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Learning in Workplace Simulations in Vocational Education: a Student Perspective

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Abstract In vocational education, workplace simulations (WPS) have been implemented to ensure a better connection between the educational setting and the labour market. Moreover, WPS are supposed to motivate students and promote self-directed learning. So far, however, not much is known about the way students experience these WPS. The aim of the present exploratory case study was to investigate students' perceptions and preparedness for WPS and explore what factors they perceive to be relevant for their learning in these simulations. Forty students from three different pre-vocational secondary schools participated. Semi-structured group interviews were conducted and thematic analysis was used to examine the qualitative data. The results revealed that authentic WPS can increase student motivation and engagement. Learner characteristics regarded as relevant in WPS were motivation, responsibility, independence and discipline. For students, the presence and guidance of the teacher played an essential role in their working and learning effectively. They felt limited in making choices to direct their own learning. Assessment criteria were not transparent enough for students. Concluding, we found that students perceived factors closely related to self-regulated and self-directed learning to be relevant for their learning; however, these learning activities and processes have not yet been sufficiently promoted and supported in the investigated vocational schools. The study highlights design dilemmas for vocational practice and offers indications in how to match both learning environmental characteristics and teacher support tailored to learners' needs.

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Introduction

One of the aims of vocational education and training (VET) is making students reflective practitioners (Griffiths and Guile 2003). Vocational students are expected to incorporate different kinds of knowledge (e.g. domain-specific and general), skills (e.g. social, cognitive and meta-cognitive) and attitudes (e.g. a will to learn and to keep up to date) into a coherent set of professional competencies to be prepared for the workplace (Biemans et al. 2016; Schaap et al. 2012). They should be able to solve complex problems and be motivated to continuously learn and develop throughout their careers (Aleandri and Refrigeri 2013).

VET is considered to be an important route alongside academic tracks for a flourishing economy (Biemans et al. 2016; Eichhorst et al. 2015). In countries with a long tradition in dual VET like Germany or Switzerland and to a lesser extent in Austria, initial vocational training forms the crucial foundation for a career in intermediate level working positions such as various types of craftsmanship (Deissinger 2015). However, VET and VET students do not always have a good reputation in Europe and beyond (Chankseliani et al. 2016; Ling 2015; Virolainen and Stenström 2014). The title of a recently published article by Ling (2015), “Bad Students Go to Vocational Schools”, illustrates also common thoughts and associations in the Netherlands. According to Chankseliani et al. (2016), vocational tracks are perceived as inferior to academic routes. Factors that feed these prejudices are high dropout rates from school, low student motivation, low income, low social-economic status and lower levels of esteem associated with manual work.

Making VET more attractive has been on the European agenda for some time (Chankseliani et al. 2016). In the Netherlands, a law (“Law of Education and Vocational Education”) was passed in 1997 that tied professional practice and vocational education together. As a result, learning in professional practice has since become more important, allowing students to acquire the necessary professional skills required for an occupation (Aleandri and Refrigeri 2013; Ministry of Education, Culture and Science 2004). Moreover, vocational education is supposed to realise broader goals than qualifying for jobs only. It is supposed to qualify VET students for work and career, for citizenship and social participation, and for further learning and personal growth (De Bruijn et al. 2017, p. 3). One model in the VET system that should prepare students for occupational practice and future challenges are workplace simulations (WPS). WPS have been implemented to create optimal opportunities for developing flexible employees who are able to adapt themselves to future changes (Biemans et al. 2004; Vrieze et al. 2001). WPS are authentic learning environments at school that simulate a (future) work situation and should inspire students for occupational practice. These simulations are intended to facilitate the transition from school to work as students acquire practice-oriented knowledge and skills that are required in specific occupations (Biemans et al. 2016). WPS can take various forms. In the following, we provide examples for three different professional domains to explain how WPS can be designed in VET.

In engineering and technology, for instance, the learning environment can look like a garage for repairing cars. Similar to professional practice, there are different workstations such as a vehicle lift or a wheel balancer where students can practice domain-specific skills like an oil change or balancing a wheel. In some cases, students may serve real clients (e.g. do a tyre change) or they work on authentic assignments like testing a demounted engine. In care and welfare, a learning environment can look like a kitchen, in which students learn to cook. A task might be to prepare a three-course lunch for real clients. Such a task can involve different aspects such as decorating the table, designing a menu, buying the ingredients, and preparing the dishes. In agriculture, the learning environment can be a flower shop. Real clients or fellow students might order a bouquet, which students have to design according to the costumers' wishes. They might also work in the school garden and trim the hedges or repair the lawn mower. All examples show that learning from practising hands-on professional activities is central in WPS. In pre-vocational education, they should help students to choose a profession. The tasks and activities vary in complexity level and range from more constructed to more realistic simulations. Compared to a classroom, students work at different workstations simultaneously. These workstations are usually at various locations indoors and outdoors so that students disperse. For instance, some students work in the flower shop, while others are busy in the garden or the stable. Although several teachers supervise the students in WPS, they cannot cover all locations at the same time. Therefore, students are required to work independently in small groups without the constant supervision of the teacher.

WPS are embedded in competence-based education and training. The starting point is a holistic approach that focusses on the development of vocational competence and encourages self-directed learning. Constructivism is the underlying principle. VET students should construct meaning in interaction with a social context, learn in situ, develop self-regulated learning skills and have enough freedom to allow subjective learning theories and learning styles (De Bruijn 2004; Doornekamp et al. 2002). The simulation is a safe and controlled setting for students to acquire vocational skills, generic skills and domain knowledge without having to be afraid of making errors. The characteristics of WPS are closely related to what Zitter et al. (2016) called "hybrid learning environments". Hybrid learning environments combine formal school-based learning with realistic, hands-on learning activities. In Jossberger et al. (2015) WPS are visualised considering the two dimensions of hybrid learning environments (acquisition-participation and constructed-realistic).

The implementation of WPS, however, has consequences for all parties involved and requires rethinking didactics. New tasks and roles for students and teachers and different forms of interaction between students and teachers should go along with the introduction of WPS (van Grinsven and Tillema 2006). Yet, we still know little about how students experience learning and working in WPS and whether this way is congruent to their needs and wishes. Prior research indicates that students' perceptions of the learning environment influence how students learn (e.g. Parpala et al. 2013; Trigwell and Prosser 1991). Insight into students' perspectives on and appreciation of WPS will help to improve the effectiveness of the learning environment (Cook-Sather 2006; Elen and Lowyck 1999; Entwistle 1991; Könings et al. 2010; Rudduck 2002). Furthermore, students' learning engagement depends on the feeling of being able to meet the challenges, the purpose and value of learning activities, and the feeling of

safety and care (Roeser et al. 2000). Therefore, the central aim of this study was to understand the opportunities and constraints students experience while working in WPS by exploring what they perceive to be relevant for their learning. This understanding can help us to identify how VET students' learning can be better supported. Knowing more about current problems in practice can shed light on factors that should be considered when designing a learning environment for VET students.

In the following sections, we will briefly review the relevant literature about the characteristics of WPS and the development of learner skills that support VET students' learning. Then, our research questions are addressed and the empirical study is presented. Here students' perceptions of WPS and aspects relevant to their learning are described. Finally, the results and limitations of the study are discussed, and implications for practice and future research are put forward.

Characteristics of WPS that Support VET Students' Learning

VET students are expected to acquire vocational qualifications that match labour-market requirements. Three pedagogical ideas underpinning WPS should support VET students in gaining the relevant vocational competence and engage them more actively: a) learning in authentic settings, b) linking theory and practice and c) learning tailored to learner's needs (cf. Vrieze et al. 2001; Jossberger et al. 2010).

To foster high-quality learning, students should be confronted with whole and authentic learning tasks that are complex, realistic and challenging in relation to the real professional work field (Vermunt 2003). Students must perform all the defined constituent skills to successfully accomplish such an authentic task and they should also acquire the necessary domain-specific knowledge (van Merriënboer and Kirschner 2013). Participating in practice helps students to develop competencies and professional identities (Tynjälä 2008). WPS bring hands-on practice into school, which is assumed to increase motivation, stimulate the development of social work-related skills, assist in gaining professional insights and support the transition between school and work (Doornekamp et al. 2002).

To help students develop an understanding of a domain, theoretical and practical knowledge should be integrated into authentic learning tasks (van Merriënboer and Kirschner 2013). In the past, theoretical domain-specific knowledge was often taught in theory classes and these classes were not tightly related to the practical lessons. As a consequence, knowledge learnt appeared to be in fragmented pieces. To support students' learning, teachers should provide information in such a way that students can span the bridge between old and new theoretical knowledge and the practical situations in which this knowledge can be applied. Moreover, students are expected to be more motivated when they recognise the link between theory and practice (Vrieze et al. 2001). They need metacognitive skills to actively analyse and reflect on theory and practice and their interconnections (Tynjälä 2008). Gaining conceptual knowledge will help students to reason and make decisions and apply knowledge in practice (Koopman et al. 2011). WPS enable students to experience meaningful professional situations, in which they have to process their theoretical and practical knowledge actively (cf. Ghisla et al. 2013).

To identify learning needs, students have to be aware of their own strengths and weaknesses in order to select learning tasks that fulfil their needs accordingly. That is not an easy task because metacognitive skills are required to evaluate one's own performance. If we take learning tailored to learner's needs seriously, then students are allowed to follow their own learning trajectory (Knowles 1975). Teachers can directly or indirectly assist in deciding which learning tasks should be accomplished by a student to fulfil the learning needs (e.g. using parameters like past performance). A portfolio, for instance, can be used as a tool to make learning and performance visible for students. It can provide an overview of possible learning tasks that need to be accomplished and offer transparent assessment criteria that help evaluate their performance (Kicken et al. 2009). In that way, metacognitive skills are actively promoted. Moreover, depending on their performance, students' learning trajectory can be adjusted to fit individual needs. As WPS offer different workstations with tasks of varying complexity, they can account for student differences and let students make choices in order to act as self-directed learners.

Developing Learning Skills in WPS

As WPS put emphasis on independent learning in small groups of students, each learner must be sufficiently motivated to interact with fellow students in an effort of collaboration. Moreover, learners need strategies to regulate, on their own, the socio-affective and cognitive aspects of the interactions. Thus, students need to have or develop metacognitive learning skills that enable them to deal effectively with the given independence. In addition, they need to approach a task actively with intrinsic interest and a will to learn, hold positive beliefs about their own capabilities and know at what point in time they need to seek assistance. Researchers have devoted considerable attention to developing models of self-regulated learning (SRL) and self-directed learning (SDL), metacognitive skills that have been identified as playing a central role in influencing learning and achievement (e.g. Loyens et al. 2008; Pilling-Cormick and Garrison 2007). SRL and SDL seem to play an important role in vocational education too. Particularly in WPS, these metacognitive skills help to organise one's own learning. In addition, metacognitive skills are an integral part of professional practice. Imagine a cook; this professional requires planning skills to perform adequately. Moreover, self-directed learning also predicts work-related learning (Gijbels et al. 2010).

Based on an earlier theoretical analysis (Jossberger et al. 2010), we suggest that learners need to take responsibility for learning both at a micro and a macro level to be successful in WPS. From this point of view, SRL concerns the micro level that deals with the execution of a task, while SDL is situated at the macro level and basically refers to the planning of the whole learning trajectory. More explicitly, skilled self-regulated learners are cognitively, meta-cognitively and motivationally active agents in the learning process at the task level who can adapt their strategies during task performance, including self-regulation strategies such as orienting, planning, monitoring, assessing, evaluating and reflecting (Zimmerman 2000). In order to become a self-regulated learner in WPS, students require metacognitive awareness, learning tasks that trigger metacognitive activity, and feedback about their performance. When learners are

skilled enough to regulate their learning at the task level, they have accomplished important skills that function as a foundation. From there, students can proceed to self-direct their learning. Skilled self-directed learners are able to decide what tasks need to be learnt next and how their learning is best accomplished by diagnosing their own learning needs, formulating learning goals, and identifying and choosing human and material resources for learning (cf. Kicken et al. 2008; Knowles 1975). This indicates that self-directed learners are ready, willing and able to prepare, execute and complete their learning independently (Van Hout-Wolters et al. 2000). That raises two prerequisites for SDL in WPS: a will to learn and the degree to which the choice of learning goals and tasks is under students' control.

Teachers play an important role in fostering the development of SRL and SDL skills in WPS. Whether and how self-directed learners develop depends, among other things, on the assistance they receive, which should be tailored to the learner's level. The role of the teacher can be seen as an activator, a change agent who engages in constructive interactions with students (Hattie 2009). Students require feedback and direct instruction in SRL and their responsibility should gradually increase to become self-directed (Bielaczyc et al. 1995; Hattie and Timperley 2007; Katz and Assor 2007; Zimmerman et al. 1996).

Aim and Research Questions

Bringing these theoretical ideas into practice is not a given; therefore, it is essential to explore what is actually happening in WPS at different schools and investigate students' perceptions and preparedness to work and learn in self-directed ways in these practical learning environments. In our exploratory case study, we addressed the following research questions:

- (1) What characteristics do students perceive as relevant in WPS?
- (2) What learner characteristics and teacher support do students perceive as relevant to learning in WPS?

Method

Educational Setting

The study took place in Dutch pre-vocational education. Fifty per cent of the students start with pre-vocational education in the Netherlands (Ministry of Education, Culture and Science 2014). Its main aim is to prepare young students (aged between 12 and 16 years) for upper-secondary vocational education and higher professional education. De Bruijn et al. (2017) describe the Dutch educational system as an early tracking of careers because the choice at the age of twelve usually predicts the future educational career. Pre-vocational education is a relevant starting point in the qualification process. Young students should gain diverse experiences and acquire competencies in a school environment that should be as authentic as possible. The duration is 4 years and consists of two parts. During the first 2 years, all students are offered the same broad

set of subjects to acquire relevant general knowledge in mathematics, language, arts, natural sciences etc. At the end of the second year, students can choose from four different sectors with a particular set of subject matters: agriculture, engineering & technology, economics and care & welfare. These sectors can be further subdivided into more specific units. From the beginning of the third year, most students start working in WPS (Ministry of Education, Culture and Science 2005).

Participants

Forty students, 18 females and 22 males, from three different schools with pre-vocational secondary education in the agriculture, engineering & technology and care & welfare sectors participated. We chose these three sectors to maximise diversity. The sectors address different practical tasks and contexts. Moreover, engineering & technology is dominated by male students and teachers, while care & welfare is dominated by female students and teachers. Agriculture is rather mixed regarding the sex of students and teachers. Moreover, agriculture incorporates learning tasks related to engineering & technology as well as care & welfare. In addition, it has some unique tasks like the care for animals. The schools are located in the south of the Netherlands. Students were in their fourth and final year, were 15 or 16 years old, with a mean age of 15.48 years (*SD* 0.51 years), and had worked in WPS for at least 1 year.

Instrument

A semi-structured group interview was developed to explore students' perceptions and preparedness to work and learn in WPS. We chose the group interview as methodology because members of a group might stimulate others to comment or react in ways that do not occur in individual interviews. They elicit thoughts, ideas and experiences and we expected that the group interactions facilitate the discussion among teenagers, as they might be more willing to share their experiences in a group (Lichtman 2013). In the interviews, a predetermined list of questions was used but discussion allowed themes that arose during the sessions to roam, taking care that all important topics were covered (Fontana and Frey 2005). The following topics were included: the learning environment, the role of students and the role of teachers.

First, questions about the learning environment were posed. The idea was to gradually proceed from a more general to a more personal topic. In this part, the students were encouraged to describe WPS and to explain what they valued, disliked, wished for and struggled with by comparing elements of well-functioning and poorly functioning WPS (e.g. "What characterises a good WPS in your opinion?"). Then, questions about the role of students were asked to gain insight into how they approach a task and what they perceive to be relevant for learning in WPS. For instance, the students were requested to think about a successful and a less successful student and then compare them with each other, considering their strengths and weaknesses (e.g. "How would you describe a good student in WPS?"). In the last part of the interview, questions about the role of the teachers were posed to understand how students perceive teachers' guidance and what students consider relevant for their learning (e.g. "Can you give an example of how the teacher supported you during the task performance?").

Procedure

A pilot was conducted with three vocational female students from the care & welfare sector to test whether the questions of the interview were clear and understandable. Furthermore, we wanted to see how the students reacted in a group-interview setting in order to determine a feasible number of participants in a group. As a result of this pilot, some questions were revised. Questions that were too complex (e.g. too long or double-barrelled) were simplified. We decided to have a maximum of five students per group to increase the discussion among participants.

The teachers asked students to participate in the study; they were not obligated to take part. The volunteering students were divided into nine groups of the same profession with a maximum of five students per group (see Table 1).

The interviewer encouraged each participant to take part actively and ensured that each one contributed to the discussion. Participants were also directly addressed to talk about their perspectives and to provide examples. Depending on the group size, the amount of information and the speed of talking, interviews took between 45 and 90 min. Interviewing took place in meeting rooms at the schools. The interviews were recorded and transcribed verbally. As data were collected in Dutch, the quotes that appear below were translated into English.

Analysis

The aim was to derive insights from the group interview data in order to enhance understanding of students' perceptions with regard to learning in WPS. Thematic analysis was used to identify the main themes related to the research questions. This qualitative approach provides a rich and detailed picture of actions and interactions in the learning environment being examined (Braun and Clarke 2006; King 2004).

To begin, the first author read and reread the interview transcripts in order to become familiar with the data. Then, for each interview transcript, a summary of the prominent themes was made. These initial findings were discussed among all the authors. Next, the meaning of the text passages was systematically described and codes were generated. This preliminary coding employed a bottom-up approach in which the material of relevance was highlighted. In an iterative process, key elements in the data were identified, each emerging theme was labelled and the meaning of the label was written down. After that, the different codes were grouped in overarching themes in order to reduce the number of units. Subsequently, how the themes in the data related to the conceptual framework was checked. The themes were reviewed and critically discussed

Table 1 Distribution of students within and across sectors

Sectors	Agriculture	Engineering & Technology	Care & Welfare
Number of students	10 (6 M, 4 F)	13 (12 M, 1 F)	17 (4 M, 13 F)
Groups of students	2 groups of 5 S	2 groups of 4 S 1 group of 5 S	1 group of 3 S 1 group of 4 S 2 groups of 5 S

Note. S indicates students, M male and F female

by all the authors. The first and second author then individually coded approximately 25% of the interview data to calculate an index of inter-rater agreement. Cohen's kappa was .73. Finally, the themes were mapped to the research questions.

Results

The findings are divided into two parts. First, students' perceptions of well-designed WPS are presented. Second, relevant learner characteristics in WPS and students' needs for pedagogical guidance are highlighted. The results describe the perceived dynamics and the interplay between the learning environment, students and teachers. Students' quotes are used as illustrations. Each abbreviation refers to an identity code: the first letter indicates the sector, with [T] standing for engineering & technology, [C] for care & welfare and [A] for agriculture. The number refers to the interview and the last letter corresponds to the name of a student.

Relevant Characteristics of Well-Designed WPS

All groups of students stressed the necessity for some general preconditions for their learning in WPS. They considered a good atmosphere essential for well-designed WPS. For them, a good working climate influenced their well-being, motivation and attitude. Moreover, they put emphasis on sociability between peers and also between students and teachers. According to students, WPS need the following important ingredients: authenticity, whole authentic learning tasks, the possibility to choose your learning trajectory, clear instructions and the presence of the teacher. Their experiences, wishes and expectations, as well as their inherent problems, are described.

Authentic WPS to Trigger Motivation Students had the feeling that they gain valuable impressions of what a job contains through authentic WPS. Authenticity helped them to imagine reality better.

A2A: "Practical lessons are good for your own development anyway, definitely if you do not know what you want to do. For example, a simulation of a hairdresser is simply nicer because then you get a bit of a foretaste."

Students clearly distinguished between WPS that are authentic and those that are not. Cooking or changing a wheel of a car was perceived as more exciting. Activities like these felt real, were valued and increased their motivation to engage in the task. Learning tasks that triggered an unusual but real experience were also perceived positively (e.g. learning the client's perspective by being in a wheelchair yourself). Role playing with a dummy (e.g. reading to a doll) was perceived as not authentic. Consequently, students indicated a drop in motivation and their seriousness to fulfil such a task decreased. Role playing with dummies was more common in the care & welfare sector.

Whole Authentic Tasks to Promote Learning Students expressed a preference for real and challenging tasks in WPS. They also indicated that they execute a complex task more seriously. According to students, tasks vary in difficulty level. The more prior knowledge students had, the easier they perceived a task. Some tasks, however, were too easy for students and they thought they did not learn anything.

C3K: "I think almost everything is rather easy here." C3D: "Yes, I also think that most tasks are easy." C3C: "Hot chocolate." C3B: "Yes." C3C: "It was a lesson about making hot chocolate." C3D: "Within fifteen minutes you were done."

Students who had completed their tasks faster than expected could approach their teachers to ask for an extra task. Again, complex extra tasks were appreciated most. For instance, two students reported receiving a challenging task while others were simply kept busy.

A1J: "Well, we went to the teacher, to Mr J., and then we said that we do not have anything to do. So he gave us the mowing-machine that was already broken for about one year and he said that we should take it apart and try to repair it. That is what we did and we managed." A1S: "And then you go to Mr P. and you get a task such as going for a walk with the ferret, or when it is beautiful weather then they say that you can trim the hedge, so then you are busy."

In particular, students in the care & welfare sector seemed to experience little challenge. The students in the engineering & technology sector differentiated between easy and difficult tasks, but they did not express a lack of challenge to the same extent as the other groups of students.

Choices in Learning Trajectory to Allow for Self-Direction Students indicated wanting to make their own choices regarding the learning tasks, but the possibility of doing so was very limited. Choosing an extra subject the students were interested in and wanted to learn more about did not seem possible.

T2K: "Yes, actually we can choose what we do, but at the end of the year all modules must be completed."

C3C: "The task says 'choose a recipe' but finally it is not allowed because it takes too much time or is too expensive... so, in the end, you pick one of the meals that are on a working card."

A1S: "In the beginning, you were allowed to choose yourself in which field you wanted to work... Thus that was much nicer. For example, if I was put to technology with engines and stuff, well I do not feel anything for that; but I could choose and I decided to do kitchen and animals... and yes, that was much more enjoyable."

According to the groups of students, choice mostly concerned picking from a preselected list rather than freely choosing a task. This was similar for all sectors of the investigated schools.

Instructions to Guarantee Understanding and Independence The students mentioned that instructions should be short and clearly formulated. In that way, they understand what to do and how to perform a task. Understanding also led to an independent task approach. Some students thought that they had enough instructional support to work independently in small groups.

C3B: “But in the kitchen, you have working cards and then everything follows automatically. Then you do not need any help.”

AIS: “Usually, everything follows a certain order, you cannot get confused actually, and teachers can also see and check if you have done everything and in the right order. If you do not have a stamp for one part [e.g. the self-assessment task], then you are not supposed to start with your practical task.”

These students indicated that they like having more freedom to work at their own pace with not everyone doing the exact same thing. Others, however, did find working independently in small groups difficult and could feel left out. They expressed frustration when instructions were too vague or too complicated.

A2Ro: “Well, I am a person, who needs quite a lot... yes, how do you say that... I need clear instructions and when the task is formulated very vaguely, I simply do not understand.”

T3Jo: “With the theory, you also usually have to figure it out yourself. And if you ask, then you receive the answer ‘it is in the book’. But sometimes you cannot find it. So that is quite difficult.”

AIS: “There are also students who need a lot of attention. They need a lot of guidance. There are students who simply cannot work independently.”

The degree to which students felt able to work independently differed no matter which sector they belonged to.

Presence of the Teacher to Maintain Order and Give Attention Teachers play an important role in WPS and students expressed the need for their presence. Students wanted the teachers to be fairly strict and control aspects of behaviour and safety.

T2D: “Well, if it is really going too far, yes then he does something about it. But I have the impression that he rather talks about it. It depends on who it is; some teachers are really a bit too soft and cannot really give out good punishment.”

In addition, they expected teachers to be calm and empathic. According to the students, the teachers should take time and try to understand students' thoughts and behaviours so that trust is created.

C2V: “We have one teacher; she really does a great job actually. She always stays calm and never tears into anyone; she is always there and gives good compliments.”

A1S: “In my opinion, our teachers mostly see quickly through the personality of the students and what they can say to... They also see quickly if you have a bad day. They know how you are and they know immediately if something is wrong.”

Students valued personal attention but indicated that most teachers' attention is given to boisterous students. Students wanted the teacher to be there immediately if needed. They complained about the absence of the teacher.

C4S: “Yes, sometimes then I call her [teacher] but she does not react, and then I call her again and then she still does not react. Then I start shouting.”

Dependency on the teacher was also partly built into the tasks as students were obligated to show the product they were working on to the teacher at certain stages before proceeding to the next phase.

A2A: “Well, then it says ‘report to the teacher’, and then you are standing there. If the teacher is not present, you have a problem.”

They got angry when the teacher was too busy and did not have enough time, but they distinguished between those teachers who were more or who were less present.

C1S: “Sometimes when you ask something she gives an answer, but when another student comes then she is quickly distracted and then she is away again, and then you still do not know what to do.”

Students expressed difficulties in working seriously without the teacher being present. The presence of the teacher was especially discussed in the care & welfare and agriculture groups as students were working in different WPS at the same time.

Relevant Learner Characteristics and Teacher Support in WPS

The students mentioned the following characteristics of a successful task approach: starting quickly, reading carefully, listening well, asking questions, not working too quickly, doing what is asked, carrying on working, working seriously, working neatly, working independently, having a good work attitude, being willing to learn and work, giving effort and commitment, “going for it”, being interested, having discipline, being responsible, being patient, having perseverance and being motivated. The opposite elements were perceived as being detrimental to learning and working in WPS, including an attitude of indifference and being easily distracted. In this section, we present in more depth the learner characteristics and teacher support the students perceived are relevant for WPS. The students' experiences, wishes, expectations and also their inherent problems are described.

Learning by Doing to Enhance Retention Students indicated a strong preference for practice. They mentioned that they learn more by doing and are better able to remember the learning material when they are actively involved in a task. Practice was also perceived as being more enjoyable.

A1D: "He [teacher] can continue explaining how something works, but you learn best when you are doing it yourself when you can work with your own hands. Then you learn the most."

T3Jo: "Practice is easier to remember."

T2K: "The more often you do it, the better you know how you need to connect circuits and wires so that it is good."

A few students mentioned that they would like to have more theory. These students indicated that they like to learn in depth about subjects they enjoy and are interested in; they want to learn something new and are willing to make an effort.

T1T: "If I were allowed to, I worked on my scooter every lesson, because I actually know everything about it."

C4B: "Yes, if you find it very interesting, it is self-evident that you also want to perform well and get the most, the best out of it. And if you do not feel like it, then you are happy if it is just sufficient."

Students who already knew their future profession emphasised the necessity for job-relevant content as they were learning for a specific aim.

C3StK: "If you know what you want, then you learn for your own aim."

Reading and learning theory from books was experienced as being more difficult and less enjoyable.

C2T: "I think learning from a book is very difficult because I have a big problem concentrating and I am very quickly distracted by what is happening around me..."

T3J: "Practice is nice as you are working on electrical connections and so on. Yes, and theory is less, but it is part of it."

T1D: "Actually, I think that what you learn in theory needs to be practised in WPS afterwards."

All groups of students valued the integration between theory and practice as effective for learning as well as practising regularly.

Taking Responsibility to Ensure Learning Students pointed out that they are expected to work independently in small groups in WPS and that it is their own responsibility

to do the learning tasks seriously. Those who worked quickly and well were also given more free rein by the teachers; a matter of trust according to the students. Some students indicated feeling responsible for their learning; however, they also mentioned that it was possible to sneak out.

T1T: “Imagine he [peer] needs to know how he has to set the valves and he finds something on the internet and actually he knows what he needs to set the valves but not everything is there on the website, then he keeps on looking until he has found everything.”

T2D: “You do need the discipline to keep working because you have a lot of freedom. There is nobody who pays attention and says that you have to finish that and you have to do it like that. If you are not in a mood, you can simply do nothing or fool around.”

A1D: “Teachers are not really there to give lessons in WPS. That is something you need to do yourself.”

C4L: “It is also your responsibility to do all the tasks. Because sometimes they [students] say like ‘How does that work? We have not practised that at all,’ even though they should have practised it. And then they say... ‘Oh, my folder is not complete.’ Well then, they have not kept it up to date every week. I think it is very much their own business.”

The students also explained that, in each WPS, one person is assigned the role of workplace assistant and in the engineering & technology sector, a second is responsible for the depot. In these roles, students indicated to assist and take over some of the teacher’s responsibilities. Tasks included the distribution of learning materials and tools, keeping order and checking assignments. However, students from all sectors expressed a feeling of boredom and dissatisfaction when being assigned as a workplace assistant. In addition, students from the agriculture sector mentioned that it was easy to cheat when students have taken over the tasks of the teacher. Apparently, these cheating students understood the difficulties in dealing with the responsibility that goes along with being workplace assistant.

Social Skills to Work Collaboratively Social skills were perceived as being crucial when students work collaboratively and interact with peers and teachers.

A1R: “Good communication and being nice to the teachers, otherwise you work against everything.”

Social skills that students found to be important were empathy, being nice and not short-tempered, having a good attitude, social manner and “feel”, getting on well with the teacher and knowing “how far you can go”. Communication skills were particularly highlighted. Communicating well enabled pleasant contacts with fellow students and teachers, which again was perceived as essential for a good atmosphere. Characteristics of good communication that

were mentioned by students are listening carefully and being straightforward, honest, patient and polite. They perceived people who get angry quickly as irked and quick-tempered, their yelling and confronting showing them to be poor communicators.

Working together was experienced as something successful when students could communicate and confer easily with each other, tasks are fairly distributed and every group member is willing to work together, understand and help each other. The students had a preference for working with friends, indicating that good collaboration is relevant because their performance is assessed.

C3D: "Good collaboration is very important because you are doing the practical tasks together and you are also assessed on that."

Students perceived collaborating as being difficult when group members were not willing to put in the same amount of effort. Some students were perceived as passive and not motivated, which ended up in procrastination.

C1S: "There are also people that stand still all the time; they are not interested and think others will do the work."

T1T: "He is really going too far, that is not normal anymore." T1B: "He actually made a drawing on someone's back." T1R: "He really does not get started. Even I start earlier."

A2Ri: "You have to work together; but if I do not like her, then I do not have much contact with her and I do my own things."

Interviewees distinguished between those students who were passive on a regular basis and those who were just not in the mood once in a while. Passive behaviour was said to be annoying; if they did not get along with each other in a group, they distributed tasks so that they could work more individually. Although a few students from the engineering & technology sector mentioned that it is important to have good communication, mutual understanding and a good work attitude, social skills were more often stressed by students from the care & welfare and agriculture sectors.

Planning to Monitor Progress When working collaboratively in small groups, students stressed that it is especially important to plan and distribute the different tasks and to stick to appointments to achieve a good result. They indicated that they have to monitor their progress by watching the time in order to avoid finishing a task too late.

C1C: "In the beginning, you really have to say what you are going to do, really make a plan..."

However, some also said that they did not need to write a plan and use it during the process.

T1B: “Normally, I just start and I’ll see where I end up.”

Although students indicated some planning activity when working in small groups, they thought that planning was only required when it was obligatory. According to students, this was mostly not the case, no matter which sector they belonged to.

Self-Assessing to Reflect on Performance Some students talked about considering their results, attitudes and perceptions of difficulty to reflect on their performance.

T3J: “I do know very well if I have done something well or poorly. If I have completed a task, then I first check if anything is wrong. For example, if it is not so precise, I first improve that. In the end, it is always good. But you have to check the measurements yourself.”

A1S: “Do it once and then they [teachers] watch how you are doing it and afterwards they point out what you did wrong. Then you have to do it again. And then you actually just realise how little you know about... things you thought ‘Oh yes, I know it.’ And then it is also nice to know how you have to handle a horse or a hamster or a mouse, yes; thus often you think that you already know and so you do it in a certain way, then mistakes are pointed out and you think ‘Oh, yes, I did not know that.’”

These students indicated to reflect on their performance. Most, however, mentioned that they found it difficult to assess themselves and reflect on what they had learnt and thus expected the teachers to tell them.

A2Ri: “You see how you performed by the mark you receive or by the way a teacher treats you.”

C4S: “I do not evaluate my performance actually.”

C3K: “But you cannot assess it yourself. We do not have checklists.”

Self-assessing was perceived difficult by students because they lacked transparent criteria. They did not know on which basis they should evaluate and thought they had too little knowledge of how a good result should look like. Assessing and reflecting on one’s own or a peer’s performance was not done seriously according to students.

C3C: “We only have that [peer-assessment] with ‘assistance’ when you, for example, have to learn the Heimlich manoeuvre. Then you are doing it with a peer and then you watch how s/he puts someone in the recovery position or so and then you check off. But you can do the check off anyway.” C3D: “You do not say ‘No, you have not done that properly,’ or anything like that.” C2Hu: “It is not compulsory.” C2T: “No, she [the teacher] also does not ask for it.” Interviewer:

“So if it is not compulsory, it is not done?” C2T: “No.” C2StC: “It is only extra work.” C2Hu: “Yes, very stupid but no it is mostly not done.”

If not obligated, they did not feel the need to follow the prescribed steps for planning or reflecting. It seemed that engineering & technology had more hard criteria to measure performance (a lamp works or it does not, a motor runs or it does not).

Proactive Help Seeking to Solve Problems Students expressed a preference for clear directions as well as simple, visible and patient explanations to enhance their learning.

A1J: “I really need a teacher who tells me ‘Do that and I’ll stay with you until you have finished,’ and then I succeed. And also someone who jumps in when something goes wrong.”

T3StJ: “Yes, and by making a drawing or demonstrating something. That is what he [the teacher] also does.”

Students desired help on request. Most students mentioned that they could ask the teacher for explanation or instruction even if they needed to ask the same question more than once.

T2J: “When you need help, then you just need to mention it.”

C2T: “And what I also like is that well, not all students do that here but a lot do... The teacher explains it 10 times if you do not understand; she explains it for as long as it takes until you do understand. If necessary, you can go there after the lesson and then she will still explain it to you until you understand. That is something I really find important.”

Other students expressed difficulties in seeking help to solve problems. One pointed out that asking a teacher too often is not good for your reputation.

T1D: “If you ask something too often and if... imagine you have asked the same thing three times and damn, you still do not get it. Then you ask again and, ‘Well, kid, do I have to explain it again?’ You receive an answer like that and that is really awful.” T1J [imitating the teacher]: “Even kids from primary school or kindergarten know that already.”

Peers were easily approachable and students indicated that they usually asked a peer for help first before they went to the teacher. Time was mentioned as the most important reason for asking a peer. It was much faster and students expected a quick reaction. Waiting frustrated them when they felt they could not continue without help. Students also mentioned choosing a peer they thought might know the answer.

T2R: “Yes, the teacher is often busy with someone and if you have to wait for that, it takes you thirty minutes extra.”

C4B: “You have students in the class who do know something about cooking; they have also done it at home and then they can help you.”

T2D: “Yes, usually you ask a student who will probably know the answer and if he does not know, you simply go to the teacher.”

All groups of students mentioned that they actively sought help if they faced interpersonal problems (e.g. conflict) or task-related ones (e.g. lack of understanding). Especially, when working on difficult tasks, students experienced exchanging information with peers as being useful.

Teacher Feedback to Evaluate Performance Feedback on processes and products was highly relevant for students to evaluate their task performance. Especially, the balance between positive and negative feedback was valued. Students expressed appreciation when teachers gave compliments or motivated them to perform better. However, students felt that some teachers focused too much on negative aspects.

A2Ro: “And he also says something like ‘You must not think that you cannot do it because you sure can.’ Some teachers do that really well and others absolutely not.”

C4N: “But she also only pays attention to mistakes that you make, not to the good things and that is simply no longer nice.”

Students differentiated between teachers who assessed and approved their work and teachers who only ticked off their tasks.

A1R: “Teacher J. assesses quite well; he always says, when you ask him to approve your performance, ‘Come here and now explain to me how all this stuff works.’ You... really must know what it is all about.”

C3C: “But you could also fill in whatever you like because they do not really look at it. They look if you have written something and then they tick off.” C3K: “It is also possible that you learn something wrong. Last year we had a task and we filled everything in, but we answered the question incorrectly. We did not realise that and so we also did that wrong in the exam.”

T1D: “I could not tell if I did it right or wrong.” T1J: “You do not know if you have done it right or wrong. The only thing the teacher does is to check the answers and sign off. But you cannot really say ‘I have done this, is that correct?’ You would not get an answer.”

A1J: “If you just had an argument with a teacher earlier and you have done your practical task perfectly, he still gives you a bad mark, because he is angry with you.”

The informative and fair assessment was highly appreciated by all students, but some felt that their personal relation with the teacher affected the assessment.

Discussion

In this exploratory study, we gained a deeper understanding about factors students perceived to be relevant for their learning in WPS. Investigating workplace simulation learning from the student perspective helped to identify success factors but also inherent problems and challenges in WPS. These need to be solved to support VET students in developing effective learning strategies and to realise the theoretical ambitions of WPS in VET.

To answer the first research question, *What characteristics do students perceive as relevant in WPS?*, we can go back to the theoretical starting point of WPS. The three pedagogical ideas that were identified include learning in authentic settings, linking theory and practice and learning tailored to learners' needs (cf. Vrieze et al. 2001). Learning in authentic WPS was highly valued by students and had two major advantages. First, it increased student motivation as the learning situation felt real, including the complexity and challenges of everyday life. Second, students mentioned grasping and imagining reality better. Thus, it became clear that authenticity concerned the learning tasks as well as the physical arrangements of a WPS. Although research pointed out that learning tasks should be complex, realistic and challenging in relation to the real professional work field and foster high-quality learning (Vermunt 2003), students did not always perceive their learning tasks as being useful, challenging and authentic. As a result, their motivation and engagement dropped.

Linking theory and practice was realised by combining the theoretical domain-specific information with a practical task. Students indicated that this was a good way of learning as long as they could use the theoretical knowledge during the practical task performance. Students described themselves as “do-learners” with a clear preference for the practical part of the learning tasks. They experienced practice as being easier and more enjoyable. According to students, the theoretical part should be as concise as possible and the instruction should be short and grammatically easy because they did not like reading and faced difficulties with long texts. Only if they were interested in the subject matter and perceived the learning task as useful in light of a possible future profession, they were willing to make an effort on the theoretical part, wanting to learn more about a certain topic.

The principle of “learning tailored to students' needs” was apparently not been implemented according to theoretical ideas (Kicken et al. 2008; Vrieze et al. 2001). Tailoring and making choices to direct one's own learning pathway was limited to a predefined narrow set of possibilities, which interferes with the idea of self-directed learning. Although students liked the idea of making their own choices, the possible alternatives involved picking rather than choosing (e.g. Katz and Assor 2007). Thus, in the eyes of students, considering learners' wishes (real choices) was not realised. Moreover, it became clear that performance and assessment criteria were not transparent, which led to difficulties in assessing their task performance and further specifying their learning needs. Likewise, reflection on task performance was only scarcely embedded in WPS and students did not perceive it as a useful activity.

In addition to these three pedagogical ideas, the atmosphere was highlighted as being very important in WPS for stimulating students' learning and working processes. The atmosphere was created by the WPS itself and by the interaction with peers and teachers. Students expressed a preference for a calm and cosy atmosphere to work and learn effectively. As collaborative learning was mostly used as a method of working, the composition of the group also contributed to the atmosphere in WPS. Students clearly preferred to choose themselves with whom to work. Peers are one part of the learning environment and they are a source for making learning enjoyable, but they can also seriously disturb the learning process and the atmosphere in WPS. Collaborating successfully requires mutual understanding and the willingness to contribute and make an effort to the same extent.

The second research question focussed on the learner characteristics and teacher support that students experienced as being important: *What learner characteristics and teacher support do students perceive as relevant to their learning in WPS?* As research has identified that SRL and SDL skills play a crucial role in learning and achievement, it was expected that these skills would help students to deal effectively with the independence given in WPS. Students indeed described issues that were closely related to SRL and SDL. They perceived successful students in WPS as those who were motivated, responsible and socially competent, took initiative, worked independently and knew what they wanted. These students were likely to approach the learning task with interest, discipline, perseverance and commitment. Motivation and interest were also related to learning engagement. These characteristics were described by students to influence their learning process positively. Peers who lacked these qualities and attitudes upset (the cooperation with and progress of) others and negatively affected the atmosphere. Our findings are in line with prior research. Brockett and Hiemstra (1991) stated that being responsible for one's own learning is an important starting point for self-directed learning. In addition, motivation was identified as being an essential dimension in SRL because this made students more attentive, display greater progress, persist, and experience greater satisfaction and positive affect (Pintrich 2003; Zimmerman and Kitsantas 1999; Zimmerman and Schunk 2008). According to Zimmerman and Schunk, "Motivational processes play a vital role in initiating, guiding, and sustaining student efforts to self-regulate their learning" (2008, p. 3).

Regarding their task approach, students showed a rather unstructured behaviour in the sense that they talked about starting and then seeing where they ended up; no planning activities seemed involved. According to students, planning was often not required to perform a WPS task. However, when working collaboratively, students indicated they made some planning, such as distributing tasks, to achieve a good result. Assessing one's own or a peer's performance was perceived as something difficult, especially doing the self-assessment seriously. Students lacked clear and transparent assessment criteria. Students self-reflected on their performance by taking into account their work attitude and their result, but their self-reflection seemed to remain superficial, and they also mentioned difficulties evaluating and reflecting on their performance, often seeing it as the task of the teacher to tell them how they had performed and where they needed to improve. Supporting the development of self-regulated learning skills can help students to plan, self-assess and self-reflect (Bielaczyc et al. 1995; Zimmerman et al. 1996), but tasks need to be complex enough so that they understand and see the surplus value of these skills (e.g. Lodewyk et al. 2009).

Although students liked working in WPS, this study shows that the implementation of WPS has inherent problems and challenges. It might not be appropriate for all kinds of learners if not enough support is offered. WPS may pose problems, especially for those students who are not motivated and who have difficulties concentrating, as they are disturbed by peers. Therefore, learning how to regulate their motivation should be a crucial aspect in teaching SRL in WPS (e.g. Zimmerman and Schunk 2008).

Research shows that teachers play an important role in promoting and supporting the development of SRL and SDL skills (e.g. Bielaczyc et al. 1995; Hattie and Timperley 2007; Zimmerman et al. 1996). In our study, the students valued those teachers who were calm and empathic, as these characteristics seemed to trigger trust and students' well-being. This, in turn, contributed to a good atmosphere. Derisive expressions were not liked. Although WPS aim to be autonomy-stimulating environments, the teacher should be present in space and time. Students seemed to be very dependent on the presence and guidance of the teacher to work and learn effectively. They expected and enjoyed it when teachers paid close attention to their work and really assessed and approved what they were doing, as long as feedback was constructive. They highly valued the balance between positive and negative feedback, both in terms of self and of task performance. Students saw good assessment as a learning experience in itself when it was fair and not affected by the appreciation of the student as a person. Ticking off tasks completed without assessment was not valued. Moreover, students expected teachers to maintain order and safety. Good teachers were said to differentiate between students by enriching the tasks of the good students and helping the ones who needed more explanation and support. Overall, however, students found that the teachers did not have enough time to pay close attention to all students. They focused on the most boisterous students who faced problems with the given independence.

Limitations and Future Research

This study shows that interviewing students can provide valuable insights into their perceptions and expectations, which can help us understand their points of view and the difficulties they face, as well as identify their needs and wishes. We believe that this research is an important move in gathering knowledge about what is happening in WPS and what needs to be improved. However, this qualitative approach also has limitations. With the aim to explore, we collected data in three pre-vocational schools and three different sectors, in which the WPS, domain-specific contents, and the organisation varied. Still our study is small-scale and cannot capture the great variety among pre-vocational schools. Participation in our study was voluntary and we wanted students who were willing to talk about their experiences. Thus, there is a risk of selection bias. We conducted group interviews because we expected that this method would stimulate group members to comment or react in ways that do not occur in individual interviews. The drawback is that group dynamics influence the students in different ways. Some students might overshadow others and some might feel uneasy to disagree with the rest of the group. Furthermore, not all statements can be validated, because students were not systematically observed in practice. Students can explicate what characteristics are important, but that does not mean they are able to act in an appropriate way and actually strive for the ideal situation they describe verbally. It is much easier to say how a good student works than it is to actually perform in that way. Thus, although students

describe learner characteristics relevant to learning in WPS, this does not necessarily mean they also know how to turn this knowledge into practice. Moreover, the interview data does not tell us whether students' appraisal of their knowledge and skills is appropriate or whether they under- or overestimate their competencies. Nevertheless, students were aware of the differences between learners.

When we compare the findings of this study with a study that investigated teachers' perceptions (Jossberger et al. 2015), we see that the perceptions of both groups, teachers and students, correspond. Interestingly, the teachers described WPS and relevant learner characteristics similarly. According to teachers, VET students are a very heterogeneous group. Some teachers thought that students are able to self-regulate their learning, while others had serious doubts. They also indicated that they are still in the process of developing learning tasks and finding ways to foster students learning. Future research should examine how students act and perform in WPS by observing their actual behaviour in order to verify the interview data in practice. Moreover, it would be interesting to examine the learning material used in WPS and observe how students and teachers interact. A thorough comparison between professions could also reveal more differences.

Conclusion and Practical Implications

To conclude, this study highlighted several design dilemmas. On the one hand, students want authenticity and agency, challenging tasks, and some tailoring and differentiation concerning enrichment and support. On the other hand, the environment should be well-structured and students prefer integrated direct teaching and support. Their personal interest was a leading factor: they liked to engage in topics they already knew a lot about rather than taking on new challenges. The type of learning task, personal sensitivities, and the relationships with teachers and peers easily affected their motivation and consequently their learning. Students valued independence and responsibility, but the handing over of responsibility also led to cheating, which counteracted learning effectiveness. Moreover, students want fair and transparent assessments that trigger learning, but, at the same time, self-assessment and self-reflection were not really valued or seen as a learning experience, nor were they taught. Last but not least, WPS demand self-direction and commitment, but essential metacognitive skills to learn in WPS are not (yet) in students' fields of vision. From the student interviews, we conclude that self-regulation and self-direction are learning activities and processes not sufficiently promoted and supported in WPS, at least in the implementations we investigated. These dilemmas have to be considered when designing effective and enjoyable WPS in which students' SRL and SDL skills are supported optimally. De Bruijn et al. (2017) pointed out that vocational education should contribute to qualify VET students for further learning and personal growth. To realise this ambitious goal, it seems essential that VET students become skilful SRL learners who can self-direct their learning. However, we cannot expect that students at the age of fifteen possess these metacognitive skills or easily develop them by just participating in WPS. A strong support system is necessary.

Our study offers indications of how to match learning environmental characteristics and teacher support tailored to learners' needs. Based on our results, we propose to focus on the design of learning tasks and teacher feedback. The learning tasks should

be authentic and challenging for students. The instruction needs to be clearly formulated so that students easily understand what they are supposed to do. In order to promote SRL, the tasks should incorporate planning, monitoring and reflecting activities. These metacognitive activities need to be designed for each learning tasks so that students also see the use for professional practice. For instance, it makes sense to plan when preparing a meal as it is important to consider preparation time of different ingredients to decide what needs to be done first (cook the potatoes or roast the meat). Providing transparent assessment criteria for each task would help students to monitor, evaluate and reflect because they gain a better understanding of what is relevant for a good task performance. SRL are not only metacognitive skills that are currently in vogue, they are required for professional practice. The teachers have the task to engage students in constructive and critical discussions about their performance to further stimulate SRL. Giving students the possibility to codetermine their own learning trajectory could be a next step in the process of better implementing SRL and SDL in WPS.

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