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VET teachers continuing professional development—the responsibility of the school leader

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ABSTRACT

Continuing professional development (CPD) for teachers in vocational education and training (VET) in Norway has largely been either the responsibility of each individual teacher or a by-product of teachers' cooperation related to student placements. Additionally, VET teachers' professional development is influenced by external drivers. These factors are assumed to shape teachers' knowledge and learning; accordingly, we investigate how VET teachers perceive their opportunities for CPD and how principals and department heads facilitate this development. Through analysis of interviews with teachers and school leaders in two vocational schools in Norway, we find that external drivers are pulling CPD in a collective and general direction, and little attention is given to VET teachers' specific needs. The development of vocational knowledge remains largely up to individual VET teachers and is connected to student activities, usually in cooperation with industry (in this case, the restaurant and food processing industry) while the school leadership carries out the authorities' orders. We argue that school leaders must understand and facilitate CPD for VET teachers in a more nuanced way, tailoring it to their vocation. This implies an emphasis on working community competence, together with other knowledge domains, and the responsibility of school leaders to increase awareness of and facilitate CPD for VET teachers is underscored.

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Introduction

Vocational education and training (VET) at the upper secondary level faces challenges arising from rapid development within the industries in which students will be working. Keeping up to date with development in the various vocational fields is particularly challenging for VET teachers. Unlike teachers of general subjects, VET teachers usually have a combination of experience from a previous professional career and formal pedagogical training; this has been called dual professionalism (Hodgson and Spours 2019). Major changes in working life and in the various industries demand that VET teachers continuously update their vocational knowledge. This continuing professional development (CPD) takes place both informally, through interaction with industry, and formally, directed by education authorities and school leaders.

As teachers of the next generation of vocational workers, VET teachers' mastery of knowledge related to their field is of vital importance (Andersson and Köpsén 2019). The literature on this topic has increased in recent years (e.g. Francisco 2020; Lecat et al. 2019; Hoekstra, Kuntz, and Newton 2018; Warwas and Helm 2018; Zhao and Ko 2018; Hodgson and Spours 2019). These contributions

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show that VET teachers' contact with the field of practice (i.e. work life in the relevant industry) is a critical source of CPD. This is similar to Hodgson and Spours' concept of triple professionalism which involves a third set of professional skills allowing teachers to work beyond the boundaries of the institution and engage with the wider geographical, policy and economic landscape (Hodgson and Spours 2019, 232). Contributions from the Nordic context show that there is a lack of deeper understanding of VET teachers' collaboration with industry and of how vocational teachers can be supported in their CPD (Dahlback et al. 2017; Hiim 2015; Paaso and Korento 2010; Andersson and Köpsén 2019). However, there remains a need for qualitative studies that can offer deep knowledge of the relationship between CPD related to vocational subjects for VET teachers and who has responsibility for it. The character of the vocational knowledge – and the process of acquiring and developing this knowledge – is defined in the literature only to a limited extent (Andersson and Köpsén 2019).

We therefore sought to explore VET teachers' CPD in professional learning communities (Wenger 1998; Bound 2011). As these communities comprise a range of practices and interactions, they are well-suited for an examination of how VET teachers perceive their opportunities for CPD and how school leaders facilitate teachers' CPD. We began by mapping the drivers and the underlying perceptions around knowledge and learning for both teachers and leaders in a VET context; of particular interest was the development of the VET teachers' vocational knowledge and the balance between categories of knowledge. We asked the following research question: What are the opportunities for CPD for VET teachers and how are these facilitated by their leaders?

In the following, we start by presenting theory relevant to CPD for VET teachers and to knowledge management, which points to the role of school leaders in teachers' professional development. We then detail the methodological approach that we used to study teachers' professional development in two counties in Norway. This is followed by a presentation of the results and a discussion of our findings.

Theoretical background

Over time, the focus of CPD policy has shifted from formal structured learning sessions to learning in the everyday activities of the workplace (Lave 1999; Wenger 1998; Bound 2011). Both internal drivers in schools and external drivers are pushing for changes to CPD. These drivers influence the exchange of knowledge and leave leaders with a significant role to play in teachers' CPD and workplace learning (Leithwood and Jantzi 2005; Ballangrud and Paulsen 2018).

VET teachers' professional knowledge

Professionals are responsible for the quality of their work and are dependent on their functional expertise, including abstract knowledge and skills (Abbott 1988; Freidson 2001). Traditionally, VET teachers have been seen as dual professionals possessing academic knowledge based on higher education and practical knowledge connected to their vocational training and practice. According to researchers in the field, this duality is too simplistic. Bathmaker (2013), Young (2008) and Broad (2016) argue against such a dichotomy between academic and vocational knowledge and between the codified knowledge of college-based curricula and the situated, and often tacit, knowledge of the workplace. They argue that the boundary between the two types of knowledge is blurred and difficult to define and that knowledge in vocational education must be conceptualised and considered in greater depth to enable progression.

Accordingly, Bathmaker (2013) defines knowledge in vocational education in terms of categories involving different kinds of knowledge and skills: a) workplace practice knowledge and skills, b) generic and transferable skills, and c) subject knowledge and theory. This categorisation takes students' learning as its point of departure in contrast to Hoekstra, Kuntz, and Newton (2018, 240), who, building on Schulman (1986), take the teachers' point of view. Shulman (1986)

differentiates between three different learning domains or categories of teacher knowledge: subject matter, which is the content taught; curricular knowledge or pedagogy as a general category; and pedagogical content knowledge, which implies questions about lessons taught. Hoekstra, Kuntz, and Newton (2018) add a fourth domain: participation in the wider organisation (mostly inside schools). In their report on the competences of teaching staff in upper secondary vocational education and training in Finland, Paaso and Korento (2010) differentiate VET teachers' 'expertise' in different competence areas. Competence is a contested concept (Westar 2001). In the Nordic tradition, competence involves both knowledge and skills and is more widely used than the concept of knowledge (Krogh, Ichimon and Nonaka 2001, 6). Paso and Korento use the concept of competence areas and introduce the following four sub-categories: a) vocational competence, which pertains to the knowledge and skills inherent in a particular vocation; b) competence in VET/industry cooperation, which concerns 'perceptions of working life skills and competence in line with the mission of vocational institutions to serve and develop the world of work' (Paaso and Korento 2010, 15–16); c) pedagogical competence, which pertains to the role of teacher and can be seen as generic across vocational subjects, although it may differ between teaching general studies and vocational subjects; and lastly, d) working community competence, which concerns the sense of community, group and team working skills, and the process and development of competence. Paaso and Korento (2010) found the last category to be especially salient. We draw on Bathmaker's (2013), Hoekstra, Kuntz, and Newton (2018), Shulman's (1986) and Paaso and Korento (2010) categorisations to provide further nuance regarding VET teachers' CPD to explore how learning takes place in everyday activities in the workplace.

Situated learning in practice

Teachers' learning takes place through both organised activities and formal learning situations, as well as informally during everyday activities in the workplace (Bound 2011; Hoekstra, Kuntz, and Newton 2018). Informal learning is closely connected to work and comprises interactions of various kinds, often referred to as communities of practice (CoP) (Lave and Wenger 1991). CoPs include opportunities for professional learning and CPD, both for the individual participating in different CoPs and for the group. Professional development and learning are contextually and historically situated and consist of transformations of and changes in the practice itself, as well as the people, relations and cultures involved (Lave and Wenger 1991). While the transformation of knowledge between practices and communities is demanding (Andersson and Köpsén 2017; Wenger 2000), research shows that professional learning communities can support teachers' knowledge development and help them further develop their teaching practice if interactions with and discussions about relevant content are facilitated (Postholm and Wæge 2016). Dahlback et al. (2017) claim, however, that there is little knowledge sharing among VET teachers, and there is still a need to facilitate these interactions.

The development of teachers' professional knowledge is influenced by the interaction between an individual teacher's knowledge base and the various professional communities in which they participate – both in the interaction with industry and at school. School leaders play a crucial part in shaping the school work environment, and the way in which they adjust the organisational framework around school development work and follow-up influences CDP (Møller 2009; Ballangrud and Paulsen 2018).

School leadership as knowledge management

A school for vocational education and training is a knowledge-intensive organisation: knowledge, which consists of both input and output, represents its most important resource (Løwendahl 2005; Newell et al. 2009). The quality and content of students' knowledge and learning in school are highly

dependent on teachers' resources (Kunter et al. 2013). Management of these resources (i.e. knowledge management) is therefore an important element of the management of a school's teachers (i.e. knowledge workers) (Newell et al. 2009). Knowledge management requires having a strategy in place for the allocation and development of knowledge resources, as well as managing knowledge in practice (Hislop, Bosua, and Helms 2018). Thus, leadership in the context of a knowledge-intensive organisation is more about cultivation and facilitation than control.

Teachers have the following characteristics of knowledge workers: they are autonomous in their work performance, both in terms of decision-making and problem-solving, and they require interpersonal collaboration with other teachers, leaders and other stakeholders (Robertson and Swan 2003; Newell et al. 2009). School leaders facilitate and support teachers' learning through schedules, the provision of learning resources and the allocation of time to support teachers' reflection and learning about different tasks and problems. Knowledge management includes strengthening the connection between school and industry through student activities, with the aim of enhancing educational quality and completion, and strengthening both recruitment and teachers' specific vocational knowledge (Dahlback et al. 2017; Hiim 2015). Wenger, McDermott, and Snyder (2002) recommend cultivating CoP by building learning and innovation skills rather than emphasising knowledge management or the nature of knowledge. Leadership in the CoP framework therefore concerns cultivating and facilitating a learning community and granting it status within the organisation. Several studies conclude that professional learning communities depend on leadership (Mulford and Silins 2003; Stoll et al. 2006). In our study, therefore, we have chosen to focus on exploring the interactions around the different activities in which VET teachers are engaged to increase their professional knowledge.

Materials and methods

Context

Norwegian VET in upper secondary school follows a 2 + 2 model: students spend two years in school, including shorter placements, plus two years working in the industry as apprentices. The two school years are strictly at upper secondary and sixth form level and have no connection to higher education, as in some other countries (Jones 2020). A central objective for these VET programmes is that students become familiar with the various vocational subjects and trades. The education authorities, and more specifically the national and the county authorities, are responsible for the CPD of teachers at the upper secondary level. CPD is delegated by the county to the school leadership, namely the principal and other individuals with leadership responsibilities. In the Nordic model, governmental regulations, white papers and curricula encourage a close collaboration between the VET schools and local industry while allowing the regional education authority and individual schools a high degree of autonomy in how they organise student placements (Telhaug, Mediås, and Aasen 2006). This organisation rests on the assumption that the models for cooperation will vary according to industry and region (Dæhlen, Hagen, and Hertzberg 2008).

In Norway, VET students are in placement for 17% of the school hours during Year 1 and 26% of the school hours in Year 2 (Utdanningsdirektoratet 2020). The teachers follow them up during placement and maintain relationships with enterprises, both as placement locations and as potential future workplaces for students. This is useful in signalling the kinds of knowledge and skills the students will need to have. These teachers are thus at the intersection of educational and occupational practice (Fejes and Köpsén 2014), and this presents additional challenges for their CPD.

VET teachers bring their occupational and professional trade and background into their teaching practice (Fejes and Köpsén 2014). When starting as teachers, they mainly lack theoretical knowledge provided by higher educational institutions, such as universities. Importantly, however, once they have obtained their formal qualifications and are operative as teachers, they are usually no longer active in the occupational field.

Methods and participants

In the present study, the aim was to examine how teachers perceive their opportunities for CPD. A case study was applied because the issue under study – professional development for VET teachers – consists of processes very much linked to their contexts. There are many 'variables' for each observation (Hartley 2004, 324), making it unfit for a cross-sectional investigation. In the study, two schools constituted a multiple-case design, which is regarded by many as more robust than single-case design (Eisenhardt and Graebner 2007; Miles and Huberman 1994; Eisenhardt 1989). The cases were selected based on convenience sampling, and we chose to study the same phenomenon in two different schools in two different counties. This was less for the purpose of comparison and more for the purpose of broadening the data and offering contrast to contribute to a better understanding of the phenomenon under study. The common denominator was the vocational field of Restaurant and Food Processing.

Data were collected through individual and group interviews. Our informants were VET teachers (4), school leaders (4) and one VET Motivator (1), responsible for the Restaurant and Food Processing programme in upper secondary vocational schools in two counties in Norway. The principal shares the responsibility for the teachers' professional development with the assistant principals and the department heads, or delegates it to them entirely. The department heads monitor and facilitate the professional development of the teachers in their respective departments, in department meetings and with individual teachers and the industry. School 1 has a VET Motivator who is not officially a member of the leadership group but is formally responsible for following up with students and for coordinating initiatives between the principal or assistant principal and the teachers in the VET departments.

Two interview guides were developed: one for the teachers and one for the leaders and the Motivator. The individual interviews lasted from 55 minutes to 1 hour and 24 minutes. One group interview lasted for 1 hour and 23 minutes, while the other lasted for 1 hour and 13 minutes. The teachers in School 2 were interviewed together, as were the two heads of department in School 2 (Table 1).

Table 1. Informants in the study.

Schools	Leader informants	VET teachers
School 1	• Assistant Principal/Head of Department • VET Motivator	• VET teacher 1 • VET teacher 2
School 2	• Principal • Head of Department 1 • Head of Department 2	• VET teacher 1 • VET teacher 2

The analysis was inductive in that we openly looked for patterns in the data. It was performed through an iterative reading of the interviews along with continuous discussions among the research team. At the same time, the analysis had deductive elements since we used both extant theory and the interview guide in the coding process. In this process, we identified the teachers' opportunities for CPD, as perceived by both the teachers and their leaders. Further, we inferred the informants assumptions about knowledge and learning from the way they described opportunities for CPD. We used NVivo version 11 to aid our qualitative analysis of the transcribed interviews, and based on the coded material, we constructed matrices (Miles, Huberman, and Saldaña 2014) to see the patterns in the data and how the findings were interconnected. The project was approved by the Norwegian Centre for Research Data (project no. 60,201), and quality was ensured by researcher triangulation and iterative analysis.

Results

The aim of this study was to identify opportunities for professional development for VET teachers and to investigate how these were facilitated by school leaders. We begin by describing the external drivers for CPD.

External drivers

Political and societal drivers

Norwegian education authorities demand and expect that measures be taken to ensure that students complete two years in school plus two years of apprenticeship. If this objective is not reached, authorities have threatened to close down study programmes. School leaders are responsible for each school's goal achievement, and according to the assistant principal, this is 'perhaps the strongest driving force to implement change in a school'. Goal-oriented governance has consequences for leaders' actions and teachers' expectations of professional development in schools, as we shall see below.

Schools compete for students, and this market situation is also a driver of change. There is an expectation from the education authorities that both leaders and teachers will contribute to the school's competitive advantage and that they will work to maintain (or increase) the number of students. Teachers perceive that their jobs are not secure if the school cannot recruit a sufficient number of students and view their own competence as important in this competition. According to one school leader, '[the teachers] are good at saying, "We need this, because we can see that the students and the industry are there, and we are not". They want more training in their "subject area"'.

Demands from industry

Industries expect vocational schools' knowledge to be up to date, and this expectation is mediated through students when they are on work placement. During shorter placements or field trips to various private and public enterprises, students acquire experience from work life, which they bring back to school. This knowledge incites learning and change, both for the students and for their teachers. This is illustrated by the following quote from a school leader: 'When the teachers observe how the industry and trade operate, they feel they have to change their teaching in order to prepare the students for what's coming'. Thus, these placements become drivers of teachers' professional development. This involves updating the education being offered to keep it relevant to the industry and the workforce, which is particularly demanding for vocational schools.

Opportunities for professional development for VET teachers

The teachers and leaders in the study identified opportunities for professional development in collaboration with the restaurant and food processing industry, both within their schools and with other teachers in the wider educational field. In the following, we describe this in detail.

Cooperation between the schools and the industry

The cooperation between industrial actors and teachers mainly centred around organising students' learning. Within the vocational field of Restaurant and Food Processing, the schools had good access to the industry and placements for students. Both the teachers and leaders agreed that student placement represents an opportunity for the teachers to learn and be brought up to date. As one principal said: 'Placement is – it is in a sense a little bit of training for the teachers'.

Teachers are responsible for securing placements for their students: they follow up with the students during placement and reflect together with the practice supervisor on how best to meet the curriculum objectives. Based on these reflections and discussions, they decide how students can achieve their goals, and this concerns both the students' vocational competence and their social

competence. In this way, the development of the teachers' vocational competence is a by-product of their visits to the various enterprises. Teachers often use elements from these conversations as examples later in class. As one of the teachers expressed,

> I think it is there [in the enterprises] that I capture [the knowledge], further develop it and transmit it to the students. Since I have such a good cooperation with the placement workplaces, we can—if there is something that the students do not understand, we can pick it up and explain it more thoroughly in school.

These discussions and reflections help the teachers understand what the students are learning in practice, giving them a clearer understanding of what the students need to be learning in school; in other words, they are able to more easily differentiate between the various forms of vocational knowledge.

The schools invited kitchen managers who had students in placement to meet with the VET teachers and their leaders. In these meetings, they discussed plans for collaboration, what they all wanted for the students' programme and subject content, how placements should be organised, and specific industry themes (e.g. equipment and tasks). The teachers shared this information further at departmental meetings with the leaders and the other teachers.

The need to learn about and become familiar with new equipment and technology was underscored by both the teachers and the leaders. Having students in placement represents an invaluable opportunity for the teachers to become aware of the technological innovations in the field and this, in turn, contributes to renewal in the school kitchen.

Development projects and networks

The study schools enact a broad range of measures aimed at developing teachers' professional knowledge, in particular through school development projects and facilitated networking.

School development projects are mainly initiated by national or regional authorities. Their goal is to contribute to the development of both the school and teachers' CPD. Three projects in particular – 'Identifying, Charting and Following Up with Students at Risk' (ICF), Assessment for Learning (AfL), and Pedagogical Walk (PW) – are currently used at the study schools and involve all the teachers, including those in the VET programme.

The ICF project's main goal is to enhance School 1's dropout prevention efforts by equipping students as well as possible, both academically and socially. The project group consists of the principal and representatives from the VET programmes, and department meetings play a central role in implementing standards for assessing students' vocational and social competence. According to one of the teachers, the intention was to use the project as a starting point for reflection on 'our own local curriculum', with standards for good practice and student behaviour.

Both schools under study had AfL projects, the main goal of which was to develop the school's assessment practices and deepen its didactic practices. The PW project had been implemented in School 2. In PW, leaders walk around and observe in the schools' classrooms and kitchens and then reflect together with teachers later on the didactic processes. These projects were all de-contextualised and implemented in their standardised form (i.e. not tailored to specific situations and contexts). According to the teachers, this means that they touched on specific VET issues only to a limited extent.

The schools participated in *networking among VET teachers across the county*. These networks are initiated by the education authorities, who also fund them. There are different types of networks: some are controlled by teachers and others facilitated by the authorities themselves. As part of this networking, teachers participated in a 'subject forum' where they meet VET teachers in Restaurant and Food Processing from other schools. One teacher described a teacher-initiated course: 'We created a course one year, and it was a success. We had a waiter that had graduated from another school in the county and got a full review of new trends in table waiting – but this was 15 years ago'. Over time, the courses have changed from being subject-oriented to more general, with a focus on pedagogy and didactics. The teachers found the vocational content lacking in the courses for which

the education authorities were responsible and felt it was unclear who the target audience was due to their broadness. For instance, one of the teachers complained that the closest they had come to professional development in these courses was to make breadsticks with other teachers.

In terms of daily routines, department meetings represented an arena where knowledge sharing and learning took place. Specific VET themes were discussed – primarily with regard to what does not work. Reflection also took place, but some teachers wanted these meetings to be more constructive. In general, the teachers seemed to want more cooperation in the department and with other VET teachers within the school. However, the teachers' opportunities for knowledge exchange with their teacher colleagues and for professional development during the school day were limited: teaching took up most of their time and there were rarely more than one or two teachers teaching the same subject in each school; moreover, this kind of exchange requires facilitation. Nevertheless, the responsibility for developing vocational knowledge, both internally and in interaction with the industry, seemed to lie with the individual teachers.

Knowledge management in schools

In their facilitation of CPD, the school leaders emphasised both individual and collective measures and highlighted school development projects and learning for the whole school.

Leaders involvement in teachers' CPD

The school leaders were involved in the VET teachers' CPD to a low degree, and the teachers seemed unhappy with this limited involvement. Some teachers also felt that their leaders had very limited knowledge of the VET programmes and the teachers' profiles. According to the leaders, many initiatives for CPD came from the teachers:

> I find that the teachers, just like the department leaders, are observant and say: 'We need to improve on this and that, we need this'. A department leader can often be responsible for two or three different study programmes and cannot follow up on all of these in the same way.

When the leaders were involved, they facilitated collective CPD initiatives that included all the teachers at the school. Beyond these collective measures, it seems that it was largely up to the individual teacher to develop his/her own competence. As one teacher put it,

> I think [my teacher colleague] and I are very independent, and as long as our practice 'works', why should we keep bringing [the leaders] with us all the time? There is only more to consider. We can do it ourselves. [The leaders] trust us: that we do what we need to.

The teachers thus have a high degree of autonomy, are uncertain about what the leaders can offer them, and doubt that the leaders have sufficient knowledge of their field. Moreover, they have limited opportunities and time to involve the leaders and think they know best what they need.

Facilitating individual teachers' CPD

We found few school-initiated measures, and even few initiatives that focus on individual teachers' needs for CPD. One initiative leaders pointed to addressing individual teachers' needs is placement for teachers. However, such placements are voluntary and rarely used. According to the leaders, placements for teachers represent an opportunity for teachers to update their vocational competence. The leaders believed this aspect should help motivate teachers to participate in the programme but found them to be uninterested. For instance, one of the leaders reported never having received an application from a teacher to shadow a teacher in another county, which is another placement option. At the same time, this leader admitted that teacher placements generate extra costs and work for the leaders since they must hire substitute teachers, and that this practice is not particularly encouraged.

Facilitating CPD at the collective level

Concerning learning and CPD at the collective level, two initiatives stood out. One, observed in School 1, is the position of a VET Motivator who supports students and teachers in their attempts to increase student throughput. Motivators work somewhat informally with the department, helping connect students and teachers with people in companies and on education councils and arranging joint meetings with the school and enterprises to identify opportunities for students. Placements are used as a way to become familiar with the enterprise community and develop a network. Motivators also have extensive contacts within the school, with the principal, department heads, class teachers and the students. They act as the 'glue' in the system, a transferor of knowledge, helping the teachers in their knowledge work and managing connections relevant to both the teachers' and the students' learning.

The second initiative consists of the school development projects, in which the leaders and teachers collaborate in formal meetings during teachers' non-teaching working time. The leaders emphasised the importance of school development projects for developing teachers' competence. Typical topics include 'the teaching profession', which covers what it means to be a teacher and what is most important to master when teaching students. The meetings involve videos, reading material, and lectures and case discussions in groups. One leader explained, 'At a combined upper secondary school [with both vocational and general studies], everyone must be involved, and now I'm talking about following up on competence'. The result is a focus on general pedagogical topics that the leaders find relevant for all their teachers and on which the education authorities want them to focus. According to a leader:

> . . . and then it's finding, and adapting what we do jointly so that everyone can identify with what we do, VET included . . . It's a long way from Béarnaise sauce to the CNC machine in the next building; everyone needs to feel that this concerns them. If they do not identify, they drop out.

One such development project that has already been mentioned is the pedagogical walk (PW), which the teachers found to be a poor fit with the specific circumstances of VET learning. VET students are being taught trades that require them 'to be up and about and not at their desks the whole time', as one of the leaders phrased it. Nevertheless, the leaders did not adapt projects like the PW to the local context in response to the teachers' critiques: 'We could have adapted the project, but then we had a lot of quarrels with teachers who do not agree. So we run the project according to the template'.

It was challenging for the leaders to transform the projects' general didactic focus to meet the needs of the VET teachers. Both the PW and ICF are initiatives led by the education authorities, and concern setting standards of practice. The individual teachers, however, did not feel that these collective standards were valid. It seems the standards highlight different competences, and the leaders placed emphasis on developing students' social competence in ICF. For example, as one leader explained,

> . . . this mixture, the conscious process of mixing social and vocational competence, this mix creates a very good future employee and skilled worker . . . And it is like, understanding how important social competence is for vocational competence and for the enterprise. How important it is for the industry – this is something we have understood more and more.

In summary, the main external drivers for competence development take the form of demands from the education authorities regarding performance measures, the competition for students in the educational marketplace, and the needs of the industry hiring the students. CPD emerges as a by-product of the students' learning activities, particularly in the collaboration between teachers and industry. The students' placements in and contact with the industry appeared to be the individual teacher's responsibility, and the leaders were less involved. We found that the school leaders saw the students' needs and the regions' needs as a whole, and they were strongly committed to implementing 'top-down' measures initiated by the education authorities, which are usually poorly tailored to the individual VET programmes.

Discussion

To examine how VET teachers perceived their opportunities for CPD and the extent to which CPD was facilitated by school leaders, we began by analysing the drivers of CPD. We identified external drivers influencing the schol's organisation but found that teachers' specific CPD needs must be understood in light of the interaction between these external drivers and internal needs.

Drivers of collective continuing professional development

The political and societal drivers in the Norwegian context, where the study was conducted, seem to be pushing for a change from an individualistic to a more collective approach to teachers' CPD. It appears that the authorities expect these drivers to increase the teachers' and school leaders' focus on increasing throughput of students, reducing student dropout, and competing for students. Our informants appeared to be highly aware of the connection between the drivers at the systemic level and how they influence teachers' learning. Inherent in the external drivers is a demand for teachers and school leaders to develop a systemic understanding of the schools' activities, including an understanding of the education authorities' need for governance and the region's need for knowledge, learning and future workers. This activates needs for learning through participation in the wider organisation (Hoekstra, Kuntz, and Newton 2018). Paaso and Korento (2010) refer to a 'working community competence' reflected in the way that teachers meet the needs of the education authorities and the industry to support triple professionalism (Hodgson and Spours 2019).

CPD for teachers – an individual responsibility

VET teachers' interactions with industry represent the most important opportunity for CPD in their vocation (here, the Restaurant and Food Processing programme); this was also found to be the case in the Swedish context (Andersson and Köpsén 2019). These interactions have the features of a CoP (Wenger 1998): they occur between teachers, chefs and mentors, and are initiated and designed mainly by teachers or take place in connection with student placements. When they include discussions about their students and workplace tasks, these interactions help develop teachers' *vocational competence* (Paaso and Korento 2010). This involves both workplace practice knowledge and skills, subject knowledge and theory, and pedagogical content knowledge (Bathmaker 2013; Shulman 1986). Staging these interactions appears to be the responsibility of individual teachers, which illustrates a dependency on both teachers' individual initiative and their autonomy when it comes to developing vocational competence (see for instance Köpsén and Andersson 2018).

The interaction between mentors, chefs and teachers also activates knowledge related to *VET/industry cooperation* (Paaso and Korento 2010). This is the school's social mandate and is in line with its mission as a supplier of relevant education. This interaction also has a strategic function since it helps increase the student throughput. Furthermore, it activates the teachers' *working community competence* (Paaso and Korento 2010; Wenger 1998) through collective reflection on learning goals, strategy and quality. The collective reflections in this CoP help create knowledge overlap, or redundancy (Nonaka 1994), between teachers and industry. Knowledge redundancy is a necessary condition for knowledge creation and learning in organisations (Nonaka 1994).

How this resonates with school leaders

The school leaders underscored the increased focus on VET teachers' learning in interaction with industry, but ironically appeared to view their role mainly as implementers of education authorities' projects (e.g. the AfL and PW projects). These projects are designed to combine school development with professional development (Hermansen 2015), resulting in a focus on teachers' professionalism and general curricular knowledge (Schulman, 1986). This knowledge applies to all teachers across all

upper secondary qualification programmes, vocational or not. This can be seen as a result of demands from the authorities. As a result, in practice, there is little emphasis on the development of vocational knowledge in vocational training programmes and on the needs of individual VET teachers.

The leaders appeared to hesitate to initiate de- and re-contextualising processes and tailor the school development projects to their VET programmes. Standardisation requires splitting up the competence aims in the subject curricula, which may be seen as checklists, according to Broad (2016, 144), thereby fragmenting knowledge and impoverishing vocational subject matter content (Young 2008). Re-contextualisation is necessary to ensure relevant pedagogical content knowledge for different vocational programmes (Ballangrud and Paulsen 2018) to fit the CPD for different vocational programmes. The ICF project, mentioned earlier, has a VET focus and highlights students' social skills but may lack a connection to workplace practice and knowledge (cf Paaso and Korento 2010; Bathmaker 2013). This is because the project is underpinned by a belief that general projects – in this case development of pedagogical competence – are fit to meet the need for professional development for all teachers, VET teachers included. It is a challenge for school leaders to explore and facilitate integration of different sub-categories of knowledge in CPD projects and to adapt programmes to teachers in different fields, VET teachers in particular. These 'one-size-fits-all' projects are relatively inexpensive because they demand relatively little equipment and time and the school achieves economies of scale.

Our findings show that projects initiated by education authorities and led by school leaders are only minimally tailored to the region. This kind of tailoring has been argued to be important (Bound 2011; Hoekstra, Kuntz, and Newton 2018; Hodgson and Spours 2019).

Broad (2016) has shown that the most significant barrier to teachers' participation in CPD stems from the quality of their networks. The teachers' networks in our study were organised top-down by the education authorities, had a broad focus that has only broadened with time, and failed to stimulate teachers' vocational knowledge. Participation in ongoing professional network development activities depends on the overlap of vocational knowledge in networks, and our findings indicate that not only are these networks weak, or what Broad (2016) would term 'impoverished', but they may be too general to be a source of professional development.

Conclusion

Opportunities for CPD for VET teachers emerge mainly from top-down initiatives and from self-initiated collaboration and networking with the relevant industry. Top-down initiatives focus on general (curricular or pedagogical) knowledge, which is in accordance with previous findings. This study offers insight into school leaders' responsibility for and facilitation of teachers' CPD and reveals a lack of focus on the development of vocational knowledge, which is largely left up to the teachers themselves. The leaders seem to prioritise general school development projects that fall short of meeting VET teachers' specific needs. Such projects require tailoring as study programmes differ greatly.

This combination of theory on CoP and theory that highlights knowledge based on a social realist stance as an analytic tool illustrates how the teachers' everyday challenges require an understanding of the need for coherence between various CPD measures and categories of knowledge. Through its exploration of VET teachers' CoPs, the study contributes to nuance the view of these teachers' knowledge base as including the ability to perform practical tasks and not simple engage in theoretical reasoning.This suggests specific challenges in providing CPD for VET teachers and their leaders in developing triple professionalism. This is underscored in our contribution to theory in demonstrating how building learning and innovative skills to cultivate communities of practice is insufficient for CPD, contrary to the claims of Wenger, McDermott, and Snyder (2002), and that knowledge management is needed to ensure the relevance of professional knowledge. VET teachers' knowledge represents a broad field in which they must keep up-to-date, underscoring the need for CPD to be understood in connection with societal demands. Thus, the teachers' working community

competence also involves regional labour needs and the students status as future workers as important dimensions.

Implications for practice

According to the results, CPD for VET teachers does not appear to systematised in the Norwegian context, in line with the findings of international research. This is despite the fact that it is the responsibility of both the education authorities and the school leaders. When it comes to CPD, VET teachers have different needs than teachers of general subjects and different measures are therefore required. School development projects as a collective measure should pay attention to the special needs of VET teachers' and the value of vocational knowledge and require collaboration between school leaders, teachers and regional enterprises. All of these elements must be taken into account when leaders design and initiate CPD projects for VET teachers. Schools may have a better chance of meeting external demands if professional development is closely connected to the work life challenges in the region, and this might also help prevent dropout.

Issues for further research

Projects with a focus on vocational knowledge, initiated to fulfil schools' social mandate, require school leaders to have an external orientation, and this involves working community competence. The position of VET Motivator represents a new role in middle management and a new way to facilitate knowledge processes for both teachers and students. It would be interesting to investigate this role further in connection with school leaders' facilitation of VET teachers' CPD.

Disclosure statement

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