Leadership and knowledge sharing in vocational education and training

Øyvind Glosvik & Dorthea Sekkingstad

Western Norway University of Applied Sciences

(oyvindgl@hvl.no)

Abstract

This is a text about *how different management practices can affect knowledge sharing in vocational education*. Data comes from a qualitative study of the Norwegian 'Vocational Teacher Training Initiative Programme'. The text is based on the premise that different management practices can create varying relationships between external, formulated requirements for knowledge development and internal processes for sharing knowledge. Sekkingstad and Glosvik (2022) have previously identified three main categories of management practices: 'management of operations', 'leadership through system and plan', and 'systemic leadership'. These characterise overlapping reflections between school managers and in the management groups in five upper secondary schools. The practices are used as analytical tools, and nine categories with relevance to the research questions are identified and presented as results.

The main message is that the three practices are intertwined, but that 'management of operations' dominates. The main finding is that one practice puts the teacher at the centre, another the school as an organisation, and the third the needs of the pupils. Management practices in vocational education thus have an impact on what is perceived as collective learning. The results are first discussed in light of a perspective on organisational learning (Pedler et al., 2019), then in light of general approaches to school and educational leadership.

Keywords: leadership practices, collective learning, systemic leadership, organisational learning, learning leadership

Introduction

Leadership and knowledge sharing

The topic of this text is school leaders' experiences with knowledge sharing. The background is the 'Vocational Teacher Training Iniatiative Programme – for the Skilled Workers of the Future' (Yrkesfaglærerløftet) in Norway (Kunnskaps-departementet [Ministry of Education and Research], 2015) and the way it put collective knowledge sharing on the agenda in vocational education. The research question is how different leadership practices can influence knowledge sharing in vocational education and training.

The Vocational Teacher Training Initiative Programme (Yrkesfaglærerløftet, abb: YFL) was a major national initiative. It is based on the understanding that workplace-based professional development promotes collective learning and thus has greater potential for school development than further education for individual teachers (Helstad & Møller, 2013). This represents a shift from individualised to collective professional learning (Hargreaves & O'Connor, 2018), even though it is expressed that individual learning should contribute to knowledge sharing and organisational development in each school (Utdanningsdirektoratet [Norwegian Directorate for Education and Training] [Udir], 2016, p. 3). At the onset of the YFL, there was a requirement that there should be a minimum of three teachers from each school in the same continuing education programme. The Norwegian Directorate for Education and Training, provided guidelines that included mandatory tasks aimed at promoting knowledge sharing within one's own staff (Udir, 2016).

In this study, we take as our starting point experiences from one of the continuing education programmes for which Western Norway University of Applied Sciences was responsible. The continuing education programme was structured with mandatory gatherings and intermediate work in network groups at the participants' own schools, combined with individual learning logs. The course concluded with an oral group exam at the participants' own school, where the participants presented their experiences and reflections on their practice to colleagues and the school leadership.

Experiences with the continuing education initiative provide us with the opportunity to pose three sub-questions about the connection between leadership practices and knowledge sharing in secondary schools. Firstly, to what extent do varying leadership practices affect the interpretation of such development initiatives? Here, the interpretation of external influence is the entry point. Secondly, whether such variations affect interpretations of the facilitation of knowledge sharing, that is, whether there are internal variations within the school organisation? And thirdly, how do leaders perceive the connection between leadership and collective learning in secondary schools?

Specifically, it is about identifying what is perceived as workplace-based professional development in light of various leadership practices.

We first outline a knowledge base and discuss a possible theoretical/analytical perspective. The study utilises a qualitative approach, and the selection of participants for focus group interviews is explained and discussed before presenting the results as three leadership practices in light of the research questions. In the discussion, some main findings are highlighted. In the conclusion, we further develop three practice categories and discuss these in light of some theoretical perspectives that can shed light on the connection between leadership and knowledge sharing in vocational education and training.

A knowledge base

The policy document *Curriculum Framework for Knowledge Promotion 2020* (Ministry of Education and Research, 2017) emphasises that learning teachers and learning schools are prerequisites for enhancing student learning, and that school leaders have a special responsibility to facilitate learning in professional communities. This aligns with international research that highlights leader involvement as a crucial factor in the development of knowledge in the education sector (Huber, 2011, p. 643; Postholm et al., 2017; Robinson, 2014). School leaders play a central role in facilitating organisational learning and development (Elstad & Helstad, 2014). It is critical that principals are closely involved with their teams (Aas & Vennebo, 2021). Hord and Sommers (2008) and Sekkingstad et al. (2024) emphasise the principal's role as a catalyst, noting that professional learning in schools does not seem to develop naturally on its own. Qvortrup et al. (2018, p. 61) state that a prerequisite for developing schools is that school leadership has enough knowledge to build the professional learning culture. Success factors appear to be facilitating the sharing of experiences and knowledge development (Elstad & Helstad, 2014, p. 31). Robinson identifies five leadership practices or leadership dimensions that affect school outcomes (2014, p. 26): establishing goals and expectations, strategic use of resources, improving the quality of teaching, leading teachers' learning and development, and ensuring a well-organised and safe learning environment. Sølvik and Roland (2022) highlight the complexity of leading collective professional learning in schools and emphasise the importance of leadership setting a collective direction and adapting collective learning processes over time to the specific school context. Leadership directly impacts teacher teams, and teacher teams directly impact teaching (DuFour & Marzano, 2011, pp. 54–55). However, Hargreaves and Fullan (2012) point out that there can be a pitfall if principals become too focused on the formalities of teacher collaboration rather than the content and goals.

Aas and Vennebo (2021) note that it is challenging to establish professional learning communities in secondary schools. This may be related to the size of the

schools, which often have many different departments with their own characteristics. Teachers may have a strong subject orientation but a weaker tradition of collaboration across subjects and departments (Huffman et al., 2016). When vocational teachers express perceived competency needs, they largely desire individual competency development within their own subject (Rokkones, 2017). Paulsen (2019) points out that vocational education faces particularly significant challenges in developing learning networks, as the training occurs in various settings with different actors within different cultures. Therefore, it is important to build practice and interpretation communities 'from within' in each department, so that local routines can be established at the lowest possible level to promote the core activities of the school. Collaborative learning and distributed leadership are emphasised (Rekdahl & Paulsen, 2023). Other studies related to the Vocational Teacher Training Initiative Programme also highlight the role of school leadership in collective competency development. Leadership must know what competencies teachers gain through continuing education and how this can be used as a resource in the school's planning and development work (Glosvik & Sekkingstad, 2024; Morud & Rokkones, 2020; Sekkingstad & Syse, 2019). Leadership is central to developing arenas that ensure content promotes collective professional learning (Sekkingstad et al., 2024).

A practice perspective on leadership

Robinson employs a practice perspective in her knowledge summaries (2014). In this text, we also follow this approach, in line with Mintzberg (2009). Mintzberg argues that this approach was introduced by the Swedish economist and leadership reserarcher Sune Carlson as early as 1951 (referenced in Mintzberg, 2009). Tengblad's message is that one should study how experienced leaders handle demanding situations with high work pressure, where unforeseen events disrupt goals and plans (2012, p. 338). Bøe (2016), in a study of leadership in kindergartens, has shown how this approach to leadership brings out the paradoxical and tension-filled aspects of leadership. Nevertheless, it is a little-used perspective in studies of leadership in Norwegian education, and this aspect of Robinson's (2014) message about what leadership 'works' can be overlooked.

Three parallel practices?

In a study of the same data base that this text builds on, Sekkingstad and Glosvik (2022, p. 286) identified three main categories of leadership practices: 'leadership as operation,' 'leadership through system and plan,' and 'systemic leadership.' These named overlapping characteristics reflected in the discussions among leaders and leadership groups in five secondary schools. One practice, 'operation,' entailed leaders focusing on ongoing tasks related to their own school and unit. Short-term operational issues dominated the agenda. Leadership

through 'system and plan' included 'operation,' but a broader, and other definitions of demands and challenges dominated. The third practice, called 'systemic' by Sekkingstad and Glosvik (2022), arose from leaders' reflections on synergy and coherence in schools and increasingly focused on learning related to core activities. These three leadership practices are used as analytical categories in what follows.

This perspective closely aligns with what Pedler et al. (1997) discussed as drivers for learning and development on three levels: leadership as survival, leadership as adaptation, and leadership for sustainability. These authors represent a view of learning organisations that involves the development of learning capacity through gradual, collective attitude changes. The first involves learning to survive, doing things well enough to meet the organisation's main goals, which are usually determined or influenced by dominant external forces, such as higher management or elected officials. From this perspective, employees have little to say other than to adapt to what may be presented as quality or production requirements. The second attitude involves doing things better, for example, in competition with others. Leadership will now more strongly focus on improvement rather than survival, possibly emphasising individual results as well as collective factors within the organisation. The attitude involves wanting to do better things, seeing one's organisation as part of a larger community. Winning is no longer central but collaborating with diverse contributors becomes important. Evaluating oneself in light of others becomes part of the leadership task, which has implications for views on power sharing, involvement, and engagement.

In later works, the authors Boydell, Pedler and Burgoyne expand the three-step development to explain the changes learning organisations need to make to matter in the world (Boydell et al., 2020). Central leadership questions become how organisations positively impact society, contribute to freedom, ethical practices, and sustainability in various ways. The fourth step, this last argument, is not used in this text, but the three attitudes and gradual attitude changes will be revisited in the discussion.

Method and data

Qualitative approach and selection of informants in focus groups

In this study, we use data from two-step focus group interviews with five groups of school leaders from five different upper secondary schools in Vestland County. The selection is based on schools that participated in the Vocational Teacher Training Initiative Programme (Yrkesfaglærerløftet, YFL), and thus have teachers who participated in the same further education organised by YFL in

2017–2018. The principal at each school was responsible for recruiting participants from their own leadership group for the interviews. The leaders who happened to be available were included. The selection of schools and participants is therefore made based on strategic and pragmatic considerations. The data basis and procedures are also described by Sekkingstad and Glosvik (2022), but the analysis is extended in this text.

Focus group interviews can bring out a variety of experiences. Participants comment on and challenge each other's understanding, which can contribute to a richer data material (Brinkmann & Tanggard, 2020; Krueger & Casey, 2015). Agreement or a shared understanding of the topic is not the goal, but that collective perceptions may come to light (Kamberelis & Dimitriadis, 2011). Two researchers were present in the interviews as moderator and assistant moderator. All participants were ensured speaking time. The first round of interviews was conducted at the participating schools in the spring of 2018, and the second round in the spring of 2019. There were 22 participants distributed across the five focus groups in each round, with the group sizes ranging from two to seven participants. A thematic semi-structured interview guide was the starting point for the interviews. The main topics are described by Sekkingstad and Glosvik (2022). The flexible structure allowed for adjusting the topics as the conversation progressed (Thaagard, 2018, p. 91). The interviews lasted 45–70 minutes and were stored as audio recordings before transcription. The leadership groups are named A, B, C, D, and E and marked with the year, although the year is not important in the analysis. Although the data collection was conducted in two steps, the empirical material in this text is considered as a whole. In line with the focus group interview method, the quotes refer to groups, not individuals.

Interviews, transcriptions, and analysis were in Norwegian, and quotations used to illustrate the findings have been translated into English.

Analysis

The study is anchored in a hermeneutic perspective (Gadamer, 2007). From such a starting point, the researcher engages in a dialogue aimed at new understanding. The material is examined descriptively, through inductive empirically-close coding (Tjora, 2017, pp. 196–198). To reduce the scope of the data material, the analysis was done in several phases. In the first phase, we read each interview and conducted a thematic analysis (Thaagard, 2018, p. 171) where we initially identified three themes discussed and presented by Sekkingstad and Glosvik (2022). In the second phase, we searched for leadership practices across the original themes, and the three categories emerged: 1) leadership as operation, 2) leadership through system and plan, and 3) systemic leadership (Sekkingstad & Glosvik, 2022). In this text, we elaborate on a third, more deductive analysis step, where the three categories are used as analytical tools to examine the same

data material more closely. Here, we partially reinterpret the same categories as in Sekkingstad and Glosvik (2022), and partly present new categories in Table 1.

Ethics and methodological considerations

As explained by Sekkingstad and Glosvik (2022), the study is approved by the Norwegian Centre for Research Data (NSD). The applicable research ethical guidelines are followed (The National Research Ethics Committees, n.d.). In all parts of the research process, we have tried to integrate research ethical considerations (Kvale & Brinkmann, 2015; Tjora, 2021). When presenting the project, we emphasised voluntary participation, anonymisation of material, and the participants' right to withdraw from the study. In addition, we have reflected on our dual roles in relation to the schools. One of us has had teaching responsibilities in the further education programme in YFL. The task as researchers has not been to control or assess to what extent the leaders followed up on the intentions of YFL. This was emphasised in the interviews. We wanted to avoid reinforcing the asymmetry between researchers and interviewees in qualitative interviews (Kvale & Brinkmann, 2015, pp. 51–52). Impressions from the focus group interviews are that the participants were honest, with a low threshold for expressing their own experiences. Data collection was carried out by Dorthea Sekkingstad and colleague Ingrid Syse, while the analysis work has been conducted by the authors. We have conducted what Denzin (1989) calls 'interpretive interactionism,' which provides a richer and more nuanced analysis process. Such colleague validation can contribute to reflection on proximity and distance by having a colleague with an outsider's perspective. This can counteract potential blind spots and preconceptions when one is close to the field (Repstad, 2002, pp. 210–211; Wadel, 2014, p. 72).

The findings of the study are presented as three overarching pictures or hypotheses of parallel leadership practices in the five upper secondary schools. These are abstract sketches that distill the findings and combine fragments into a whole that in reality is far more colorful than we describe. Such images can be generalised beyond their own context to the extent that they elicit recognition.

Results: Three parallel leadership practices

We first provide an overview of the findings in the form of a table that should be read as follows: The three leadership practices form the main structure for presenting the empirical findings (Column C). In light of the three sub-questions in Column A, the findings are organised so that Column B shows the nine empirical categories that have emerged from the material through analysis. The coloured cells in the table highlight the findings of the study. We will explain these in more detail further on.

Table 1. Overview of findings, organised by leadership practices and sub-questions.

A) Three Sub-questions	B) Categories	C) Three Parallel Leadership Practices		
		1. Leadership as Operation	2. Leadership as Plan and System	3. Systemic Leadership
Interpretation of YFL as Development Initiative	Recruitment and Selection of Participants	YFL is about making everything fit together	Both individual motivation and organisational needs	It's about pedagogy and didactics
	Connection to the County Council	The County Council as a Mediator	It's about being part of a hierarchical system	It's about larger contexts
	Relation to Higher Education	Higher education is a supplement	It's about concrete, practical updates	Higher education can be a development partner
Interpretation of YFL as Knowledge Sharing	Effect of Continued Education and Training Here and Now	It's a question of updating	It's a question of tools for problem-solving	Shared experiences and language create bridges for collaboration
	How Knowledge Transfer is Believed to Occur	Knowledge sharing happens naturally through 'contagion'	Knowledge sharing can also happen through formal structures	Knowledge sharing through team-building around the students
	View on Competence Development	The goal of competence development is to meet formal requirements	The goal of competence development is higher quality in subjects	The goal of competence development is the student's learning
Perception of the Connection Between Leadership and Collective Learning	What is Seen as the Learning Arena	External courses are the learning arena	The department and subject group are the learning arena	The workshop is the learning arena
	Who is the Learning Unit	Individuals are the learning unit	The school is the learning unit	Teams are the learning unit
	View on Collective Leadership	It's about functions and tasks	It's about developing roles and distribution of responsibilities	It's about the leadership group as a team

Management as operation

When the leadership groups are asked about recruitment to The Vocational Teacher Training Initiative Programme (YFL), a practice with a strong emphasis

on operation becomes apparent. Recruitment becomes a matter of interested teachers coming forward. They talk about being confident that everyone is informed, referring to the county's intranet and emails from the county administration. However, there are exceptions to voluntary recruitment: 'We had a redundancy situation, so we specifically encouraged those teachers to apply,' one leadership group explains (D, 2018). Beyond this, recruitment is described as 'a bit random' (D, 2018), based on who is interested and how many the school can send. 'We can't have too many, then we become vulnerable' (D, 2018). The challenge is to find substitute teachers: 'We have to manage the school day at home.' In reality, it works as described by two leadership groups: 'You know how it is with secondary schools and application numbers, redundancies, economic fluctuations in the industry…' (B, 2018). 'It's difficult to make the schedule fit together, we have to consider practicalities' (D, 2018).

According to this practice, the county primarily acts as an information disseminator and an extended arm of the local management. Communication is described as 'good and orderly' (B, 2018), the county is 'good at conveying information' (A, 2018) and 'answering questions' (B, 2018). At the same time, the amount of information is large, and it can 'be difficult to sort out' (D, 2018). 'You have to be alert because you have to keep up' (C, 2018). It can be 'challenging to navigate all the offerings, financing, substitute arrangements, and scholarship opportunities' (B, 2018). They are concerned that the content of YFL contributes to providing participants with professional updates on central topics in pedagogy and didactics. Relevant professional literature and research are highlighted as important. Leaders hope that participation in continuing education can lead to 'more realising that they actually need some input' (C, 2018). Some mention teachers who do not function well enough in the role of class leaders, and 'We have teachers who do not know what assessment for learning means' (A, 2019). These teachers thus violate current regulations, and in this leadership practice, it is hoped that continuing education offers will eventually correct this.

In this practice, there is an expression of belief that participants can function as resource persons in the teaching staff: 'I think it provides a very good learning effect for the rest of the staff when their own come and tell them, and not us in the management,' says one leadership group (A, 2019). Especially, they believe teachers can serve as good role models for each other: 'When they see good examples from other teachers. That's the way we must go, we must use the teachers' (A, 2019). According to this practice, it is argued that there will automatically be a natural transfer of knowledge: 'Teachers work closely together, they are integrated into each other's daily lives […] of course, it trickles down, it is transferred from those who have educated themselves to those who have not..', and '…others pick up some good tips' (A, 2018). This happens

naturally when teachers share offices, collaborate on teaching in, for example, the same subject and the same student groups is one view: 'One can draw some of the effects from them being so close together' (B, 2018). 'The setups one teacher tests with the students, the other teacher necessarily gets part of' (C, 2018).

In this practice, there is a focus on individual teachers and addressing those who lack formal teaching competence. These '…craftsmen and those who come from industry […] the first thing we talk to them about is competence development. It means setting requirements for them to take the education they lack' (D, 2018).

Competence development is understood as teachers participating in external courses, away from colleagues and students. This is also primarily the type of opportunity teachers ask for and expect leaders to facilitate: 'And regardless, in vocational subjects, we can't get away from the external thing. Just to take those for construction machinery. They travel to Germany every other year because it's Germany that makes the trucks and buses and tractors […]. They want to go there' (D, 2018).

Here, it is primarily expected that the individual teacher 'has expanded their toolbox in relation to teaching, and […] developed as teachers' (C, 2018). It is put this way: 'I have expectations that they do it in a better and more correct way than perhaps they did before. To promote learning for the students, of course' (A, 2018).

Leadership is primarily seen as functions following the formal, hierarchical structure of the school. Department heads are central, with responsibility for 'their' teachers and their tasks. A principal emphasises the hierarchical chain of command by saying that no teachers should come to his office without having spoken to the department head first (E, 2019). Department heads also talk about 'my teachers and your teachers,' says for example E (2018).

Leadership as plan and system

It is primarily the individual department head who makes the decision about who will participate in YFL. Principals also delegate the responsibility regarding participants' roles as resources within their own departments. Additionally, as A stated in 2018: 'It is the department heads who make plans for how they will work with and implement development work in their department.' Leadership group A showcases here the leadership practice of 'plan and system,' where the search for voluntary participation is further emphasised, but there is also reflection on the advantages of recruiting participants from the same department versus participants from different departments for the same further education. It '…can […] be easier to spread knowledge when they are from the same department,' said C in 2018. Together, participants can serve as a resource within their own department. The advantage of choosing participants across

departments is to '…break down barriers between departments and make the thresholds lower' (E, 2018). School D had an organic view of collaboration constellations that can emerge without the leadership needing to facilitate experience sharing through planning: '…but here we would get it for free, and hopefully it would provide something afterward' (D, 2018). Following this practice, some leaders would emphasise prioritising younger teachers who are more likely to stay at the school for many years to come.

In this leadership practice, there is a desire for stronger guidance from the county level. One leadership group would have preferred clear guidelines on buyouts and financing: 'It is unfortunate that there are so many models […]. The county should handle this more' (B, 2018). It is believed that offerings are nevertheless 'controlled by the county, by what they have funds for […] which teacher groups and competency areas they want to strengthen' (B, 2018).

In the plan and system practice, emphasis is placed on YFL having a good connection between theory and practice and that this contributes to professional updates: 'Continue with education programmes directed towards teachers' daily lives, that they should try things out in practice, so it does not become very theoretical, but that it is both. I believe that is the way to go, that they experience the immediate benefit of the education' (C, 2018). If the education is perceived as useful, this will lead to the spread of knowledge to the rest of the staff (D, 2018). Additionally, when participants must try something in their practice, these are 'tools that are used […]. It is clear that the further education on Assessment for Learning has given these teachers a boost and push in the right direction' (E, 2019). 'And when they experience doing something well in a class, they take it to the next class. They want the students to experience that the assessment practice is consistent' (C, 2019). When asked about how the leadership has used these teachers as resources within their own staff, it is argued that 'knowledge sharing happens informally, so the leadership does not necessarily need to do anything' (C, 2018). This statement is illustrative: 'So far, we have not done much. We will see a bit over time, I think' (B, 2018). Others say: 'We are not necessarily good at such things […] to pull those threads, to spread this to many more' (C, 2019).

Knowledge is framed as tools individuals have learned outside the school. Transfer happens through informal sharing but within the same unit. The school leaders do reflect on how they can facilitate structures for knowledge sharing. Among other things, through common meetings and departmental meetings. However, 'we have tight meeting schedules, which perhaps dampen […], but it is something we are working on' (C, 2018). The use of planning days and regular departmental meetings is highlighted as a potential by everyone. The challenge for most department heads is finding time for common meeting points for departments and teams: 'It should have been scheduled a free hour when I could

organise a weekly meeting in the timetable. Then I could have worked more systematically with it' (D, 2019).

Many of the teachers in vocational education programmes have a strong subject focus and demand competency development within their own field: 'The vast majority wish for subject-specific courses […] Electricians want courses in electrical subjects, mechanics want mechanical courses' (C, 2018). 'That is, they do not think about the student; they think about the subject' (C, 2018). This is not a leadership practice but a practice among the teachers.

The individual department is perceived as the learning arena in this practice. Subject similarity, shared cultures, and student groups are highlighted as good starting points for knowledge sharing. Shared context is seen as a basis for relevant knowledge about their own subject and teaching practice: 'The English teacher must get to talk about their subject, and the Norwegian teacher the same way, etc. […] Good discussions […] close to the subject and the challenges they have in everyday life' (C, 2018).

In the plan and system practice, the collective appears stronger than in operational practice, although the experiences are not always good. All schools point to experiences with common meetings across departments. Here, 'everyone […] hears the same thing' (C, 2019). However, this is only partially a functioning arena for knowledge sharing, partly because 'we have little time if we are to gather everyone in a large auditorium, we are so large and fragmented' (C, 2018), or because 'we are a mixed group […] two cultural differences apply: The vocational part and the common subject part […] and there are different cultures within all those subjects as well' (D, 2019). It is difficult to know how things are received and develop: 'It is not always successful to open for dialogue' (C, 2018). Leaders also have mixed experiences when it comes to the content of common gatherings and follow-up in the departments.

In management as operation, the dominant view is that responsibility and tasks follow the formal organisation, but within the system and plan, we also find examples of discussing tasks and the division of work across departments. One example is challenges related to many teachers wanting to participate in YFL. Another example is the use of employees' expertise across departments: 'how we shall have systematic exchanges and build a sharing culture across departments' (B, 2018). Here, competency development also becomes a question of organisational development.

Systemic leadership as leadership practice

The systemic practice views YFL as more than just replenishment and professional updating; it is also a good measure to strengthen competence in pedagogy and didactics: 'Vocational education has had a strong focus on the subject and pedagogy is just some thing […] In other words, they [the teachers]

do not think of the student, they think of the subject' (D, 2018). Especially the need for competence in classroom management and assessment for learning is highlighted: 'It is good that such offers are being established' (A, 2018). Strengthening competencies in pedagogy and didactics through participation in YFL also provides value beyond the competence of individual teachers (E, 2019). The focus on pedagogy and didactics is relevant to everyone and can create professional communities across subject departments.

Many mention that they see a connection between the content of further education and the school's development plan. The offers through YFL are interpreted as contributions towards achieving goals: 'We had three themes that the student survey showed we were not very good at. And then […] YFL fit so well' (D, 2018). Everyone wants to become better at driving development: 'It is something we are working on to improve,' says, for example, A (2018). Practice-oriented educations with trying out tools in one's own practice and linked to competence development in the workplace are believed to be the right way forward, and it is highlighted that colleagues can be partners and support schools' development work. How, however, should one proceed? 'We have a goal of starting with colleague visits […] but there is a lot of resistance […] so sometimes we are a bit unsure, a bit unsure of how we can proceed in the smartest possible way, […]. Good suggestions, we could perhaps benefit from' (D, 2018). It is mentioned that the university college could be more physically present in the development work: 'Preferably […] to provide guidance' (E, 2018). Action research is also mentioned in this context.

In this leadership practice, shared experience is used as a possible explanation for the enthusiasm and engagement of those who have participated in YFL. A school leader says: 'I have not experienced it before, in that way. This has grown as a result of further education' (C, 2019). The engagement is shown, among other things, through initiatives for collaboration across the subjects and teams. The start of reading circles is another example. Leaders point out that participants develop a shared professional language that builds bridges for collaboration. To several who over time have the opportunity to participate in the same further education 'several teachers share a common professional language […] In the long run, the development of a common language will give an organisational effect' (E, 2018).

The systemic leadership practice highlights knowledge-sharing through teams as a good alternative to large common meetings. This is particularly true for one of the schools, where it is emphasised that in the teams, which are smaller units where teachers work closely, those who have participated in YFL find a natural arena for sharing knowledge: '…there is more room for pedagogical discussions and knowledge-sharing' (E, 2018). 'Sharing of knowledge, this happens in the work in the teams with a focus on the student's learning […] I spend a lot of time

assembling good teams,' says E (2019). Thus, in this practice, the group level is highlighted as the place for knowledge-sharing.

While many teachers want and expect offers for competence development within their field, the systemic leadership practice sees the need for competence development related to pedagogy and didactics: 'One of the tasks I spend a fair amount of time on is talking about […] that they should transition to a new profession called teacher. That is, pedagogue' (C, 2018). This practice ties the need for competence development to: '…the individual student and adapting the teaching to the student's conditions' (E, 2018). This leadership group also emphasises that teaching should lead to 'students learning to learn, so we can prepare them for the future.'

While the other two practices highlight the individual and the school as learning arenas, the systemic practice also highlights the workshop, both in physical and abstract terms. Primarily the workshop is described as a physical classroom where students get practical training, often through interdisciplinary exercises. In this arena, teachers collaborate on teaching: 'They are working on a project in the workshop, and then one teacher can go out, and another can come in […]. You know that overlap there. They talk about it together, they evaluate together […] of course they discuss in the backroom' (A, 2019). The workshop is described as a place: 'where learning grows from the student and the tasks' (B, 2018). 'Workshop' is also associated with leaders' experiences related to joint projects across subjects. This requires cooperation on concrete problem-solving among students and teachers across programme subjects and subject areas. This stimulates teams of teachers and students to shared learning: 'A common methodology is developed with interaction between different subject and knowledge areas […] subjects are used as tools in the process' (E, 2018). If the school lacks the competence to solve the tasks, external expertise is brought into the workshop and included in the context where the knowledge is to be used and developed. 'The workshop' thus becomes a metaphor for the workplace in this leadership practice.

In this practice, assembling teams around a group of students is described as a good approach to creating learning units. By planning the timetable, a close collaboration in teams is facilitated, and '…it is a way of leading' (E, 2019). 'We must work to create good teams […] We want to reduce the number of teachers around the students' (E, 2018). This is done by assembling teams of core teachers who will have all the teaching directed towards the student group. The team takes collective responsibility, says E (2018). Tasks are solved in the team by teachers collaborating on facilitating students' learning. One of the informants has an important reflection here: 'There are two ways to organise the school, either around subjects or around students. The academic subject is important, but it is not the most important. The most important is the social aspect around the

student, collaboration with parents and colleagues' (E, 2019). When teachers have more teaching hours in the same student groups, on the same team, this will also affect the teacher: 'intuitively, one puts more effort into creating a good learning environment, also for oneself […] teams can function as good working and learning communities' (E, 2018).

Generally, there is a reflection among the informants that too much leadership time is spent on operation. For example: 'There is too little focus on pedagogy in the school leadership of the upper secondary school, at least in our school' (E, 2019). Nevertheless, we find some examples of a systemic practice where there is reflection on leaders as a team, exercising collective leadership: 'We are in a process where there is a dynamic in the leadership group. We try to find the essence in some things […] We can talk about values, […], so we need to talk about what should be common for us' (E, 2018). This requires 'hard work over time […] and there is no quick-fix' (E, 2018). One of the leadership groups has good experiences with participating in the same further education as their teachers: 'We have just started on Assessment for Learning for leaders […] It helps build the school's capacity for change' (A, 2019). This is about the development of leaders needing to be in sync with the competence development of teachers.

Three parallel leadership practices affect knowledge sharing

As stated in the introduction, Sekkingstad and Glosvik (2022) previously identified three parallel leadership practices that organise this text. By using these as lenses to reinterpret the same data material, the impression of parallel leadership practices is reinforced. Short-term operational issues dominate the agenda in 'leadership as operation.' 'Leadership through system and plan' is more comprehensive, with the school organisation becoming more apparent. Sekkingstad and Glosvik (2022) referred to the third leadership practice as 'systemic' because it emerged from reflections on interconnections. This is a practice that views didactics and students' learning needs as the central turning point for school leadership. In a pointed way, the first leadership practice places the teacher at the center, the second the school as an organisation, and the third the students' learning. We will elaborate on this.

Can we, in light of these practices, discuss whether upper secondary schools can be learning organisations? Pedler et al. (1997) have discussed this in a way that can shed light on our findings. As stated in the introduction, the driving forces for learning and development are discussed by these authors in the form of leadership as survival, leadership as adaptation, and sustainable leadership. The latter we in this study call 'systemic leadership' based on the empirical

material. We will discuss the findings in light of these concepts and thinking, while simultaneously answering the three sub-questions.

Leadership as operation – leadership as survival?

The first level, 'survival,' involves developing basic routines and processes that handle challenges as they arise. Pedler et al. (1997) call it firefighting-based learning (p. 97), and it seems to be what we have observed through 'leadership as operation.' The authors further develop this idea into what they call 'attitudes' toward learning, quality, and development. Attitude 1 in this context means doing things right, following procedures, systems, and established methods. Structures and overall methods are designed outside and above the leaders who try their best to live up to what is expected.

To survive YFL?

The first sub-question is to what extent varying leadership practices in upper secondary schools affect the interpretation of such development initiatives as YFL. The answer is yes, to a large extent. When YFL is on the agenda, with the requirement that three teachers from each school participate in the educational offerings, this is interpreted within 'operation as leadership' as a question of managing the teaching schedule, of surviving day-to-day operations. In situations with scarce teacher resources, it is about quality in teaching here and now. Absent teachers become a problem. Generally, participation otherwise becomes a question of the individual teacher's motivation. Exceptions are related to surplus staff, where YFL is used as an emergency solution to postpone the loss of teaching staff. We see a clear alignment with Pedler et al.'s (1997) concept of 'firefighting' at this point. The county council organisation is perceived in light of this practice primarily as a provider of information about the educational offers, and it is expected that the teachers themselves stay informed about the offers through established communication channels. Within the practice of leadership as operation, external educational offerings are referred to as 'refill,' and it is reasonable to interpret this as a perspective on knowledge where the individual teacher's basic education needs updating in relation to new literature and research. 'Knowledge development' becomes an individual question related to existing subject and knowledge structures. Again, this aligns with the notion of attitude 1, and in leadership as operation, existing knowledge, organisational, or power structures are not questioned. The focus is on surviving and adhering to what comes from outside.

Facilitating learning of minimun standards?

The second sub-question was whether variations in leadership practices affect the facilitation of knowledge sharing. Within the practice of 'leadership as

operation,' the offers in YFL are linked to an understanding of knowledge as something 'you fill up' in the teachers, or that teachers are 'updated.' The goal of competence development is to meet formal requirements for teachers coming from industry. Again, we see alignment with Pedler et al. (1997). Standards for quality are something that comes from outside, and leadership as operation will be about meeting these. To the extent that there is a view on knowledge sharing in leadership as operation, it is seen as an idea of natural contagion, a kind of more or less conscious perception of socialisation and copying as the main learning mechanisms in upper secondary education. These are fundamental processes in social systems, and in line with what Pedler et al. (1997) call the first level of learning in organisations.

Managing established knowledge?
The third sub-question dealt with how the leadership groups perceived the relationship between leadership and collective learning. Within 'leadership as operation,' individuals appear as the most important learning unit. It is the individual teacher who acquires knowledge – gets 'refill' – through external courses. It is the courses outside the organisation that are the learning arena. In line with Pedler et al. (1997), leadership in this practice is linked to the operational responsibility for units, functions, and tasks according to the organisational structure. The link between leadership and collective learning becomes a question of the distribution of responsibility within formal structures and whether these provide individuals in the organisation with access to relevant updates in light of what they already know. Pedler et al. (1997) do not explicitly discuss the latter, but what they call attitude 1 involves precisely the management of the established.

Leadership as plan and system – to improve things?

The second level Pedler et al. (1997) call adaptation, or that organisations continuously adapt their routines, knowledge, and actions in light of how they interpret changes in their environment. Attitude 2 they call 'making things better.' Here, leaders are concerned with learning and training because it is the way to continuously improve their own units. In the practice 'plan and system,' such a broader perspective on change and learning becomes evident.

Concrete and practical improvement?
In this practice, participation in YFL was both a question of individual motivation and organisational needs, consistent with the idea of improvement. The ideal participants are younger teachers whom the school can count on for many years. We get a picture of the school as part of a larger, county-level hierarchy, where top-down control is accepted and sought after. Knowledge from outside, through

YFL, is considered good when it is 'concrete' and 'practical,' or according to Pedler et al. (1997), making things better. This must be understood in an organisational context: YFL and other offerings from higher education are seen as possible tools for solving academic challenges in schools.

Seeking systems for improvement?
At level 2, Pedler et al. (1997) state that the focus is directed towards challenges from outside, and new knowledge is then seen as measures for potential improvement. Within the practice 'plan and system,' academic offerings like YFL are seen precisely as access to new tools for problem-solving. This should be understood as teachers acquiring new knowledge, also linked to an understanding that the goal of competence development is about higher quality in the school's subject areas. Within the practice, we also see, consistent with attitude 2, ambitions to make schools arenas for knowledge sharing. Active leadership of knowledge transfer can be part of the practice.

Is knowledge sharing something leaders actively do?
The third sub-question dealt with the relationship between leadership practices and the view on collective learning. The practice 'plan and system' appears to deal more with attempts at more active adaptation. Departments or subject groups are seen as learning arenas, and there is a belief that facilitating the use of knowledge in this context is central. As we mentioned above, efforts are made to make the school a place for knowledge sharing. Although the initiatives are not always perceived as successful, it makes the school more clearly the learning unit, or rather the unit that is the focus of active leadership practice. The practice is also characterised by formal functions and tasks, but consistent with attitude 2, also discussions about role development and changes in the distribution of responsibility. Competence development is linked to organisational development in this practice. The organisation is attempted to be adapted to new knowledge.

Systemic leadership

When Pedler et al. (1997) use the term 'sustainable,' it means that organisations create their own reality through symbiotic relationships with the environment. They are actively acting, interpreting, and creating. This is recognised in the practice we call 'systemic.' The authors speak about leadership attitude 3, 'doing better things together.' This attitude involves a focus on partnerships, collaboration, customer focus, and/or users. This is consistent with the observation of a practice where students' learning needs become the focus of the upper secondary school's attention.

Students focus as shared value in a school community?
Within 'systemic leadership,' the sub-question about interpreting YFL as a development initiative is consistent with leadership attitude 3, linked to students, pedagogical and didactical challenges. Student focus can unite schools across subject and departmental lines, or lay the foundation for common visions, a term Pedler et al. (1997) also use. The relationship with the county municipality is also characterised by a more overall coherence, where the offers are seen in light of what Pedler et al. (1997) call a broader dialogue. In our context, we see that both student surveys and development plans are part of such thinking, which also influences the attitude towards higher education. YFL offers are part of an understanding of, and a desire for, higher education as a partner in the development of the school. 'Knowledge' is something more than the individuals 'knowing' something, or possessing new 'tools.' It approaches knowledge as something created in interplay between higher education, teachers, and students.

A leadership practice for symbiotic knowledge sharing?
The practice 'systemic leadership' viewed YFL as an initiative where participants gain shared experiences and develop a common language that creates bridges for cooperation between units and subjects. This was linked to a perception that the goal of competency enhancement is students' learning, not just a renewal of teachers' subject knowledge. This is a way of thinking that actually only characterised two leadership groups, but there the student perspective was clear. Teachers should see themselves as teachers, not subject specialists. In this practice, teambuilding around students was also highlighted as the means to knowledge sharing.

Leaders as facilitators for teambuilding?
The practice 'systemic leadership' identified 'the workshop' as a learning arena, both in a concrete and an abstract sense. Here it was pointed to the reality-based activity characteristic of vocational education and how external knowledge had to be applied there where students and teachers gathered around concrete projects and problem-solving. The practice also emphasises teams as the learning unit. Teams represent the group level in organisations, as an alternative to individuals and the formal organisation. Reflections about the leadership group as a team can be identified, and that leaders in vocational education can develop in the execution of their roles in practice. The link between leadership and collective learning runs through dynamic group processes at both leadership and team levels, not just through the teachers or the formal school organisation. Pedler et al. (1997) mention that attempts at collective responsibility building can be a hallmark of attitude 3.

Pedler et al. (1997) say that the three leadership attitudes survival, adaptation, and sustainable are intertwined. We call sustainable 'systemic,' but only one of the leadership groups in the five upper secondary schools reports such a practice. The data is not unequivocal, and another leadership group may have had elements of such thinking. This still points to the likelihood that variation may be common.

Concluding discussion

The Vocational Teacher Training Initiative Programme (YFL) was based on the idea that workplace-based competence development has greater potential for school development than further education for individual teachers (Hargreaves & O'Connor, 2018; Helstad & Møller, 2013). Nonetheless, the requirement from The Directorate for Education and Training that at least three teachers from each school should participate in the same continued education (The Directorate for Education and Training, 2016, p. 3) disappeared quite quickly and was replaced in 2019 with the conventional focus on individual learning for each teacher (Glosvik & Sekkingstad, 2024, p. 43). This aligns with Fullan's point (2010) that individualistic strategies tend to dominate development measures in the school system.

Many studies emphasise the crucial role of principals being closely involved with their staff when developing the professional learning community at school (e.g., Aas & Vennebo, 2021; Sekkingstad et al., 2024). This study also shows that leadership practices in leadership groups can play a role. Sekkingstad and Glosvik (2022) and Glosvik and Sekkingstad (2024) write that systemic leadership practices allow for the work methods and mindsets that teachers acquire through further education and training to actually be used in a collective context. We have not used 'professional learning communities' as an analytical concept, but it has been pointed out that difficulties in building such learning communities in upper secondary schools can be related to both the size of the schools, departmental organisation, strong individual orientation among teachers (Aas & Vennebo, 2021; Rokkones, 2017), and weak traditions for collaboration (Huffman et al., 2016). This study shows that such factors can promote the dominant leadership practice known as 'management as operations.' Nevertheless, we saw that one leadership team had developed a mindset where 'workshop,' 'teacher team,' 'functional project,' and 'leadership teams as teams' appeared as an infrastructure for learning, which Senge (2006, p. 322) calls it.

Sølvik and Roland (2022) argue that facilitating collective learning is linked to systems thinking and sensitivity to the school context. The principal has a direct influence on collaborative teacher teams, and the teacher team has a direct impact on what happens in the classroom (DuFour & Marzanoa, 2011, p. 54–55). When

we observe school leaders talking about investing time and effort in assembling good teams for problem-solving around tasks and students, they act as what Pedler et al. (1997, p. 99) call 'leadership midwives,' facilitating workplace-based learning. Hargreaves and Fullan (2012) emphasise that leaders can support processes that clarify content, roles, and goals for collaboration among teachers. They also highlight that structural support through the facilitation of meeting time and group composition is important. Such thinking was observed within the practice called 'management as a plan and system.'

An infrastructure for learning in vocational education will consist of productive links to external knowledge environments, but it does not necessarily need to be limited to higher education. A variety of arenas or contexts promoting the development and use of knowledge surrounding student learning can be envisioned. This is one of the main messages when Paulsen (2019) writes about strategic school leadership, where collaborative leadership is presented as important. Paulsen believes that middle management in vocational education will be essential, but a comprehensive learning community that promotes student learning requires collaboration between both the principal, department heads, subject leaders, vocational teachers, and various parties in the workforce. Perhaps what Paulsen calls strategic, collaborative school leadership is the same as what we refer to as a 'systemic leadership practice.' He also describes vocational education as an extreme variant of a loosely coupled system (2019, p. 105). This reference to Weick's classic text (1976) leads us, like Paulsen (2019) and Sølvik and Roland (2022), to point out that systems thinking can contribute to understanding how close ties between external knowledge enterprises, companies, teams, and workgroups constitute the infrastructure for learning in upper secondary schools.

Conclusion

The research question in this study is how varying leadership practices can influence knowledge sharing in vocational education. We have identified three distinct practices: 'leadership as operations,' focusing on the teacher, 'leadership as a plan and system,' centered on the school as an organisation, and 'systemic leadership,' focusing on student learning.

The main findings are that the three leadership practices significantly influenced the interpretation of the YFL development initiative, which in 'operations' became a matter of the teaching schedule here and now. External education offerings became 'refills,' and knowledge development was an individual matter related to existing discipline and knowledge structures. The goal of education was to meet formal requirements for the teaching staff. In 'leadership as operations,' knowledge sharing appears as a natural 'transmission'

between individuals, with each teacher acquiring knowledge through training outside their organisation as the learning arena. The relationship between leadership and collective learning is a matter of responsibility distribution within formal structures.

In 'leadership as plan and system,' external knowledge is considered good when it is 'concrete' and 'useful.' Offers from higher education are perceived as possible tools for addressing academic challenges. The goal of competence development is higher quality within the school's academic areas, with the ambition to make schools arenas for knowledge sharing through organisational leadership. Competence development is linked to organisational development in this practice, with the organisation being adapted to new knowledge.

In 'systemic leadership,' students' learning needs and pedagogical and didactic challenges take centre stage. A student focus can unite schools across discipline and departmental boundaries. YFL offerings are part of an understanding and a desire for higher education to be a cooperative partner in school development. 'Knowledge' is more than individual proficiency or new 'tools.' YFL was about shared experiences and common language creating bridges for cooperation between units and disciplines. The aim of competence enhancement is student learning, not just updating the teachers' subject knowledge. Team building around students is highlighted as the means for knowledge sharing, identifying the 'workshop' as a learning arena in both concrete and abstract senses. The link between leadership and collective learning goes through group processes at both the leadership and team levels, not just via teachers or the formal school organisation.

The first practice dominates in the upper secondary schools included in this study, while the third, 'systemic leadership,' was clearly visible only in one school, although elements were noticeable in another. Despite this, the study shows how conscious organisation of further education and training for teachers can stimulate development work in upper secondary schools, but collective learning is also influenced by leadership practice at each individual school. A conclusion is that practice is something not primarily tied to the individual but to the group level. However, we cannot conclude from this study what hampers and promotes one leadership practice over another, but this appears as a clear theme for future research.

Notes on contributors

Øyvind Glosvik is a Professor at the department of Pedagogy, Religion and Social Studies, Faculty of Education, Arts ans Sports, Western Norway University of Applied Sciences, Campus Sogndal. His research interests are shool leadership and learning in organisations.

Dorthea Sekkingstad is an Associate Professor at the department of Pedagogy, Religion ans Social Studies, Faculty of Education, Arts ans Sports, Western Norway University of Applied Sciences, Campus Sogndal. Her research interests are mainly in shool leadership, mentoring and professional learning and development.

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