

5 The (im)possibility of new learning and self-direction

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'New learning' puts demands on learners, students and workers in the field of self-direction and the development of competences, career identity and employability which many of them cannot (yet) meet. This conclusion was made nearly ten years ago based on development theories supported by empirical research (Luken, 1999). 'New learning' was then referred to as 'learning how to learn' and was specified as a creative-social learning process. The conclusion was based on an analysis of this learning process in terms of nine specific demands it brings to the learner. If the above conclusion persists then it undermines the foundations of many programs for educational reform and career guidance that have been launched on a massive scale. Odd as it may seem, critical reviews on new learning (Van der Werf, 2005) and several analyses of failed educational reforms (Basoski, Wieges & Overmeer, 2007; Dijsselbloem Committee, 2008) conducted in recent years rarely addressed the question whether the demands made by new learning in its many different forms are at all feasible for the people concerned. Such failures are mainly blamed on political, organizational, preconditional and technical operational difficulties. In recent times, this trend seems to have shifted somewhat, as demonstrated in the publications by Jolles (2006, 2007, 2008), Westenberg's Dies Oration (2008) and the response in the press. The findings from relatively recent, large-scale and advanced research into the functioning of the brain led to increased attention to the discrepancy between the demands and the learners' abilities. The voice from solid science is always heard. It provides unexpected support for the conclusions drawn earlier from the development theories.

'New learning' offers many aspects that are emphasized by several different authors in their own personal way. This chapter zooms in on the aspect of self-direction or self-regulation. It investigates what we can learn from development theories, development research and brain research at this point in time. The first question is: What is the current status of said development theories? What exactly is the status of these theories and of the empirical research conducted in this field? This is followed by a brief description of the content and results of brain research. Finally, a number of conclusions are drawn which specifically address the question: what to do with this? Concluding that people are currently incapable to do something is one thing, yet it is equally important to ask: *can* they learn, and if so, how?

5.1 Definitions

New learning refers to new learning output (often in terms of competences), new types of learning processes and new methods of instruction. "It is based on the conception that learning is a social-interactive, contextual, construing, self-regulating and reflective process", as Simons explained (in Van der Werf, 2005:9). In many vision and program documents for intermediate vocational education (MBO) and higher vocational education (HBO), learners/students are referred to as 'directors of their own learning process'.

Self-direction and *self-regulation* are a complex notion for which many different approaches and descriptions exist. Donkers (1999), for example, devotes 33 well-wrought pages to these concepts, without offering a clear distinction however, nor a clear description. In this chapter, *self-direction* is

defined as a continuous process where people direct their actions towards goals that have been set and reviewed by them, based on a personal vision. *Self-regulation* is considered to be the same, with the exception that the goals have been preset. Learners can (co) decide on sections in the learning and production process and hold a personal responsibility with regard to the approach and the implementation thereof, yet without being able or being permitted to question the objectives. In cybernetic terms: self-regulation is mainly about a feedback process that reduces the discrepancies between a desired situation and the actual situation. Self-direction involves a feedforward process in which people are consciously setting goals which then generate discrepancies. Self-direction implies that there is greater autonomy than in self-regulation.

5.2 Personal development

In Jean Piaget's footsteps, numerous scientists have created appealing theories about the personal development of people. Some important examples are (e.g. see Hoare, 2006): Kohlberg (moral development), Loevinger (ego development), Perry (intellectual development), Kegan (development of consciousness), Torbert (professional development and leadership), Elder & Paul (critical thinking) and King & Kitchener (reflective judgement). These theories have in common that the development occurs in a number of distinctive steps or stages. During one stage in their development, people will be faced with limitations, which require a qualitative change to be able to reach the next stage. In the words of Piaget: at one stage, assimilation with confronting information or experiences will no longer suffice, and the system will have to accommodate. We will examine three of the above theories: the oldest and most well known theory (Kohlberg), the most researched theory (Loevinger) and possibly the most significant theory (Kegan).

Kohlberg's moral development

Lawrence Kohlberg (e.g. see Kohlberg & Ryncarz, 1990) describes moral development in six (in later publications, seven) stages, classified under three main categories. This theory has been subjected considerably to empirical research, mainly based on storylines, where the subjects are requested to respond to moral dilemmas. For example: imagine that while on holidays you recognise a man, who was once sentenced for a serious offence. He did not serve his sentence as he escaped prison shortly after. Now he is leading a decent and altruistic life in a different country... What would you or wouldn't you do, and why?

The first of the three main levels are labelled 'preconventional' (see table 1), where the individual mainly focuses on self-interest. The individual obeys rules and people who have more power in order to avoid punishment. Doing something for others to get something in return. In early adolescence, this would still be classified under the modal stage. Until around age 16, the majority of adolescents should have reached the first stage of the second ('conventional') main level. In their role as son, brother or friend (daughter, sister, friend), they mainly do what is expected by people they esteem highly. It is important to them to be considered as 'good' by their social environment.

Table 1. Overview of moral stages, Kohlberg

I		Preconventional
	1	Obedience and punishment
	2	Individualism and exchange
II		Conventional
	3	Interpersonal accordance?
	4	Social order and authority
III		Postconventional
	5	Social contract
	6	Universal ethical principles
	(7)	(hypothetically: transcendent morality)

The second stage of the second main level is the modal stage, which relates to adults. Now the emphasis is not so much on one's expectations from their personal, close social environment but rather on the organisation in which one is operational or on society as a whole. The main focus is on performing the duties one has committed to. It is referred to as the 'Law and Order' stage, as the main concern lies with maintaining 'the system', respecting authorities and obeying laws and convention. The third ('postconventional') level can be reached around age 23. However, the above study showed that only 15% of people have reached this stage by the age of 36. At this level, people start observing the relative aspect of conventions and rules. One makes an agreement and fulfils that agreement. Finally, stage 6 subjects construe their own ethics based on universal ethical principles. Only a minority of subjects would reach the last 'cosmic perspective' stage.

Loevinger's ego development

Jane Loevinger (Lê Xuân Hy & Loevinger, 1996) researched 'ego' development. By this she means "the spectacles through which we look at ourselves and at others throughout social interaction and relationships" (Westenberg, 2002, 316). Loevinger primarily bases her theory on experiences using the Sentence Completion Test or the WUSCT, testing many tens of thousands of subjects (young and old) throughout the years. De interrater reliability and internal consistency of this instrument are rated very high (Rogers et al., 2001). Research based on the WUSCT and variants led to a theory according to which ego development follows nine stages. One metastudy, which critically examined the hundreds of studies conducted throughout the last 20 years, states as its principal conclusion: "... there is substantial empirical support for the conceptual soundness of ego development theory and the WUSCT." (Manners & Durkin, 2001: 541). Below you will find a description of the nine stages. A number of examples are provided (*italics*) to illustrate the characteristic ways, according to Lê Xuân Hy and Loevinger, to complete the sentence "*When I am being criticised...*". The examples will demonstrate that it would not be easy for a layman to categorise the responses from the subjects into several different stages. In order to achieve the abovementioned high standard of interrater reliability, the raters must be trained!

1. Pre-social stage

At this stage, children are slowly learning to make a distinction between self and not-self and are not yet capable of giving interpretable answers to the Sentence Completion Test.

2. Impulsive stage

In this mode, children are often impulsive, though obedient. It categorises people based on simple dichotomies (nice people give me good things, mean people give me nothing). There is little insight in causation and rules; punishment is a rather arbitrary means of revenge.

"When I am being criticised, I do as I'm told."

"... I go to my room."

3. Self-protective stage

Children now start to understand rules as they comprehend why it can be beneficial to obey the rules. However, it is a state of hedonism and the immediate satisfaction of the desires of self is paramount. When something goes wrong, they blame others or a circumstance or maybe something for which the child does not feel responsible ("my eyes").

"... I will criticise them."

"... I get angry."

4. Conformist stage

The focus has shifted from egocentric to group-centered. The person identifies with the group to which he or she belongs. The subjects are preoccupied with appearance, material things, being accepted, and belonging. No clear distinction between what people are like (including oneself) and what they should be like.

"... I don't like it."

"... I don't care."

5. Self-awareness

This stage is seen as a transitional stage: the person remains a conformist in essence, which is demonstrated by a high level of sensitivity to valuation and by concern about possible rejection and abandonment. At the same time, it is the beginning of the inner life and thus the need for individuality arises. The subject experiences an increased level of self-awareness, demonstrated for example by the growing availability of concepts to describe his or her inner life (such as emotions). More so than in the previous stage, subjects now display more interest in individual differences.

"... I try to learn from it."

"... I pretend not to care."

6. Conscientious stage

By now, the individual conscience plays a directional role instead of external authorities or peer standards. Where a stage 3 subject will obey the rules to avoid punishment and stage 4 and 5 subjects obey the rules in order to be accepted by the group, the organisation or society respectively, stage 6 subjects will evaluate the rules by themselves in view of personal ethical principles, ideals and plans (which could very well lead to conformist behaviour, which in this case would be a choice they made). At this stage, subjects are capable to personally set some long-term goals. This stage is further characterised by a strong sense of responsibility.

"... it will hurt, but (afterwards) I may consider it to be quite a positive experience"

"... I assess the criticism and consider it carefully."

7. Individualistic stage

Personal individuality and (emotional) independence become paramount. Excessive feelings of responsibility for others disappear. They are more accepting towards individual differences. They gain insight in their own and others' personal development and they differentiate more clearly between people and their roles.

"... I listen, think about it and then decide."

"... I try not to react in a defensive manner and I try to see what I can learn."

8. Autonomous stage

This stage is characterised by a developed capacity to deal with ambiguity and to integrate differing ideas. There is respect for the autonomy of others and a desire for interdependence.

"... I would like to see it from the viewpoint of the other"

"... I will react openly, accept the criticism or defend my own viewpoint."

9. Integrated stage

Little is known about this stage due to lack of participants and psychologists who function at an adequate level of ego development to rate it. It resembles Maslow's self-actualisation.

According to the research using Sentence Completion Tests – mainly in the United States – the fourth (conformist) stage is the modal stage for adolescents. The fifth (self-awareness) stage is the stage of the average (American) adult. However, not everyone develops at an average level! Sometimes the sixth, conscientious stage (increased sense of responsibility, self-made long-term goals, etc.) is reached during early adolescence (at age 13 or 14). This is rare however. Most adults exceed stage 3, yet some do not. However, Loevinger believes that the latter (e.g. when born rich or with a lot of luck or if they have a high IQ) can function in a normal, good manner within society. Most people never reach the Conscientious stage, let alone a following stage.

Since 2000, there has been a proper, validated Dutch Sentence Completion Test, also referred to as 'ZALC' (Westenberg, 2002). This was used, for example, in a study by Nelck-da Silva Rosa & Schlundt Bodien (2004) on learning how to reflect on literature. Three versions of the ZALC are available for three age categories. The instrument consists of 32 incomplete sentences, such as "When a child keeps refusing to participate in group activities...", "What I like about myself is..." and "Rules are...". The subjects are instructed as follows: "Complete the following sentences in whichever way you like." Based on an extensive score manual, the responses written on the dotted lines lead to a classification into stages of ego development. Apart from that, the ZALC does not encompass all Loevinger's stages but only stage two until stage six inclusive.

The qualities of the ZALC have been determined by conducting the test among a large group of subjects (approx. 3000 children and youngsters). The instrument has a high level of interrater reliability, great consistency and solid arguments for validity. Based on data collected in the Netherlands (Westenberg, 2008), the development of Dutch people differs only little from that of Americans, at least up to adulthood, as little research has been carried out in the Netherlands into the development of adults. On average, the transition from the self-protective to the conformist stage occurs between ages 13 and 14. Around the ages of 17 and 18 on average, the transition occurs towards the self-awareness stage. However, this varies greatly. "About one quarter of adults remain stagnant at the developmental level of a fifteen-year-old!"⁵ The transition towards the Conscientious stage, if it occurs at all, varies too strongly to be linked to a specific age. It is clear however that the ego development of girls is ahead of that of boys. For example, the average 14-year-old girl is Conformist, whereas the average 14-year-old boy is still Self-protective (Nelck-da Silva Rosa & Schlundt Bodien, 2004: 126). "The difference between sexes is apparent in late childhood and disappears in early adulthood" (Westenberg, in Nelck-da Silva Rosa & Schlundt Bodien, 2004: 146).

⁵ Statement by Saskia Kunnen in her keynote introduction '*Is Kiezen te Leren*' ('Can choosing be learned') at the conference 'Career development between old and new learning', 24 April 2008, The Hague University.

Below are some other interesting research findings:

- There are only minor (positive) correlations with intelligence, language skill and socio-economic status (Cohn & Westenberg, 2004). In other words: the fact that someone is intelligent, eloquent and holds a good social position does not necessarily mean that that person is at a more advanced stage of ego-development.
- Contrary to what is predicted in Loevinger's theory, ego development does not only progress upwards, but some people (men more often than women) regress in their developmental (Manners & Durkin, 2001).
- There are indications that ego development can be promoted. Manners, Durkin & Nesdale (2004) reported a successful, well-controlled intervention study (control group matched on relevant characteristics, people conducting the tests were unaware of the ego development stage of the subjects, etc.), with the intervention consisting of a training program of ten sessions based on discussion, communication exercises, guided fantasy, extracting feedback and relaxation exercises. Nevertheless, as Loevinger (op. cit.: 20) admitted personally, there is no satisfying explanation as to what instigates or halts ego development.

Kegan's consciousness development

The narrative of Robert Kegan (1994) does more justice to the phrase 'theory' than those of Kohlberg or Loevinger. The different stages of the last two authors are based on research using interviews and questionnaires and hold a primarily descriptive, yet less explanatory value. Kegan focuses more on the principle which lies at the basis of stepwise development. While doing so, he also explains Piaget's theory. Either way, his work seems to inspire many people. For example, a search for his name on the Internet generates nearly five times as many hits as Jane Loevinger's. Many chapters in the handbook on adult development (Hoare, 2006) are partially built on Kegan's work. With regard to development, Kegan believes that the manner of knowing and of constructing meaning, changes stepwise. Knowing presupposes that there is a subject (the knower or understander) and an object (what is known or understood). The subject is what we are but cannot look at from a distance. You can compare this to the eye, which cannot see itself, or a fish, which only knows a world of water and discovers what water is as soon as it is thrown ashore. Object is what we can take perspective of, think about, and take responsibility for. At each step throughout the development process a limit is reached and exceeded in the relationship between subject and object: step-by-step, what was once subject will become object. During this process, consciousness will reach higher levels from which more and more complex data can be observed and correlated. Thus, as a young child you *are* emotions. When you are a bit older, you *have* emotions (in the sense that you know that you are something different than your emotion, because you know that you have other emotions at other times). Later, you are able to feel emotions about emotions and you are able to think about them. Finally, you are able to anticipate your own emotions and to consciously influence them.

Kegan's theory describes the process of development in terms of five orders of consciousness. In order to establish which order of consciousness one belongs to, a considerably reliable, albeit laborious instrument has been developed: the 'subject-object interview', which, without the standardised processing, takes approximately one and a half hours (Lahey e.a.). Below is a description of the five orders of consciousness. The names given by Kegan to these five orders of consciousness are not very clear. Hence, many authors use their own names. This is what I did as well, and I added the terms used by Kegan in quotation marks alongside some alternatives used by other authors. In practice, one often simply refers to them by their sequence number.

1. Impulsive (“Social Perceptions”)

At this stage, there is quite a direct relation between stimulus and response. Little consciousness is involved at this point. The child ‘is’ his or her hunger or sadness. This stage runs parallel to Piaget’s pre-operational stage and lasts until age six on average. The child has an incredible learning capacity (in the field of language acquisition, for instance), but is hardly able to solve problems.

2. Instrumental (“Point of View”, Imperial)

This stage is in keeping with Piaget’s stage of concrete operations. The subject is now able to solve real (i.e. non-abstract) problems. However, this is mainly geared towards the subject’s own interests, needs and desires: you can’t get something for nothing. Other features are: little empathy as yet, black-and-white and monocausal cause-effect thought process. In education, this stage is characterised by statements such as: *“Now tell me which theory is the correct one”*; *“Give me clear, step-by-step instructions on how to do this”*; *“What you told us was great and very interesting, but can this lesson please be more about preparing for our test”*. Reliable sources (also see § 4) confirm that these kind of statements are anything but rare in MBO or even in HBO. We will return to this topic later.

3. Interpersonal (“Mutuality/Interpersonalism”, Socialising, Traditional)

The interpersonal stage is similar to Piaget’s stage of formal operations. The subject is able to think in an abstract and hypothetical manner (what would happen if ice were heavier than water?). He or she is no longer ‘embedded’ in his or her own needs and is now able to empathise with others. However, this new skill is rather dominating, which causes subjects to look at themselves and the world through the eyes of people who are important to them (often the parents first, followed by peers, friends and heroes, and finally ‘authorities’). There is an internalised viewpoint of others. Self-image and values originate from others. Subjects consider themselves responsible for the feelings of others (and consider others responsible for their feelings). He or she considers it important to be regarded as nice (or smart, strong, etc.) and is sensitive to criticism. Conflicts within their own group are considered threatening, because this could, in a certain sense, split one’s self (which is strongly interlinked with that particular group).

4. Self-directed (“Institutional”, Self-authoring, Modern)

Piaget believed that development reached its final stage with abstract thinking, but according to Kegan (and numerous other authors who have written on the subject of postformal thinking – such as Alexander & Langer, 1990), several other stages may follow. At the stage of self-direction, one becomes aware that knowledge is construed and that values and ethics are determined by situation. The subject is able to identify and question underlying assumptions behind stories. He or she is able to step out of their own or others’ frame of thought (a requirement for Argyris’ double-loop learning). At this stage, the subject is not autonomous, not bound to rules and conventions. The fact that others question the subject’s ideas does not necessarily create a feeling of loss of self-esteem. The subject appreciates the positive aspect of the conflict, the criticism and the differences. They feel responsible, for their own state of mind as well. They see themselves (also) ‘through their own eyes’. They are able to define boundaries. The subject will determine his or her own (learning) career based on a personal vision and will take on challenges to develop even further. They are able to switch easily between roles.

5. Transforming (“Interinstitutional”, Interindividual, Dialectic, Postmodern)

At this stage, subjects are capable of discovering transcending principles and new paradigms to solve conflicts between systems of thought, and to solve dilemmas. The subject has a well-developed ego, but is aware of its illusive character. They see themselves, while maintaining their acquired autonomy, as part of a larger whole and are consciously steering this.

The leitmotiv throughout Kegan's development theory can be defined in terms of two 'basic motives of human existence' (Hermans, Hermans-Jansen & Van Gilst, 1985): 'S', the need for self-preservation and self-expansion and 'O', the need for solidarity and being submerged in a larger whole. According to Kegan's theory, both motives intermittently dominate the individual stages in life. People must first discover that they exist as a separate entity, and then, that they are part of a social environment, after which they must break away from it by developing a sense of autonomy. If successful, the subject will finally experience subcommunity at a higher level (as an autonomous individual). A cyclic process can be distinguished throughout the five stages. Stages one, three and five are primarily about being submerged in a larger whole, while the core aspect of stages two and four is breaking away from the environment. However, this always occurs at a higher level, with the acquired skills from the previous level being taken along. One needs to acquire autonomy first before it can be surrendered. The subject must be part of a community first, before being able to break away from it. They must build a position and an ego first, before learning how to put these into perspective.

The cyclic nature of development can make it quite difficult to assess the stage at which the subject finds himself or herself. At first glance, subjects who find themselves at two different stages may display similarities. We must differentiate between your own will and standing up for your own interests (level 2) and the autonomy which is only acquired after experiencing social solidarity (level 4). Similarly, a distinction must be made between solidarity with the group which exists without ever having left a group (level 3) and solidarity as an autonomous preference and realisation (level 5). The first type of solidarity (level 3) could be compared to Marcia's foreclosure (see Den Boer & Bakker's contribution in this volume), and the second type of solidarity (level 5) with an actual identity that grew through exploration. Following this line of reasoning, a true career identity cannot be present yet during one's first real profession.

Throughout the years, the level of consciousness of many hundreds of subjects (though nearly exclusively from the United States) has been established by conducting subject-object interviews. Here are a number of results (Kegan, 1994; Hoare, 2006):

- level 3 is the average level reached by adults
- 21% of the US population reach level 4
- slightly less than half the people in the US with a higher education degree reach level 4
- according to a number of studies, women reach level 4 more often than men
- subjects who function at level 5 are rare and are never of an age below 40

Table 2 displays a concrete, rather recent example from the context of higher education. It shows us the results from research conducted at West Point, a military academy for the training of officers (Lewis, Forsythe & Sweeney, 2005). During this study, a subject-object interview was conducted twice throughout the training course among a group of 52 students in total (ages 17 to 23 at the beginning of the study, 13% women). The numbers represent percentages. This table uses intermediate levels (2/3, 3/4).

Table 2: Percentage of students per level and per grade at West Point

Level	Year 1	Year 2	Year 3
2	21	23	6
2/3	63	52	31
3	16	19	44
3/4	0	6	19
4	0	0	0

The good news is that there is a clear increase in the level of consciousness. The bad news is that in grades 1 and 2 at least one in five students has stagnated at level 2. As an example, one student is rather angry because two of his mates have been expelled from school because they lied. Even after persisting with more questions, he merely repeats how much more fun it was prior to their expulsion and how those times are now gone. There is no reflection on the reason why they were forced to leave or on the school policy.

Level 3 seems to dominate the last grade. The students in this group made statements such as “*My biggest fear is to let down my platoon*”.

Not one student truly reaches level 4, not even in the last year of the program. One may wonder whether the nature of the training course affects the outcome. Students who are prepared to submit to a strong hierarchy and who are essentially prepared to kill are not necessarily representative of the entire population. However, Lewis & co. (op. cit.: 365) makes mention of a comparable study conducted among 20 students at a State University, with similar results regarding the levels of consciousness.

Conclusion

A first conclusion is that the theories described by Luken (1999) are still very much alive and that they have been supported by recent studies as well. Nevertheless, at least three aspects remain rather unclear:

- To which extent can we truly say these are qualitative steps, or should we refer to them as gradual processes?
- How can we explain the major individual differences in development rates?
- What exactly belongs to one stage and what belongs to another?

There is however a clear concordance overall. The average adult is essentially ‘conventional’ or ‘conformist’. This means that he/she lives according to behavioural patterns and standards and values which were taken from the surroundings without defining an independent point of view. Most youngsters and young adults are not capable of self-direction. What they are lacking the most is overview and autonomy. If self-direction is indeed an essential element in new learning, then this new learning is expecting something of the learner which the average learner cannot do. After briefly discussing brain research we will elaborate on the conclusions to be drawn.

5.3 Brain research

The human brain is a marvellous organ weighing less than one and half kilos. There are about 100 billion neurons in the brain (by way of comparison: the world population currently stands at less than 7 billion people). Each neuron is connected to an average of 7000 other neurons. These connections

are made through approximately one hundred thousand kilometres of wiring (axons and dendrites). That is two and a half times the circumference of the Earth. All this in one single head... Throughout previous centuries, the functioning of the brain remained a mystery. Only in the last few decades, thanks to the development of more refined techniques, the inside of the brain could finally be studied while it was functioning. Examples of this are computed tomography (CT scans) using X-rays and positron emission tomography (PET scans) using radioactive isotopes, both delivering ultra detailed three-dimensional images of the brain. Another example is (functional) 'Magnetic Resonance Imaging' (fMRI). Using ultra strong magnets and photon detection, this technique allows us to trace minor changes in blood flow.

Numerous popular scientific publications about the findings have been published in recent years, such as Johnson (2004), Goldberg (2005), Sitskoorn (2007) and Mieras (2007). In publications such as '*Hersenen jongeren niet klaar voor nieuwe leren*' (Youngsters' brains not ready for new learning) and '*Hersenen pubers niet rijp voor het studiehuis en nieuwe leren*' (Young adolescents' brains not ready for study centre and new learning), Jolles (2006, 2007, 2008; also see Nieuwenbroek, 2006) has established several links between brain development and education. Stuss and Anderson (2003) examined the relationship between the several types and levels of consciousness and focal brain lesions. Unfortunately, only a handful of other authors have established an explicit link between brain research and development theories. One that needs mentioning is the Dies Oration of Westenberg (2008), which received a lot attention from the press, and in which the author explicitly links Loevinger's theory with the brain research results by Ruigrok Prize winner Crone.

How does the above brain research fit in with this topic? In relation to the functioning of the brain, there are many puzzles left unsolved, but at the same time, a number of undisputed conclusions can be formulated:

1. The brain does not stop developing around the age of puberty, as it was often believed in the past based on the fact that a skull reaches its maximum circumference around that age. It has been known for quite some time that until around the age of 20, gyrification (i.e. the degree of 'rumpedness' of convolutions in the neocortex) increases (Luken & Vloet, 1998). Now, we know for a fact that the brain keeps growing until well beyond the age of 20. In fact, it keeps developing throughout one's entire life. New neurons may be developed even much later in life (20 years ago it was believed that one was born with a maximum number of neurons and that the number of neurons could only decrease during a person's lifetime, not increase). More importantly: throughout our entire life, new connections between neurons are established all the time via new dendrites and synapses, while other connections are 'cut back' at the same time (which is equally important). For instance, when a fifty-year-old decides to take up juggling, then this will bring about clearly noticeable changes in certain brain regions. Also, main connections between brain regions will improve through 'myelination', at least up until early adulthood. This process clusters and isolates nerve fibres, which heavily increases the connection speed ('from dial-up to ADSL').
2. When growing older, many abilities deteriorate, such as the speed of mental operations, the ability to remain undistracted, storage memory, mental flexibility, memory for new facts etc. This is replaced by other improved capacities, e.g. in the field of pattern recognition and comprehension and the ability to deal with complex emotions (Goldberg, 2005; Considine & Magai, 2006).
3. The development varies greatly between individuals.
4. The development occurs at a faster rate in girls than in boys.
5. Complex activities (this includes nearly all competences) rely on subprocesses, during which different parts of the brain are active. In order to be competent, the connections between those parts must be functioning properly.

6. The part of the brain behind the forehead (prefrontal cortex) is needed for abilities such as empathising with and understanding others, consciously feeling emotions, controlling impulses, contemplating (moral) dilemmas, gaining an overview of complex matters, being truly self-aware and integration of affect and cognition (Stuss & Anderson, 2003: 12), decision-making, thinking ahead and planning.
7. These parts – and their connection to the rest of the brain – only start developing properly after the age of 16 and they continue to do so until sometime between the ages of 20 and 30.

If we look at the conclusions drawn about brain development, it is quite understandable that the average adolescent makes impulsive choices until around the age of 18, with a great deal of attention placed on possible rewards but little attention on alternatives, long-term planning and risks. They are strongly influenced by their social environment. After this age, possibly until somewhere between the ages of 20 and 30, it remains difficult to integrate thoughts with feelings. All this and more will result in problematic planning and self-direction.

5.4 Discussion, conclusions and recommendations

Similarities and differences between developmental and brain research

The sources referred to from two varying fields display some striking similarities on a number of issues: development does not end during puberty, as previously believed, but continues well beyond that; the individual differences are considerable; development occurs at a more rapid rate in girls than in boys. In that sense, recent brain research confirms the somewhat older development theories. However, there are some differences as well. Development research based on theories by Kohlberg, Loevinger and Kegan demonstrate that major developmental steps can occur even in late adulthood. Brain research reveals little about this after the age of 30, apart from the disintegration processes later in life.

Everything points to the fact that maturing as well as life experiences (with regard to problems, limitations and dilemmas, etc.) are prerequisites for the development of a career identity and for the ability to self-direct, self-regulate and display true competence. It is yet unclear what the exact relationship is between influences from 'nature' and 'nurture' and how they affect each other. A key question left with no clear answer in both source types, is: to which degree can the development process be accelerated or promoted? The experiments conducted by Piaget and his school are not very promising. Providing extra stimuli and guidance may indeed accelerate the transition from pre-operational to concrete operations in children, though this will not lead to a permanent headstart. For instance, it is of little value to teach babies how to count or toddlers how to read. It may even have an adverse effect. In this line of reasoning, it may be useless or even detrimental to rely on self-direction or to force students to reflect on issues at too young an age.

On the other hand there are several clear indications, such as the previously mentioned study by Manners, Durkin & Nesdale (2004), that development *can* be promoted. Both developmental and brain research demonstrate clearly that development does not occur without the presence of stimuli from and opportunities within the surroundings. Brain research also shows that brains can be 'moulded' during the entire lifespan, albeit to an ever-decreasing degree. It is not clear as yet, however, how this plasticity relates to the maturing process of brain structures and connections.

Views from conference attendees and reflection on those views

On 24 April 2008, about 100 attendees at the conference on 'Career development between old and new learning' at The Hague University took part in a discussion about the (im)possibility of self-direction. The majority of participants were instructors or other staff members from MBO and HBO establishments. Many issues discussed were met with recognition, such as the fact that many students,

even in higher education, are strongly focused on tests. A relatively small number of students display a strong, intrinsic sense of motivation for the subject matter taught and are purposefully working on their personal learning and development process. Only few students have a well-founded vision on the future and their role within that future.

There was a rather unanimous optimistic atmosphere about the opportunities to help students develop the ability to self-direction. Some means mentioned to achieve this purpose were mainly in the field of culture (e.g. mistakes are allowed, addressing each other, good listening skills) and providing space and responsibility.

Furthermore, a number of examples were brought forward of learners or students who exercise self-direction. There is one student at an MBO school, for instance, who did not like being in one group and who took the initiative to be moved to a different group. These examples demonstrated the importance of the definition of self-direction. Self-direction occurs through several stages, depending on the designated room for decision-making and responsibility. The concept of self-direction goes much further than self-regulation. Self-direction is difficult and even prominent politicians, intellectuals, artists and captains of industry do not put this concept into practice. Ruud Lubbers, Philip Freriks, Hans Wijers, Hedy d'Ancona, Hans Blankert, Dries van Agt, Winny Sorgdrager, Sies Wieggersma, Wim de Bie, Henny Huisman – this is only a small selection from numerous public figures who have admitted during interviews that they are unaware of their own motives, that what they did in the past was pure coincidence or that they do not plan for the future. Thus, something is required from learners and students that even the most successful adults in our society are unable to do, or for some reason won't do.

For that matter, *self-regulation* is difficult enough as it is, given the vain attempt of some experts in the field of self-direction to not put on weight, to not get too busy with work or to not exceed the time allocated to give a lecture during a congress.

The need for development and self-direction

The other side of the story is that self-direction and the development towards a higher moral, ego or consciousness level are a mere necessity. Firstly, self-direction is necessary in view of learning output. Learning is much easier and will provide much more useful and long-lasting results when learners are able to personally select the subject matter and the method of learning. Experience tells us that when we take the passenger seat in a car, or when the driver is guided by a navigation system, we have trouble remembering the travelled route afterwards. It is much more easily remembered when we drive the vehicle ourselves. Points of recognition are captured in the brain when we make decisions (Mieras, 2007). Self-direction is a crucial element in new learning which is needed to have a chance of success in the individualised knowledge society of today (Diepstraten, 2006). It is an essential element in employability and is regarded as such by employees, employers and authorities alike (Luken, 2003).

However, the need for a personal and cognitive development process which stretches further than Piaget's formal operations is even broader. Kegan (1994) demonstrates rather convincingly that his fourth order of consciousness is necessary in order to function successfully in a modern society and that the fifth level will be necessary for a postmodern society. At a more concrete level, Manners, Durkin, & Nesdale (2004) demonstrate – based on empirical research results – that advanced levels of ego development are beneficial to one's health, marital happiness, rearing capacities, the quality of problem definition and decision-making processes in managers and self-care in the elderly. Finally, we would like to quote Taylor (2006: 215): "A glance through almost any newspaper reveals that the ill-structured problems of the modern world are not effectively solved by avoiding conflicts over ideas, depending on authorities to provide solutions, and assuming that one's own group (however defined: affinity, social, racial, religious, cultural, regional, language, political, national) is in some essential way better or righter than those from whom we differ."

Summary and criticism on the current curriculum

In summary, we can say that:

1. self-direction is currently well above the head of the majority of youngsters and of many young adults
2. it is important for them to develop this skill for various reasons
3. it is yet to be discovered to which degree it can be developed.

One of the problems lies in the fact that point 2 is generally acknowledged and dealt with, while points 1 and 3 are disregarded. Too much is based on what is desirable and not enough attention is paid to the original situation and how the gap can be bridged. It is like trying to build a bridge while only working on one side (Kegan, 1994). For instance, the instructors' handbook for the Intro program, aimed at students who are entering MBO (all four levels) states the following about their first core activity: "The purpose of this first core activity is many-sided. Participants will:

- gain insight in their personal (professional) development.
- learn how to set learning objectives and to select the appropriate learning activities and resources.
- learn to guide their personal career from a developed professional image, self-image and vision on training." (*Stichting Consortium Beroepsonderwijs*, 2007: 3)

And in one handbook, aimed at first-year students in HBO: "In the portfolio report you will need to demonstrate and make clear that – if you want to be accepted into the main section of the course – ... you are capable of self-direction, or in other words; are you capable to guide your personal development?" (Fontys, 2007: 4). And stated on the website of professional journal 'P&Oactueel': "Employees must take responsibility for their own career, mobility and employability. Each individual employee must reflect on how his or her opportunities and competences can be developed and broadened."

When the desired end result is emphasized and both the starting point and the road to be travelled are disregarded, frustration will rise among both students and instructors (as well as employees and managers). Risks include an undermined self-confidence and an increased resistance to learning. According to Kegan (1984), it is of utmost importance that the bridge is solidly anchored on both sides instead of just one. Instructors must see both sides to be able to form a bridge: they must place themselves in the position of the student and take on the latter's perspective on the world while at the same time retaining focus on the self-directed individual. To do this, Kegan believes that the instructor must have reached the fourth level of consciousness himself. If not, well-meant assignments will generally not yield the desired effect. Working with groups of people often leads to a true dialogue among level four subjects which then leads to valuable learning results. Subjects at level three, however, are more likely to think: "I better not say anything important because I don't want to run the risk of others disagreeing with me or create conflict within the group." And level two subjects will often fail to listen and will find group work to be a waste of time, as it does not lead to concrete results. In order for group work to be effective at these levels, a well thought-out setup and guidance will be required.

Reflection is a different example. Reflection assignments often seem to fail. Zijlstra & Meijers (2006:59) concluded the following on the basis of four independent studies conducted among first-year students in HBO: "Many students do not relate reflection to themselves, and education activities associated with reflection are not taken seriously but are instead regarded as a mandatory task. The response from students to the increased focus on reflection yields the same response as the rest of the curriculum: they try to survive while putting in the least amount of effort possible" (Zijlstra & Meijers, 2006:59). Perhaps learners and students are quite right when they resist reflection assignments. Research conducted by Nelck-da Silva Rosa & Schlundt Bodien (2004) shows that a rather long and

intensive program to promote reflection on literature seems to lead to a *reduced* capacity to reflect, at least among boys. Moreover, there appears to be no relationship between the capacity to reflect and the ego development stage. Dijksterhuis (2008) describes numerous examples of studies which show that conscious reflection can negatively affect the quality of decision-making.

What should it be like?

Education should not impose a standard for all students to shape a career identity and to become self-directed during their school years or academic years. It is an objective that is often only attained after the regular schooling career. However, education can and should contribute to this objective. How? A proper answer to this question will require more research and thought. The ZALC (see § 3) might help us learn more about development in youngsters and in (young) adults. It would be interesting, for instance, to examine whether there are differences between ZALC performance results from schools that are actively promoting self-direction (i.e. room to explore, room for dialogue and personal choices) and from schools that do not. Again, it would be interesting to examine whether level differences in the ZALC correspond to the development of the frontal lobes in our brain and the functioning of connections inside the brain. Another possibility would be to design an abbreviated or written version of the subject-object interview. Lewis – mentioned previously in § 3 – is currently working on this in the United States. In anticipation of further research results, a few suggestions are listed below regarding the different ways in which the education system could consider the ideas and facts brought forward in this chapter (see for example Hoare, 2006; Kegan et al. 2001; Meijers, Kuijpers & Bakker, 2006):

- Do not suppress but instead discuss paradoxes. For example, the paradox of competence-oriented education and self-direction on the one hand and a school year and qualification system with closed curricula on the other, which allows for no freedom of choice or a true connection with the competences that are already present. Such paradoxes are difficult to solve at implementation level. Administrators and politicians have a great responsibility in this respect.
- Instructors must learn to assess the actual developmental level of students and must take this into consideration. For this purpose, they need to 'enter the student's mind' every so often.
- Personal contact between student and instructor might even be the most important factor to promote development in students. As Light concluded (2001: 81) from in-depth interviews held among many hundreds of students: "Good advising may be the single most underestimated characteristic of a successful college experience. Graduating seniors report that certain kinds of advising, often described as asking unexpected questions, were critical for their success." Learning career counsellors, who have personal contact with students with regard to some important personal issues, can play an essential role in this process.
- Confront student with different cultures, systems of thought and with disorienting questions and dilemmas. For example, working not (only) with peers but (also) with workers, instructors and students from different grades or other courses.
- Stimulate students to pay attention to personal experiences and signals from within (feelings and voices in the Dialogical Self, see Hermans, 2006) and guide them in this process.
- Assist students in gaining an overview of their lives and of anything that was, is and will be of influence, through autobiographical assignments for instance, or through methods such as 'My System of Career Influences' (MSCI, McMahan, Patton & Watson, 2005).
- Allow students to practice the assessment of any task with unclear standards (such as analyses, interpretations) from themselves and other students.
- Structure the curriculum to gradually create more room for self-direction, or in other words, provide real room for choice and make it possible to be responsible for the choices made.

- Provide information in the curriculum about development theories to generate insight into the road to be travelled and the results it will bring; provide feedback on any progress made in this field.
- The majority of the above recommendations are also applicable to instructors: their personal development is a prerequisite for the development of their students.
- Provide more support. Development is an emotional and at times painful process. As pointed out by Kegan (1994), for instance, gaining autonomy can bring about a strong resistance from the social environment. It may even cause the subject to feel afraid of being a traitor and of being abandoned. English speaking colleagues talk about 'Teaching as care' (Daloz in Taylor, 2006: 215): "Good teaching rests neither in accumulating a shelfful of knowledge nor in developing a repertoire of skills. In the end, good teaching lies in willingness to care for what happens in our students, ourselves, and the space between us."

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