Towards a constructivistic theory of self-directed learning

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Abstract
In this article a theory of self-directed learning is presented based on social constructivistic starting points. Social constructivism focuses on the exchange of perspectives on reality between people who are willing to maintain and strengthen each other's identities. For learning this means that perspectives and perspective taking are important processes in learning. Moreover collective meaning construction is essential. Learning is described as a social-interactive, contextual, constructive, self-regulated and reflective process. The theory focuses on three kinds of learning functions (preparatory, executive and closing) as building blocks that can be used in three different ways: in guided environments, in self-directed learning and in situations where learning is a side effect of other activities only. Learning functions are psychological processes and activities that people execute when learning, be it consciously or unconsciously. The three ways to learn (guided, self-directed, unconsciously) are described as three different ways to organize the same learning functions in different ways. We describe the success factors for these three ways to learn. Skills of self-directed learning are also different for the three ways to learn. In guided environments, skills of learner control consist mostly of executive learning functions. The skills for self-directed learning (or action learning in working situations) are described next. Here the preparatory and closing learning functions tend to dominate. Finally, skills of experiential learning are described. In this way of learning the key skill is to design and look for environments that may lead to unconscious forms of learning where the learning functions follow from action automatically.

Introduction

A theory of self-directed learning has, in our view, to answer four main questions: a) What kinds of self-directed learning should be distinguished? b) What kinds of activities of learners and teachers / counselors could be discerned? c) What kinds of roles and activities are expected of teachers, or counselors for the various kinds of self-directed learning? d) What are the skills and attitudes to be learned by learners in order to become a self-directed learner? In this article these four questions are answered from a constructivistic point of view. First we will explain what we mean with the term constructivism. Then we describe learning functions: important linking pins between learning and teaching that will be used to analyze and answer the remaining questions. Then follows an analysis of the various kinds of self-directed learning and an application of the distinctions proposed to a) the success factors of learning environments and b) the kinds of skills and attitudes needed for the three main kinds of self-directed learning. Finally, we will put things together in relating the constructivistic points of departure and self-direction in learning.

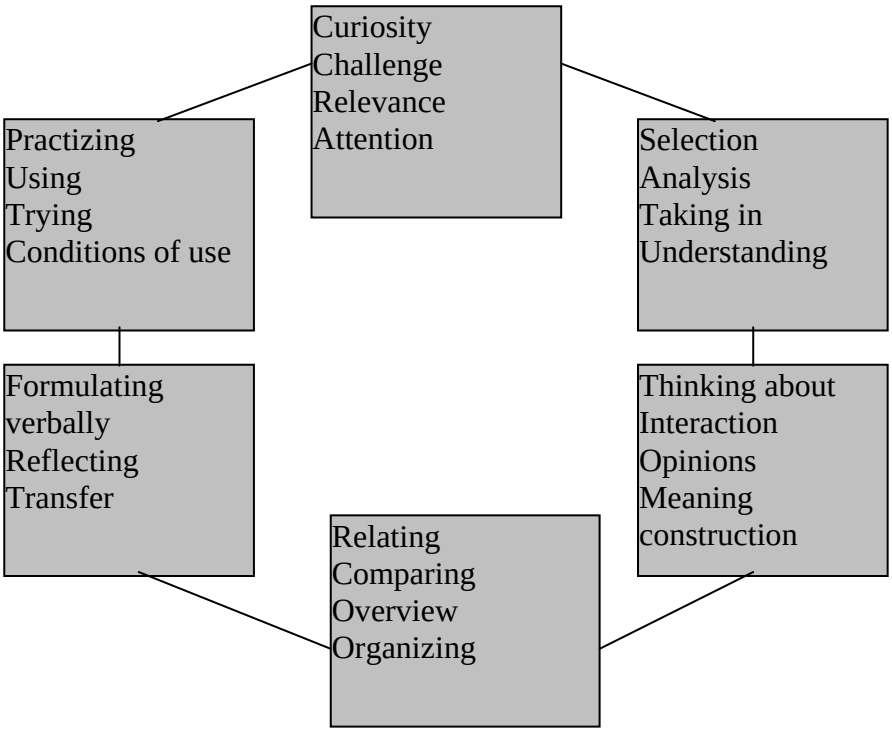
Constructivism and a theory of self-direction in learning

Constructivism (also called social constructionism) is a theoretical approach to human functioning originating in social psychology. (Gergen (1985). It stresses the fundamental social nature of human functioning. Human beings are not observing an objective reality nor are they taking in information that is just there. Instead, they are constructing and reconstructing their own interpretation of reality. The individual perspective of a certain situation a person is taking determines his / her behavior and not the so-called objective reality. But the groups one is functioning in codetermine this individual perspective. Furthermore, it is assumed that persons have a fundamental wish to maintain and strengthen their sense of identity (how they look at themselves through the eyes of others). Individuals do this in interaction with significant other people. On the one hand this means that perspectives are not totally individual but partly similar for people from the same subculture. On the other hand this also means that it is important to find out which people are considered to be important others. Important others are those people who are willing to maintain and strengthen a person's sense of identity (how the person sees himself as a person). Social comparison processes (Rijsman, 1984) are important ways to study and develop ones' identity. Significant others are mostly people who are nearby and in some respects similar to the person. People are not comparing themselves with distant and dissimilar others but with closely related others who are in one or more respects similar to the self. The persons, although codetermined by the subculture, can change their perspectives. The key process to do this is *reflection in action* (Schön, 1988*)*: trying and learning to reflect upon the way one is acting as closely related to the action itself as possible. With the help of other people one can become able to look at oneself and ones' actions a sit is occurring instead of through the lenses of our theories.

For a constructivistic theory of learning this social constructivism means that social processes are important for learning, both in educational situations, in working situations and in life contexts. The social psychology makes clear to the learning psychologist that construction of meaning with the help of significant others is very essential. Learning in other words is *a social interactive process* and interaction between learners and of learners with other people is very important. A theory of self-direction in learning should take this interaction-perspective into account.

People differ in the perspectives they have of situations. Their subculture, history and backgrounds as well as the significant others in their environment play important roles in constructing perspectives. Learning is the process through which people construct collective meaning and develop and construct their perspectives of situations. In professional education and in working life this means an enculturation in a community of practice. This means that these differences in perspectives should be taken into account and that people get opportunities to construct them. In this sense learning is a *contextual process*. Moreover, learning is also a *constructive process* in which deep processing of information means interaction with other perspectives. Figure 1 presents our overview of learning activities that are needed in a constructive way of learning.

Figure 1: learning activities



For a theory of self-direction of learning this also means that self-directed learning should be conceived as an active constructive form of learning in which learners are becoming better and better in designing their own learning environments. Thus, also *self-regulation* is an important part of it.

In learning it is important to *reflect* upon ones' perspectives and to become aware of the differences in perspectives. Reflection therefore is a third key process of learning. For a theory of self-direction in learning this means that reflection on action, as well as on learning itself should form important aspects of the skill of self-directed learning.

To summarize: a constructivistic theory of self-direction in learning should take into account that self-directed learning is a social-interactive, contextual, constructive, self-regulated and reflective process.

Learning functions as building blocks of the theory

Learning functions are psychological functions to be fulfilled before, during and after learning by a learner alone or with the help of outsiders like teachers, fellow students, computers or bosses (see Boekaerts & Simons, 1995; Simons, 1989). Apart from the basic functions described in Figure 1 there are metacognitive and affective functions to be fulfilled. Moreover, learning should also be prepared and closed. The Figures 2 to 4 present the major learning functions in preparing, executing and closing learning. Learning functions can be used to define learning skills and readiness: being able and ready to learn as a self-directed learner means being able and ready to execute the learning functions described in the three Figures on one's own. Thus a self-directed learner is able and ready to prepare learning independently, to execute the executive learning functions independently and to close learning independently.

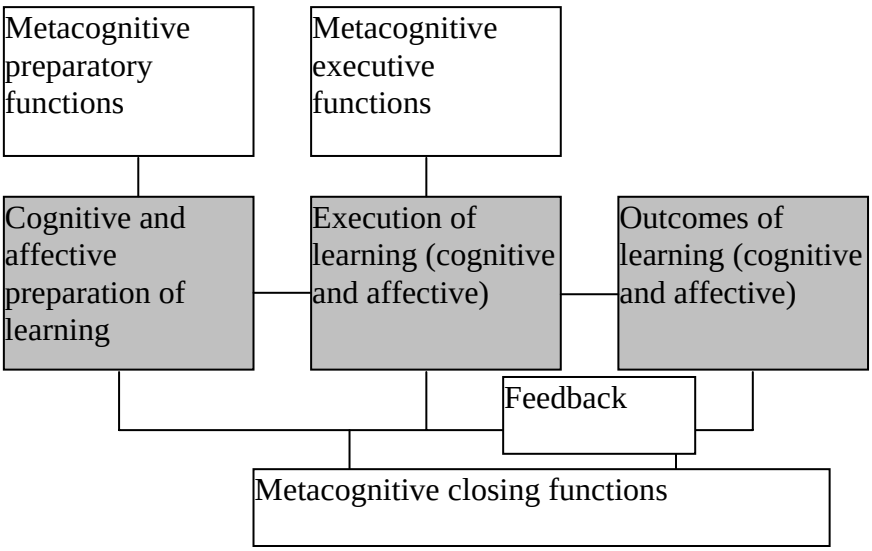
Figure 2: Preparatory learning functions
COGNITIVE PREPARATION Finding missing prior knowledge Getting an overview of knowledge, skills and attitudes to be learnt Mobilizing prior knowledge and skills for the task at hand Finding connections between prior knowledge and new information and skills AFFECTIVE PREPARATION Illuminating the relevance of the learning goals Building up self-confidence Directing attention to the learning task Preparing reward structures Trickering curiosity Finding challenges Soliciting interest Getting started Coupling intentions and plans METACOGNITIVE PREPARATION Orientation on learning goals Choice of learning goals and subgoals Orientation on learning strategies Choice of learning strategy Planning of time, sequence and places for learning

Figure 3: Executive learning functions
COGNITIVE EXECUTIVE FUNCTIONS Selecting information Thinking about information Coming to conclusions and own opinions Formulating conclusions verbally Getting overview Practicing and applying Getting an overview over application conditions and possibilities AFFECTIVE EXECUTIVE FUNCTIONS Maintaining curiosity Concentration management Persisting Upholding motivation and self-confidence Keeping intentions and plans coupled METACOGNITIVE EXECUTIVE FUNCTIONS Monitoring learning processes Monitoring learning outcomes Testing progress Diagnosing causes of failures and problems

Repairing Reflecting on the learning process
Figure 4: Closing learning functions
COGNITIVE CLOSING FUNCTIONS Summing up new knowledge and skills Thinking about future use and transfer conditions AFFECTIVE CLOSING FUNCTIONS Uncoupling intentions and plans Rewarding Judgement of results Attribution of outcomes METACOGNITIVE CLOSING Evaluating learning process Evaluating learning outcomes Reflecting

Figure 5 presents a graphical representation of the learning functions.

Figure 5: The relations between the categories of learning functions



The use of learning functions

The scheme of learning functions can be used to describe and analyze several aspects of learning and teaching, because they can be organized, executed and controlled in different ways. Sometimes a teacher, parent, manager, or counselor takes care of most or even all the learning functions (*guided learning*). The learner then just has to obey and to do what is told. This of course can hardly be called self-directed learning. At other times, the student is fulfilling all of the functions consciously. Then, of course this is truly *self-directed learning*. In many cases however there is a *division of tasks* between the learner and other persons (teachers, parents, managers, colleagues, etc.)

where the learner has control over some of the learning functions and the other person(s) over the other functions. Thus, for instance, the learning goals are in the hands of a teacher, but the learner decides the learning strategies. Another possibility that occurs frequently is that there is, instead of the division of tasks, collective control over the learning functions. Then, learners and the surrounding persons collaborate and negotiate about the way the functions are controlled and executed. This we call *collaborative control* over learning functions. Divided control and collaborative control are often called *learner control* when they are taking place in educational environments (see below). There is one other way to control and execute the learning functions: unconsciously and not controlled by any people directly. The learning is in these cases a side effect of working, problem solving or living. We call this *experiential learning*. Although the learning functions are in this case not controlled directly, there may be indirect control over the working, problem solving or living that codetermines the learning in a distant way.

Learning functions form, in our view, important psychological building blocks of a theory of self-directed learning, because they fulfil several functions. A basic assumption underlying our approach is that a learner will and often can not do and control independently what another person (teacher, etc.) is doing or controlling. The first use of learning functions is that they define good teaching as facilitating good learning The intrinsic relationships of teaching and learning are visualized and described in a way that makes it possible to keep focusing on learning. Secondly they can be used to analyze learning -teaching interactions. How does the way of teaching influence the way of learning and the amount and quality of self-directedness in learning? Thirdly, they make it better possible to distinguish various kinds of learning and various kinds of self-directedness in learning. Fourthly, they define learning skills and learning problems: what are important skills learners need in order to execute and control the various learning functions on their own (or in collaboration with other people?) Finally, they can be used to design integrated learning to learn approaches: how can learning the skills of learning be taught and learned?

In the next section we will describe the three main ways to deal with learning functions more fully: guided learning, action (or self-directed) learning and experiential learning. We will focus on the way the environment and or other people influence the way one is learning under the three conditions distinguished. After that, we will discuss the skills of self-directed learning in the three different situations using the learning functions described before.

Three ways to influence learning functions

In our view there are thus three different ways to influence learning: guided learning, experiential learning and self-directed learning (which we will call action learning when it is related to working (see below)). These three ways to learn can be compared with three different ways to undertake a journey: travelling, trekking and exploring. In these comparisons we will find possible success factors of the relationships between environmental influences and learning.

In organizing a collective *travelling* journey the guide is an expert who knows the way and who plans a trip. The guide tells about the various parts of the trip and acts as the decision-maker. What are important success-factors for such a trip? In analogy with a description by Schweiker (1993) the following factors may be

deduced. It is important that the leader or guide looks carefully to the wishes and needs of all travelers and to bring in their ideas in an early stage. They have to be asked where the journey should go to and commit themselves to the destination chosen. When the trip starts, it should be possible to start at different moments: some flexibility of starting times is important. During the trip the group should stay together, thus some coordination of tempo is important. During the trip the guide and scouts in the group should monitor how the group is proceeding: are they still on the right road? Is the destination still valued or should a change of route or destination be considered? They should also look for necessities to change the plans when changes in the environment occur.
Likewise in *guided learning* a trainer or teacher takes all the relevant decisions and the learner can and should follow him or her. He decides about the goals of learning, the learning strategies, the way to measure learning outcomes and he takes care of feedback, judgment and rewards. The learners should commit themselves to the decisions made and should follow and obey the trainer or teacher.
Success factors for guided learning are then:

- Taking differences in interests, prior knowledge and abilities into account.
- Good commitment to learning goals through good communication about it.
- Good communication about learning strategies.
- Tolerance for differences in starting speed.
- Co-ordination of tempo while on the way: keeping the group together; helping each other.
- Openness for new strategies, new goals through metacognitive control by the trainer and the participants
- Timing and quality of reward and judgment systems. What is measured and rewarded determines learning strategies.

In a trekking journey a group of people undertakes a trip without planning and organizing at forehand. One might think of a group of (young) people with their back-bags, walking or biking together. If a group member doesn't like the group anymore (s)he goes to another group or continues alone, perhaps meeting the group somewhere later on. They just go away on a certain date without any concrete destination planned. They just go where they agree to go and let their plans develop underway, depending on the circumstances like the weather, the people they meet, their feelings and so on. The group wants to be as flexible as possible and does not like to plan and organize. The main idea is going together and having fun. People agree to inspire each other and negotiate about the next steps on a day to day base. All members should, however, be heard and their needs should be fulfilled now and then. There is no fixed leader or guide. Everyone can and will be a leader, depending on the expertise available. Finding harmony is the main decision model. The group is very open and listens carefully to other groups of trekkers. Though the group members should share the essential values that guide the journey, there may be many differences outside of the group-life.

Likewise in *experiential learning* it is not so much a leader or even a predetermined goal that controls the learning. Rather circumstances, personal motivation, other people, innovations, discoveries, experiments etc. determine what and how one learns. There is not even an explicit set of learning goals. Instead, learning is a side effect of the activities one undertakes.
Success factors in trekking kinds of experiential learning are in our view:

- Interests, knowledge and action-plans of participants are put central.
- There are no explicit or very vague learning goals only.
- Long-term higher-order generic goals are thought more important than short-term goals.
- Learning from experiences is the key strategy.
- Each learner can have his / her own tempo.
- Team learning from and with each other is important.
- Metacognitive control of activities by the learners themselves.
- Extreme flexibility for new strategies, new goals: experimentation and innovation
- Reward and judgment systems tuned to discoveries and innovations

Between travelling and trekking one might discern a third way to travel: *exploring* like pioneers who explore new land. It is not having fun that guides them (as with trekking), but the need to get to find a suitable surrounding to start a new life. There is a sense of urgency that determines the route and destination in a certain perspective. It is looking for a place that fulfils certain criteria.

Likewise, there is in *action learning* (Revans, 1982) a much more active and explicit role for learners and learning goals than in experiential learning. Learning is central and not a side-effect, but the learners themselves determine the goals of learning according to needs arising in their actions (at work or elsewhere). Learning is not pre-organized and preplanned by an outsider or expert, nor is it depending on coincidental intrinsic motivations. It is self-organized and self-planned. Learners determine furthermore their own ways of self-testing. Reflection plays an important role in finding out what was learned and what should still be learned. Thus instead of letting the trainers decide about the learning goals, learning strategies and testing, these factors become not unplanned and unorganized as in trekking, but learners decide on their own, and they do this explicitly.
For action learning trainers the following seem to be success factors:

- opportunities to determine ones own learning goals explicitly
- opportunities to choose ones own learning strategies
- control of learning by learners
- self-responsibility for their own learning
- opportunities to learn independently
- opportunity for self-testing

The three ways to learn occur in school-situations and training as well as in work and life situations. The division of time over the three ways, however, is different in the different contexts mentioned. At work experiential learning prevails, in schools and training, however, guided learning gets more accent. But all three occur in all three different contexts. In home situations probably action learning is more prominent.
We see tendencies in the three contexts of learning (school, work, and home) to stress one of the other two ways of learning. Thus, in schools there is a plea for more independent learning (action learning and experiential learning). At work there is a tendency to return to still more experiential learning after we had a decade of emphasis on guided learning (training and workplace instruction).
It can be shown that current changes and tendencies in learning and instruction processes in the different contexts have to do with a change in the division of tasks and of time between the three ways to learn (see below).

Skills of self-directed learning in guided learning settings: learner control

In educational or work-environments fully self-directed learning is rare because of the pedagogical authorities and responsibilities of teachers and managers. This does not mean, however, that it is absent. There is a lot of self-directed learning in these environments because the authorities may give opportunities for self-regulation and because learners just take the opportunity to do as they like. We call these kinds of self-direction *learner control.* Skills of learner control refer to the competence of learners to take opportunities for self-regulation when given chances in regulated situations or when they decide to go their own way in spite of the control of teachers and managers. In the literature we found many characteristics of learners that have to do with this. In relation to our learning functions learner control mostly refers to the executive functions: Getting or taking chances to execute the executive learning functions independently within the constraints of the borderlines defined by the teacher, the manager or the institution. Thus, learner control means being able to control and execute the executive learning functions independently within the constraints of external control (see Figure 3). Moreover it means to be able to control and execute some parts of the preparatory and closing learning functions (Figure 2 and 4) as far as the environment permits opportunities to do so. This may mean, for instance, being able to choose learning goals out of a list of possibilities and within a range determined by the environment. Also trying to become aware of the goals and testing strategies of the teacher forms a skill related to learner control. Another example is being able to make a time planning for learning, when the environment permits one to determine this aspect of learning independently.

Skills of self-directed learning outside of guided settings: action learning

Outside of guided learning settings, like in some working environments or at home, people are forced to learn fully independently. All the skills that are needed for learner control are useful under these circumstances too. Moreover, there are some skills and attitudes that are specific for action learning. The most important ones relate to the preparatory ands closing functions of learning (see Figures 2 and 4). Figure 6 presents an overview of the most important skills and attitudes related to action learning (Candy, 1991; Van der Hoeven-van Doornum and Simons, 1994). Below we will give some examples.

Figure 6: Skills and attitudes related to action learning
Readiness to learn
Self-management of learning
Personal autonomy related to learning
Anticipatory schemes
Skills of learning and thinking
Subject matter autonomy
Metacognitive skills
Sense of personal control

The first refers to readiness to learn. This is the readiness to learn consciously and explicitly formulating ones own learning goals. Although all people learn all the time,

so we presume, there are differences between people in the extend to which they are ready to learn in a conscious and pre-planned way. Moreover readiness to learn in this way may be very domain-specific (see Candy, 1991). Self-management of learning refers to the skills people may have to regulate their own learning actively. From the Figures 2 to 4 one may deduce (see also Candy, 1991) skills like formulating learning goals, choosing learning activities, making a time planning, finding relevant criteria to judge ones' learning, etc. Personal autonomy relates to skills like being able to learn without pressure from others; persistence, keeping intentions and actions coupled (Boekaerts and Simons, 1993; Kuhl and Kraska, 1989), being disciplined, etc. Candy argues quite convincingly that personal autonomy is not a general personality characteristic but a more domain-related set of skills. Therefore we emphasize personal autonomy *as related to learning.* Anticipatory schemes are schemes and overviews that help people to make choices in a certain domain. They represent the general insights people have of a domain specifying what there is to learn for them in that field. Skills of learning and thinking concern skills like problem solving, deep level processing, critical thinking, creativity etc. Subject matter autonomy is the word Candy uses to describe the (tacit) skills people need when they are learning subject matter on their own. It has to do with the structure of a domain, with domain specific methodologies (the way one looks to the world through the eyes of a disciplinary expert), domain specific higher order skills, application conditions and possibilities, etc. Metacognitive skills are skills like orientation, monitoring, checking, testing, reflecting, etc (see Figures 2-4). A sense of personal control relates tot he affective motivational skills self-directed learners need. Examples are having the belief in ones' own possibilities, and attributional skills like seeing that ones' actions may help to reach certain goals.

Self-directed learning as a side effect: creating and looking for environments

In many situations learning is a side-effect of problem solving, working or acting only and it will appear as experiential or incidental leaning. There is no explicit regulation of learning, nor any conscious attempts of learners to regulate learning as such. They are regulating their actions, problem solving or working. Learning occurs unconsciously and is regulated by the environment. Thus there are no learning goals, no learning strategies and no testing of learning. Still there is learning, even very important learning. Although learners themselves do not organize this kind of learning, some organization is still possible, be it through pedagogical authorities or through learners themselves. The (work)environment can be organized in such ways that experiential learning becomes more or less probable.

What kinds of skills and attitudes do learners need when they do this themselves? The first set of skills and attitudes relate to being able and ready to work without help of experts (alone and with fellow students). This has to do with personal autonomy (Candy, 1991). A second set of skills and attitudes relate to working in such a way that experiential learning becomes probable. Let us look at the kinds of activities that are important for this experiential learning.

There can be four different kinds of activities on or near the job (or while working in school contexts) that can lead to experiential learning. One is getting feedback on ones' activities. This is thinking about actions "in action". Apart from that there is reflection on actions in a more general sense. Thinking about the way one

is acting generally. Usually this occurs in a safe and detached environment with colleagues or fellow-students one can trust. Thirdly, there is innovation and experimentation. Trying out new actions in practice and developing new ways to deal with problems and change. Finally there is theory construction or vision development: getting ones' own view of the profession. Figure 7 presents the four kinds of actions in relation to the people with whom these actions can be performed: colleagues, experts, managers and clients. They can all be performed individually too.

Figure 7: Overview of kinds of learning skills and attitudes in independent work

	self	**colleagues**	**experts**	**managers**	**clients**
Getting feedback					
Reflection					
Innovation / Experiments					
Vision construction					

The skills and attitudes that people need in order to learn experientially may be derived from this scheme of activities and partners. Figure 6 presents an overview of these skills and attitudes.

Figure 8 presents the skills and attitudes that relate to experiential learning as derived from Figure 7.

Figure 5: Skills and attitudes related to independent work
Working without support or external control
Regulation of working
Working co-operatively
Looking for opportunities to
get feedback
reflect
innovate and experiment
develop a vision
Accepting feedback in an open way
Giving feedback to others
Taking time to reflect
Trying out new things
Making mistakes
Theory-orientation
Working with experts in such a way that one can learn from and with them
Working with colleagues in such a way that one can learn from and with them
Working with managers in such a way that one can learn from and with them
Working with clients in such a way that one can learn from and with them

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