

New learning: implications for life long learning
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Introduction

In the year of life-long learning, many people and institutions are thinking about ways to create continuous states of learning in all people, schools and other non-profit organisations, companies and even societies, developing learning organisations and learning societies. In all attempts people are expected to learn during their whole life-time and at all places. Learning, in this respect, is seen as joyful, positive and easy to attain. In this paper I focus on some of my concerns with this state of affairs, being a psychologist who studied learning and found out how difficult and painful learning often is. All people and organisations learn all the time and at all places. People cannot stop learning. Learning, however, can have different qualities. We need criteria then, in order to be able to distinguish better and worse forms of learning. The idea of Ónew learningÓ is described as a beginning way to develop these criteria. After reaching the conclusion that there are many obstacles to learning, I will propose some solutions: different forms of life long learning will have to be taught and where-else can this been done than in schools? Process-oriented instruction, the proposed answer, will be described. Finally, some implications for workplace learning and the role of technology will be sketched.

Concerns about life long learning

One first concern is that there exist many too romantic views of (life long) learning. According to these views life long learning occurs automatically when people get the chance to do it. Often then one encounters the implicit idea that learning depends on the availability of teaching. More teaching, however, will only be part of the answer: 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 (see below). 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 be very painful. Some times the result of learning is joyful, but the process is energy-taking and very emotional. 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 criticized by the mistress herself publicly. I witnessed how painful and difficult it is 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 in very successful students. Because one model of learning (Ólearning mainly is reproducing factual information that is rather uselessÓ) 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 forms 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 equalize learning with the intake of factual information through reproduction activities instead of realizing that learning is a constructive activity and process in its very essence (even when you want to memorize 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 forms 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 structurize 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?

A final concern of mine is the emphasis on methods and technology I tend to observe. ØIf only there were better methods and if only new technology is available, people will learnØ. 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 summarizing 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 utilizing the new possibilities. Equally, some people use computer-text processors as typewriting machines instead of utilizing all the new possibilities computers offer to optimize writing.

New learning

The concerns of mine discussed in the previous section 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, equalizing 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. 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.

These misconceptions about learning, by the way, develop because we use the term learning without reflecting on its meaning. Learning is often taken for granted (see Šljić, 1979). We think everybody attaches the same meaning to the word and we restrict the number of meanings. So, we fail to make distinctions between learning and being taught, between learning that is regulated externally and self-regulated learning, between learning that is taking place consciously (mental activities directed at learning) and unconsciously (mental activities directed at working, problem solving or other human activities), and between learning processes and learning activities. Learning processes are unconscious, hidden mental processes that result in changes in knowledge, attitudes and/or skills. Learning activities are (mental) activities people undertake in order to influence the hidden learning processes (like comparing, summarizing, analyzing, etc.). When I use the term learning I refer to learning processes and/or learning activities that lead to relative stable changes in knowledge, attitudes and/or skills.

What are the consequences of all of this theory for life long learning? The answer to this question is: we need criteria for good life long learning. Because everyone is learning all the time and there are differences in the quality of learning processes and learning outcomes, our emphasis on life long learning is only meaningful when we have criteria for better and worse kinds of learning processes and outcomes. For me life long learning means that people are able and willing to learn in different ways: both by being taught, learning independently and learning implicitly / incidentally. The kind of learning that is needed can further be described by referring to the "new learning" that is needed in all three of these. New learning is the kind of learning that, according to recent and modern learning psychology is to be preferred. (see also Shuell, 1988). Below follow my proposals for new learning outcomes and learning processes needed to reach these outcomes.

New learning outcomes refer, in my view, to outcomes that are durable, flexible, functional, meaningful and application-oriented (see also Engeström, 1994; Lodewijks, 1993). They should be durable in the sense that they remain over a long period of time. Instead of learning for today and tomorrow people should be learning for months, years or even life time. Learning outcomes should be flexible in that they can be approached from different angles and perspectives. Flexibility relates to internal relational networks between knowledge elements that are approachable in an easy way. The functionality of learning outcomes refers to their "just in time, just in place" character: the results of learning should come to the fore at the right time and place. People should learn what they need at a certain time and place, not less nor more. Learning outcomes should also be meaningful: real understanding of a few basic principles with far-reaching importance for understanding is more important than superficial understanding of many facts that become outdated anyhow. Finally, learning outcomes should be application-oriented: people should know the possible applications and their conditions of use: when and where is application of the learning possible or necessary.

Furthermore, new learning asks for new kinds of learning outcomes: generic outcomes like learning-, thinking-, and regulation-skills. Next to information these kinds of skills will be needed because of the information overflow and the exponential increase of information. It will be impossible and unwise to focus

on taking in as much information as possible. Instead, a focus on the skills of learning, thinking and regulating should prevail. It is more what people can do with information than the information itself that becomes important. Finding ones way in the growing body of knowledge becomes more important than having many factual details in memory.

In order to be able to reach these new learning outcomes new kinds of learning processes are needed. The following are , in my view (see also Simons, 1993) the characteristics of these new kinds of learning processes::

- a) Learning processes that are active in the sense that various sorts of mental thinking and learning activities are undertaken;
- b) Learning processes that are goal-oriented in the sense that people have explicit learning, thinking or working goals of which they have some (metacognitive) awareness;
- c) Learning processes that are cumulative: because next learning builds upon prior learning, both in a specific and in a broader sense;
- d) Learning processes that are situated in an authentic context. Learning appears to be very situation-specific. Research shows that knowledge and skills remain, in human long term memory, attached to the context of intake. Only after intense endeavors can general knowledge be decontextualized.
- e) Learning processes that are self-regulated through conscious decisions by the learner himself. Self-regulated learning processes start from self-chosen goals and a self-determined plan or strategy. Progress is monitored and checked by the learner himself as is evaluation, testing and judgement.
- f) Learning processes that are reflective in the sense that the learner thinks about its begin, middle and end phase consciously in the perspective of improving next learning processes.
- g) Learning processes that are strategic: the learner proceeds according to a well-chosen way of working and learning (strategy) that can be changed when the circumstances or outcomes change.

These kinds of learning processes are, in my view, necessary when one wants to reach the learning outcomes described before.

My main message until now has been that learning is varied and difficult and that we need life long learning that is proceeding according to the characteristics of the new learning processes as described leading to the new learning outcomes. Many people, however, we know from research, are not willing and able to learn according to these criteria (see above). School-learning may even result in the opposite, because schools tend to stress certain outcomes. Testing habits fail, whether we like and want it or not, to focus on the kinds of learning outcomes as described before. People even unlearn valuable forms of learning. Big companies teach well-educated people how to learn after 15 - 20 years of formal schooling. We need, therefore, schools that prepare students for the different kinds of life long learning and teach them how to learn in the new way. The kind of teaching needed in such schools I call process-oriented instruction. (Simons, 1989; Vermunt, 1992)

Process-oriented instruction: what

Process-oriented instruction is instruction focussing on the further development of processes of thinking, learning and self-regulation of learning and thinking integrated in regular domain-specific instruction. Thus it is: integrated learning to think, integrated learning to learn and integrated learning to regulate learning and thinking. Process-oriented instruction not only focusses on the kinds of general skills mentioned, it also tries to hand over responsibility for learning and teaching to the learner gradually. The more learning, thinking and regulation skills the learner acquires, the more freedom he gets to regulate his own learning and thinking. What kinds of skills are important? This question is treated in the current paragraph. The next one discusses how process-oriented instruction can proceed?

Learning to think

Two kinds of thinking skills can be discerned: general and discipline specific thinking skills. Examples of relevant general thinking skills are:

- analogical reasoning
- critical thinking
- logical reasoning

Discipline specific skills are skills that originate in specific domains, disciplines or subject matter areas. In history, for instance, there are some skills that relate to time and place of historical events: historians want students to consider the time and place dimensions of an event, almost as an automatism. Moreover, historical thinking and methodology stresses that one should always try to compare different sources and to take the perspective of the writer into account (Öis the writer a king or a blue collar worker?). In geography the correct analysis and interpretation of maps is a complex skill that resides close to the core of the discipline. In biology thinking in hierarchical schematic representations seems to be important. In foreign language learning it is important to take the culture of the country into account.

Learning to learn

There are various kinds of learning skills that could form the focus of process-oriented instruction: cognitive skills, metacognitive skills and affective-motivational skills. Examples of cognitive skills are deep learning strategies like comparing, criticizing and structuring, overview skills like summarizing, schematizing, reviewing and generalizing and transfer skills like considering possible and necessary conditions of use. Examples of metacognitive learning skills are making a planning of times and strategies for learning, orientation on goals and outcomes, realistic goal-setting, regular checking and testing and finally restarting when problems occur and reflection on process and outcome.

Learning to regulate

Learning to regulate one's own learning and thinking means on the one hand having the learning, thinking and regulation skills that were described before. On the other hand it means a gradual increase of independence in learning and thinking. What we need is a systematic sequence of steps of increasing independence and a common set of words and concepts to denote these steps. In a previous publication Simons and Zuijlen (1995) proposed the following sequence: Working independently - Learning strategically - Self-directed learning. When working independently the learning goals, the learning strategy, the time and place of learning, the way of testing and feedback and judgement-procedures are fully determined by the teacher or learning environment. Students just have to fulfil assignments and learning will occur if and when they follow the guidelines or obey. When learning strategically students have freedom of choice related to the learning strategy: what kinds of learning strategy to take (i.e. verbal or visual processing, surface or elaborate strategies, learning alone or together with others). It also relates to where and when learning takes place: freedom of time and or place of learning. The learning goals, ways of testing and feedback / judgement procedures, however, remain under teacher-control. In self-directed learning students have more freedom, for instance with respect to choice of learning goals, self-testing and / or feedback / judgement procedures. Typically, in learning to regulate all these three kinds of independent regulation of learning should be taught : different kinds of skills are involved in each of them. In beginning phases of teaching, in my view, more emphasis should be laid upon teaching how to work independently, then how to learn strategically gets more attention gradually and finally, self-directed learning seems to be the most complex form of learning.

Gradual increase of independence

This does not mean, however, that we should wait with the introduction of self-directed learning until strategic learning and the attached skills have been mastered fully. And similarly, it is, in my view, not necessary to wait with the introduction of strategic learning until independent working has been mastered.

Instead, the main two principles of sequence should be a) that in beginning phases the simpler forms of independence should occupy more time than the more complex ones with a gradual increase of time for more complex forms; and b) more complex forms of independence can in the beginning phases of learning only be practiced with respect to themes where one has a relative high level of expertise. In other words in beginning phases there is more independent work and some strategic learning in relation to topics one has prior knowledge about. Later there comes more room for strategic learning, also in relation to less familiar topics and some room for self-directed learning about very familiar topics. Finally, there is also some self-directed learning related to unfamiliar themes.

The main motivational principle underlying all of these sequences should in my view be "Freedom as reward": as long as a student shows that he can handle the freedom given, gradually more and more freedom of choice and regulation can be allowed. When students, however, misuse the freedom allowed they should be sent back to previous steps.

A related and important question is whether students should work and learn in groups or individually. On the one hand one would think that it seems better to learn to work independently individually and then in groups (first in pairs then in bigger groups). After that one could learn to learn strategically individually and after that in pairs and bigger groups. Finally, students should then learn to learn in a self-directed way individually first and at last in pairs and groups. The sequence then would become:

1. Working independently a) alone - b) in pairs - c) in groups;
2. Learning strategically a) alone - b) in pairs - c) in groups;
3. Self-directed learning a) alone - b) in pairs - c) in groups.

There are, however, equally valid arguments, in my view for the opposite sequences. Learning to learn can be facilitated in groups as has been shown in reciprocal teaching procedures (Palincsar & Brown, 1984). Experiments should clear this issue.

Process-oriented instruction: how

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 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 younger students take these processes for granted. They don't realize 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 and regulation skills. Fellow-students sometimes form better and more convincing models of learning, thinking and regulation than teachers., because they are better identification models and because their way of thinking is perhaps less automatized and unconscious.

Furthermore, in process-oriented instruction teachers should be an external monitor of the learning, thinking 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 teachers 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 this monitoring and other kinds of teacher control when students are ready. This is called scaffolding : after scaffolds have been built they can become the base 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 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 organize positive self-evaluation by students. They should believe in themselves. They should believe that they can 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 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.

New learning at the workplace

New learning and process-oriented instruction should, in my view, not be restricted to instructional situations in schools or off the job courses. It is also important at the work-place. Here also the idea of gradual increase of independence and autonomy is important. Autonomous teams are the building blocks of learning organisations. Again, the gradual increase of independence and responsibility should be connected to availability of skills: when workers have developed the skills they can get more responsibility and freedom. The coaching manager or front-line worker could use the same principles as process-oriented teachers do when helping workers to become more self-regulated workers and learners. In fact, process-oriented facilitation of learning may be a good model for adequate coaching at the work-place. Integrated learning to learn, think and regulate should, in my view, become important goals of on-the-job learning.

Some specific correlates of new learning at the workplace are the following. First job-rotation and regular change of position seem important for people to experience variation in order to remain / become flexible. Secondly, team-learning is as important as individual learning at the workplace. Team learning is more than and different from team work. Teams should learn how to work together and how to learn collectively. Collective learning is more than the sum of individual learning: it is, for instance, helping each other when learning, it is developing a common memory and common interpretations, and it is having team learning goals and team strategies for learning. Thirdly, at the workplace new learning can also be learning from coaching others: in supporting the learning of colleagues one may learn a lot oneself. Fourthly, personal and team development plans may become important tools for new learning at the work place: plans that specify long-term learning goals and strategies for individuals and teams, as well as ways to test the reaching of the goals. Fifth, organizing time for reflection at the work place at regular intervals are important vehicles for learning for teams and individuals

New learning and modern technology

Finally, some consequences of the concept of new learning for modern technology will be considered. We need courseware that facilitates process-orientation in learning to learn, to think and to regulate. In applying the principles described before, in multimedia, in web-learning and in other kinds of computerprograms new learning may be supported, both in schools and at the workplace. Build-in coaches looking-over the shoulder of the learner the new learning. We will need machines that stimulate reflection, active experimentation and self-regulation. Moreover, we need programs that support team-learning.

To conclude: let us not reproduce teaching as it is now but let us try to organize the new learning with the help of technology.

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