

Various kinds of life long learning

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Abstract

People have, often without realising, too romantic and simplistic conceptions of life long learning. Three underlying misconceptions are described. One is that all learning is joyful. The other is that learning is only occurring with certain people and not with others. The third is that there is one kind of learning only. In this paper five dimensions related to learning in and outside work-contexts are described. This results in a scheme of nine types of learning varying according to two dimensions. One concerns the place where learning takes place and who is controlling it (schools and courses, work-place and home). The other dimension concerns the amount and the quality of control: external control, self-control and experiential learning in which there is an absence of control with respect to learning goals, learning activities and testing procedures. Derived from this analysis three independent kinds of learning ability and learning readiness are discerned: as related to externally controlled learning, self-controlled learning and experiential learning. It is argued that schools and adult education should prepare students for life long learning through the creation of opportunities for self-controlled learning and experiential learning. Moreover they should help students develop the skills of learning, thinking, collaboration and self-regulation through process-oriented instruction.

Introduction: misconceptions about learning

When one reads articles about life long learning or listens to discussions about it, one finds several different implicit opinions about (life long) learning. In my view, many of these learning conceptions draw a too romantic or too simplistic picture of learning.

One example is the belief that life long learning occurs automatically when people get the chance to do it. Just give people the opportunity to learn and they will do it. Another implicit idea is that learning depends on the availability of teaching. When there is a need or necessity for learning, automatically one thinks of finding a teacher or a teaching situation. More teaching, however, will only be part of the response to more learning needs: more and more people will have to learn independently and embedded in work- and other life-contexts. New technology will help a lot, but it cannot be the whole answer. Many people are only learning in certain ways and in certain directions and are not willing to learn in the way and direction needed for life long learning.

Another romanticism is that learning is joyful. Often however, learning is not (yet) joyful at all. People hate it, partially because of negative experiences at school, partially because learning can and should sometimes be very painful. The result of learning may be joyful, but the process is energy taking and very emotional in some cases. One may think, for instance, of the struggle and pain people suffer when they want to become an expert ballerina or opera singer. Some time ago I attended a so-called master- class run by the famous Dutch opera singer Christine Deutekom. For an audience of 200 or more people young, but very talented singers are coached and critiqued by the mistress herself publicly. I witnessed how painful and difficult it is for good singers to learn to become an even better singer. One could feel the effort it costs them to refrain from reacting to the criticism and instead to work on it.

Clearly, the audience was very helpful in making critics more acceptable. Would not it be great if we would have masterclasses that help us to become expert teachers!

There is, in my view, an underestimation of the difficulties people have with learning: a) there is a lot of resistance to learning, b) it is very difficult to learn adequately, and c) people are not distinguishing the different kinds of learning.

First, resistance to learning, so I believe, originates, for one part, in negative school experiences, even with very successful students. Because one model of learning ("learning mainly is reproducing factual information that is rather useless") tends to dominate school learning, especially people with bad experiences at school are developing a resistance to all kinds of learning. Of course there will be many other causes for resistance to learning, like laziness, lack of intelligence, not seeing its necessity, affective blockades, etc. Secondly, one lacks adequate coaching of the process of learning. You just do it the way you always did it, the way you were supposed to do it in schools, the way your parents and friends did it, the way you believe everybody is doing it. Learning in a meaningful way and distinguishing the different kinds of learning will only develop in many people when adequate coaching of the learning processes and skills is available. Thirdly, our research shows that people have restricted mental models of learning. Many tend to equalise learning with the intake of factual information through reproduction activities instead of realising that learning is a constructive activity and process in its very essence (even when you want to memorise something) (see Simons, 1993). Other people stress the concrete side of learning (Vermunt, 1992). They focus on the concrete applications, examples and personal relevance (what can I use today), instead of trying to understand the underlying meaning and constructing a mental representation that kinds a solid basis for future applications.

A further worry I have is a strong tendency to teach. Not only teachers but also all other kinds of human beings tend to explain, to give answers, to structure and to help instead of making information available just on time, asking questions, inducing curiosity and postponing helping behavior to let students help themselves or each other. When younger students were connected to older students over internet and asked questions, even these students showed teaching behavior: they gave too long and too extensive answers to the questions, but also they gave answers to questions that were not posed by the younger students at all. Older students, parents, and teachers are killing learning through this tendency to teach. How can we stop this?

Finally, the emphasis on methods and technology tends to kill learning. "If only there were better methods and if only new technology is available, people will learn". Of course, methods will help and possibilities for new technology are great. They will not be enough, however. Wonderful methods can be and are destroyed in the hands of some teachers. I saw teachers answering video-problems devised for students to think about themselves and reading the right answers to them. I saw teachers summarising texts that were meant for students to paraphrase themselves. I saw teachers answering questions they posed instead of waiting for students to even think about it. I saw teachers surpassing parts of methods that were there to have students think on their own. Equally, new technology can be also very harmful. When new technological products are technology driven instead of learning driven, they will strengthen the tendency to reproduce. Many instances of distance learning take traditional teaching as model instead of trying to develop new kinds of learning. What is happening in modern technological learning environments is what happened when cars replaced horses: the first cars resembled the horse-wagon instead of utilising the new possibilities. Equally, some people use computer-text processors as typewriting machines instead of utilising all the new possibilities computers offer to optimise writing.

The concerns discussed above may be reduced to two underlying misconceptions about life long learning. One is the idea that some or even many people are not learning at all and should get the chance to start life long learning. But all people are learning all the time. People can not stop learning. Perhaps they are not learning enough, with the wrong processes, in wrong directions or with the wrong results, but still they are learning. Probably, this misconception is related to the idea that learning has to do with willingness to be educated or trained, equalising learning with being taught. The message of life long learning then becomes: developing the readiness to be educated. It may be clear by now that this is not my conception of learning. Apart from being educated and trained, I think that it is important a) for people to learn on their own, executing self-directed, self-managed or independent learning, and b) to learn implicitly and informally, without explicit learning intentions but with an open mind and from time to time reflectively summing up or making the results of learning explicit (for instance in a learning log).

The second underlying misconception about learning is that it is always a positive experience, that is being enjoyed by people if only they give learning a chance. All learning is seen as positive, both as a process and as a product. As described above, however, I believe that in the process of learning often pain and emotion are involved. The results of learning are often not so positive at all too. People learn, for instance, to hate math (at school), they learn that they are incapable, they learn to stop doing valuable things at the workplace, and they learn to stop certain kinds of learning. The joy of learning sometimes, indeed comes from the process itself, but sometimes only from the (expected) result. Related to this idea are two views I encountered many times. The one is that learning is considered to be unimportant for work situations because it is too soft and intangible. The other is that learning is so difficult and that it is reserved for the happy few that it is for that reason kept out of our thinking. It seems very difficult to just see learning as a normal human process that is sometimes joyful sometimes painful, sometimes soft at other times hard, sometimes only occurring with certain groups of privileged groups in other kinds and circumstances as natural and general as living.

The third underlying misconception is that we implicitly fail to distinguish the various kinds of learning. All learning is the same. Yet, in my view (see below) there are very important different kinds of learning that are to be organised differently.

These misconceptions about learning, by the way, develop because we use the term learning without reflecting on its meaning. Learning is "Taken for granted" (see Säljö, 1979). We think everybody attaches the same meaning to the word and we tend to restrict the number of meanings. We fail to make, in our thinking, distinctions between the various kinds of learning.

Different kinds of (life long) learning

The central question this paper addresses is what kinds of learning and what kinds of learning abilities and readiness for learning are important in organisations and especially in so called learning organisations. First an analysis is made of dimensions of learning, that have been made in the literature. I will discuss five dimensions that have been suggested. My main argument is that these distinctions are often unclear because they overlap and are sometimes interpreted in a wrong sense. At the end, I will propose a scheme of nine types of learning, varying along 2 dimensions.

A first distinction is the difference between learning on the job and learning off the job (Marsick, 1987). On the job learning refers to learning in the context of work. Off the job learning is all learning outside of the direct work-context (for instance at home, at a conference, in a course, in a car, etc.). One important obscurity is that it is often unclear whether on the job learning is confined to learning that is really taking place at the work place during working, or that other kinds of learning are included as well. For instance learning after working hours at the workplace and learning in a special classroom at the workplace are sometimes included in on the job learning. Another obscurity concerns the distinction that is made between learning on the job and training on the job (Kruijd, 1991). Training on the job is reserved for preplanned learning activities on the job. Learning on the job is the rest of the autonomous learning that is taking place in and during working hours. Kruijd (1991) proposes to exclude learning on the job from the discussion because it cannot be planned and organised. Because of the growing interest in learning organisations, however, attention for these kinds of learning on the job increased. De Jong (1991), therefore, proposed a further distinction within the category of on the job training (or learning): workplace-instruction, workplace-practice, workplace-development and workplace study. I will describe these four in the next paragraph.

Workplace-instruction occurs when a supervisor or manager instructs on the basis of a task-analysis. Workplace-practice is the old apprenticeship system. A supervisor is there when needed. The learner gets the chance to execute working tasks when he is ready for them. Therefore, tasks are arranged according to complexity by the supervisor. Work-place study refers to learning by workers in higher positions who can work independently and undertake learning activities on their own in the context of exploring work-situations and -problems. Workplace-development refers to kinds of learning on the job that occur in the context of open tasks, where a worker has to analyse, find new paths and procedures. It is learning through action or innovation.

Van der Zee (1991) made a distinction between four kinds of work-place learning: guided learning, self-guided learning, hidden learning and spontaneous learning. Guided learning is learning regulated by a pedagogical authority or a chief (comparable to formal learning). Self-guided learning is learning that is regulated by learners themselves. Hidden learning is learning that occurs in the shadow of guided learning that was not intended (incidental learning during guided learning). Spontaneous learning is incidental learning in work-settings, where learning is a side-effect of working, rather than the result of explicit learning goals or learning activities. These distinctions resemble the distinctions made by De Jong (1991), but they focus more explicitly on who is controlling the learning, whereas De Jong focused on the kind of control executed.

In this way the distinction between on the job and off the job is blurred still more. Are all kinds of workplace study taking place on the job? Is work-place instruction really taking place during working hours and on the workplace or are other kinds of instruction included too? Furthermore, the category of off the job learning is a container of all kinds of learning taking place in schools and conference centres, in cars, at home and in open learning centres, having as much in common as they have differences.

A second distinction, that resembles the previous one, is between learning in school and outside of school (Resnick, 1989). Learning in schools differs from learning outside of school with respect to the following four aspects:

- * It is symbol-oriented instead of tool-oriented.
- * It is decontextualised instead of context-bound.

- * It is individual instead of group learning
- * It is general instead of situation-specific learning.

A problem with this distinction between in- and outside of school-learning is that it confuses the most probable situations with possible situations. Resnick herself admits that many learning situations outside of schools, like job-instruction, became school-like. Many situations of on the job training are remarkable similar to school-situations. Furthermore, the fact that many school situations stressed decontextualised, individual, symbol-oriented learning without tools should not make us conclude that this is the only possibility. In reality, recent changes in schools aiming, for instance, for cognitive apprenticeship approaches show that other kinds of schools are also feasible.

A third distinction, that solves some of the problems caused by Resnick, is the difference between informal and formal learning (Van Onna, 1985). Formal learning is learning organised by some kind of pedagogical authority, like a teacher, trainer or work-counsellor or supervisor. Informal learning is learning by people themselves, mostly in the context of work. This distinction is often unjustly confused with the distinctions between on and off the job and between inside and outside of school. Formal learning becomes school learning and informal learning becomes learning on the job. A lot of on the job learning is, however, formal learning (see workplace instruction and -practice). A lot of school learning can be informal (see below).

The fourth distinction is between intentional and incidental learning (Thijssen, 1988, Kruijd, 1991). This distinction is similar to the distinction between explicit learning and implicit learning. Intentional learning is learning heading for prespecified goals. Sometimes these goals are very specific, sometimes they are specified globally only. Incidental learning is learning that occurs automatically without a preplanning or even opposed to the goals that were planned. An example of incidental learning is when a worker learns the culture of an organisation during discussions with colleagues. Recently, the idea of tacit knowledge, presumably originating from incidental learning, attracted a lot of attention from researchers (Myers & Davids, 1992). One problem of the distinction between intentional learning and incidental learning is that it remains unclear who is having the intentions: the learner or the trainer or both. A second problem is that this dimension is often confused with the previous one. Intentional learning is thought to be formal learning and incidental learning is considered to be informal learning. Yet, informal learning can be intentional. This is, for instance, the case when a researcher has the explicit goal to learn from studies done by others. Also, formal learning can be incidental. In the context of learning in schools, for instance, students may learn that a certain subject like math can be interesting.

The fifth distinction is between learner controlled learning and autodidactical learning (Candy, 1991). Learner control is independent learning in the context of a school or course where some pedagogical authority leaves a certain amount of freedom for students to learn with respect to learning goals, learning activities and evaluation procedures. Candy (1991) states that it is neither possible nor desirable to give students control over some aspects of learning and determine some others for them. Thus, he claims that it is not possible nor desirable to let the students choose the learning activities, but to determine the learning goals for them. Learner control is an all or none phenomenon. Research on learner control shows that it does not result in better learning performance on the short run. It does result, however, in increased curiosity and critical thinking, in a better quality of the insight reached and it kinds a better preparation for later autodidactical learning. Autodidactical learning is learning that is not preplanned or pre-organized by an outside agency, but controlled by learners themselves. Candy (1991) reviews studies done about autodidactical learning projects. He

concludes that most adults spend a lot of time learning autodidactically and that there are five characteristics of autodidactical learning:

- a) autodidactical learning is not totally self-guided. Much of it is externally regulated, at least partly;
- b) coincidence plays an important role in autodidactical learning;
- c) often problem situations determine the route that learning takes;
- d) autodidactical learning is not recognised as learning by learners. Problems form the context in which learning takes place (unnoticed by the learner). The accent is on problem solving or working and learning is a side-effect.
- e) many autodidactical learning activities take place in the context of co-operation with others.

There are three problems with this distinction between learner control and autodidactical learning. First, in my view, two kinds of autodidactical learning are confused by Candy. One is intentional learning where people strive to reach certain learning goals. The other is learning that is a side effect of problem solving or working (Koper, 1992), where action goals are more important than learning goals. It is learning without awareness from the side of the learner that (s)he is learning. Bereiter's (1989) distinction between learning as problem solving and learning through problem solving is a similar one. In learning as problem solving people are solving problems and they learn certain skills or knowledge implicitly. In learning through problem solving they are aware of the skills they are developing in the problem solving process. So there is intentional autodidactical learning and incidental autodidactical learning and these two should, in my opinion, be distinguished, because the way they are controlled is completely different. The core difference is whether or not there is conscious control and planning of learning by the learner or that the task-environment determines the learning as a side effect of problem solving. I will call the first form of learning self-directed learning and the second one experiential learning.

Secondly, I do not agree with Candy (1991) that learner control is an all-or-none phenomenon, not that it should be because of ethical reasons. There are good examples of learning environments where students have control over some aspects of learning and teachers have control over the other. Think, for example, of problem oriented learning (Simons, 1989) where teachers define a broad spectrum of learning goals, that is, however, constrained by real-working problems and the evaluation procedures, but students have freedom to specify their personal learning goals and to choose their own learning activities. Similarly, in anchored instruction (cognition and technology group at Vanderbilt, 1991) and in Leittext-systems (Teurlings and Simons, 1992) learners get some freedom in choosing learning goals and learning activities, but their learning is preplanned considerably. In essence, Candy (1991) is somewhat unclear in his treatment of learner control. On the one hand he claims that it is an all-or-none phenomenon, on the other hand he admits that there is no complete learner-control in school-like learning environments, because of the responsibilities and roles of teachers and trainers (which are to control learning of students). In my view there are differences in the amount of learning control and I don't agree that it would be unethical to divide the control over learners and teachers. There are good examples of divided control where teachers control part of the learning and leave students freedom to control other parts. The kinds of divided control have important motivational effects and are necessary for learning to learn (see below). Apart from divided control there can also be shared control of learning, where the decisions about learning are negotiated between teachers and learners.

Thirdly, this distinction confuses learning on and off the job. Learner controlled learning can take place outside of school situations, for instance on the job where a boss or coach determines part of your learning, but leaves some possibilities open. Autodidactical learning, totally determined by learners themselves, can take place in both work and school-like situations, as well as at home or elsewhere. Examples of autodidactical learning at the work place are a professor of physics learning about a new kind of molecules or a researcher in a department of research and development of a pharmaceutical company.

Nine types of learning

I propose a more extended categorisation of types of learning by combining the categorisations of De Jong (1991) and Van der Zee (1991), that focus on work-place learning, with a categorisation of off the job learning (both in school-like situations and elsewhere off the job). Explicitly I make use of the five distinctions described before. These distinctions above overlap considerably, as was shown before. Formal learning is confused with intentional learning. On the job learning is confused with incidental learning, etc. Some of these problems are caused by the fact that we tend to think in dichotomies. Let us look, for instance, at the dimension "on the job" learning versus "off the job" learning. People who believe in and are promoting on the job learning use this distinction. They, therefore, blur all kinds of learning outside the job into one category, without realising that there are at least two kinds of places outside the workplace where people can learn: in schools and other pedagogical institutions and in places like homes, cars, libraries and open learning centres. Other people, like Resnick, started thinking from school-learning. Then a distinction between inside and outside schools is made, blurring on the job and off the job learning in one category. Therefore a trichotomy is to be preferred: at school, on the job and outside of both schools and work.

In the same way, the other dimensions should, in my view, be extended also. There is externally controlled learning, self-controlled learning and experiential learning.. There is learning where a pedagogical authority has intentions, the learner him or herself has intentions and learning without intentions from either of the two. This leaves 2 dimensions defining nine types of learning (see Figure 1).

Figure 1 Nine types of learning

	At schools / in training	On the job	Outside of schools and work
External control			
Self-control			
Experiential learning			

One of the reasons why it is important to distinguish between these different kinds of learning is that they are controlled differently (by different participants and at different places). The one dimension combines the place where learning takes place and the persons who control the learning (trainer, manager or learner). The other dimensions concerns the amount and quality of the control executed by these persons or places. Another reason is that by distinguishing them, we can better combine them and give them their own place. Reaching transfer of

learning and of training is often a question of combining several kinds of learning (Simons and Verschaffel, 1992). After a course, for example, measures should be taken that guarantee that learners keep on learning (e.g. through work-place-practice, -study or -development). On the other hand designing tailor-made courses means tuning to prior and existing other kinds of learning (like work-place practice). Thirdly, distinguishing these nine kinds of learning attracts attention to the way they can be influenced. Educational psychologists tend to think that learning can be influenced by specifying objectives and by designing learning activities. There are, however several other ways to influence learning. One can, for instance, let learners themselves control their learning. One can also control learning by specifying the kinds of testing of performance that will follow. Or one can organise work-situations in such a way that learning becomes likely (see the dimensions complexity and opportunity to regulate, mentioned above). As a last example one can also stimulate people to reflect on what they learned after the fact. A final reason concerns the learning skills people need or might use in the different kinds of learning. It might be the case that for the different kinds of learning different kinds of learning skills are important and needed. Instead of explicating all these nine kinds of learning abilities, we will, because of time and place constraints, confine our discussion to one of the dimensions and describe learning skills for the dimension control of learning.

To complicate this state of affairs still more, we should realise ourselves that there can be a kind of nesting of one type of learning under the other. This has to do with the mutual or reciprocal relationship between external and internal control of learning. Teachers and trainers can leave control over learning partly to the learner or to task-environments. Instead of using the power given by the institution and the learners to control the learning they can give their learners permission to execute self-control. Learners, however, should use their freedom to choose. If they don't, the trainers / teachers are forced to fill in after all. Thus inside the category of guided learning there can also be self-controlled learning and experiential learning (as long as the teachers / trainers permit and as long as the learners accept). Moreover, there are kinds of divided control of learning where pedagogical authorities or bosses take part of the decisions and leave some other to the learners and there are kinds of shared control where the decisions about learning are negotiated between teachers / trainers and learners.

Three kinds of learning-skills and readiness to learn

What are the underlying skills and attitudes that determine learning ability and learning readiness? Are there differences between the different kinds of learning? Resnick (1989) concluded her presidential address as follows: "The evidence developed on the discontinuity between school and work (as learning environments) should make us suspicious of attempts to apply directly what we know about skills for learning in school to the problems of fostering capabilities for learning outside school" (p18). Candy (1991) therefore, distinguished between two kinds of learning skills: a) for school situations and b) learning skills for outside of school. In my view, however, it is not the place where learning takes place and under who's supervision (cf. our horizontal dimension), but the amount and quality of control executed (cf our vertical dimension) that is the most important one. In line with the points raised above we need at least three kinds of learning-skills: referring to learning that is totally or partly determined by someone else, referring to self-controlled learning planned and controlled by the learner him- or herself and referring to experiential learning that is a side effect of

working or problem solving. Some of these skills have been described by Candy (1991) and extended by Van der Hoeven-van Doornum and Simons (1994) (see also Simons, in press). Guided learning skills refer to accepting control by others, to deep learning strategies, question-asking, problem solving, reading and information-seeking. Self-controlled-learning skills have to do with - rather domain-specific skills of self-management, personal autonomy in learning, action control, subject matter autonomy, metacognition and motivational skills. Experiential learning skills concern reflection, transfer, generalisation and openness for possibilities to learn. Similarly, I think that there are three independent kinds of learning readiness: being ready to be educated, being ready to learn on your own and being ready to profit from incidental learning experiences. In line with Candy (1991) I assume that these learning skills and these type of learning readiness have a rather domain-specific character. Thus, I do not expect - as was done in prior research - that these skills and attitudes are of a general quality nor that they automatically transfer from one domain to another. Further research should make clear how domain-specific these skills and attitudes are and how transfer can occur.

Preparing students for life long learning in schools and adult education

It is my firm conviction that schools and adult education should prepare students for life long learning. This has two very important implications. The one is that they then should provide for opportunities to practice the three ways to learn described above. How could students learn the skills and attitudes if they have no opportunity to practice them (and get feedback and support for them from schools and adult education)? The other is that they should help students to develop the skills and readiness of the three ways to learn. This form of instruction I call process-oriented instruction. I will treat both the ways to incorporate the three ways to learn in schools and adult education and process-oriented instruction.

Success factors for the three ways to learn

The three ways to learn can be compared with three different ways to undertake a journey: travelling, trekking and exploring. Through this comparison we can deduce factors to take into account when organizing them in schools and adult education.

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 my 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 or like journalists who have to write an article or book. 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 or to write about. 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 self-controlled learning or *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 emphasis. In home situations probably action learning is more prominent. But all three occur in all three different contexts. 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). Schools and adult education that want to prepare students for life long learning should, in my view, organise self-controlled and experiential learning. But allowing for practice will not be enough. Needed is coaching of the learning, thinking, collaboration and regulation skills within regular instruction: process oriented instruction

Process-oriented instruction

In process-oriented instruction the processes and skills to be learned are modelled, both by teacher and by fellow-students. This means that the important thinking, learning, collaboration and regulation skills are made public, by demonstrating and discussing them with each other on a regular basis. One of the main obstacles to learning to learn and think is that these processes are hidden and remain invisible. Research shows that students take these processes for granted. They don't realise that people have many different ways to approach tasks. Moreover, they tend to believe that their own way is the only possible way. This has to change when one wants to teach learning, thinking, collaboration and regulation skills. Fellow-students sometimes form better and more convincing models of learning, thinking, collaboration and regulation than teachers, because they are better identification models and because their way of thinking is perhaps less automatised and unconscious.

Furthermore, in process-oriented instruction teachers should be external monitors of the learning, thinking, collaboration and regulation activities of students temporarily. As long as students are unable to monitor themselves adequately, the teacher should take this role for them and keep an eye on their processes. Through observations and questions the teacher tries to find out whether the processes are still on the right track, whether problems occur and whether students understand what they are doing.

Gradually, however, the teacher should withdraw these monitoring and other kinds of teacher control when students are ready. This is called scaffolding: after scaffolds have been built they can become the basis for new scaffolds to reach a higher part of the house that is being built. When parts of the house are ready, scaffolds can be removed.

Moreover, the process-oriented teacher should become a metacognitive guide of the students. This means trying to make them aware of their way of learning, thinking, collaboration and regulation. It is only when they have this kind of metacognitive awareness themselves that they can become self-regulators. Thus, the teachers' role is to help them develop this awareness.

Another role of teachers in process-oriented instruction is to organise positive self-evaluation by students. They should believe in themselves and their skills. They should believe that they could do it, because without this it is hard to learn and think independently. Orchestrating positive self-evaluation means to help students with goal setting: choosing goals that are reachable and still have a kind of challenge.

Of course, teachers should also provide for multiple opportunities to practice the various skills in various circumstances, getting lots of feedback, from fellow-students and from teachers. These practical applications should occur, preferably in authentic tasks: cases, simulations, real problems, in situ. First-hand experiences are very important.

Finally, students should be stimulated to reflect on their learning, thinking, collaboration and regulation, both in action as well as on action. Reflection in action means reflecting during or immediately after task-execution, reflection on action means reflecting in a more general sense about one's actions in various circumstances.

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