



How Can Collaboration between Schools and Workplaces Contribute to Relevant Vocational Education?

Results of an Action Research Project in the School-based Part of Norwegian Vocational Education and Training

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Abstract

Collaboration between schools and enterprises in vocational education and training (VET) is a challenge in many countries, Norway included. There is a tendency to organise VET in separate theoretical and practical learning arenas that lack mutual coherence. This article presents the findings of a four-year action research study in which 30 vocational teachers, who were taking an in-service master's degree programme in vocational pedagogy, completed systematic research-based projects on developing partnerships between schools and enterprises in the school-based part of Norwegian VET. The goal was to strengthen the relevance of vocational education by creating stronger links between the content of the education and the content of the vocation. The study was based on a pragmatic, holistic perspective on vocational competence and education where essential, authentic vocational tasks to which theory is related are regarded as the core educational content, both in the enterprises and in schools. The findings are based on an analysis of 30 master's degree theses documenting each of the teachers' development projects.

The results show examples of and principles for how collaboration between schools and enterprises can be organised around vocational tasks. Core principles include formal agreements on collaboration between schools and enterprises, regular dialogues between vocational teachers, instructors and students about educational tasks and content, joint planning and follow-up of students' placements in enterprises, and exchanges of experience and competence between teachers and instructors. The results show that, according to students, instructors and vocational teachers, the application of such principles contributed to vocational relevance and students' motivation and learning outcomes.

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Keywords quality in vocational education · cooperation school-working life · collaboration schools-enterprises · relevant vocational education · holistic vocational education

Introduction

Extensive research emphasises a general lack of collaboration between schools and workplaces on vocational education and training (Gessler, 2017; Louw, 2017; Walgren & Aarkrog, 2012). A lack of or a poorly developed collaboration tends to result in a weak link between school-based learning and workplace learning (Billett, 2008). The problem is rooted in a long-standing tradition of distinguishing between learning and work and between theoretical knowledge and practical skills. This is reflected in how the study programmes are organised, and in the curricula (Hiim, 2017).

Research points to a need to strengthen school-workplace collaboration and for greater coherence between the learning arenas. However, epistemological analyses are also needed of vocational competence and education that can serve as a framework for developing more knowledge about *how* schools and vocational enterprises can collaborate and *how* a more relevant education can be achieved. (Koenen et al., 2015; Schön, 1995). The purpose of this article and the research project it concerns is to contribute knowledge about the following questions, based on analyses and a pragmatic, holistic epistemological perspective: how can schools and enterprises work together to achieve coherent, vocationally relevant education, what are the challenges at hand, and what are the benefits of collaboration for students, teachers and instructors in enterprises? For now, vocationally relevant education and training can be defined as being characterised by close coherence between the educational content and the basic tasks and competence needs of the vocation in question (Hiim, 2017).

The research project was conducted in partnership between the author, who was the project manager, and 30 vocational teachers who were participating in an in-service, part-time master's degree programme in vocational pedagogy, over a four-year period (2015–2019). The students / vocational teachers initiated and led independent, research-based development projects in the form of educational action research in their schools. All the projects concerned various forms of collaboration between schools and enterprises, aimed at achieving coherence between the basic tasks of the vocation and the educational content. Educational action research can be defined as follows: 'Research that entails collaboration on practical-theoretical planning, implementation, assessment and critical analysis of educational, teaching and learning processes with the aim of developing new knowledge about such processes in schools and workplaces' (Hiim, 2016). The vocational teachers' projects were conducted in collaboration with students, colleagues and instructors in vocational enterprises, and were documented in master's theses with a scope equivalent to 60 ECTS. The results presented in this article are based on an analysis of all the 30 theses.

Below, I will first briefly present the Norwegian VET model, which is important to understanding the context of the overall action research project, and provide some information about how the project was organised. This will be followed by an analysis of Norwegian and international research that sheds light on collaboration between

schools and enterprises and the issue of relevance in VET. Vocational relevance and school-workplace collaboration are then discussed in light of epistemological, pragmatic perspectives on vocational competence and education. The research approach in the project as a whole is then reviewed, focusing on both the action research projects and the analysis of the master's degree theses.

In the presentation of results, the vocational teachers' views on the challenges involved in cooperation with enterprises is first briefly presented. Then a description is given of different collaboration measures that were tried out in the teachers' projects, followed by the students, instructors and vocational teachers' assessments of them. In the last part of the article, the measures and the participants' experiences from the projects are discussed from a pragmatic epistemological perspective, with the focus on how collaboration between schools and enterprises can be carried out in a way that strengthens the relevance of VET, and what opportunities and challenges this entails.

Context of the study

The main Norwegian VET model consists of two years of upper secondary school, followed by a two-year apprenticeship period. The education is currently organised in ten broad study programmes, for example Building and Construction; Restaurant and Food Processing; Healthcare, Childhood and Youth Development etc. The first year (Vg1) of the respective programmes is common to a range of different, but related vocations, while the second year (Vg2) is more specialised and focuses on just a few or only one vocation. Further specialisation and qualification for a specific vocation takes place during the apprenticeship period. The research project concerned collaboration between schools and enterprises in the first two school-based years.

The content of the school-based part of VET is divided into academic subjects / common subjects such as Norwegian, Mathematics and Social Studies, and vocational subjects / programme subjects that include subjects of relevance to the vocations in the programme (Norwegian Directorate for Education and Training, 2020). One of the vocational subjects is called Vocational In-depth Study and is intended to give the students a realistic experience of tasks and the content of one or more vocations they would like to qualify for, preferably through collaboration with enterprises and a work placement (Norwegian Directorate for Education and Training, 2021).

When this study was conducted in 2015–2019, vocational education was organised in nine vocational study programmes. In 2020, the new Knowledge Promotion Reform was implemented, which reorganised the programmes as the ten that are currently offered, with increased specialisation at Vg2 level. The reform is regarded as a continuation and improvement of the first Knowledge Promotion Reform of 2006. It was considered important to maintain the 2+2 structure with fairly broad vocational study programmes, while also improving students' opportunities to specialise in their chosen vocation in the school-based part of the education. Reform documents and new national curricula describe school-workplace collaboration as essential to making the study programmes more vocationally relevant and specialised, which under-

lines the importance of this study (Meld. St. 28 2015–2016; Norwegian Directorate for Education and Training, 2020).

The vocational teachers / master's students who participated in the action research study came from three different cohorts, and participation was voluntary. The participants attended three full-day project seminars per semester over a period of two years in connection with the implementation of their projects and their work on their theses. The seminars consisted of research-based and theoretical input aimed at shedding light on vocationally relevant education and school-workplace collaboration, action research methodology and the exchange of experience. Other than that, the students participated in normal teaching and supervision activities. The completed master's theses were submitted between 2017 and 2019. They all concerned action research projects aimed at developing school-workplace collaboration, but in different vocational programmes.

In the next section, research on school-workplace collaboration in the school-based part of the Norwegian VET model is first presented, followed by an analysis of international research in the area.

Research that sheds light on school-workplace collaboration on relevant vocational education and training

Research on the Norwegian VET system indicates that, despite recommendations in the formal guidelines, many of the students are not given an opportunity to take a work placement in their first year (Vg1) (Bødtker-Lund, Hansen & Haaland, 2017; Hiim, 2013; Nyen & Tønder 2012). In the second year (Vg2), more students have workplace training. However, responsibility for organising and following up contact with vocational enterprises is largely left to the individual teachers, who often lack time and management support for this work (Aspøy & Tønder, 2017; Bødtker-Lund et al., 2017). Students who have actually completed a placement describe a lack of follow up and little coherence between what they experience in the workplace and what they do at school (Bødtker-Lund et al., 2017; Hiim, 2013; Nyen & Tønder 2012). Many students state that they lose track of the vocation they would like to qualify for during the first two school-based years of the programme, and that they do not perceive the education as relevant (Bødtker-Lund et al., 2017). However, the extent, quality and traditions of school-workplace collaboration vary between programmes, schools and vocations (Olsen, Reegård, Seland & Skålholt, 2015). Some research indicates that the training offices, which are responsible for formally organising the collaboration between enterprises on the training of apprentices, can play a role in strengthening the opportunities for and quality of work placements also for students in the school-based part of VET (Michelsen & Høst, 2015). One comprehensive study based on efforts to make school-based Norwegian VET programmes more vocationally relevant shows how systematic, supervised workplace training is of great importance to students' motivation and learning, but points to the need for better structural conditions and in-service training of teachers in order to strengthen the cooperation between school and working life (Hiim, 2013). It can be concluded that non-binding guidelines, organisational obstacles, lack of resources and a lack

of traditions are key challenges for cooperation between school and working life in VET.

As mentioned, international research shows that weak school-workplace collaboration is a challenge in different VET models and that it is related to lack of coherence between the curricula and the content of the vocation. Gessler (2017) has conducted a comprehensive study that suggests that school-workplace collaboration is more or less non-existent in the German VET system. He claims that it functions as a parallel system with little or no contact between the learning arenas, rather than as a system consisting of two cooperating parts. The research conducted by Walgren and Aarkrog (2012) points out that the transfer of knowledge between schools and workplaces is equally challenging in the Danish VET system, and, like many other Danish researchers, they emphasise the importance of stronger links between the curriculum and the content of the vocation (Louw, 2017; Young, 2004) showed that schools and enterprises in the UK VET system have different views of the content and found that enterprises tend to focus on limited instrumental skills, while the schools focus on discipline-based theoretical knowledge. He claims that students may end up with purely instrumental skills with a weak theoretical foundation since theory is not perceived as relevant. Billett's (2008) argument that rich, integrated learning from the school and workplace is necessary to ensure students' development of professional competence can serve as a conclusion.

Some research based on concepts such as innovation education, design education and hybrid learning is about developing educational content and models that cross the boundary between school-based and workplace learning (Kairisto-Mertanen, Kasanen, Lehtonen & Lappalainen, 2012; Zitter, Hoeve & De Bruijn, 2016). Emphasis is placed on the principle that the content of the study programme must be closely linked to work tasks, and on the interdisciplinary organisation of the content around authentic vocational tasks. Schools systematically taking on assignments for businesses could be one way of collaborating (Cremers, Walz, Wesseling and Mulder, 2016). Some research on crossing the boundary between school-based and workplace learning is explicitly based on a holistic concept of competence. In an article based on a comprehensive study of European VET programmes at university college level, Koenen et al., (2015, p. 2) define competence as follows: 'An integrated set of knowledge, skills and attitudes'. They go on to say that a competence-based education is one whose main principle is that the content is based on and organised around authentic vocational tasks to which theory is linked. The results of the study show that the programmes in question were only competence-based to a rather limited extent (Koenen et al., 2015). A holistic concept of competence and the implications it has for the understanding of school-workplace collaboration is the theme of the next section.

Vocational relevance and school-workplace collaboration in light of a holistic, pragmatic competence concept

In the following, relevance issues in VET are first seen in light of a dominant rationalist knowledge tradition. The epistemological basis for a pragmatic, holistic perception of vocational competence and education is then analysed.

The rationalist, technical understanding of knowledge has been criticised for its tendency to consider the relationship between theory and practice as a kind of one-to-one relationship, in which general, given concepts and conceptual structures can be transferred through verbal statements and then applied in the practical performance of a vocation (Dreyfus & Dreyfus, 1986; Schön, 1983). This is based on the understanding that theory and theoretical disciplines can first be learnt in school and then applied in practice. The 2+2 Norwegian VET model can illustrate such an understanding. When it was established in 1994, the national curricula for the school part exclusively contained descriptions of theoretical learning outcomes as regards what the students were expected to be able to explain, discuss etc. The curricula for the workplace training part, on the other hand, almost exclusively contained descriptions of practical learning outcomes as regards what the students were expected to be able to perform, produce etc. The sharp distinction between theoretical and practical learning outcomes was criticised for giving rise to relevance issues relating to a lack of coherence in the curriculum and between learning arenas (Blichfeldt, 1996), and in the 2006 and 2020 reforms it was softened to some extent. The curriculum is increasingly based on learning outcomes that describe vocational functions and tasks, to make it more vocationally relevant. According to formal guidelines, VET shall now be based on a holistic concept of competence (Meld. St. 20 2015–2016); Norwegian Directorate for Education and Training, 2006; 2020).

However, epistemological analyses are needed of what a holistic concept of vocational competence and education means and how it can shed light on questions of coherence and relevance. Below, pragmatic interpretations of Wittgenstein's late philosophy are related to a holistic perspective on experience and competence in VET. The interpretations are seen in conjunction with perspectives on vocational education and training in Dreyfus & Dreyfus (1986) and Schön (1983).

Through his game metaphor, Wittgenstein (2003) interprets experience and learning as living, participatory activities interwoven with cultural, practical patterns or 'games'. There is a purpose to the game – for example the 'game' as an electrician, healthcare worker or hairdresser. Understanding the purpose is necessary to learn the game, and to do so, someone who knows how to play it must show it to you. Experience and learning are achieved by participating in something you see the point and purpose of, for example the social, professional and personal purpose of being an electrician or healthcare worker. The game metaphor means that experience, learning and the development of vocational competence can be understood as participating in life forms and practices, into which words and concepts are woven and which give them meaning.

From Wittgenstein's perspective, experience and competence are comprised of actions, sensations, understanding, intentions and language as a whole. Involvement, sensitivity, skills and instinct are as important as theoretical and intellectual reason. Seen from that perspective, vocational competence is multi-dimensional and holistic – it is in our bodies, in our way of watching, doing and understanding, and in the vocational culture. Wittgenstein's holistic concept of experience and competence underlines the importance of learning by example because situations and contexts give meaning to concepts and conceptual structures. One of the main challenges in vocational education and training is thereby to clarify the vocation's social mission

and core tasks and, based on that, to facilitate authentic, pattern-forming example situations in which the students can learn. Wittgenstein rejects the idea that concepts are defined by absolute, given structures that can be transferred through verbal statements, and emphasises the necessity of learning through a variety of different but related examples (Hiim, 2017).

Both Dreyfus & Dreyfus (1986) and Schön (1983) are inspired by a pragmatic, holistic concept of knowledge and competence (Hiim, 2017). Schön (1983) uses the term 'knowledge-in-action' to emphasise the holistic aspect, while Dreyfus & Dreyfus (1986) use the term 'skills' in an expanded, holistic sense. According to Schön, the core of vocational education and training is what he calls a reflective practicum, i.e. a workshop or workplace where students are given an opportunity to experiment with, contemplate, reflect on and explain essential, authentic tasks together with experienced practitioners from whom they can learn, and in which there is room for error. Real workplace training can and should function as a reflective practicum, but limits must be drawn out of consideration for production and clients or customers. Dreyfus & Dreyfus's (1986) skills model emphasises that the acquisition of high-level skills requires participation in authentic, varied and coherent tasks of increasing difficulty and complexity, and with an increasing degree of professional and social responsibility and involvement. Involvement is also central to Lave and Wenger's (1991) concept of community of practice and the idea that identification with the work creates meaning in the learning process and is essential for the development of professional competence. It can be concluded that, from a pragmatic point of view, participation in authentic work tasks is necessary to understand the purpose and meaning of basic concepts of the vocation.

The next section deals with educational action research as the methodological approach taken in the vocational teachers / master students' projects and its relationship to pragmatic epistemology. The role of the project leader and the analysis of the master's theses are also described.

Methodology

Educational action research in the form of practitioner research, which was the approach taken in this project, is closely related to pragmatic epistemology. (Elliott, 1991; Hiim 2016, Schön 1991). Professional performance of work, e.g. as a teacher, is seen as a necessary basis for research and concept development in the profession. From a pragmatic epistemological perspective, practice-based, task-based learning and research are aspects of the same issue. They concern the need to develop professionally relevant knowledge and competence (Schön, 1991). In this project, the aim of the teachers' action research was to investigate, improve and document research on their collaboration with enterprises and instructors, which is an important task for VET teachers. Each project can be seen as an experiment and a kind of paradigmatic example of school-working life collaboration (Elliott, 1991; Hiim, 2016).

Educational action research is typically a collaborative form of research (McNiff, 2017). The teachers organised regular sequences of planning, feedback and reflection during their projects, including all participants – students, instructors in voca-

tional enterprises, colleagues and others. The process was systematically documented through written plans, observation notes, personal logs, logs from students and other participants etc. In this type of research, the empirical data largely consist of qualitative descriptions of the participants' actions, views, and experience during the development process (McNiff, 2017). The documentation contains comprehensive descriptions and analyses of the measures that were tried out to strengthen collaboration between schools and enterprises, the individual participants' experiences, and key obstacles and opportunities that were identified.

The project leader's role was, in accordance with e.g. Elliott (1991) and Kemmis, (2012), to facilitate the vocational teachers' action research. This was done by organising input and discussions about methodology in action research / practitioner research. Epistemologies and theories of vocational competence, practice-based learning and collaboration between school and working life were also presented. One main principle was to relate theoretical input and discussions as closely as possible to the vocational teachers' work and experience from their projects, for instance by continuously using some of their projects as examples. The project leader had no role in formally assessing or supervising the projects. An important role for the project leader that was agreed on from the start was to analyse and compare the results documented in the master's theses. The idea was to strengthen the impact of the overall project.

The purpose of the analysis was to systematise results that shed light on collaboration between school and working life and relevant vocational education. The analysis consisted of first reading and writing relatively detailed summaries of each thesis, with page references to key findings and quotes. In the next readthrough, the notes were used as support to analyse the theses in greater depth. The analysis was to a fairly large extent structured in relatively broad categories / questions related to previous research and epistemological and theoretical perspectives on holistic competence, relevance and school-workplace collaboration (Creswell, 2013), but also to some extent inspired by grounded theory and aimed at the categories that emerged from the material (Chamaz, 2006). About fifteen theses that represented both the commonality and breadth of the project results were selected for a new in-depth reading (Creswell, 2013). The presentation of findings from the study largely refers to this selection.

As regards pre-defined main themes or questions, the vocational teachers' perceptions of structural challenges related to implementing collaboration between schools and enterprises were of interest, such as governing documents, organisational obstacles, teaching resources and established local traditions. Further, it was examined how collaboration was established and organised in the projects. For instance, was the collaboration the responsibility of individual teachers or regulated by fixed agreements, and what opportunities were there for contact between vocational teachers and instructors? Further issues concerned what the theses said about the pedagogical and vocational content of the collaboration. One main question was how working life practice was planned and followed up by teachers and instructors. This was related to sub-questions about how the students in placements were socially and professionally welcomed in the enterprise, and what types of tasks they were assigned (Dreyfus & Dreyfus, 1986; Lave & Wenger, 1991). The vocational relevance of the tasks, prog-

ress, variation, opportunities for reflection and theoretical explanations, what type of supervision and assessment the students received, were important themes seen from a pragmatic epistemological perspective (Dreyfus & Dreyfus, 1986; Koenen et al., 2015; Schön, 1983). The relationship between the students' workplace experience and their schoolwork, the instructors' influence on the content in school and the teachers' influence on the content of the students' practical training were also topics of interest. It was important to include experience and views from the teachers, students and instructors relating to these questions.

Concerning references, many of the specific findings recur in several of the theses and referring to all of them would take too much space. Therefore, references are made to some selected theses that contain examples of key findings. When it comes to the students, teachers and instructors' assessments of the experiments that were conducted, emphasis has been placed on relatively extensive use of quotes that either represent something many people were concerned with or specific experiences that are of importance (Creswell, 2013).

The presentation of results in the next sections is structured around the above categories. The vocational teachers' perceptions of challenges relating to cooperation with enterprises are first briefly presented, followed by a description of the measures that were tried out. Then the students, instructors and vocational teachers' experiences and assessments of the measures are described. The results are discussed in relation to previous research and pragmatic theoretical perspectives in the last part of the article.

Results from the projects

The vocational teachers' experience of challenges related to collaboration with enterprises

The vocational teachers' experience of challenges relating to collaboration between schools and working life is largely in line with previous research on Norwegian VET mentioned above (e.g. Bødtker Lund et al., 2017; Nyen & Tønder 2012). They emphasise that, although the subject Vocational In-Depth Study creates opportunities for school-workplace collaboration, the formal guidelines are not sufficiently binding, since students are only recommended, not required to undergo practical training in an enterprise (Norwegian Directorate for Education and Training, 2021). Traditions relating to whether students are offered workplace training, and the scope, organisation, and content of such training, still vary greatly, and only limited resources are available for developing agreements with enterprises, holding meetings or following up students on placements (Eriksen, 2018; Løberg 2019; Melby, 2018; Øverli 2019). When students undergo practical training, a lack of opportunities for contact between the school and the enterprise may mean that teachers do not know the student's instructor / supervisor in the enterprise, or that the student does not have a dedicated supervisor (Øverli, 2019). The vocational teachers in the project found opportunities to develop and try out measures to increase the scope and quality of the school-workplace collaboration, even though some of the above-mentioned challenges were

not easy to handle. Key measures are presented below, followed by descriptions of the students', instructors' and vocational teachers' experiences.

Measures to strengthen collaboration between schools and enterprises

All the teachers arranged for some form of practical work experience for their students. Some undertook assignments for enterprises that were partly performed at school, partly at the enterprise. An example from the Media and Communication programme involved some of the students contributing to producing news stories from the Alpine World Ski Championships for the Norwegian Broadcasting Corporation (NRK) (Berg & Lund, 2018). Student enterprises and school clinics were also established, e.g. in the programme for skincare workers (Melbye, 2018). However, most of the teachers prioritised organising regular placements in enterprises for the students (Dølving, 2018). Many of them contacted school leaders, managers and instructors to make formal arrangements for this (Melby, 2018; Norvoll 2017). The degree of formalisation and the duration of the agreements between the schools and enterprises varied. In some cases, agreements were established at the county authority or municipal level and involved school owners, school managers, teachers, business managers, vocational training offices and instructors. The agreements included a commitment to hold collaboration meetings, to take a certain number of students on placement and sometimes also to take on apprentices (Mugaas, 2017; Popperud, 2019). The aim of such agreements is to strengthen the link between workplace training and teaching in school.

Regular dialogue meetings were held between the teachers, instructors/supervisors and students. The meetings were intended to clarify the parties' expectations and discuss the content and quality of the collaboration (Egeland, 2019; Skarsnes, 2018). The meetings concerned the core tasks of the vocation, qualification needs, and objectives in the national curriculum. Key topics were the students' tasks, variation and progression, and the importance of reflection and the theoretical justification for the work that was carried out. Specific plans for the individual students' placements were discussed. The meetings were organised for several instructors jointly (Dølving, 2018; Mugaas, 2017) or in connection with the teacher following up students on placements (Løberg, 2019).

Great emphasis was placed on preparation for and follow-up during and after workplace training, and on the criteria for assessment. The preparations entailed preparing the students theoretically and practically for tasks they would encounter during the placement. The teachers visited students during their placement and sometimes also supervised them in connection with specific work tasks. In some cases, the teacher participated in the work together with the students, reflected on the activity and drew on relevant theoretical perspectives (Dølving, 2018). Follow-up after a placement is about giving the students an opportunity to share, reflect on and discuss experience gained during the placement, and about linking this experience to theoretical and practical tuition (Kopperud, 2017; Øverli, 2019). Several of the vocational teachers cooperated with the instructors on developing assessment criteria for practical training, related to objectives in the curricula and vocational tasks the

students are expected to carry out satisfactorily in relation to their level of education (Løberg, 2019).

The exchange of competence between teachers and instructors was emphasised. To ensure that the teaching was up to date with developments in the vocations, some of the teachers invited instructors to hold courses for students and teachers at the school. In some cases, industry organisations and instructors offered certification courses to students or students and teachers jointly, for example scaffolding courses, wet room courses, nail gun courses etc. (Trudvang, 2019). The teachers, on their part, contributed in some cases by organising educational supervisor courses for instructors (Popperud, 2019). There is also an example of a Vg2-level Industrial Technology class moving into a business park for three days a week. Here, both teachers and students received training in state-of-the-art equipment and were given an opportunity to take part in meetings and discussions with professionals and apprentices (Popperud, 2019).

The students, instructors and vocational teachers' experiences of the different measures are presented in the following sections.

The students' experience of school-workplace collaboration

Feedback from the students shows that different forms of workplace training generally create motivation and learning outcomes. For example, a student in the media programme who participated in an assignment for a media company stated: 'We are introduced to how the real industry works!' (Berg & Lund, 2018, p. 97). Students at both Vg1 and Vg2 level generally express that workplace training gives them a sense of purpose and of mattering in a professional community: 'You really understand that something is expected of you ... You need to show up because you are part of something.' (Eriksen, 2018, p. 87).

It is important for the students to feel welcome and included in the enterprise: 'I was shown round the salon. Everyone was really friendly, and I felt welcome' (Nordvoll, 2017, p. 73). Good, regular follow-up from the supervisor in the enterprise is also important to the students' sense of security and learning, as illustrated by the following statement from a student on a placement in a nursing home: 'Even when I was taking care of someone on my own ... I could always go and say that I needed help or ask about things' (Øverli, 2019, p. 65).

The students want preparation for the placement in the form of exercises and theory relating to the tasks they will encounter in the workplace (Kopperud, 2017). Many express a wish for more frequent visits from their teacher during placements and for more discussion, reflection and theory relating to practical experience, because it helps to improve their learning outcome (Kopperud, 2017). The students are concerned with responsibility, variation and progress in the tasks they are given, and say, for example: 'We want varied tasks and to be included in different activities, such as wound care or other important tasks that are taking place' (Mugaas, 2017, p. 56). They also emphasise the importance of their experience from their placements being shared and followed up once they are back at school: 'We learn different ways of doing things in the workplace setting, so it's hugely beneficial to learn from each other's experiences' (Egeland, 2019, p. 62). The students also express that experience

of the professional field makes it easier to see the relevance of practical exercises and theory tuition in school (Popperud, 2019).

Students who take part in certification courses or other professional offerings from the enterprises describe increased relevance and opportunities for apprenticeships: ‘Course certificates from a safety course, nail gun course and other courses have paid off ... the enterprise has appreciated it’ (Trudvang, 2019, p. 12). One of the students in the Industrial Technology class who were moved into a business park says: ‘We’re using brand new machinery now, and it’s great!’ (Popperud, 2019, p. 76, p. 81).

The following quote can serve to summarise student experiences: ‘Workplace training is something we wouldn’t be without’ (Nordvoll, 2017, p. 75).

The instructors’ experience of the school-workplace collaboration

The instructors who took part in the action research projects state that information from and regular follow-up by the school are vital to their willingness to take students on placements. Many appreciate dialogue meetings organised by the school because they know little about the study programme in question and find the curriculum documents and wording of objectives complicated and difficult to relate to: ‘It’s a good initiative, coming together and exchanging thoughts and raising any questions we might have’ (Mugaas, 2017, p. 52). Many have opinions about the organisation of placements, and point out, among other things, that they need information well in advance. One instructor says: ‘I’m given too short notice. There’s work to be done, students to be placed and schedules to be drawn up’ (Skarsnes, 2018, p. 53). The instructors want to see a system that informs the enterprise at the start of the year which students would like a placement, and when. Several enterprises and instructors would like to enter into formal agreements on collaboration that provide predictability and commitment. A representative of a vocational training office in carpentry that has entered into such an agreement states: ‘The agreement commits us to collaborating with schools to get students into workplace training, and that’s good’ (Trudvang, 2019).

The instructors are concerned with how they can collaborate with the teachers during placements (Dølving, 2018; Egeland, 2019). It is emphasised that students should have a dedicated practical training supervisor to avoid random and unsystematic follow-up (Melby, 2018). However, the instructors would also like teachers from the school to help to supervise the students during practical training, both to ensure the students’ outcome and to link theory and practice: ‘That the teacher is there is very, very important’ (Kopperud, 2017, p. 76). Some instructors want more opportunities to discuss theory with the teachers: ‘I would like time and space to discuss theory relating to the competence goals the students are working on’ (Skarsnes, 2018, p. 76). The instructors are eager to give the students relevant, varied tasks, but at the same time they are unsure about what they can expect from the students professionally and about how to assess their work (Dølving, 2018; Løberg, 2019). Several emphasise that they would like to help to define the content and assessment criteria for the students’ work practice (Øverli, 2019). According to the instructors, content and assessment criteria should be about the students active’ participation in core vocational activities. A supervisor on the Child Care and Youth Worker programme underlines,

for example, that students on a placement in an early childhood education centre (kindergarten) should participate in activities and tasks involving play, meals, clothing, circle time, minor conflicts between children, hygiene etc. (Løberg, 2019). The instructors also emphasise that content and assessment criteria must include students' key competencies, for example responsibility, initiative and cooperation. A supervisor in a kindergarten said, for example: 'Personal suitability is important to function in the vocation ... and should be emphasised more in the education and training' (Løberg, 2019, p. 61).

Instructors who are offered supervisor courses by the school appreciate it: 'Courses are a good thing!' ... 'I've learnt how important the role of supervisor is!' (Mugaas, 2017, p. 65). The instructors also state that the courses they themselves offer can update the vocational competence of the school, strengthen its professional reputation and lead to more qualified apprentices (Trudvang, 2019).

The vocational teachers' experience of school-workplace collaboration

When the school-workplace collaboration was supported by formal agreements that included local educational authorities and the management level, the teachers believed that this had a great impact on the framework conditions and on the scope and quality of the collaboration (Mugaas, 2017; Popperud, 2019). Teachers who had a more individual responsibility for the collaboration experienced greater resource challenges. The teachers underline that resources to follow up students on placements are also important because 'the enterprises express a wish for engaged, interested teachers' (Øverli, 2019, p. 88).

According to the teachers, the teachers and instructors need to develop a common understanding of the curriculum, core tasks and concepts of the vocation. They claim that it is important to have discussed with instructors in advance the tasks students will be assigned: 'Now, our collaboration has been strengthened through a common understanding of what the students are to do' (Løberg, 2019, p. 89). When the teachers take part in the supervision of students, they attempt, together with the supervisors, to encourage the students to use professional concepts and terms and to reflect on their work. One example from Child Care and Youth Work shows how the students develop their understanding of 'play', 'co-determination for children' or 'bullying' when they experience and put the concepts into words during placements, and this is followed up in teaching at the school (Løberg, 2019). Several teachers have found that using a log in which students are encouraged to describe in professional terms and state the reasons for the tasks they carry out during a placement can create links between theory and practice and strengthen the relevance of the education. (Nordvoll, 2017; Skårvik 2019). According to the teachers, the quality of the tasks the students are assigned is of decisive importance, however. Not being assigned tasks or being assigned tasks that are not challenging enough can be detrimental to motivation and learning outcomes. (Melby, 2018). Emphasis was placed on solving such problems together with the instructors.

Many of the teachers underline that collaboration on assessment in Vocational In-Depth Study is needed, in particular. One of them said: 'It is difficult to assess the students in Vocational In-Depth Study, because we have so little time to observe

their practical performance during a placement' (Skarsnes, 2018, p. 6). One teacher found that collaboration between teachers and instructors on developing assessment criteria contributed to raising the relevance of the study programme as a whole: 'The collaboration on assessment criteria has contributed to making the content of the Child Care and Youth Worker programme more vocationally relevant' (Løberg, 2019, p. 90). Several teachers emphasise that close collaboration with the instructors as professional practitioners represents a huge learning potential for the students. One of the teachers says: 'It was the supervisors the students learnt the most from. They learnt by doing the tasks together and the supervisor explained as they went along ...' (Øverli, 2019, p. 88).

The vocational teachers state that the collaboration with enterprises and instructors helps them to stay up-to-date about the field, gives them insight into new equipment and practical examples they can use in their teaching (Løberg, 2019; Popperud, 2019; Trudvang, 2019). However, it is also said that some teachers feel insecure in their encounters with the field of practice because they do not feel sufficiently up-to-date. Technical courses and further education with the possibility of spending time in enterprises are emphasised as effective measures to strengthen school-workplace collaboration. A vocational teacher who attended such a course put it as follows: 'It's easier to send students to places where I've been since I know the enterprises better' (Hoel & Embresen, 2017, p. 92). Overall, the vocational teachers state that close, systematic collaboration between schools and enterprises is necessary for students to develop holistic vocational competence.

Summary of findings

The results from the study indicate that binding agreements between schools and enterprises, a shared understanding of core tasks in the vocations and the curriculum, and systematically supervised work practice are essential if vocational education is to be relevant. In the next section, the findings presented above are discussed from a pragmatic epistemological perspective.

Discussion: Relevant vocational education and training through school-workplace collaboration

As mentioned, Norwegian and international research indicates that there is a need to strengthen the organisation and content of school-workplace collaboration (Billett, 2008; Bødtker-Lund et al., 2017; Gessler, 2017; Hiim, 2013; Walgren & Aarkrog, 2012). The epistemological analyses presented above emphasise the holistic nature of vocational qualifications. Learning arenas that form a unified whole, with authentic vocational tasks at their core, is fundamental to developing vocationally relevant education and training (Dreyfus & Dreyfus, 1986; Hiim, 2017; Koenen et al., 2015; Molander, 1996; Schön 1983). Based on the findings from the study, I will discuss how and why collaboration between schools and enterprises can be carried out with a view to developing coherent, relevant vocational education.

Formal organisation and collaboration agreements

The challenges involved in developing school-workplace collaboration indicate that the rationalist tradition of distinguishing between the organisation and content of school-based and workplace learning and between the theoretical and practical content of education, is relatively strong in the Norwegian education system (Bødtker-Lund et al., 2017; Nyen & Tønder, 2012). Guidelines advocating more coherence in governing documents and curricula in both the 2006 and 2020 Knowledge Promotion Reform are a step in the right direction. The results nonetheless indicate that formal regulations relating to the organisation and content of the school-workplace collaboration in the school-based part of the Norwegian VET system should be made more specific and binding than is currently the case. Among other things, supervised workplace training should be made a requirement in both years of the programme.

As regards organisation, the study also indicates that there is great variation in the scope of collaboration and the use of formal, binding collaboration agreements. Local education authorities and school leaders take formal and genuine responsibility for collaboration between individual schools and enterprises in different ways, and the allocation of resources to implementation and follow-up varies, which has also been documented in previous research (Bødtker-Lund et al., 2017; Nyen & Tønder 2012). The vocational teachers, instructors and students in this study would like to see stronger formal collaboration agreements that create predictability, a long-term perspective and more equal provision for students.

The agreements can include mutual obligations concerning assignments for and practical training in enterprises, the scope and time of placements, the number of students in the enterprise, follow-up and guidance, meetings between teachers, instructors, students and other involved parties, courses offered by the enterprise to students and teachers, courses offered by teachers to the enterprise etc. One of the main points is that such agreements help to create a clear framework and to clarify the content of the collaboration. At the same time, it is important to provide ample opportunities for local adaptation. One important point is to ensure that all students are given supervised workplace training in their desired vocation each year, that the placement is systematically prepared and followed up, and that teachers and instructors collaborate on the content of the placement and of the education as a whole. The goal of the agreements is to contribute to vocational education and training that is based on the holistic nature of vocational qualifications, and to soften the rigid boundaries between learning arenas and subjects that to some extent still characterise the Norwegian VET model.

The instructors who participated in the study take a positive view of collaboration because they believe it strengthens the possibility of recruiting well-qualified skilled workers, and they call for agreements that create predictability, ensure follow-up by the school and clarify responsibilities. The teachers would like to see agreements that ensure good framework conditions and that mean that they do not have to carry out the additional work of organising placements every time. Based on this and other studies, part of the explanation for why so many students are not given an opportunity to take a placement seems to be that workplace training has not been sufficiently formalised and that many teachers do not have enough time and energy to organise

placements without formal and resource-related support (Bødtker-Lund et al., 2017; Nyen & Tønder, 2012; Aspøy & Tønder, 2017). The students, on their part, clearly state that workplace training is of fundamental importance because it is about understanding the purpose and meaning of education, creates motivation and helps to give meaning to professional concepts. Collaboration agreements that create predictability and quality are also important to them. From the students' perspective, school-workplace collaboration is so important to their possibility of developing competence in the chosen vocation that it should be formalised to a much greater extent than is currently the case.

Creating a common understanding of the basics of the vocation

As regards the content of the collaboration, the teachers and instructors emphasise joint efforts to clarify the basic activities and tasks involved in the vocation, and what the students can work on during their placements. The students are also involved in these discussions, which are often linked to the interpretation of the goals in the curriculum. From a pragmatic, didactic perspective, a common understanding between teachers, instructors and students of the overall purpose and social mission of the vocation and education is the key to achieving vocationally relevant education (Hiim, 2017). It is about how the parties involved see the purpose and meaning of the 'game' as childcare and youth workers or carpenters, to use Wittgenstein's metaphor (2003). An overall understanding of the vocation helps to make the education meaningful and makes it possible to view more specific tasks in light of their purpose. Organising the content of the education around authentic work tasks, which Koenen et al., (2015) are concerned with, requires continuous collaboration between the parties involved on interpreting and specifying what the tasks consist of.

Furthermore, it is necessary to link theory to the performance of tasks, both during supervision of the students' workplace training and in connection with teaching at school. The teachers, instructors and students involved in the study were all concerned with this. When students perform and give theoretical grounds for the performance of the core activities of a vocation, for example 'care', 'play', 'meals', or 'hygiene' in the education of childcare and youth workers, this can be regarded as a form of paradigmatic exemplification that enables the development of comprehensive vocational qualifications. An important didactic principle is to highlight the link between tasks and concepts and how they form an integral whole in vocational qualifications (Dreyfus & Dreyfus, 1986).

The teachers, instructors and students all emphasise that the quality of the tasks the students are given is of decisive importance to their motivation and desire to learn. Vocational relevance, internal coherence, variation and progress are key to the quality of the tasks.

Preparing and following up workplace training

The instructors, students and teachers are all concerned with how school-based work prepares the students for workplace training. The students' desire to do well and succeed can be seen as an expression of identification with the professional practice

and the relevant ‘game’ as, e.g., an electrician or healthcare worker. They want to be taken seriously and be included in the professional community (Lave & Wenger, 1991). An important purpose of the preparations is to strengthen the link between schoolwork and workplace training, and the students’ possibility of succeeding with their placement.

Follow-up by the teacher in the workplace can help to further strengthen this link when supervision and theory are related to the tasks the students perform, something the teachers, instructors and students in the study are all concerned with. When skilled professionals, whether they are instructors or vocational teachers, work together with the students and explain and state the grounds for their actions, this forms a particularly good basis for the students’ learning. From a pragmatic perspective, it is emphasised that no one can learn a practice or ‘game’ alone – they depend on skilled colleagues who can show them and explain how and why the tasks are to be performed (Schøn, 1983).

Dreyfus & Dreyfus (1986) underline the importance of learning through varied tasks and examples. The students are concerned with precisely this when they emphasise the importance of sharing experiences relating to the tasks they have performed. They have experienced that there are different ways of performing the tasks, and that they can learn a lot from reflecting on different solutions and challenges when they get together with the other students after completion of their placements. Systematic sharing of experiences after workplace training can also create good opportunities for developing coherence between workplace and school-based content, which many of the teachers also underline. Together, schools and enterprises can function as a reflective practice, in which the students learn through systematic reflection on the performance of practical tasks (Schøn, 1988).

The results of the study show that there is a close connection between developing a common understanding of basic vocational tasks and assessment criteria. The teachers and instructors’ discussions of assessment criteria helped to direct the focus towards the basic competence of the vocation, and that it concerns both how the tasks are performed and why. This points to forms of assessment that address both practical execution and theoretical justification in Vocational In-Depth Study and common programme subjects. From a pragmatic perspective, collaboration and coherence between school-based and workplace learning warrant forms of assessment where theoretical knowledge and practical execution make up a whole (Hiim, 2013).

Competence development between teachers and instructors

When the enterprises and instructors included in the study contributed input on school-based teaching in the form of views and courses for students and teachers, this also helped to create coherence and vocational relevance, and brought the education up to date. When the teachers, on their part, organised and held courses in vocational pedagogical and didactic supervision for instructors, the instructors gained better insight into curricula and school-based work, thereby further increasing coherence. Competence exchange between teachers and instructors is key to the students’ possibility of developing comprehensive, updated vocational qualifications.

Conclusion

In this study, it has been argued that a reason for the lack of cooperation between schools and workplaces in VET is the longstanding and dominating tradition for distinguishing between practical and theoretical knowledge. This is also often expressed in the curricula and in distinctions between learning arenas. However, pragmatic epistemological analyses of vocational competence emphasise its holistic character. The study indicates that, in school-based Norwegian VET, formal guidelines in the curricula that ensure formal regional and local agreements on collaboration between schools and enterprises are required. Guidelines and agreements must ensure students' rights to supervised working life practice, create structures for contact and dialogue between vocational teachers and instructors, and set out principles for integrating learning at school with learning in the workplace, and vice versa. This is necessary to counteract traditional distinctions and create a realistic framework for a holistic, coherent and relevant vocational education.

The results from the study suggest that a key to holistic vocational education is a shared understanding between vocational teachers, instructors and students of the social and professional purpose and basic tasks of the vocation. Such an understanding gives meaning to the educational content and strengthens the students' opportunities to identify with the vocation. The findings show how regular joint discussions of basic vocational tasks are followed up by systematically relating theory and assignments, both at school and in the enterprise, and assessment criteria, to key professional tasks. The results show that the teachers, instructors and students involved in the study consider collaboration between schools and enterprises based on these principles as crucial to the relevance and quality of vocational education. One conclusion is that, to achieve relevant vocational education, it is necessary to strengthen a holistic conception of vocational competence. However, more research is needed that can, epistemologically and empirically, shed light on how coherence between educational institutions and the field of practice can be strengthened.

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