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Teaching practices for self-directed and self-regulated learning: case studies in Dutch innovative secondary schools

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ABSTRACT

Although self-directed learning is considered important in both educational practice and theory as a 21st century skill and as a means to motivate students, most teachers find it difficult to integrate self-directed learning into their practice. An instrumental case study was conducted to investigate how teachers at four innovative Dutch secondary schools define self-directed learning and how they try to enhance it in their students. Special attention was paid to how the teachers dealt with differences in students' ability in self-directed learning. It was found that the teachers' definitions of self-directed learning varied from students working independently (which seemed closer to the concept of self-regulation) to students making decisions about learning goals and content. Methods used to enhance self-directed learning varied from clear instruction and well-organised learning materials to having students carry out self-designed projects. Teachers' ways of dealing with differences depended on their schools' interpretation of self-directed learning.

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Introduction

Nowadays people are expected more than previous generations to shape their own lives, make choices and take responsibility for those choices. The current generation of students must in addition prepare themselves for lifelong learning; they will have to continue to acquire new knowledge and skills throughout their entire professional career. This makes large demands on students' ability to manage themselves. Against this background, self-direction and self-regulation are often called 21st-century skills that students must learn at school (Partnership for 21st century skills 2019). At the same time self-directed and self-regulated learning are also seen as ways of motivating students to learn at school; by giving students more choices and responsibility they will take a more active, involved approach at school (Francom 2010).

Although the terms self-directed and self-regulated learning are not always clearly distinguished in the literature (Saks and Leijen 2014), there is some agreement about their different emphases. Self-directed learning is considered to allow students a greater say in the learning process than self-regulated learning. In self-directed learning the student is responsible for the

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whole process, from determining goals to designing and implementing the learning task, whereas in self-regulated learning the emphasis is on independently accomplishing a learning task designed by the teacher (Jossberger et al. 2010; Saks and Leijen 2014).

Both self-directed learning and self-regulated learning are seen as ways of learning that students cannot be assumed to be competent in. They require skills that can be learned but explicit attention must be paid to them at school. This is not, however, often the case (Kistner et al. 2010). Teachers play an important role in students learning self-regulatory skills (Moos and Ringdal 2012; Zimmerman 2002; Yan 2018), but research has shown that they are not often extremely effective in this (Dignath and Büttner 2008). Furthermore, a frequently expressed concern is that educational concepts based on self-direction and self-regulation are possibly not equally suitable for all students, as they assume that students already have the necessary skills for self-direction and self-regulation (Thoonen et al. 2011; Stoten 2014). More insight is therefore necessary into how teachers can teach students the necessary skills and into how they can deal with the possible differences in students' ability to learn in a self-directed or self-regulated way.

In Dutch education in recent years "zelfsturing" has been the subject of much discussion. It is defined as the ability in self-management that students will need in the future and is a characteristic of learning processes in which students have a relatively large input and responsibility (Thijs, Fisser, and van der Hoeven 2014). In educational practice this term is often used to refer to both self-direction and self-regulation. Although more and more schools say they think *zelfsturing* is important, it is predominantly innovative schools that explicitly mention it in their concept and way of working (Schuitema, Peetsma, and van der Veen 2012). Thus something can be learned from these schools regarding the question how can self-directed learning become part of the learning process and how can students learn the skills it requires.

The last few years we have worked closely with a number of Dutch innovative secondary schools in the context of a school-university collaboration that aimed to study how schools approach the teaching of 21st-century competencies. One of the underlying ideas of the research was that other schools would be able to learn from the approaches and experiences of these schools. In this study we focus on four schools that explicitly name *zelfsturing* in their vision or mission. We wanted to gain insight into the meaning of this concept in these schools and into the ways in which they realised the concept pedagogically. In addition we were interested in the question how teachers deal with differences between students regarding self-directed learning.

Self-directed and self-regulated learning

The *Self-directed learning* (SDL) theory has its origins in adult education. Knowles (1975) described self-directed learning as the process in which an individual either independently or under guidance determines what he or she must or wants to learn. He or she formulates goals to achieve this and identifies the resources that can be used, chooses and implements learning strategies that are fitting for these goals and evaluates the results of the learning process. Whereas it was originally used for describing learning outside the school context, it made its entry into Dutch secondary education in the 1990s (Bolhuis and Voeten 2001). SDL was also the subject of discussion in the context of secondary education in other countries. Students who can self-direct their learning,

think of their own learning goals and determine how they want to shape the accompanying learning processes themselves (Francom 2010; Saks and Leijen 2014).

The theory of *self-regulated learning* (SRL) originates from educational psychology and the phenomenon SRL is mainly studied in the school context (Boekaerts 1999; Loyens, Magda, and Rikers 2008). Self-regulated learning means that during the learning process students monitor their behaviour, motivation and metacognitive skills and adapt them as necessary in relation to the learning goal. Hence the student has an active role in the learning process (Pintrich 2000; Schunk 2005). Students who self-direct their learning themselves choose, for example, whether to read a text thoroughly or globally. The self-regulated learning theory differentiates three phases in the self-regulated learning process: the preparatory forethought phase, the implementation phase and the self-reflection phase (Zimmerman 2015).

The terms self-directed learning and self-regulated learning are often used interchangeably but do differ theoretically (Saks and Leijen 2014; Loyens, Magda, and Rikers 2008; Jossberger et al. 2010). In self-directed learning the student has responsibility for the entire learning process. The student determines both the goal of the learning process and the way in which the goal is worked on. In self-regulated learning a teacher determines the learning task. Jossberger et al. (2010) argued, therefore, that self-directed learning concerns learning at the macro level, namely designing the whole learning process, whereas self-regulated learning occurs at the micro level. Seen like this, self-regulatory skills are a condition for being able to self-direct your learning but self-directed learning is not necessarily a condition for self-regulated learning (Saks and Leijen 2014).

Developing self-direction and self-regulation skills

Both the self-directed learning theory and the theories about self-regulated learning point out the important task of teachers in developing the necessary skills. Bolhuis and Voeten (2001) argued that although self-direction is increasingly considered to be important, students in formal education do not by definition learn the skills necessary to be able to self-direct one's learning. They show that teachers often take over a large part of the learning process, so that students do not learn how to direct their own learning. Teaching the skills for self-direction, according to them, requires a change in teaching strategy. Little is known, however, about how teachers can support self-directed learning (Dignath and Büttner 2018; Guglielmino 2013).

Research based on the self-regulated learning theory also shows that teachers find it difficult to support students in learning self-regulatory skills. Students' use of self-regulatory skills can evidently be furthered by lessons explicitly dealing with this (Dignath and Büttner 2008; Perels, Gürtler, and Schmitz 2005). But although teachers do realise the importance of these skills and sometimes give students room to work in a self-regulatory way, they do not pay explicit attention to teaching these skills (Kistner et al. 2010). Teachers also do not have much knowledge about how they can teach students these skills (Dignath and van der Werf 2012).

Differences between students

In the literature it is suggested that some students might be better off with traditional teaching practices, in which the instructions and tasks are well structured, than with self-

directed learning and self-regulated learning that make demands on students' ability to regulate their own learning (Thoonen et al. 2011; Stoten 2014). Others suggest it is important that teachers adapt their support in self-directed and self-regulated learning to students' ability (Francom 2010; Moos and Ringdal 2012).

Research has mainly been on the differences between students in applying self-regulatory skills. This has revealed differences between boys and girls and between students from different educational ability levels. Zimmerman and Martinez-Pons (1990) determined that girls use self-regulatory skills more often than boys. Niemivirta's research (1997) showed that boys and girls motivate themselves for school work in a different way, with boys being more achievement oriented. Students' self-reports in the research of Schuitema, Peetsma, and van der Veen (2012) showed that students in lower-level educational tracks made less use of metacognitive skills than students of the same age in higher-level tracks.

In addition to the use of self-regulatory skills, Vandeveld, Vandebussche and Van Keer's research (2012) on primary-school teachers showed that teachers find it more difficult to teach students self-regulatory skills when there are big differences between students in the group, for example in the extent to which students already have a command of self-regulatory skills or in intelligence.

The present study

Although self-direction and self-regulation are seen as important 21st-century skills, little is known about how teachers can work on them. The principle of self-directed learning has acquired a place, via teacher education, in-service training and research, in the thinking of teachers and managers in Dutch education. The attention paid to 21st-century skills has boosted this. Mainly innovative schools make work of this and give it a place in their vision and mission. The practice of these schools provides a good opportunity to study how these self-directed learning can be incorporated into educational practice. The following research question was formulated against this background: *How do teachers in innovative secondary schools try to enhance their students' skills in self-directed learning and how do they deal with differences in students' ability to learn self-directedly?*

To answer this question we carried out an exploratory case study at four innovative secondary schools. We analysed in detail:

- (1) How do teachers define self-directed learning and what skills, according to them, does it demand of students?
- (2) How do teachers aim to enhance their students' self-directed learning skills?
- (3) What do teachers consider relevant differences between students related to self-directed learning?
- (4) How do teachers take differences between students related to self-directed learning into account?

Method

Design

This research is an instrumental *case study* of the practice of self-directed learning at four secondary schools. The aim is to get insight into how this concept may be interpreted in educational practice and to generate ideas for teaching practices that enhance or facilitate self-directed learning, not to generalise about how schools approach self-directed learning. The data were collected via document analysis, interviews with teachers and observations.

Participants

We used purposive sampling for selecting the cases. Our school-university collaboration included ten secondary schools with innovative educational concepts. They either had a tradition of emphasising educational goals and pedagogies aimed at self-direction, creativity, critical thinking and collaboration or had more recently started to pay attention to such educational goals and pedagogies. From these schools four schools were selected on the basis of three criteria: 1) *zelfsturing* was mentioned in the school's mission/vision or other policy documents; 2) the school offered different (ability) tracks (in connection with the question about differences between students), as in the Netherlands many schools only offer either (one of) the higher or the lower ability tracks; 3) there were sufficient respondents prepared to participate in the research. Four participants were involved in the research at each school: the team leader of grade 7, a tutor of a grade 7 or 8 class and two subject teachers. We assumed that the team leaders would have enough knowledge of the school's policy; tutors fulfil an important role in coaching students and often have the task of teaching students study skills; the subject teachers are the ones who actually have to give self-directed learning concrete form in their lessons. Teachers of different subjects were involved because subjects can vary in the possibilities for self-directed learning and the demands it makes.

Procedure and data collection

First of all the researchers acquainted themselves with the vision and pedagogical approach of each school with the help of the school guide, documents available on the school's vision, and the website. The first author then spent half a day at each school where she followed lessons by the two subject teachers and the tutor. She also took note of the spatial arrangement of the school, teachers' and students' use of the space and the school's daily rhythm. Field notes were made on this and interviews with the respondents were then held.

The interviews comprised two parts: a semi-structured part and a cued interview. Three themes were dealt with in the semi-structured part of the interviews: 1) the vision of the teacher and the school regarding self-directed learning, 2) the way in which the school works on developing students' self-directed learning, 3) differences in ability between students to learn self-directedly, and 4) how the teacher took these into account in their guidance of students. We explicitly asked about gender differences and differences between students in different ability tracks in their ability to learn self-directedly.

An observation of a lesson was the starting point for the second, cued part of the interview. Statements from policy documents were also used as cues. For the interviews with the team leaders only statements were used as input. An example of a question in the cued part of the interview is: "I saw students working with tablets; what role does this play in students' self-directed learning?" That the interview was in two parts made it possible to discuss the predefined concepts as well as focus on the observed practice.

Data analysis

The school's vision and how it intends to handle self-directed learning were deduced from the documents through content analysis (Miles and Huberman 1994). This information was used with the field notes to make a first draft on the vision and pedagogical approach of self-directed learning at the four case-study schools.

The interviews were transcribed and analysed with ATLAS.ti. They were then, as a first step, grouped by case and the relevant excerpts were allocated the following global codes, that corresponded with the research questions: 1) vision on self-directed learning and the skills it requires; 2) teaching strategies aimed at self-directed learning; 3) vision on differences between students regarding self-directed learning; and 4) teaching strategies regarding students with different abilities in self-directed learning. As a second step, excerpts with the same code were grouped together and an iterative process was used to determine more specific themes within these subjects and classify them. For the skills necessary for self-directed learning (question 1), for example, we differentiated codes for planning, perseverance, discipline, etc. Teaching strategies (question 2) resulted in codes for instruction, giving space, discussions about learning etc. The third step was to make tables per sub-question and per case in which excerpts with the same codes were entered, and to determine per case whether themes could be identified in the tables. Finally the cases were compared, looking for differences, similarities and other patterns.

The steps described above were performed by the first author. To ensure the reliability of the coding and the validity of the interpretations, the results of each step were discussed with the second and third author, who critically asked her about the choices made and looked into codes and interpretations the first author was not entirely sure of.

Results

School 1: working independently

Interpretation of self-directed learning

For school 1 respondents self-directed learning is mainly working independently. The respondents emphasised in the interviews that students must learn to get started on an assignment independently, to keep working on it and not become distracted. They also thought it was important for students to learn to determine whether and when they need help. The tutor therefore pays attention to the development of study skills and metacognitive skills such as reflection. In addition a certain degree of freedom of choice plays a role in the school's vision on self-directed learning. For a number of subjects, students could choose different ways of working on the learning goal, for example, watching

a short instruction film or doing an assignment, and there was worktime, during which students can choose for themselves the subjects they want to do homework for.

According to school 1 respondents, self-directed learning requires students to have the *ability to self-reflect*, so that they gain insight into why things succeed or not. They must be able to *plan* and have an *overview* of what is expected of them. For working independently, *being able to read well* is also a condition. This skill is necessary to be able to understand and do assignments. A *motivated attitude* was also considered necessary but the respondents pointed out that the teacher also plays an important role in motivating students.

Developing skills for working independently

Good preparations are necessary to make it possible for students to work independently, according to the respondents of school 1. This means that the *goals to be achieved are clear* to students and that *clear instructions* are given. It is important that an *overview of the task* to be worked on is provided and students have *well-organised learning resources* at their disposal. Students at school 1 also *learn to reflect* on their work. They begin and end the day in their tutor class. For the last hour they work independently and the tutor asks students individually what choices they have made during the hour. *Feedback* from the teacher on performing a learning task is of great importance:

'Feedback, when something has worked well too. Keep asking questions: what happened, how did you make it work and how will you tackle that next time? So elaborate on it.' (School 1 Teacher 2)

In the interviews a few specific tools were mentioned that are used to support independent learning: *assignments/tasks* that students can do independently and a *monitoring system* giving insight into progress. At school 1 a *monitoring book* is also used. Students write in it at the start of the day what they are going to do and how far they want to get. They write what they have done at the end of the week and what will continue into the following week. Teachers can note tips and compliments for students after the lesson.

Dealing with differences between students

Teachers saw clear differences between students in the extent to which they are capable of self-directed learning. Signals that students are having difficulties with self-directed learning, according to the teachers, are: school materials not in order, difficulty getting started, agitation, difficulty focussing, unable to continue working, not much finished work, and not keeping to the planning.

According to the teachers and team leader girls are better at self-directed learning than boys, and all respondents at school 1 stated that students in the higher ability tracks are better at self-directed learning, giving their greater motivation for school as a possible explanation. The respondents did not agree on whether ability in self-directed learning is a trait that is stronger in some students than others. The two teachers supported this view, whereas the team leader and tutor emphasised that students who are motivated for learning at school are more inclined to self-directed learning. The tutor also mentioned that upbringing has an influence on student's ability to learn self-directedly. When parents take over too much from a child, he/she is not challenged to learn self-directedly. Conversely the team leader said that students need guidance at home to develop self-directed learning.

At school 1 teachers give extra guidance to students who find working independently difficult, after they have given general instructions to the group.

School 2: taking responsibility for managing one's learning process

Interpretation of self-directed learning

At school 2 the emphasis in self-directed learning is on learning to take responsibility for managing one's own learning process. Respondents value an equal relationship between students and teachers. Students are allowed to decide for themselves how they work on the goals they aspire to and in some periods students can choose which subject they work on. Teachers are aware that this requires skills that must be consciously taught and which they must pay attention to.

Like the teachers at school 1, the respondents at school 2 also emphasised the importance of *self-reflection* as a skill that is necessary for self-directed learning; students must discover what their strong and weak points are (for example, planning) to be able to work on them. This presupposes that students are *open to feedback* and want to do something with it, so that they can learn from their mistakes. Being able to *plan* (in particular, estimate how long a task is going to take is considered an important skill at this school. *Perseverance* (in the sense of not giving up quickly) and a *motivated attitude* were also mentioned by the respondents; a student must want to learn.

Developing skills for managing one's own learning process

Providing students with an *overview* of what is expected of them was considered important at school 1 for students being able to work independently. At school 2 this is considered similarly important for being able to manage one's learning process.

Having *discussions about the learning process* is the way used most at school 2 to support students in taking the responsibility to manage one's own learning process. Students are required to set their own learning goals, within the framework set by the teacher. In discussions about the learning process, teachers reflect with students on how they have worked on their goals. *Feedback* and *reflection*, teaching strategies that also play a role in working independently, form part of these discussions. In relation to managing the learning process, however, they have a somewhat different accent; they are not only about students' progress in relation to the subject matter but also to the development of their ability in self-directed learning. In tutor lessons at school 2 it is specifically discussed how to manage one's own learning process and what the necessary skills are to do this. During so-called *between weeks* teachers at school 2 also pay attention to metacognitive skills. This school uses a skills game in which students discuss various metacognitive skills to learn what these skills are about.

Unlike school 1, at school 2 this sort of discussion not only takes place during the tutor hour but also *during other lessons*. There are many informal moments during the lesson when attention is paid to self-directed learning; before starting, during and after doing a learning task. One teacher at school 2 described a discussion at the start of a lesson.

'And you then very quickly find out who really has no idea, who's really floundering. And then I start a discussion. And then what is actually achievable now, what do you think you can do in this hour? What do you need to do it, do you know what you have to do?' (School 2 Teacher 1)

In addition to these concrete demonstrable activities, the respondents of school 2 emphasised that it is important for the furthering of self-directed learning to give students *space* and as teachers to have confidence in them.

School 2 uses concrete learning aids to support students in managing their own learning process. *Progress and reflection reports* are used, which students work on during the tutorial and when they reflect on their learning process and set new goals. *Rubrics* are also used which enable students to ascertain the level at which they have mastered particular skills (for example, planning, collaborating, reflecting and taking responsibility) and what skills they want to develop in the coming period. Ultimately these reports and products from a period are put into a *portfolio* with which students can show what they have learned during the school year.

Dealing with differences between students

Some of the respondents at school 2 mentioned gender differences in self-directed learning skills; they think that girls are better at planning and that boys reflect more briefly. They made no unequivocal comments on whether there is a relationship between self-directed learning and educational track. Two school 2 respondents mentioned developmental differences, namely in the executive functions that improve with time. The others pointed at the influence of upbringing on student's ability to learn self-directedly.

The team leader and the two teachers at school 2 unanimously explained that depending on how well students are able to direct their own learning process, they take some *by the hand* but give others *more space*. They support the first group of students by asking *questions* to help them on their way. (Do you know what you want to finish today? Do you know how you are going to tackle it?) Sometimes these students need the teacher to tell them *what they have to do*. With other students the teacher can *discuss* what they want to get done.

School 3: having a say in one's own learning process

Interpretation of self-directed learning

At school 3 respondents explained that they are in a process of giving students more say in the learning process. Terms like "contributing one's ideas", "taking the initiative" and "being in charge of one's own learning process" were used. A new educational stream is being developed in which students will work on cross-curricular projects and will be able to follow learning routes that are personalised to their level and interests. The aim is that students in this educational stream will also set their own goals but at the moment self-directed learning mainly comprises students co-determining the form of the learning process: where you learn, with whom, how and via which instructional format.

All the respondents at school 3 emphasised that it is important for students to *get to know yourself* as a learning person: in what circumstances do you learn well and what are your personal pitfalls. This requires the *ability to self-reflect*. The new stream is inspired by the educational concept Building Learning Power. *Reflection* (evaluating, looking ahead and amending the learning task), *resourcefulness* (being able to deal with an unknown situation), *interaction* (experiencing the extra value of collaboration) and *resilience* (being able to deal with distractions and work from a state of *flow*) play an important role in Building Learning Power. Respondents also mentioned that a student must be *motivated* to learn but that a student becomes motivated when challenged in the right way.

Developing skills for having a say in one's learning process

Like at school 1 and 2, providing students with an *overview* of what is expected of them is considered a prerequisite for self-directed learning. One of the teachers summarised how an overview can be created for students:

'... when all the materials and all the plans are accessible and the monitoring system provides good insight into what a student has already achieved and when there's a list of what has to be done that year and insight in where does the student stand.' (School 3 Teacher 3)

The approach of developing skills for students having a say in their own learning process at school 3 is quite similar to what respondents from school 2 mentioned related to students managing their learning process. *Discussions* about self-directed learning are conducted group-wise during tutor lessons, and with students individually during informal moments. The team leader of school 3 described the questions that were asked in such a discussion after a learning task was finished.

'So you've opted for this route. Why precisely did you do that? What's the outcome and what did it cost you? How will you tackle it next time? Now that is a discussion reflecting on learning, but especially on the activity of the student while learning.' (School 3 Team leader)

Schools 3, like school 2, makes use of several learning aids that support students in their self-directed learning on thus enable them to have a say in their learning process: rubrics, progress and reflection reports and portfolios.

Dealing with differences between students

One of the teachers at school 3 thinks that a traditional, teacher-directed set-up is less suitable for boys because they have more difficulty fitting in with the school's expectations than girls. The other respondents, however, object to talking about differences between boys and girls in a general way. One of the teachers at school 3 also mentions that students in the lower tracks have more difficulty getting into a state of flow when working at school. The others do not make unequivocal comments on the relationship between self-directed learning and educational track. A respondent from school 3 points at students' mindset as a source of differences in ability in self-directed learning, a reference to Carol Dweck's work, which is popular in Dutch educational practice. Students with a growth mindset are better at self-directed learning, according to this teacher, because they do not give up quickly and are quicker to go and try something.

Teachers at school 3 particularly take differences between students into consideration by giving extra support to those who find self-directed learning difficult. They do this by *discussing* with them why they get stuck while working. In addition, two teachers and the team leader said that they try to *match the learning task with the student's competence*. This means that when a learning task proves to be too difficult and a student gets stuck, the teacher simplifies the task or divides it up into parts for the student.

School 4: ownership of one's learning

Interpretation of self-directed learning

At school 4 the respondents emphasised the importance of ownership. Students' own questions and motives form the starting point of teaching. Here self-directed learning goes further than letting students determine how they will work on specific goals. Students can also determine what they learn, not just how; they formulate their own learning goals, under guidance of the teacher who also stimulates them to set challenging goals. To make this possible, the traditional structure of subjects and periods has been abandoned. Students work on projects following their own learning route and also, for example, go out of the school. The teacher has a supportive role during the projects. On completion the student reflects with the teacher on the whole project.

The skills necessary for self-directed learning, named by the respondents at school 4 are: *knowing yourself* as a learning person, *self-reflection*, *planning*, *overview* of the task, and *motivation*. In addition they mentioned *discipline*, in the sense of being prepared to do difficult or unpleasant tasks to achieve a goal. They emphasised that the school must not presume that students have these skills and qualities. It is the school's responsibility to create the conditions in which students can and want to develop them.

Developing skills for ownership of one's learning process

Letting students set their *own goals* is an important way of furthering ownership and is therefore a crucial part of school 4's way of working. For this school it is about the student "finding his or her passion". It is a combined effort by teacher and student, in which the teacher tries to challenge the student and get him/her thinking.

'The student can come up with things but it's also possible for a coach to suggest subjects or topics. Have you already ... ?' (School 4 Teacher 2)

The learning process at school 4 is *designed by the student in collaboration with the teacher*, for example, by student and teacher looking for a suitable approach together.

'Students may on request use and buy anything. They don't decide that, it's more that you look together, with the student at: what are you up against? (...) It's always on individual demand of the student. Together we look at what they need: you really want to do something out of a book? Okay, let's have a look at what there is. What appeals to you and what doesn't?' (School 4 Teacher 1)

The teachers at school 4 support the students in their self-chosen projects by means of individual *coaching talks*. Every student has an appointment with the teacher at least once a week to discuss progress. But these talks are not just about the learning process, they are also about the student's development in a broader sense.

'How far have you got, what have you come up against and how are you going to take it further? This is exactly the part that we can help the student with further [...]. Who are you and how can you still grow? What are you good at and what do you still want to develop?' (School 4 Teacher 1)

At school 4 the teachers also mentioned the *review talk*: a talk at the end of a project in which the student looks back, with the teacher and a fellow student, over the completed project and formulates learning points for the following assignment. The teacher plays an active role in this. According to the team leader and teachers, it is up to them to observe

what students need to develop further and then to ask them about it in such a way that they themselves become aware of the need.

School 4 also pays explicit attention to learning about self-directed learning and the skills it requires. The *opening of the day*, the time when the teacher and the group come together before each student begins working on an individual project, is sometimes used for this. Rubrics are used at school 4. They are part of an online *digital progress monitor* with which students can show what level they have mastered several core skills, such as self-reflection, by providing evidence.

Dealing with differences between students

As far as the respondents at school 4 see gender differences in students' ability to learn self-directedly and the ability to take ownership of one's learning, they explain them as differences in development. Girls' executive skills develop more quickly in puberty which might explain why they are better at self-directed learning in grade 7 and 8. However, similar to one of the respondents at school 3, the team leader recognised that the innovative approach of the school might be particularly favourable for some boys who have difficulty fitting in with a traditional school regime. The respondents of school 4 were in agreement that ability in self-directed learning is not dependent on general cognitive ability, and thus not related to educational track. According to them this is determined by a student's interest in the subject and whether the task is appropriately challenging – challenging but attainable. The two school 4 teachers see differences in ability in self-directed learning by age. The student's mindset as a source of differences in ability in self-directed learning is recognised here as well. However, school 4 respondents emphasised that ability in self-directed learning can be developed by experience, and so does a growth mind set.

At school 4 there is no "extra" support. All students work on self-chosen learning tasks, so the guidance is by definition different.

'Because everyone's following their own path. And I think that as coach it's up to you to judge, to ask what the student needs.' (School 4 Teacher 2)

The teachers therefore adapt their support to each individual student and each individual learning path.

Conclusion and discussion

An instrumental case study, drawing on document analysis, observations and interviews, was conducted to investigate how teachers at four innovative Dutch secondary schools define self-directed learning and how they try to enhance it in their students. Special attention was paid to how the teachers dealt with differences in students' ability to learn self-directedly.

We found that the four schools each placed different accents in their interpretation of self-directed learning (research question 1). These interpretations can be placed on a continuum from less to more room for students to exercise influence on how and what they learn. School 1 mainly sees self-directed learning as being able to work independently on learning tasks the student has been given. This interpretation actually seems closer to the concept of self-regulation than to self-directed learning, as these concepts are defined in the literature. At school 2 teachers want to teach students to take

responsibility for the learning process. This mainly involves encouraging students to actively manage given learning tasks, with some freedom for students to decide how to learn. Teachers at school 3 interpret self-directed learning as students having a say in how and what they learn. They emphasise students' initiative but the educational concept that giving students a say in learning goals and content is still being developed. School 4 goes a step further and aims for students to experience ownership of the entire learning process by letting them partly determine both the content (what) and approach (how).

The skills and attitudes students need to direct their own learning processes in these different meanings, according to the respondents, did in part correspond. At all the schools the metacognitive skills of reflection and planning and a motivated attitude were mentioned. In addition the respondents placed their own accents, in line with the interpretation of self-directed learning at their school. For example, the emphasis on responsibility at school 2 is evident in the importance attached to openness to feedback and to perseverance. The mentioning of discipline at school 4 may be related to the large amount of freedom for students in this school's educational concept.

There are also differences in the way teachers support and promote their students' ability in self-directed learning (research question 2), largely in line with their school's vision on self-directed learning. [Table 1](#) presents an overview of these teaching strategies.

Methods used to enhance self-directed learning varied from clear instructions and well-organised learning materials (for working independently) to having students carry out their self-designed projects (as a way to enhance students' ownership of the learning process). Reflecting with students and giving them feedback on their learning process and reflecting on learning in general, however, was mentioned in all the schools. This happened in individual and group discussions, in workshops, coaching hours and during ordinary lessons. Tools that were used included games, reflection reports, portfolios and rubrics. However, the emphases made by schools differed again. Feedback and reflection when self-directed learning was interpreted as working independently was mainly directed at the student's progress in relation to the subject matter. When self-directed learning was interpreted as managing the learning process or giving students a say in their learning the accent was more on developing the student's self-directed learning ability. And when the emphasis was on ownership, reflection focused on the students' development in a broad sense, including their self-directed learning abilities. More self-direction by the student appears to go with a place for daily reflective discussions in teachers' pedagogy. At the school where self-directed learning particularly meant working independently, such discussions mainly took place during the tutor lessons.

We also examined which differences between students teachers find relevant for self-directed learning (research question 3). Differences between girls and boys are indeed recognised but many respondents were reluctant to generalise, seeing gender differences mainly as developmental differences. Remarkably teachers at two schools nevertheless pointed out the favourable effects for boys of self-directed learning. Further, there seems to be a relationship between the school's interpretation of self-directed learning and the way in which differences between students are perceived. At the school where students have least influence on the learning process, more emphasis was placed on more or less definite traits that students need for self-directed learning (certain traits, character, cognitive ability), whereas at the school where students have the most freedom and room, it was emphasised that self-directed learning can be developed.

Table 1. Teaching strategies for supporting students' self-directed learning.

	Supporting students to work independently	Supporting students to manage the learning process and having a say in their learning*	Supporting students' ownership of the learning process
● Setting clear goals	x		
● Giving clear instructions	x		
● Providing overview of the task	x	x	
● Well-organised resources	x	x	
● Feedback and reflection on the learning process during tutor classes during other classes at end project: review talk	x	x	x (coaching talks)
● Group discussions about learning during tutor classes during special weeks	x	x	x (day opening)
● Giving space		x	
● Setting own goals		x (in a restricted sense)	x
● Collaboratively designing the learning process			x

* As the teaching strategies mentioned in school 2 for supporting students to manage their learning process and in school 3 for supporting students in having a say in their learning were quite similar, we categorised these strategies together in this table

Teachers' ways of dealing with differences between students in their abilities in self-directed learning (research question 4) depended on the school's interpretation of the concept. While most teachers take differences in students' self-directed learning ability into consideration by giving extra guidance to those who find it difficult, at the school where teachers aim for students to experience ownership of their learning, the starting point is that every student is given individual support.

The results of the case studies give a picture of the diverse ways in which innovative secondary schools work on the development of their students' self-directed learning abilities and how teachers meet students' different learning needs. Although the literature suggests a dichotomy between self-regulated learning and self-directed learning (Jossberger et al. 2010; Saks and Leijen 2014), it seems that at the schools in our study there is a continuum in the extent to which students influence and have responsibility for the learning process. The differentiation between an approach in which the teacher sets the goal of the learning process versus an approach in which that is the role of the student, is not wholly sufficient to typify these schools. The respondents at three schools stated that the students determine the goal of the learning process. But they proved to have a different understanding of this. While teachers at school 4 meant that students defined their own projects on a self-chosen learning domain, teachers at school 2 and 3 meant that students could decide to what depth and level they want to study the subject matter.

While the research of Kistner et al. (2010) showed that teachers mainly pay implicit attention to skills for self-regulation, many forms of support proved to be explicitly geared to this at the schools in our study. None of the schools automatically presumed that students would be skilled in self-direction or self-regulation but they did assume that students would in principle be capable of developing these skills. Teachers did not appear to find differences in self-directed learning abilities between students a problem, like the teachers in the research of Vandevelde, Vandebussche, and Van Keer (2012). Students were supported in the development of skills for self-directed learning and teachers tried to adapt their support to their students' abilities (Francom 2010; Moos and Ringdal 2012). At these schools students develop skills for self-directed learning because a demand is made on these skills, in combination with explicit reflection on the learning process. Regardless of the interpretation of self-directed learning three phases in the learning process were clearly identifiable: a preparatory, implementation and self-reflection phase (Zimmerman 2015).

Saks and Leijen (2014) indicated that self-regulatory skills are a condition for self-directed learning, which the teachers in our research would probably endorse. This cannot, however be directly translated into teaching methods. The teaching methods used to promote self-regulatory skills, as we saw for self-directed learning in the meaning of working independently, are not by definition necessary to promote self-directed learning. The pre-structuring of tasks and clear instruction that teachers deploy to promote independent working were in fact less relevant in the educational concepts of the schools that wanted to give students more say in the learning process, which is the case in self-directed learning.

This research was intended to be a preliminary exploration of concrete methods of working used by schools to develop and promote self-directed learning in students. The conclusions must be formulated with caution. It was a small-scale study involving only four schools and a limited number of teachers were interviewed at each school. Moreover, these schools are forerunners with regard to self-directed learning and certainly not

representative of secondary schools in the Netherlands. However, the aim of this study not to generalise about how schools approach self-directed learning, but to get insight into how this concept may be interpreted in educational practice and to generate ideas for teaching practices that enhance or facilitate self-directed learning. The research did indeed show a varied picture of interpretations and working methods. And as these schools are some of the first to try explicitly to promote and support self-directed learning in students, other schools can learn from them. Other schools might implement the teaching strategies for supporting students' self-directed learning that fit the approach they envision and make use of the tools that are suggested in this article.

The extent to which the methods used are effective was not considered in this study. It is certainly a relevant question that requires a follow-up study on a larger scale. The challenge will be to find or develop instruments that are suitable to monitor and measure skills for students' self-directed learning.

This research has shown that different interpretations of the concept of self-directed learning exist in schools. Schools that want to work on the self-directed learning of their students would do well to be explicit about the interpretation they want to give to the concept, so that it is clear to both teachers and students what is expected of them. As Stoten (2014) showed, confusion can arise, certainly by students who are used to teacher-directed education, when a school starts promoting self-directed learning. Schools can take inspiration from the interpretations of self-directed learning found in this research and the possibilities described to support students in developing the necessary skills.

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