stage: Gradually, gaps in understanding are closed. Even bulky terms, e.g. "being on and for oneself", are gradually becoming attractive objects that will later be offered to the participants in a repetitive manner. Only now does flow already occur during preparation.

Fourth stage: The individual, initially separate knowledge building blocks, in Hegel's case, for example, the "subjective mind", the "objective mind", the "absolute mind", are joined together, creating an overall structure that urges presentation. One would like to introduce the now understood Hegel to his group.

Fifth stage: The cognitive schemes created about Hegel's thoughts urge the teachers to act. Since they have understood Hegel and "control" his thoughts in the form of cognitive schemes, they want to convey their knowledge and adjust emotionally positively to the teaching situation. You want to experience the anticipated flow in class in real life.

In principle, it can be stated that although information processing makes a contribution to control, comprehensive, life-sustaining and life-promoting control can only be achieved in a stable manner through permanent conceptualization. LdL offers the possibility to lead the students to continuous conceptualization and to habitualize the corresponding techniques.

3. Thinking and happiness from the point of view of philosophy

Characteristic of Greek antiquity is the eudaemonistic attitude that is later to be found among the utilitarians, especially Stuart Mill. Satisfying needs is highlighted as a source of happiness, distinguishing between lower and higher pleasures. The more valuable pleasures are assigned to the realm of thought.

Aristotle from "Nicomachic Ethics" (Aristotle, 2010, p.17) should be quoted as representative of this attitude: "But those who think and cultivate this in themselves may not only enjoy the best constitution, but also be loved most by the deity. For if the gods, as we believe, have any care for our human things, we can assume that they have the best and most related joy - and this is our spirit - and that they reward those who love and respect this most with good, because they care for what is dear to them and act justly and nobly. But it is unmistakable that all this can be found excellently with the sage. So he is loved most by the deity; but if this, he must also be the happiest. "For this reason too, the wise man would be the happiest."

4. Project as a happiness-generating structure

In the search for task profiles that require permanent conceptualization, contain high potential for satisfying basic needs and at the same time permanently induce flow feelings, one quickly comes across the project structure. This is particularly true for the LdL method, which designs the entire teaching of the project: the responsibility lies with the pupils from the moment they receive the material to be taught from the teacher until the examination of their teacher success within the framework of their enquiries in class. This applies from the first hour at the beginning of the year to the last hour before the holidays. In this context, all conditions conducive to the satisfaction of basic needs are fulfilled: social inclusion, social recognition, self-realization and meaning, because the rapid and labour-intensive

learning of a foreign language and its cultural components (geography, literature, music, painting) is a meaningful occupation.

5. Globalization and the expansion of conceptualization spaces

In the classroom, explorative behavior and the urge for conceptualization are always limited. Digitalization and globalization have opened up new spaces. It is very favorable, because on the basis of LdL competencies are quickly acquired, which look for new expansion fields. Here, it makes sense to define the Internet metaphorically as a macrobrain and to recognize that people can interact rapidly and stably worldwide due to the new communication possibilities, as billions of neurons do in the brain. Just as thoughts emerge in the brain on the basis of neuron interactions, humans can enter the architecture of neuronal networks, jointly conceptualize and construct knowledge. To this end, the actors, especially the students, must behave "like neurons". Martin (2011a) has made bids for this in a slightly ironic form:

Neurons are open and transparent 2. neurons pass on their knowledge immediately. Since neurons are not afraid of making mistakes and embarrassing themselves, they fire very quickly from 4 When neurons are docked, they immediately react. 5. neurons try to make constant contact with other neurons; they are not afraid of being penetrating 6. Neurons are not offended 7. neurons do not pause; they do not take a break until their project is completed 8. neural networks play around 9. neural networks have a basic democratic attitude 10. note, HIGH DANGER: neuronal behavior must be controlled and used depending on the situation!

The recommended neuron behaviours refer to the individual in simple interactions. More comprehensive activities and initiatives are required for the implementation of Internet projects (Martin 2011b):

Basic rules for Internet projects

What I am looking for on the net are comrades-in-arms, people I can dock to carry out long-term projects with them. This is where sustainability, endurance and toughness count. In order to win comrades-in-arms for my projects in the virtual world, I observe the following rules:

1. make yourself transparent: provide as much information about yourself as possible in your profile that is exciting for the user. The more information you give about yourself, the greater the chance that someone will discover a starting point for collaboration. Fear of misuse of the information is usually unfounded. No risk, no fun!

2. offer motivating projects: Personally, I rely on Maslow's description of basic needs. My offers speak for the need for social affiliation and social recognition, for self-realization but above all for meaning, because only this is sustainable in the long term: we want to improve the world!

3. Contact a lot of people: If you are looking for comrades-in-arms, you have to address people, even if you can be penetrating to some. If you don't move, no one will notice you. If someone finds you penetrating, he wouldn't be a good working partner for you anyway.

4. if someone responds positively to your offers, nurture them: show them that you are interested in them. As a possible partner, he has certain "resources" that are valuable for the cooperation. These are the skills you need to discover.

5. always answer quickly (reaction speed), be present and reliable: Don't disappoint the people who invest energy and time for you. People and relationships are very volatile on the net, but you want to do more with people! You have plans with these people! They have to feel that!

6. put your partners on a stage and network them: If you want to work with people for the long term, you should connect them. Show them what they can do, bring streams of attention to them by mentioning them in bulk emails and pointing out their work.

7. keep thinking about exciting project goals and make sure that these goals are achieved. This is also important in the Republic of Lithuania, but even more so in virtual space, because - as already noted - the relationships in the network are particularly volatile. Participation initiatives demand that the initiator repeatedly provides impulses. Until the end.

These behaviors form what I call network sensitivity (Martin, 2009). They must be automated if you want to work successfully in the new paradigm. Anyone who has been socialised in the traditional scientific system has not learned this.

6. Conceptualization as a basic need and human right.

Happiness research (Bornmans 2011) leads to the realization that if one refrains from philosophical and metaphysical speculations, human happiness depends on the satisfaction of the basic needs listed by Maslow. However, Maslow does not list thinking (information processing and conceptualization). This is due to the fact that the neurosciences have only become aware of the functioning of the brain in recent decades. If this is indeed the case, human rights would have to be reformulated. The Declaration of Human Rights was drawn up in 1948 and was subject to different premises than those prevailing today. The terminology remains philosophical and religious, as can be seen from the blurred terms. Thus the central concept of dignity is indeterminate, opens up scope for countless interpretations and can hardly be operationalised. This also applies to other key concepts of current human rights such as brotherhood, equality and justice.

A reference to basic needs opens up other possibilities for implementation in everyday life and in legislation. If a human condition of happiness consists in reflection and participation in collective reflection on the future of humanity (Martin 2009), this activity should be a prominent part of the **Universal Declaration of Human Rights**.

Here **Martin's proposal** (below each section are the numbers of the articles from the *Universal Declaration of Human Rights,* which can be linked to the content of the respective text):

Preamble:Happiness The goal of all measures worldwide is the creation of structures (economic, political, ethical) that ensure more development for nature and happiness for all living beings. The following articles are the prerequisites for this.

General Declaration of Human Rights: not applicable

Article 1: Thinking

The central basic human need is thinking (information processing and conceptualization). Conditions must be created so that all people have access to information and the possibility of conceptualisation. Thinking presupposes the implementation of Articles 2 to 6.

General statement: Articles 18, 19, 26, 27

Article 2: Health

All measures are taken worldwide to enable living beings to satisfy their physiological needs (e.g. sleep, hunger, sexuality). Nature as a reservoir is treated carefully and gently.

General statement: Articles 24, 25

Article 3: Security

Worldwide efforts are being made to create structures that ensure maximum safety for all living beings. In this context, too, nature is treated with care.

General statement: Articles 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 17, 22, 28

Article 4: Social inclusion

It is ensured worldwide that living beings can move in a socially supportive environment. Structures are to be created that socially support self-realization.

General statement: Articles 1, 16, 20, 22, 25, 26, 27

Article 5: Self-realization and participation

It must be ensured worldwide that living beings can all develop their potential. Nature must be treated with care. The development of the individual can only take place within the framework of the structures surrounding him. There must be the possibility of influencing these structures, i.e. of participating. Society depends on as many people as possible making their intellectual, emotional and material resources available for this purpose.

General statement: Articles 12, 13, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27

Article 6: Meaning

It is ensured worldwide that living beings can experience their lives as meaningful and satisfying.

General declaration: not applicable

One advantage of this new formulation of human rights is its operationalizability. While "human dignity" or "freedom" are difficult to enforce directly because of their abstractness, "the right to good thinking conditions" is easier to put into concrete terms. Thus, a prisoner who is not given access to information, who is not offered a working group on topics of interest to him, will be able to insist on his right to conceptualization through routine work that is mentally understretched. This applies to a large number of professionals who do not experience an intellectual challenge in their workplace. If the satisfaction of the basic need for information processing and conceptualization is to become a human right, it requires a new organization of society with the goal of mobilizing all the thinking capacities of humanity worldwide so that we can solve the problems that arise and create a better world.

[…]

Works Cited

Aristoteles (2010). Das Glück des Philosophen. In: Michel, S. (Hrsg.) (2010). Glück. Ein philosophischer Streifzug. Frankfurt am Main: Fischer Verlag. S.9-17

Berger, L., Grzega,J., Spannagel, C. (Hrsg.) (2011). Lernen durch Lehren im Fokus. Berichte von LdL-Einsteigern und LdL-Experten. Berlin: Epubli

Bormans, L. (Hrsg.) (2011). Glück: The Worldbook of Happiness. Köln: Dumont

Cau, L. (2015). Lernen durch Lehren – ganz konkret. In: Pädagogik. Heft 02/2015, S. 20–23.

Csikszentmihalyi, M. (1999). Lebe gut! Wie Sie das Beste aus Ihrem Leben machen. Stuttgart: Klett-Cotta

Dörner, D. (Hrsg.) (1983): Lohhausen. Vom Umgang mit Unbestimmtheit und Komplexität. Bern: Huber

Grzega, J. (2011). Das Leben für Lerner und Lehrer spannender machen. Eine Einführung in LdL. In: Lutz Berger et al. (2011), S.11-19

Martin, J.-P. (1985). Zum Aufbau didaktischer Teilkompetenzen beim Schüler. Fremdsprachenunterricht auf der lerntheoretischen Basis des Informationsverarbeitungsansatzes. Tübingen: Narr Verlag

Martin, J.-P. (2002). Weltverbesserungskompetenz als Lernziel?. In: Pädagogisches Handeln – Wissenschaft und Praxis im Dialog. 6. Jahrgang, Heft 01/2002, S. 71–76.

Martin, J.-P. (2009): Lernziel Partizipation und Netzsensibilität. In: Oebel G. (2009) (Hrsg.). S.115-127

Martin J.-P. (2011a). Wie verhalten sich Neuronen? In: Lutz Berger et al. (2011), S.31-33

Martin J.-P. (2011b). Basisregeln für Internetprojekte. In: Lutz Berger et al. (2011), S.35-37

Maslow, A. (1981). Motivation und Persönlichkeit. Hamburg: Rowohlt

Oebel G. (2009) (Hrsg.): LdL - Lernen durch Lehren goes global: Paradigmenwechsel in der Fremdsprachendidaktik und kulturspezifische Lerntraditionen. Hamburg: Verlag Dr. Kovac.

Oesterreich, R. (1981) Handlungsregulation und Kontrolle. München: Urban & Schwarzenberg.

Portele, G. (1975): Lernen und Motivation. Weinheim und Basel: Beltz